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INDIAN IRON & STEEL SECTOR SKILL COUNCIL

Facilitator Guide

Sector
Iron & Steel

Sub-Sector
Steel, Sponge Iron, Ferro Alloys

Occupation
Mechanical Maintenance

Reference ID: **ISC/Q0906, Version 1.0**
NSQF Level: **3**

Bearing Maintenance

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Disclaimer

"Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission."

Shri Narendra Modi
Prime Minister of India

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Certificate

COMPLIANCE TO
QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

Indian Iron & Steel Sector Skill Council

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: ' Bearing Maintenance ' QP No. ' ISC/Q0906 NSQF Level: 3 '

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ALL INDIA STEEL REROLLERS ASSOCIATION

About this book

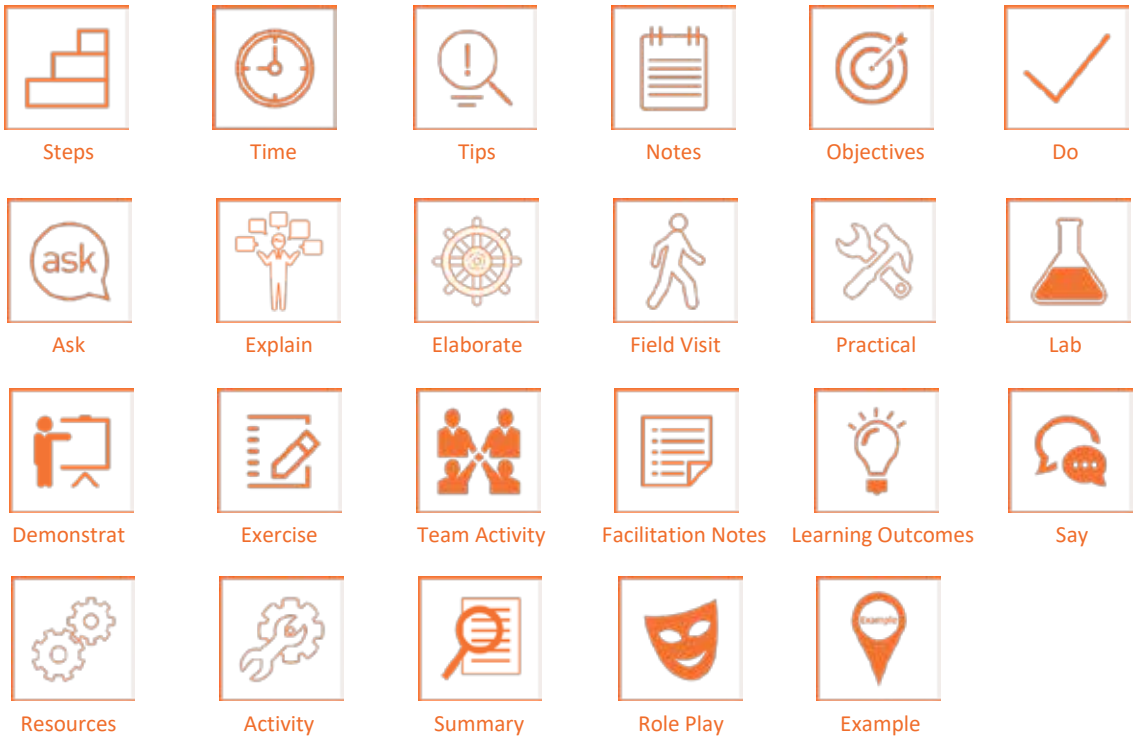
This Facilitator Guide is designed to enable training for the specific Qualification Pack (QP). Each National Occupational (NOS) is covered across Unit/s.

The job is to inspect, identify the problems in the equipment, rectify the root causes for e.g. leakages, replaces the bearings, lubricates the bearings, and ensures fitness of all types of bearings in the plant and carry out routine maintenance.

This job requires the individual to work independently as well as in teams. He should be physically fit, not having color blindness, having analytical skills, problem solving attitude, high concentration levels and willingness to work in a factory environment.

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS. The symbols used in this book are described below.

Symbols Used



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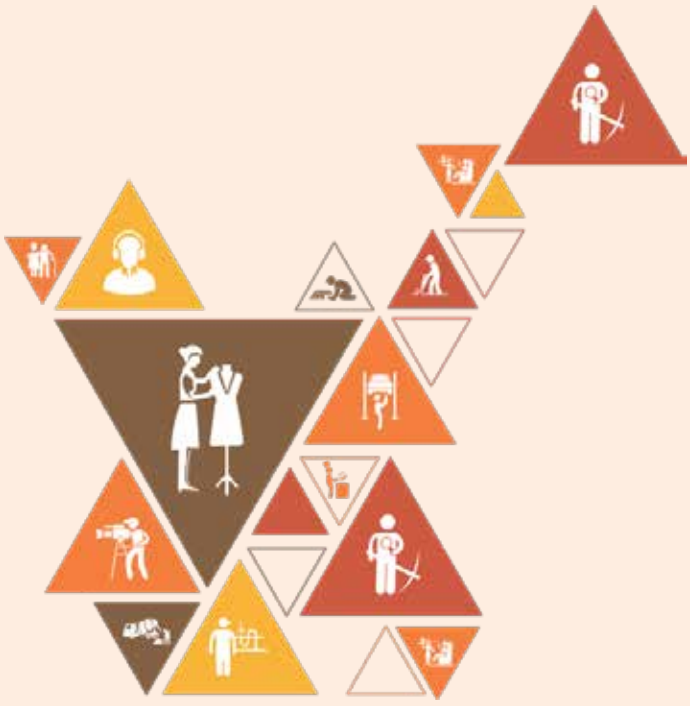
1. Introduction

Unit 1.1 - Understanding of Iron & steel industry

Unit 1.2 - Understanding various types of Iron & Steel Industry

Unit 1.3 - Creation of products in Iron & Steel industry



Key Learning Outcomes

At the end of this module, you will be able to:

1. Discuss about Iron & Steel industry
2. Discuss about development activities in Iron & Steel industry
3. Discuss about employment opportunities in India
4. Know about industry structure
5. Know about Iron & Steel plants in India
6. Know about steel making procedure
7. Know about processes involve in steel making

UNIT 1.1: Understanding of Iron & Steel Industry

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about Iron & Steel industry
2. Discuss about development activities in the industry
3. Know about opportunities in Iron & Steel Industry in India

Resources to be Used

- Invigilator can use the available objects such as a marker, duster, pen, notebook etc.

Do

- Take a parcel, mention some details such as student name, hobbies, likes, dislikes etc.
- Make the students stand in a circle, close enough to the person each side of them that they can
- Pass the parcel quickly.
- Say 'Stop' when the students least expect it. The person who has the parcel at that time should get out from the class.
- Those who get out should introduce themselves by providing the details mentioned in the parcel.
- The winner of the game should stand and introduce himself/herself at the end of the game.
- At last, say thank the students for their participation.

Say

- India comes under the list of world's largest crude steel producer countries.
- Crude steel capacity of India reached 109.85 Million tonnes (MT), with a growth of 7.4 per cent.
- Requirement of large amount of iron ore and coal for production of steel.
- According to the data, the Indian metallurgical industries attracted Foreign Direct Investments (FDI) of around US$ 8.7 billion.
- Indian government is aiming to increase steel production to 300 MT by 2025 in the country.

- The Ministry of Steel is facilitating setting up of an industry driven Steel Research and Technology Mission of India (SRTMI) in association with the public and private sector steel companies to spearhead research and development activities in the iron and steel industry at an initial corpus of Rs 200 crore.
- The total employment in the steel industry is more than 2 million which includes both direct and indirect employment.

Notes for Facilitation

- You could ask the students who get out during the game to be the music keepers. They can start and stop the music as the game progresses.
- Encourage shy students to provide information about themselves by prompting them with questions such as 'what do you enjoy doing the most', 'what is your favorite movie or book' etc.
- Brief about iron and steel industry.
- What all conditions for the growth in iron and steel industry.
- Explain the government initiatives in this sector.
- You could ask from the students about employment opportunities in the industry.

UNIT 1.2: Understanding various types of Iron & Steel Industry

Unit Objectives

At the end of this unit, students will be able to:

1. Discuss about Iron & Steel industry structure
2. Know about Iron & Steel plants in India

Say

- The Iron and Steel Industry in India is separated into two divisions:
  - Integrated producers, and
  - Secondary producers
- TISCO is the oldest iron and steel plant of India.
- There are more than 50 Iron and Steel industries in India.
- There capacity varying from ten thousand to five lakh tonnes, these are known as mini steel plants.

Notes for Facilitation

- You could ask the students about the expectations from the course.
- Invite students to participate.
- List the major Iron and Steel producing companies in India.
- Give the students a brief overview of what all will be covered in the program.
- You could ask the location of different industries in India.
- You could ask the iron and steel industries name in India.

UNIT 1.3: Creation of products in Iron & Steel Industry

Unit Objectives

At the end of this unit, students will be able to:

1. Discuss about steel making process
2. Know about different processes involved in steel making

Say

- Production of steel involves many process steps which can be carried out in different combinations of energy supply, product mix, available raw materials and investment.
- There are many processes involved in steel making like coke making, blast furnace, smelting, reduction etc.
- Coke is produced by heating coking coals up to 1000 to 1200 °C for several hours in coke ovens to drive off volatile compounds and moisture.
- In Basic Oxygen Furnace (BOF)-Blast furnace (BF) route: pig iron is produced by using iron ore (70-100%) and coke in a blast furnace, and then turned into steel in a basic oxygen furnace.
- Smelting reduction unit combine processes for the gasification of coal with the melted iron ore.
- Smelting reduction unit has lower energy intensity than blast furnace

Notes for Facilitation

- You could ask the students the three main steel making procedures.
- Give students some time to think about how the iron and steel industry has changed in the last five years.
- Set the context and describe the industry trends in iron and steel.
- You could ask the entire process involve in steel making.

Field Visit

- You could visit the Iron and steel producing company and demonstrate the procedure of steel making

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2. Occupational, Health and safety (OHAS)

Unit 2.1 - Learn Occupational health & Safety

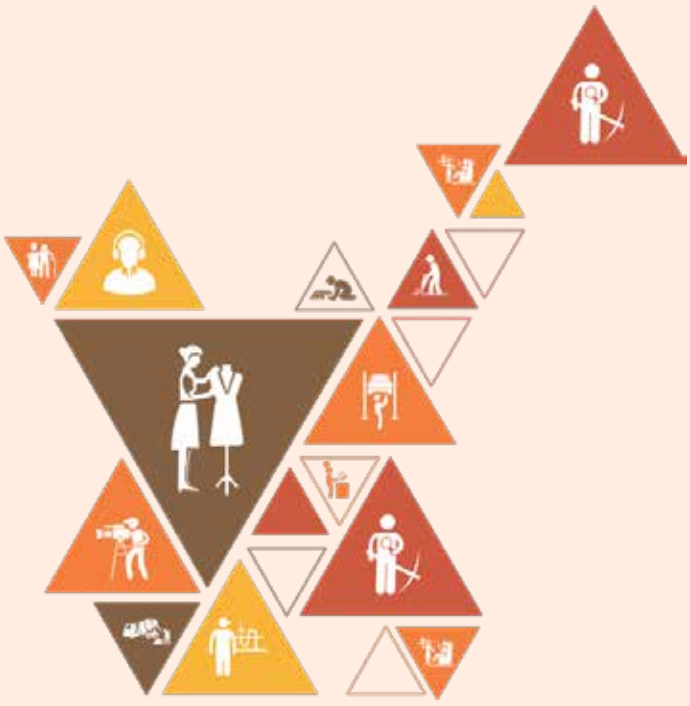
Unit 2.2 - What is hazard

Unit 2.3 - Safe working practices

Unit 2.4 - Working at Heights and confined spaces

Unit 2.5 – Fire prevention

Unit 2.6 - Emergencies, rescue and first aid procedures



ISC/N0008

Key Learning Outcomes

At the end of this module, students will be able to:

1. Discuss about safety requirements, procedures, and resources for different areas
2. Discuss about safe work practices
3. Know about hazards, types of hazards and how to control hazards
4. Know about PPE requirements
5. Know about safe working practices at heights
6. Know about safe working practices at confined spaces
7. Discuss about protection from fire hazards
8. Know about fire extinguisher and how to use it.

UNIT 2.1: Learn Occupational Health & Safety

Unit Objectives

At the end of this unit, students will be able to:

1. Discuss about health and safety requirements in industry
2. Know about essential elements for safety
3. Know about good safety work practices

Resources to be Used

- Available objects such as a duster, pen, notebook etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.At last, say thank the students for their participation.

Say

- The health and safety of workers is a very important factor in this industry because it affects both social and economic factors of an organization.
- An iceberg of incidents is showing the nature of various types of accidents. They are unsafe actions, incidents, minor injuries, lost time injuries, serious accidents and fatalities.
- Three features are vital for advancement of safety in a workshop.
- Conducting regular safety audits to identify unsafe practices and areas and how to take corrective actions to overcome the issues. Safety audits can help in timely recognition of hazards and risks.

Elaborate

- Three features are vital for advancement of safety in a workshop:
  - Situation of environment of work place in terms of plant access, housekeeping, safety and safe place of work etc..
  - Workers training and ability which assists them to recognize and apply safe systems of work.

o The development of motivational and behavioral influences of employees. This includes identifying unsafe behavior and attitudes by using more direct strategies and to motivate employees.

Ask

- Ask various type of accident.
- Ask three aspects are important for progress of safety in a steel plant.
- Ask the essential elements necessary for safety
- Ask about the good safety practices

Notes for Facilitation

- You could ask what the students think about safety in steel plant.
- You could ask the benefits to adopt such technique.

UNIT 2.2: What Is Hazard

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about hazards and different types of hazards
2. Know about, how to identify and control hazards
3. Know about safe working practices

Resources to be Used

- Available objects such as a duster, pen, notebook, PPE, heavy weight etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- A hazard is something that has the potential to cause injury, disease or death in a workplace.
- Aspects for the development of a safe workplace environment are development policies, consultative process, hazard identification and control.
- Hazards are of following types: Physical, Mechanical, chemical and Electrical etc.
- Mineral oil is typically used for operation purposes for bulk density control and dust suppression.
- The emissions contain numerous polycyclic aromatic hydrocarbons (PAHs), some of which are carcinogenic.
- Ensure the control measures

Elaborate

There are a number of aspects to the development of a safe workplace environment.

- The development of policies
- The development of consultative processes
- Hazard identification, assessment and control.

A steel plant is full of hazards. For the sake of workers safety in plant, these hazards have to be tackled. Major hazards occur in plant are:

- Road hazards- road hazards are very high because of movement of heavy and heterogeneous traffic on plant. This hazard occurs mainly during the shift change timings of workers.
- Coke oven and sinter plant – Here hazards occur due to dust, heat, chemicals, smoke, fire and explosion etc.
- Blast furnace and steel melting shop – The main hazards occur here due to gas poisoning, heat, slag, dust, moving equipments and vehicles, fire and working at heights.
- Rolling mills – In rolling mills, the hazards occur are moving equipment, heat, suspended loads, splinters and slippery floors.
- Power plant – The main hazards are heat, working at height, noise, vibrations and gas and steam lines etc.
- Material handling – The main hazards occur due to improper material handling are posture, improper signaling, moving equipment, loads and suspended overhead loads etc.
- Other major hazards which are common to most of the places are working in confined space, working with improper tools, poor illumination, poor ventilation, electrical hazards, loco movements, unmanned crossings, unpreparedness for emergencies, unsafe scaffoldings, over confidence and working without safety appliances, personal protective equipments (PPEs), written clearances, and shutdown clearances etc.

Ask

- You can ask the different types of hazard
- You can pick the students and ask the hazard warning sign.
- You can ask the different ideas to control the hazard.
- You could ask the common causes of hazard.

Notes for Facilitation

- You could ask the hazard during workplace.
- You could show all the hazard warning sign and their differences.
- You could ask the various techniques to avoid and control from hazards.
- Give students some time to think about how the hazard affects physical and mentally to our body.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- You could show the various Hazard signs and ask the identification from the students one by one.

UNIT 2.3: Safe Working Practices

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about safe working practices
2. Know about material safe handling
3. Know about personal protective equipments

Resources to be Used

- Available objects such as a duster, pen, notebook, PPE, heavy weight etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- There are safe practices need to be consider for avoiding general shop hazards
- There are safe practices need to be consider for avoiding machine hazards
- Every worker has to lift and move heavy weight during the job whenever required.
- Extreme care should be taken while lifting or moving the job so that no damage occurs to the job or plant and also to prevent accidents at work place.

Elaborate

Personal protective equipment provides us the last level for controlling hazards. Before using of personal protective equipment, the working requirements of the equipment should be checked to make sure it fulfills the same, verify the required standards, make sure it fits the body shape of the user, be user-friendly and is under regular maintenance and can be switched if required.

Personal Protective Equipment (PPE)

- **Safety helmet**: Safety helmets guard the head from injuries caused by falling objects.
- **Earmuffs, earplugs**: Earmuffs and earplugs protect the ears from injuries by loud noises.
- **Safety belt**: Safety harnesses guard from falling from heights.
- **Goggles**: Goggles protect the eyes from injuries caused by strong light or flying objects.
- **Safety boots**: Safety boots guard the feet from puncture wounds, injuries and slipping.
- **Respirator**: Respirators guard the respiratory system from the attack of poisonous gases, mist, fumes and dust.

Fig 2.3.1: *PPE*

Ask

- You can pick the students and ask the safe practices for avoiding general shop hazards.
- You can ask the various types of personal protective equipment.

Notes for Facilitation

- You could ask the safety checklist before operating a machine.
- You could show the protective equipment and ask the causes.
- You could ask the causes of wrong handling

Do

- Show them the PPE
- Demonstrate the use and requirement of PPE
- Demonstrate the safe material handling practices

Demonstrate

Points to be taken care of while lifting / moving material

- Lift the materials in correct posture.
- Do not try to lift too heavy materials alone.
- Ensure the grip is right so that the job doesn't slip from hand and fall
- Put down the job at the destined place properly.
- Do not throw the job on ground.
- Avoid double handling.
- Take rest breaks during heavy or repetitive work.

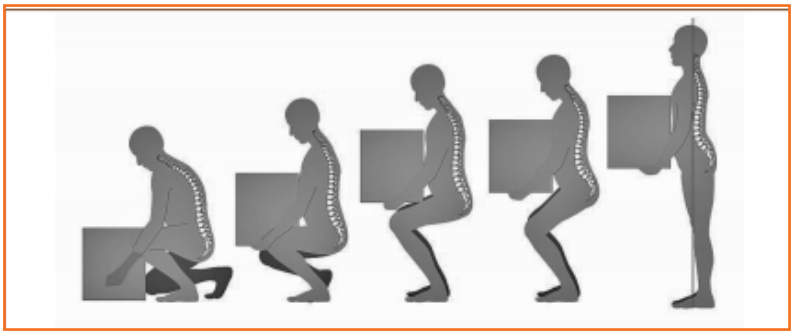


Fig 2.3.2: *Safe material lifting*

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
PPE and Safe material handling	2 hours	PPE
		Heavy weight

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Lab

- You could show the various personal protective equipments (PPE) to the students in the lab

UNIT 2.4: Working at heights and confined spaces

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about risks of working at heights
2. Know about safety precautions while working at heights
3. Discuss about risks of working at confined spaces
4. Know about safety precautions while working at confined spaces

Resources to be Used

- Available objects such as a duster, pen, notebook, ladder, respiratory equipments etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Notes for Facilitation

- You could ask the students about the understanding of safe working practices at heights and confined spaces.
- Invite students to participate. List the responses from students on the whiteboard.
- Give the students a brief overview of what all will be covered in the program.

2.4.1: Safe working at heights

Say

- Falls from height are responsible for many serious and fatal injuries every year.
- The Health and Safety Executive recommends a five-step approach to risk assessment, and the risk of slips, trips and falls should also be considered.

Elaborate

The main hazards associated with working at height are people falling and objects falling onto people below. These may occur as a result of inadequate edge protection, or from objects in storage being poorly secured.

Safety equipments can use while working at heights:

- Mobile elevated platforms
- Ladders
- Step-ladders
- Scaffolder
- Harnessing belts

Do

- Show the risk assessment procedure
  1. Look for hazards associated with falls from height around the workplace. Where are people required to work at height? Do they carry out work from ladders, platforms, scaffolds, or unprotected or fragile roofs?
  2. Decide who might be harmed and how. Who comes into the workplace? Are they at risk? Are some groups more at risk than others?
  3. Consider the risks. Are there already measures in place to deal with the risks? Look at areas with unguarded openings or without guardrails and covers. Are regular inspections carried out?
  4. Record your findings if you have five or more employees.
  5. Regularly review the assessment. If any significant changes take place, make sure that precautions are still adequate to deal with the risks.
- Demonstrate the safe use of ladders

Demonstrate

Steps of how to work safely on ladder:

1. Climb only the front of the ladder, never the back.
2. Don't climb higher than the tread that's third from the top (there should two steps above you, including the top); never sit on the top.
3. Keep your hips centered between the vertical side rails; don't overreach to either side.
4. Never stand on the spreaders or paint shelf.
5. Don't leave ladders unattended, especially around children.
6. Allow only one person on the ladder at a time.
7. Never lean a closed stepladder against a wall and climb it; it can slide out from under you.

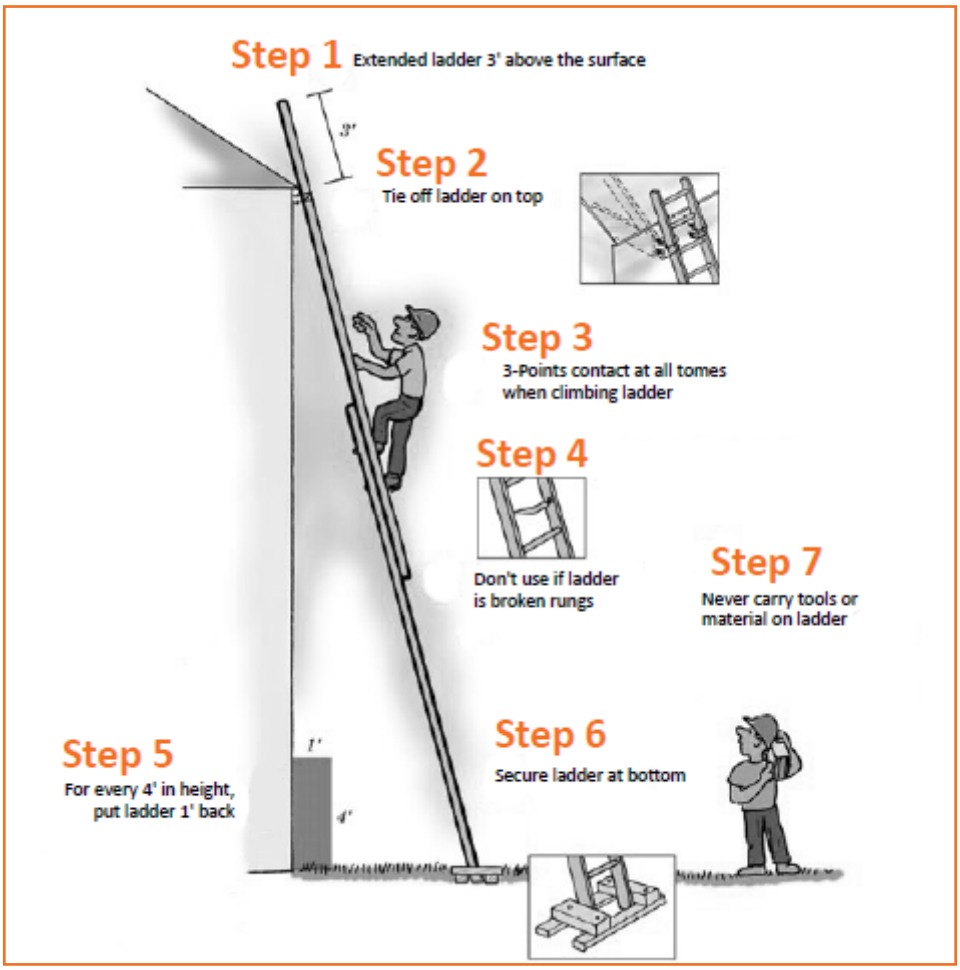


Fig 2.4.1: *Safe use of ladder*

Do's

- Work on ground level, as much as possible.
- Make sure equipment is sufficiently stable, appropriate and strong for the job.

- When working on or near delicate areas, take safeguards
- Always be prepared for protection from falling objects
- make strategy for evacuation in case of emergency and rescue procedures

Don’t

- Overload ladders
- Overreach on ladders or stepladders
- Fix the ladder on weak and uneven surfaces
- Use stepladders or ladders for tough or heavy tasks.

Ask

- You could ask the safe working procedure while working at height.

2.4.2: Safe working at confined spaces

Say

- Spaces which are enclosed from all around and risk of death or serious injury from dangerous conditions and hazardous substances is very high, are known as confined spaces.
- If you cannot avoid entry into a confined space, make sure you have a safe system for working inside the space.

Elaborate

Dangers can arise in confined spaces because of the following issues.

- A lack of oxygen. This can occur:
  - Spaces where reaction between some soils type and oxygen happens in the atmosphere;
  - Reaction of groundwater with limestone produces carbon dioxide;
  - Rust formation inside the vessels and steel tanks.
- Poisonous gas, fume:
  - Formation of poisonous gases in sewers and manholes;
  - Leakage of gases and fumes into trenches and pits in a poisonous area.
  - enter tanks or vessels from connecting pipes;
- Liquids and solids which can suddenly fill the space, or release gases into it, when disturbed. Free-flowing solids such as grain can also partially solidify or 'bridge' in silos, causing blockages which can collapse unexpectedly.
- Fire and explosions due to excess oxygen and flammable vapours.
- Filling of liquids and solids inside the space, when disturbed.
- Hot temperature conditions leading to increase in body temperature dangerously.
- Residues of fumes and vapour left in tanks, vessels etc.
- High concentrations of dust e.g. in flour silos.

Safe systems of work at confined spaces

If you have to work in a confined space, carry safety systems and equipments for working inside the space. The following checklist is important while working in a confined space.

- **Isolation**: Isolate the electrical and mechanical system of equipments need to be operating in space. In any cases, ensure that isolation done is effective.

- **Cleaning**: Make sure that there is no formation of fumes from residues during the work.
- **Size of entrance**: Entrance size is big enough to permit workers to enter in the space with all the necessary equipment required, and provide ready exit during an emergency.
- **Provision of ventilation**: Ensure that there is proper mechanical ventilation for an adequate supply of fresh air in the confined space. It is very important where portable gas cylinders and diesel fuelled equipment are used.
- **Isolation**: Mechanical and electrical isolation of equipment is essential if it could otherwise operate, or be operated, inadvertently. If gas, fume or vapour could enter the confined space, you need to isolate the pipework. In all cases, a check should be made to ensure isolation is effective.
- **Cleaning**: before entry this may be necessary to ensure fumes do not develop from residues etc while the work is done.
- **Check the size of the entrance**: Is it big enough to allow workers wearing all the necessary equipment to climb in and out easily, and provide ready access and exit in an emergency? For example, the size of the opening may mean choosing air-line breathing apparatus in place of self-contained equipment which is more bulky and therefore likely to restrict ready passage.
- **Provision of ventilation**: You may be able to increase the number of openings and therefore improve ventilation. Mechanical ventilation may be needed to make sure there is an adequate supply of fresh air. This is essential where portable gas cylinders and diesel fuelled equipment are used inside the space because of the dangers from build-up of engine exhaust.
- **Provision of special tools and lighting**: Use non-sparking tools and protected lighting systems to avoid flammable and explosive atmospheres. In confined space like inside metal tanks, appropriate precautions are required for safety from electric shock.
- **Provision of breathing apparatus**: Availability of breathing apparatus, if the air inside the space is not adequate and suitable for breathing because of poisonous fumes, gases or vapours in the space and lack of oxygen.
- **Preparation of emergency arrangements**: Proper emergency arrangements which cover the necessary equipments and practice drills.
- **Provision of rescue harnesses**: Availability of safety harnesses at the point outside the confined space.
- **Emergency procedures**: When situations are not favorable, there can be chance of serious and immediate danger. Effective arrangements like alarm systems and rescue operations during an emergency are essential.

Notes for Facilitation

- You could ask about essential elements to help prepare a safe system of work at confined spaces.
- Show them the safety equipments required while working at confined spaces.

Ask

- You could ask the confined space at safe working.
- You could ask how the danger can arise in confined space.
- What can occur if there is lack of oxygen?
- You could ask the isolation process.
- You could ask the safe systems of work at confined spaces.

UNIT 2.5: Fire Prevention

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about fire hazards and how to control
2. Discuss about fire extinguishers
3. Know about types of fire extinguishers
4. Know about how to use fire extinguishers

Resources to be Used

- Available objects such as a duster, pen, notebook, fire extinguisher, fire alarm, PPE etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Fire is defined as a self-sustaining combustion process in which a substance (fuel) combines with oxygen in air to produce immense heat and light.
- Fire hazards pose threats to life and property.
- Fire is categorized into class A, B and C fire.
- A fire extinguisher is a fire protection device used to extinguish or control small fires during fire emergency situations.
- Dry chemical is a powder based. They stops and halts the production of fire supporting by “free-radicals”, accordingly extinguish the fire.

Elaborate

Different fuels create different fires and require different types of fire extinguishing agents.

Class A

Class A fires are fires in ordinary combustibles such as wood, paper, cloth, trash, and Plastics.

Class B

Class B fires are fires in flammable liquids such as gasoline, petroleum oil and paint. Class B fires also include flammable gases such as propane and butane. Class B fires do not include fires involving cooking oils and grease.

Class C

Class C fires are fires involving energized electrical equipment such as motors, transformers, and appliances. Remove the power and the Class C fire becomes one of the other classes of fire.

Class D

Class D fires are fires in combustible metals such as potassium, sodium, aluminum and magnesium.

Common fire extinguishers are:

- **Dry chemical**: These types of fire extinguisher are in powder form. They stops and halts the production of fire supporting by “free-radicals”, accordingly extinguish the fire.
- **Foams**: This type is applied over aspirated or non-aspirated fuels. It forms a seal or foamy blanket over the fuel and stops oxygen to reach near the fuel. Unlike powder type, foam type fire extinguisher is used to extinguish fires without flashback.

Fig 2.5.1: *Fire extinguisher*

- **Water**: It cools burning material by absorbing heat through the use of air pressurized water. It is successful to extinguish class A fires. Unlike dry chemicals and foams based fire extinguisher it is harmless, inexpensive and easy to clean.
- **Clean agents and carbon dioxide**: These types of extinguisher displace oxygen, control chemical chain reaction and remove heat from fire zone. This extinguisher does not leave any remains after release which is ideal for electronics items and sensitive documents.

Do

- Tell them about the fire fighting equipments.
- Show them the equipments and explain their use.
- Demonstrate them the use of fire extinguisher.
- Explain them about different types of fire extinguishers.

Demonstrate

Steps for using the fire extinguisher

Step 1: **Pull the pin** from the top of the extinguisher for releasing locking mechanism which discharges the extinguisher.

Step 2: **Aim the extinguisher towards** the base of the fire not the flame.

Step 3: **Squeeze the lever slowly.** Deliver the extinguishing agent in the extinguisher. When the lever of extinguisher is released, the discharge of extinguishing agent stops.

Step 4: **Sweep from side to side.** Move the fire extinguisher to and fro by sweeping motion until the fire is under control. Operate the extinguisher from a safe distance. Move towards the fire when it starts to reduce.

Fig 2.5.2: *Using fire extinguisher*

Notes for Facilitation

- You could ask the common fire extinguisher.
- You could ask the type of fire extinguisher and their role?
- You could ask what all information contains fire drill report.

Tips - During fire outbreak

1. On noticing a fire, immediately start shouting “fire” at top of your voice. Do not wait for the automatic fire alarms to start ringing.
2. Take a fire extinguisher
3. Use extinguisher as per fire type: - Water and co2 fire extinguishers for general fires - Foam type extinguishers for oil fires - Co2 fire extinguisher only for electrical fires.
4. Switch off all main switches during an electrical fire.
5. Do not try to switch off electrical equipment. Cut the power from the main source.
6. do not panic and alert the building fire department
7. Call the fire brigade immediately.
8. Ensure that the water sprinklers and other fire-fighting equipment have started operating.
9. First priority should be to save people. Help others to safely get out of the floor
10. Alert the nearest hospital to prepare to treat serious burn injuries.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Use of fire extinguisher	2 hours	Fire extinguisher
		PPE

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Field Visit

- You could visit any of the industry and show the firefighting equipment. With the help of field visit you could show the where we need to fit various firefighting equipment and its role.

UNIT 2.6: Emergencies, rescue and first aid procedures

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about basic first aid techniques during electric shock, burns and choking
2. Know about CPR process
3. Know about bandaging process

Say

- If you think someone is suffering from electric shock, approach with extreme caution.

Demonstrate

You can make a group of few students to do demonstrate:

Steps - How to free a person from electrocution

If find someone is suffering from electric shock, approach with extreme caution and following first aid steps.

Step 1: **Firstly take** the suffered person away from the electricity source as fast as possible. Turning off the electric supply of machine is the best method for doing this.

Step 2: If this seems impossible, remove the person from electricity source by using a piece of wood or insulating material.

Step 3: **Don't touch the victim getting the electric shock** because you could also get shock too.

Step 4: **After successful executing the victim from the electricity source**, call the ambulance, if victim is unconscious. Give first-aid to victim till the time ambulance is coming.

Step 5: **If victim is conscious** and looking well, monitor its condition, as the results of shock must not be clear immediately.

Fig 2.6.1: *Freeing a person from electrocution*

Bleeding and Wounds

Step 1: Cover the wound by a clean cloth and gloved hand; then apply firm and steady pressure on wound for 5 mins at least.

Step 2: Lift up the injured leg or arm above the victim's heart level.

Step 3: Secure the wound by a bandage when bleeding stops. Ensure that bandage is not fixed too tightly—it may stops blood circulation.

Step 4: Check the victim for shock.

Burns

Chemical or Compressed Gas Burns

Step 1: Use a drench hose and emergency shower for at least 15 mins to rinse away all residues of chemicals.

Step 2: Cover the burn by a clean and dry cloth or special dressing for burns.

Heat or Electrical Burns

Step 1: Cool burning of skin by water.

Step 2: Place the burned area under cold running water if the skin is not broken and gently compress the wound by hand. Bandage the wound by a dry and clean cloth.

Step 3: If blister appear, don't try to break it.

Step 4: Do not apply ointments or creams.

Step 5: If skin is cracked, or if injuries are severe:

- Do not clean the wound or remove embedded clothing.
- Cover the injury insecurely with a clean, dry cloth.
- Expect shock and treat accordingly.

Choking

Step 1: Wrap your arms around the stomach and stand directly behind the victim.

Step 2: Just above the navel and well below the ribs, make a fist by a hand. Place that fist with the thumb and forefinger side toward you.

Step 3: Hold the fist by other hand and pull it rapidly towards you by a slightly upward and inward thrust. If required, repeat it.

Basic techniques of banding

The key points when applying a bandage are:

Step 1: Make sure the person is comfortable.

Step 2: Never lean across their body and ensure that you are working from the side of the injury.

Step 3: First clean the wound and apply the antibacterial cream over it.

Step 4: When the bandage is on always remember keep the injured part of the body supported in the position it will be in.

Step 5: Always use right size of bandage.

Step 6: To check the passage easily, don't cover fingers or toes when bandaging a limb.

Step 7: Never wrap the bandage tight, and secure the end by folding it over and binding a knot in the end. Safety pin, adhesive tape, or a bandage clip can be used.

Artificial respiration and the CPR Process

Step 1: Check the Victim - tap and shout to get response.

Step 2: Circulation - pump the chest 30 times.

Step 3: At the center of the chest put the heel of one hand and your other hand on top of it. At a rate of 100 per minute (16 compressions in 10 seconds), press chest down 2 inches.

Step 4: Tilt head back, lift chin up to open airway - Airway.

Step 5: Breathing - Tweak nose closed, take a normal breath, cover patient mouth with yours and blow out your breath until you see the chest rise. Make one breath per 1 second. Again open airway again if chest doesn't rise.

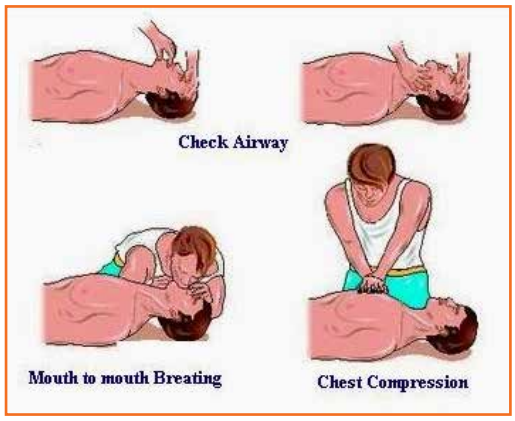


Fig 2.6.2: *CPR Process*

Step 6: Repeat procedure until help arrives or the victim begins breathing.

Correct method to move injured people during an emergency

Step 1: Stand on either side of the conscious victim. Grab the victim's wrist with the hand closest to the victim's feet on your side.

Step 2: Use your other hand to grasp the clothing on the shoulder nearest to you and pull the victim's arms to help them to a sitting position.

Step 3: Assist the victim to his or her feet and place the arms around your shoulders, if possible.

Step 4: Place your free hand around the person's waist and let him or her set the pace on hobbling out.

Step.5: Help the victim for moving slowly.

Do

- Shock can be life threatening. Symptoms include cold sweat, weakness, irregular breathing, chills, pale or bluish lips and fingernails, rapid weak pulse and nausea.

SHOCK	Do's	Don't
Shock	Take a rest	Do not give the victim anything to eat or drink
Shock	Lay the victim on his/her back	Do not move him/her.
Shock	Keep the victim warm by using the blanket or clothes.	Do not keep the victim hot.
Shock	If the victim not in pain, raise their feet and legs with a pillow.	If victim in pain do not move.

Notes for Facilitation

- You could ask the steps to free a person from electrocution.
- You could ask the steps of bleeding and wounds
- You could ask the steps of burn
- You could ask the steps of choking
- You could ask the steps of banding
- You could ask the steps of CPR

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
First aid practices	3 hours	Mannequin
		First aid box

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

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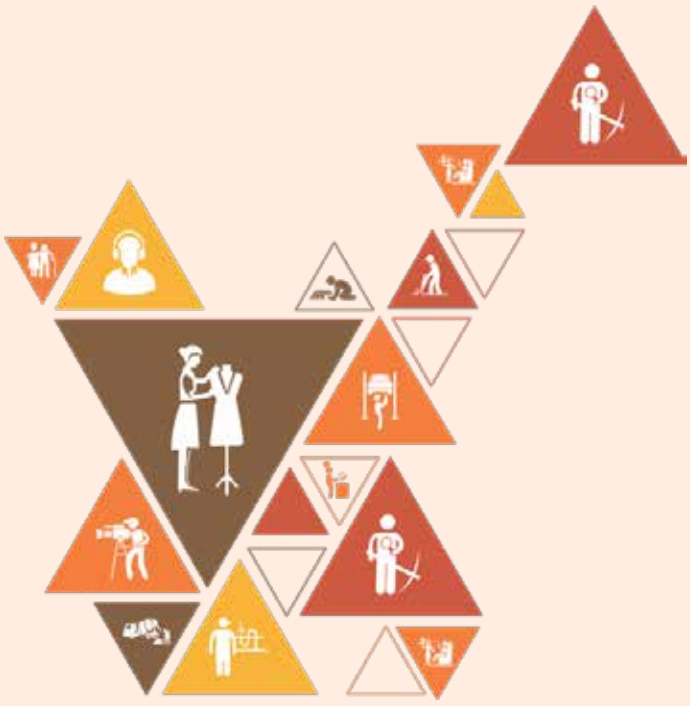
3. 5S & House Keeping

Unit 3.1 – Identification of bottlenecks in functioning of work place

Unit 3.2 - Various methods of housekeeping

Unit 3.3 – Waste management



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Key Learning Outcomes

At the end of this module, students will be able to:

1. Discuss about safety issues at workplace
2. Know about 5S safety management system
3. Discuss about housekeeping practices
4. Know about benefits of housekeeping
5. Know about elements of effective housekeeping
6. Know about waste management practices

UNIT 3.1: Identification of bottlenecks in functioning of work place

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about safety issues in the industry
2. Know about housekeeping issues in the industry

Resources to be Used

- Available objects such as a duster, pen, notebook etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Manufacturing facilities are riddled with risks, both hidden and out in the open. Hazards can result in serious injury or death, if don't know where to begin looking.
- Few of the biggest safety concerns in any manufacturing setting like hearing protection, eye hazards, chemical exposures, mechanical hazards etc
- The Occupational Safety & Health Administration requires companies to provide hearing guard when noise levels surpass specific levels.
- 61 percent of eye damages occur in the manufacturing, construction industries and trade a report by the Vision Council reports.
- In manufacturing, heat and flame can produce by the tools and equipment, which cumulative the risk for fires.
- During the manufacturing process, at many points dust and fumes are generated. Dense fumes released during the use of oxygen can cause lung diseases.

Elaborate

Safety concerns in any manufacturing setting are:

- **Hearing Protection:** Hearing can be affect by noise is produce by Industrial machines if you are uncovered to the noise on a long basis.
- **Eye Hazards:** 61 percent of eye damages occur in the manufacturing, construction industries and trade a report by the Vision Council reports. Eyes may be injured by dust, metal, concrete and other particles throw by machines. Eyes can burn or irritate by chemical fumes and splashes.
- **Chemical Exposure:** Some employees in manufacturing units work with hazardous chemicals like workers who produce batteries may be exposed to lead in the form of dust or fumes. This can harm nervous, urinary systems and reproductive with lead exposure linked to failures, seizures, coma and death.

Fig 3.1.1: *Chemicals*

- **Mechanical Hazards:** There are several risks to employees while working with manufacturing machines. Machines that have sprockets, gears, pulleys and rotating shafts pose risks of predicament.
- **Fire Hazards:** In manufacturing, heat and flame can produce by the tools and equipment, which cumulative the risk for fires. Employees should aware of where to find fire extinguishers and how to rescue the facility immediately in the event of a serious fire.

Fig 3.1.2: *Mechanical hazard*

- **Carbon monoxide poisoning:** In manufacturing industries, blast furnaces and converters generate huge amount of gases. Once dust has been removed, these gases are used as fuel resources and some are use as raw materials and supplied to chemical plants.
- **Dust and fumes:** During the manufacturing process, at many points dust and fumes are generated. Dense fumes released during the use of oxygen can cause lung diseases. Contact with silica is also a danger for the workers and cause serious infections and injuries.

Fig 3.1.3: *Dust and fumes*

Notes for Facilitation

- You could ask the students safety concern in manufacturing plant.
- Invite students to participate.
- You could ask the students how carbon monoxide poisoning released.
- You could ask the students effects of chemical exposure.

UNIT 3.2: Various methods of Housekeeping

Unit Objectives

At the end of this unit, students will be able to:

1. Know about 5S Safety system
2. Discuss about essential elements of housekeeping
3. Know about good housekeeping practices

Say

- 5S is a fundamental, systematic, basic, approach for quality, productivity and safety improvement.
- 5S is created by a list of five Japanese words: seiri, seiton, seiso, seiketsu, and shitsuke.
- Workplaces hazards can be eliminate by effective housekeeping and complete a job safely and properly.
- Poor housekeeping and hiding hazards can cause frequent accidents which can cause injuries.
- Elements of an effective housekeeping program are Dust and Dirt removal, clean surfaces, Maintain light fixtures, aisles and stairways, spills control, waste disposal, storage etc.

Elaborate

5S is created by a list of five Japanese words: seiri, seiton, seiso, seiketsu, and shitsuke. 5S system is implemented for organizing the workplace for increasing effectiveness and efficiency by maintaining the area and items, storing the items used, and sustaining the new practices.

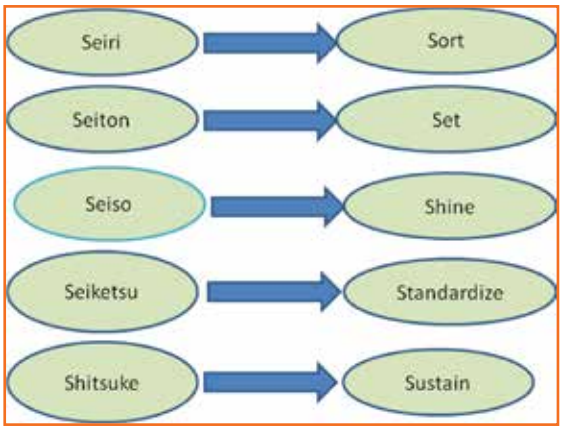

Fig 3.2.1: *5 S terminology*

Purposes of conducting regular 5S audits are:

- Evaluation of 5S standards for industry
- To fix what is wrong! - note and address non-compliance
- Give a official chance to suggest improvements

The basic steps of 5S audit are:

- Plan for the audit. Divide the workplace into several areas for successful audit reviews.

- Based on the standards set during audit, make a list for every area.

Three key tasks has to be done during the audit

1. Find out whether known difficulties have been addressed:
   - Lubricants are still leak from this machine?
   - People are not walking under crane, is the warning sign in place?
   - Why outdated drill press is still in the workshop?
2. Look into the standards is being met:
   - Are tools left on work tables?
   - From the tool rack is something missing?
   - Is dirt collecting anywhere?
   - Are safety labels visible and readable?
3. To be noted that what has not yet been standardized – Most imaginative and hard section, it may include seeing what is missing in an area that seems neat:
   - Why is there no sign over the well-ordered stack of work-in-process materials on that shelf?
   - Tools that are not yet labeled

Housekeeping

Cleanliness doesn't mean housekeeping. Housekeeping includes keeping work areas tidy and arranged; keep floors free of slip and trip accidents; clearing of waste materials (paper, cardboard) and other fire hazards.

Efficient housekeeping results in:

- Decrease handling to comfort the materials flow
- Fewer slipping and tripping accidents
- Less fire hazards
- Hazardous substances e.g. dusts, vapors exposures to lower worker
- Better control of tools and materials in managing inventory and supplies
- Equipment's are more cleaned and well maintained.
- Better hygienic conditions for good health
- Space utilization is more efficient
- Reduced property damage due to improvement in preventive maintenance
- Improved efficiency because it is easy to find tools and materials.

Ask

- You could ask the objectives and advantages of 5S
- You could ask the benefits of good housekeeping practices.
- You could ask the elements of an effective housekeeping program

Notes for Facilitation

- Invite students to participate.
- You could ask about the standards that were set during 5S for make a checklist
- You could ask how housekeeping program make effective.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Do the 5S audit of your training center and make the 5S Audit form and fill it.

Field Visit

You could visit any of the industry and show the 5S Safety system and check the various points of safety with the help of housekeeping checklist

UNIT 3.3: Waste Management

Unit Objectives

At the end of this unit, students will be able to:

1. Discuss about waste management
2. Know about elements of waste management
3. Know about methods of waste management

Say

- Waste management is gathering, transport, recycling, processing and disposal of waste materials. Waste management is carried by recovering resources from waste materials.
- Waste may be classified as garbage, rubbish, industrial wastes, mining wastes etc.
- Industrial waste can be of two types: non-hazardous and hazardous waste.
- Waste management strategy involves legal and proper decomposition of waste.
- Methods of waste management are segregation, composting and burning.

Elaborate

Elements of a waste management strategy

Good waste management practices involve much more than that disposing of waste legally and properly. Strategy for the management of industrial waste can include the subsequent elements:

- Current waste management procedures and primary audit of wastes produced.
- Risk assessment to find that stowage and handling procedures does not possess any health or environmental risk.
- Identification of options for reuse, waste reduction, recovery assessment and recycling of waste.
- Identification of best practicable environment! There should be an option for dumping of waste and residues.
- Selection of the contractor offering the best service and audit of potential waste management contractors.

Waste management methods

1. **Segregation:** Separation of waste using different containers is necessary because plastics, building materials, glass and waste from the site work could take a really long time period to decompose. This is the reason, thus, it is required to maintain green practices so waste management should be done

Fig 3.3.1: *Waste segregation*

with proper segregation. Thus we make sure to support you in removing hazardous waste from compostable non-hazardous solid waste, organic waste, recyclable materials and other regulated material.

2. **Composting:** This waste management process turns waste into organic compounds that you can use to feed plants. In terms of the environment advantages this is actually beneficial technique. Making use of this method, it's easy to turn unsafe organic products into safe compost.

3. **Burning:** If your approach is not towards disposing materials and other wastes, then burning method will be a good approach for you. If waste is bio-degradable or cannot produce hazardous gases after burning, you can burn the waste.

Fig 3.3.2: *Waste Compositing*

Ask

- You could ask the elements of waste management strategy
- You could ask from the students' different method of waste management

Field Visit

- You could visit any of the industry and show the waste management system and how they do the segregation of waste.

Notes

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4. Job Understanding Requirements

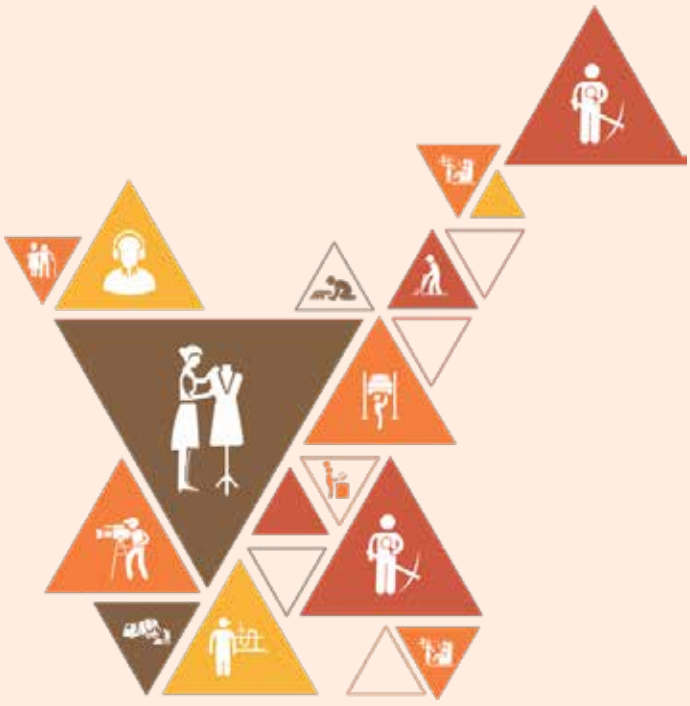
Unit 4.1 – Limits, fits and tolerances

Unit 4.2 – Understanding the engineering drawing

Unit 4.3 – Using of hand tools

Unit 4.4 – Using of measuring instruments

Unit 4.5 – Diagnosing defects in tools and instruments



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Key Learning Outcomes

At the end of this module, students will be able to:

1. Know about limits, fits and tolerances
2. Know about engineering drawing
3. Discuss about tools used
4. Discuss about use of measuring instruments
5. Know about how to calibrate instruments

UNIT 4.1: Limits, Fits and Tolerances

Unit Objectives

At the end of this unit, you will be able to:

1. Know about basic deviation, tolerance and tolerance grades
2. Discuss about transition fit, limits and system for limits and fits

Resources to be Used

- Available objects such as a duster, pen, notebook etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- The most extreme and least permissible sizes inside which the actual size of a part lies are called Limits.
- Important terminologies of limit systems like limits of size, nominal size, basic size, deviation etc.
- When two sections are to be collected, the connection resulting because of the difference between their sizes before assembly is known as a fit.
- A fit can be divided into three classes: Clearance, interference and transition fit
- Standard System of limits and fits are hole basis system and shaft basis system
- Tolerance is the difference between maximum limit of size and minimum limit of size. It characterizes the permissible or limits in size variation.
- There are two types of tolerance- unilateral and bilateral tolerance
- Tolerance Size includes the basic size, the fundamental deviation and grade of tolerance.

Elaborate

Terminology of limit systems:

- **Limits of size**: The two maximum allowable sizes of a part between which the actual size should lie. It includes the maximum and least sizes of the part.
- **Nominal size**: Actual size of the component through which it is referred.
- **Basic size**: It is the part of a section in connection to which all points of variation are determined.
- **Zero Line**: It is the line in which places of resistance zones are appeared.
- **Deviation**: Deviation is mathematical difference between highest size and essential size.
- **Upper Deviation**: Logarithmic differen--ce between most extreme limit of size and relating fundamental size is upper deviation. It is meant by letters "ES" for a hole and "es" for a shaft.

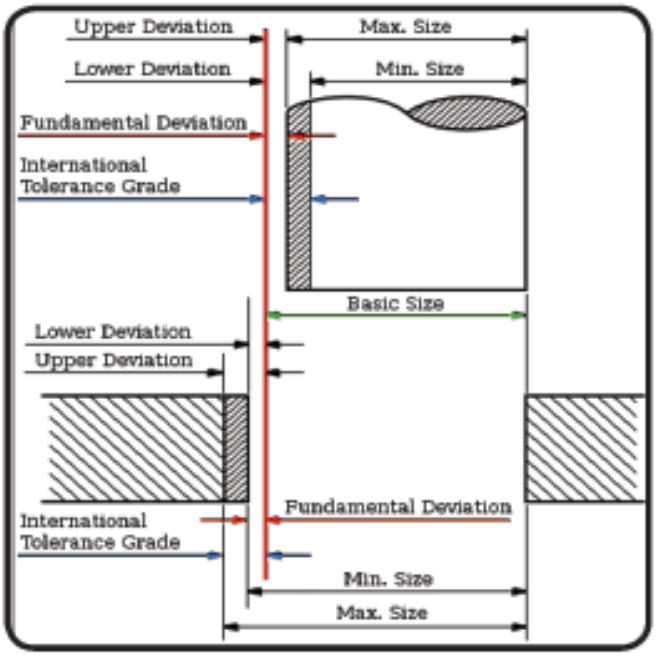

Fig 4.1.1: *Limit system terminology*

- **Lower Deviation**: Mathematical distinction between the minimum limit of size and the relating essential size is lower deviation. It is meant by letters "EI" for hole and "ei" for a shaft.
- **Fundamental Deviation**: It is either upper or lower deviation, which is closest to the zero line for either a shaft or a hole. It settles the position of the resistance zone in connection to the zero line.
- **Allowance**: Allowance is intentional difference between hole measurements and shaft measurement for a fit.

A fit can be divided into three classes:

1. **Clearance**: It is the difference between size of the shaft and extent of the hole (it is constantly positive).
2. **Interference**: Difference between span of hole and shaft before get assembly is interference.
3. **Transition Fit**: It is a fit that some provides clearance and sometime interference

Types of Tolerance

- The tolerances are known as unilateral, when two measurements are on one side of the nominal size.
- When two limit measurements are above and beneath apparent size, the tolerances are said to be bilateral or two-sided.

Ask

- You could ask the different terminologies of limit systems
- You could ask the meaning of Fit and its classes
- You could ask the meaning of Tolerance and its types.
- You could ask to calculate the tolerance. Given the hole is shown as 25 +/- 0.2

UNIT 4.2: Understanding the engineering drawing

Unit Objectives

At the end of this unit, students will be able to:

1. Discuss about basics of engineering drawing
2. Know about orthographic projection views
3. Discuss about concept of quadrants
4. Know about engineering standards
5. Know about tools require for engineering drawing

Resources to be Used

- Available objects such as a duster, pen, notebook, drawing tools etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- The reason for engineering drawing is to pass on graphically the thoughts and fundamental data for the development or examination of structures, machines or frameworks.
- It includes basic knowledge of engineering drawing and engineering drawing standards.

Notes for Facilitation

- You could ask the students about the purpose of engineering drawing.

4.2.1: Basic knowledge of engineering drawing

Say

- Engineering drawing a graphical language utilized by specialists and other specialized faculty related with this profession.
- In basic engineering drawing, orthographic projection method is used.
- Orthographic drawings are the establishment of technical and machine drawings.

Elaborate

- The orthographic projection demonstrates the object like it views from the front, right, left, base, top or back, as per the projections in first-angle or third-angle projection. Third angle orthographic projection is standard projection for every single mechanical drawing.
- Orthographic projection is the technique for speaking to the correct state of an object in at least two perspectives, on projection planes commonly at right angle position to each other or by drawing perpendiculars from object to planes.
- For example: Orthographic views of a cylinder are

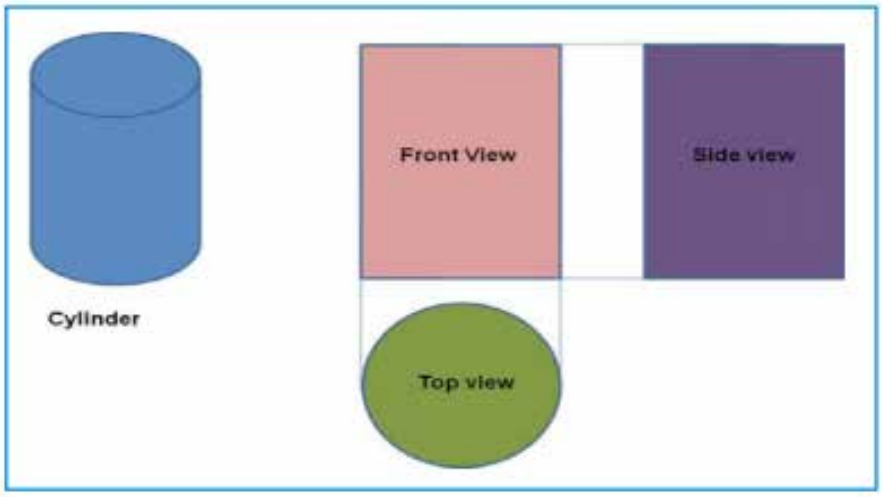

Fig 4.2.1: *Orthographic projection of a cylinder*

Do

- Tell them about the orthographic projection and quadrants
- Show them the orthographic views
- Demonstrate them the first and third angle of projection

Demonstrate

For basic engineering drawings; two guidelines are regularly being used in orthographic projection; the first angle projection also known as European projection and third angle projection also known as American projection. Perspectives are indistinguishable in both techniques for projection with the exception of their relative positions on the drawing paper. So, let's understand them:

1st angle Projection – In 1st angle projection, the front view is reference VIEW and other views are drawn as "shadows" of that view. For example, the left hand side view is drawn on the right side of front view. So, the top view (plan) is drawn at the base of front view, and so on.

Step 1: Rotate the Horizontal Plane Clockwise through 90^0.

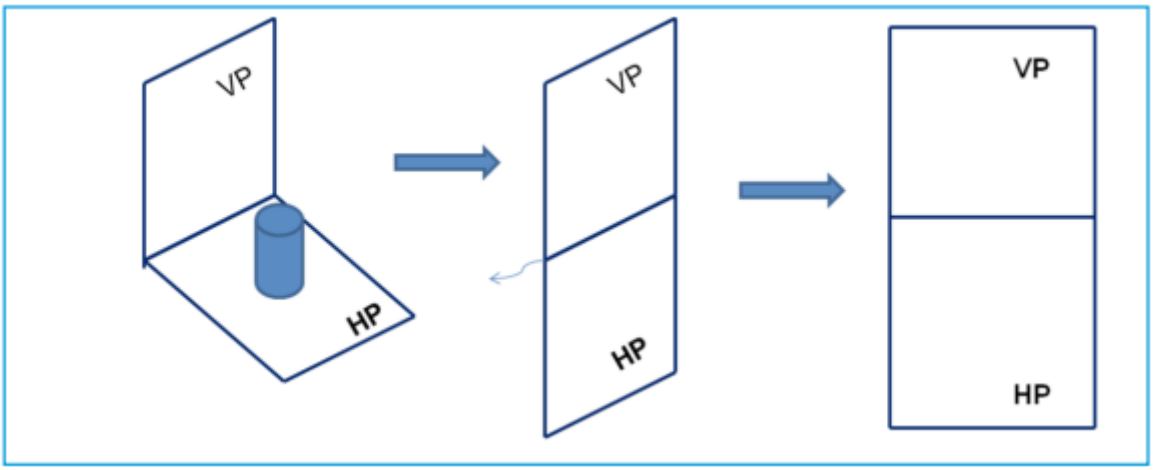

***Fig 4.2.2**: First angle projection*

Step 2: Rotate the planes clockwise through 90^0 to face the observer.

3rd angle Projection – In 3rd angle projection, the front view is the premise (similarly as before) however other views are drawn as "reflections" of font view. In this projection, the left hand side view is drawn on the left hand side of front view. Additionally, the top view (plan) is drawn over the front view.

Step 1: Rotate HP through 90^0 in the clockwise direction

Step 2: Rotate the planes through 90^0 in the clockwise direction to face the observer

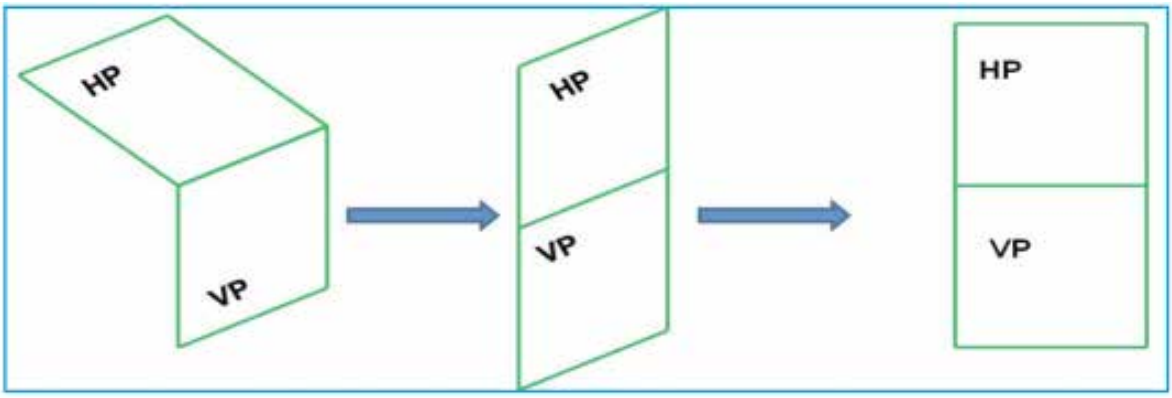

***Fig 4.2.3:** Third angle projection*

Tips

For drawing technical drawings, some tips given are:

- **Visualize Object:** Visualize the definite and clear picture of object in mind, and then a decent graphical picture can be created.
- **Determine Views:** The perspectives might possibly be the same with respect to a scale drawing; e.g., the thickness or state of the line can be utilized to draw a view.
- **Determine Size:** Determine the size of sheet of paper for portraying the object. Size of the sheet should be enough to show all details the object, however permit a lot of space for measurements, notes, and particulars.
- **Locate Center Lines:** When going to start drawing, always locate the inside lines of object.
- **Block in Main Outlines:** Check the extents of width to height in drawing. Select one edge of the object as a unit and assess the proportionate lengths of alternate edges.
- **Complete Detail:** Once the primary blueprint is acceptable, fill the points of interest for right extent.
- **Dimension Lines and Arrowheads:** When the state of the object has been drawn completely, then include the measurement arrowheads and lines. Don't make any estimation until the work is finished.
- **Dimensions:** Now embed the measurements on the drawing. These measurements can be obtained by a steel cable. Take all estimations from completed surfaces.
- **Titles and Notes:** Titles and notes should be embedded together with the date mentioned on sheet.
- **Check:** Make a last check after completing the draw. Do it carefully.

Ask

- You could ask what are the systematic order of application should be followed for both idea sketches and sketches from objects
- You could ask about the quadrants

Notes for Facilitation

- You could ask why orthographic projection method is used.

4.2.2: Engineering drawing standards

Say

- Engineering drawings, being one of the many types of specialized form of exchanging information, need to satisfy some acknowledged guidelines and ISO standards.
- ISO most prescribed paper sizes for specialized drawings are known as A-FORMATS.
- In technical drawings, various type of lines and line styles are used to provide the desired information.
- Dimensions express the appropriate sizes of features. Distances might be shown with either of two accepted forms of dimension: ordinate and linear.

Elaborate

Distances might be shown with either of two accepted forms of dimension: ordinate and linear.

- In ***linear dimensioning***, two parallel lines, also known as "extension lines," separated at the distance between two components, which are shown at every element. A line perpendicular to the extension lines, known as "dimension line," is appeared between and ending at the extension lines. The distance is shown in numerical form at the midpoint of the dimension line.
- In ***ordinate dimensioning***, an origin is established between one horizontal and one vertical extension line for the complete object view. The small circles placed at the ends of these lines shows the origin of line. Measurements along the x- and y-axes are shown by these extension lines, with the distances written in numerical form at the ends of these lines.

Typical standards of lines are summarized below.

- **Visible** – these are sequential lines used to represent edges which can be seen directly from a specific angle?
- **Hidden** – these lines are used to represent edges which can't be seen directly.
- **Center** – These lines are used to represent the axes of circular features. These lines are long and short dashed.
- **Cutting plane** – are lines that used to define sections for section views, these are thin and medium dashed lines, or also thick, long and double short-dashed lines.
- **Section** – These are thin lines, represent section views which results due to cutting of object. These are also known as "cross-hatching."

- **Phantom** – These lines indicates feature or component of the assembly which is not the described part or assembly. These lines are alternately long and double short-dashed thin in shape.

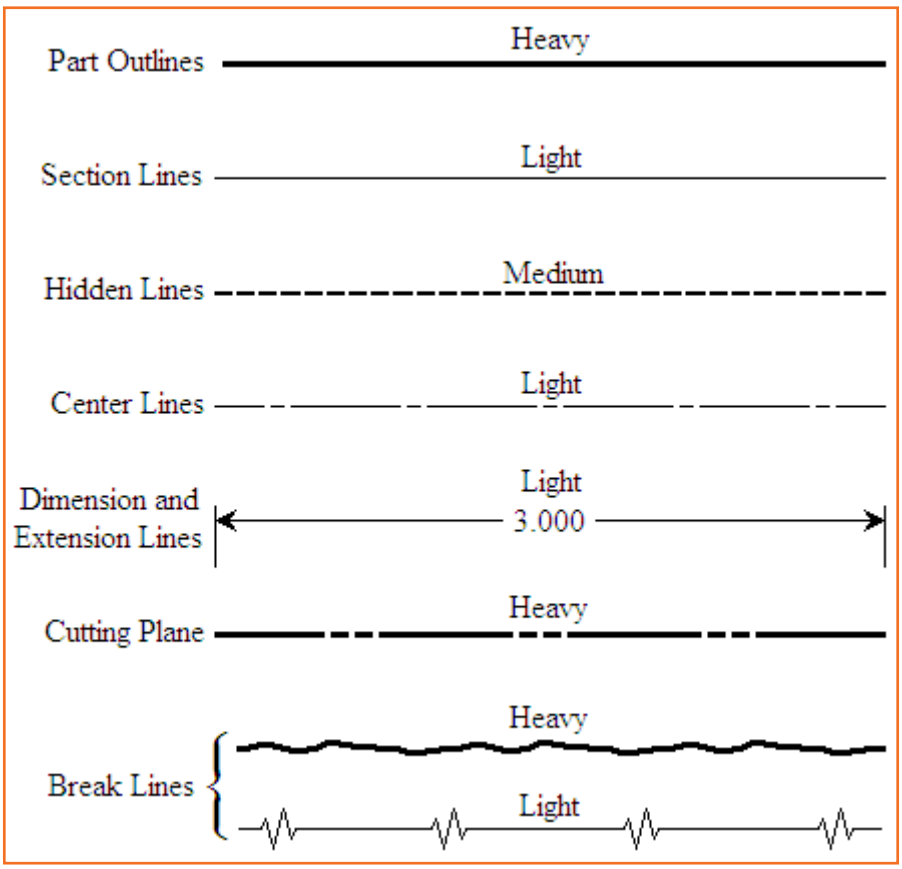

Fig 4.2.4: *Different types of lines*

Ask

- You could ask the standardized form of dimension
- You could ask what are the Basic drawing tools and equipments dimensioning
- You could ask about the different lines used in engineering drawing

UNIT 4.3: Using of hand tools

Unit Objectives

At the end of this unit, students will be able to:

1. Discuss about different hand tools
2. Know about how to use tools properly

Resources to be Used

- Available objects such as a duster, pen, notebook, hand tools etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Spanners are used to apply a twisting force (torque) to tighten or release a nut, bolt or threaded fasteners.
- Mallets sometimes called soft faced hammers are more suitable as the force of the blow is distributed over a larger area and any stretching of the metal is reduced or even eliminated.
- Rubber mallets and soft faced mallets are the types of mallets.
- Files are one of the most important and most frequently used of the fitter's hand tools.
- The screwdriver is a driving tool with a blade fitted to a handle. The tip of the blade is shaped to fit in to the head of a screw and, when turned, will either tighten or loosen the screw.
- A torque wrench is a tool used to apply a torque to a fastener like a nut or bolt. Generally, it comes in the form of a socket wrench with some exceptional mechanisms.

4.3.1: Spanner

Say

- Spanners have jaws or openings which can fit into hexagonal or square nuts and bolts.
- The following spanners are typical of those used in an engineering workshop:
  - Open end spanner;
  - Socket spanner;
  - Ring spanner;
  - Adjustable spanners;
  - Torque wrench; and
  - Ratchet spanners.

Do

- Show the spanners to the students.
- Demonstrate the use of spanner.
- Explain the use of spanner.

Elaborate

1. **Open End Spanner:** These spanners are open at both ends. These spanners are very helpful when it is difficult to place the spanner over the bolt head or due to some obstruction in the way.

Fig 4.3.1: *Open end spanner*

2. **Socket Spanner:** It is a cylindrical shaped tool manufactured by chrome plated alloy steel. Its one end has a square opening with an internal groove while other end has opening for fitting into nut or bolt head.

Fig 4.3.2: *Socket spanner*

3. **Ring Spanner:** Ring spanners are generally accessible with angled shanks. They come in the form of a ring and greater force may be applied for removing difficult or "frozen" nuts.

Fig 4.3.3: *Ring spanner*

4. **Combination Ring and Open End Spanner:** In these spanners, ring side opening is used to loosen the nut and the open end side is used to tighten the nut.

Fig 4.3.4: *Combination spanner*

5. **Adjustable Spanners:** Adjustable spanners are like open end spanners, but they are carrying one moveable jaw.

Fig 4.3.5: *Adjustable spanner*

6. **Tension Wrench** The tension wrench is used where a prescribed amount of torque is specified for the final tightening.

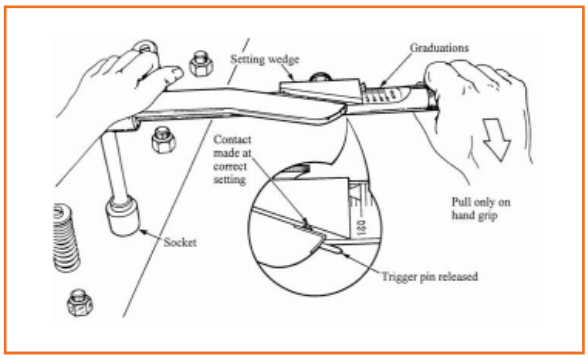

Fig 4.3.6: *Tension wrench*

7. **Reversible Ratchet Spanner** The ratchet spanner is used in conjunction with sockets and a wide range of socket accessories.

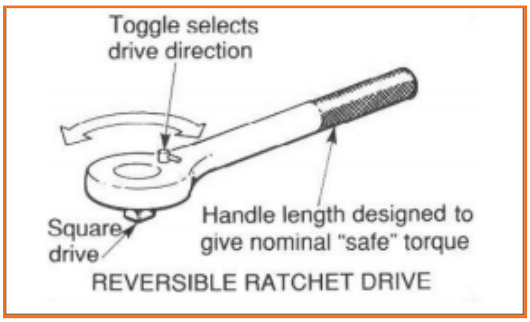

Fig 4.3.7: *Reversible ratchet spanner*

Ask

- You could ask about the details of spanners used in an engineering workshop

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.

- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of spanners

Skill Practice	Time	Resources
Use of spanners	1 hour	Spanners
		Machine

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.3.2: Mallets

Say

- Hammers are used to strike the hard materials.
- Mallets called soft faced hammers are suitable as the force of the blow is distributed over a larger area and any stretching of the metal is reduced or even eliminated.

Do

- Show the mallets to the students.
- Demonstrate the use of mallets.
- Explain the use of mallets.

Elaborate

1. **Rubber Mallets:** The rubber mallet has a cylindrical head made from solid rubber moulded to a wooden handle. Correct use of this mallet will prevent damage to surfaces which may have been painted, plated or finely machined.
2. **Soft Faced Mallets or Hammers:** There are two types of soft faced mallets:
   - Plastic mallets
   - Copper and rawhide faced mallets

Ask

- You could ask about the details of hammers used in an engineering workshop

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of mallets

Skill Practice	Time	Resources
Use of mallets	1 hour	Mallets
		Workpiece

Do

- Ask them to do the practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.3.3: Pliers and clamps

Say

- Pliers are gripping tools mostly used to hold small components that would otherwise be difficult to grasp and control. Pliers are also used for shaping and bending light sheet metal as well as bending, twisting and cutting small diameter wires.
- Wide ranges of clamping tools are common to the metal workshop. Clamps are commonly used tools.

Do

- Show the pliers and clamps to the students.
- Demonstrate the use of pliers and clamps.
- Explain the use of pliers and clamps.

Elaborate

Types of pliers are:

1. **Combination Pliers** -Standard engineers' pliers are also called combination pliers because of their versatility.
2. **Slip joint Pliers** -Slip joint, multigrip pliers have a shaped pivot pin which can fit into two or more openings in the legs. This gives a range of jaw openings which allows parallel gripping by the jaws in a number of positions.
3. **Diagonal Cutting Pliers**- Another name for diagonal cutting pliers is 'side cutters'. These pliers are made with the jaws cranked, or offset, that is, they are set at an angle which allows wire to be cut close to a surface or in confined spaces.
4. **Circlip Pliers**- Circlip, or snap ring pliers are designed for use on external or internal circlips

Clamps

Each clamp has a variety of uses in situations which require the holding or aligning of materials in position ready for welding, riveting or screwing.

The 'G' clamp has its main body drop forged from high quality steel in the form of a 'G'. The top of the 'G' forms the fixed upper jaw while the lower jaw is adjusted by turning the threaded shaft. Depending on the way it is turned, it will either increase or decrease the pressure between the jaws. 'G' clamps are available in a variety of sizes ranging from 50 mm to about 300 mm capacity.

Fig 4.3.8: *Clamp*

Ask

- You could ask what is plier and its types
- Ask about G clamps.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of pliers and clamps

Skill Practice	Time	Resources
Use of pliers and clamps	1 hour	Pliers
		Clamps
		Woekpiece

Do

- Ask them to do the practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.3.4: Screw driver

Say

- The screwdriver is a driving tool with a blade fitted to a handle.
- The tip of the blade is shaped to fit in to the head of a screw and, when turned, will either tighten or loosen the screw.

Do

- Show the screw driver to the students.
- Demonstrate the use of screw driver.

Elaborate

Standard screwdrivers are made with tips to turn screws with slotted heads. The size of screwdrivers is specified by the length of the blade and the width of the tip; they vary from 45mm x 3mm to 300mm x 10mm.

The light duty screwdriver is made with parallel tips and may be used by electricians. The steel blade, as well as the handle, is insulated with plastic.

Fig 4.3.9: *Screwdriver*

Ask

- Ask about screw drivers
- Ask about different types of screw drivers available in market.

4.3.5: Files

Say

- Files are one of the most important and most frequently used of the fitter's hand tools. Modern files are made of high grade 1¼% carbon tool steel.
- Some files have two faces; others like the half round file, have only one face, the curved side being referred to as the back.
- Files are classified by the following features: Length , Kind of cut , Grade of cut , Longitudinal shape and Cross-sectional shape or most common use
- Explain the types of files

Do

- Show the files to the students.
- Demonstrate the use of files.
- Explain the use of files.

Elaborate

Parts of a file

The diagram below shows the principal parts of a file. Some files have two faces; others like the half round file, have only one face, the curved side being referred to as the back.

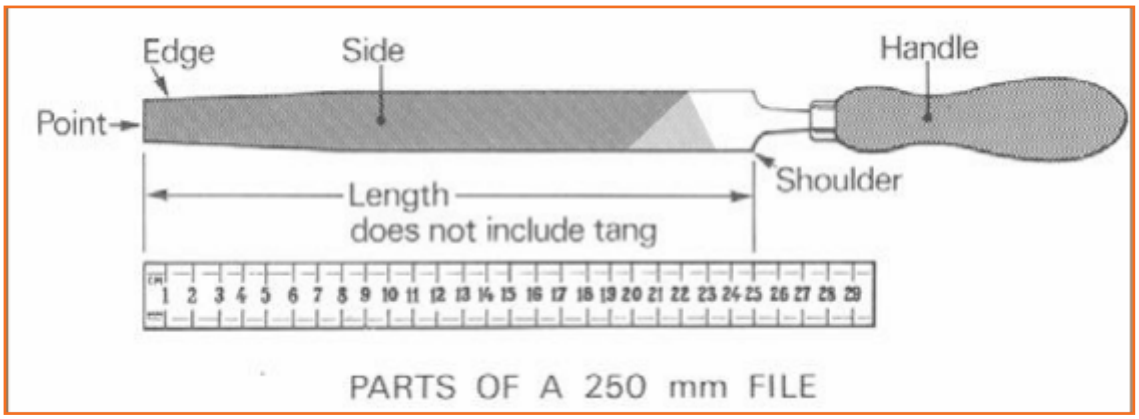

Fig 4.3.10: *Parts of a file*

Classification of files

1. **The Length of a File:** This is measured from the point to the heel or shoulder and does not include the tank (see above). The common types of file are made in various lengths.
2. **Kinds of Cut**
   - **Single cut** files have their teeth formed by a single set of parallel chisel cuts. Each tooth runs the full width of the side of the file at an angle to its edge. These files are used with lighter pressure than double-cut files and give a smoother finish.
   - Single cut files are made in three grades of cut: **bastard, second cut and smooth**.
   - Double cut files have their teeth formed by a double set of parallel chisel cuts that cross each other diagonally. This gives a series of small diamond shaped teeth.
   - Double cut files are made in three grades of cut: **bastard, second cut and smooth**.
3. **Dreadnought cut files** have coarse, curved teeth and are used for cutting soft metals such as aluminium and lead.
4. **Grades of Cut:** The grade of cut is indicated by the pitch or size of the file teeth. The grades found on common types of files are known as rough, coarse, bastard, second, smooth and dead smooth.

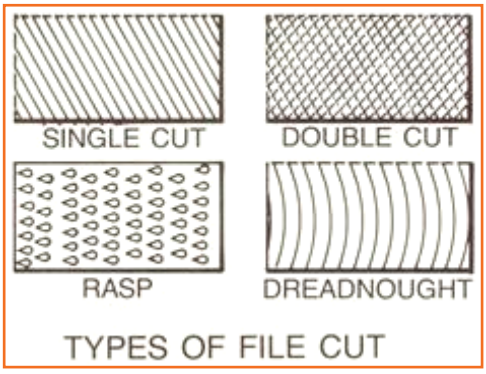

Fig 4.3.11: *Types of file cut*

Demonstrate

- Explain the use of filing.
- Demonstrate the procedure of draw filing.

Steps: Draw filing

Step 1: Balance the file across the work at right angles to its length;

Step 2: Grip the file with both hands as close as possible to the work, with your thumbs on the rear edge and your fingers on the front edge;

Step 3: Make sure you keep the file level and move both hands at the same time;

Step 4: Make the cutting stroke by moving the file directly forward using light pressure;

Step 5: Don't use heavy pressure on the file on the return stroke; and

Step 6: Continue at a speed suited to the job.

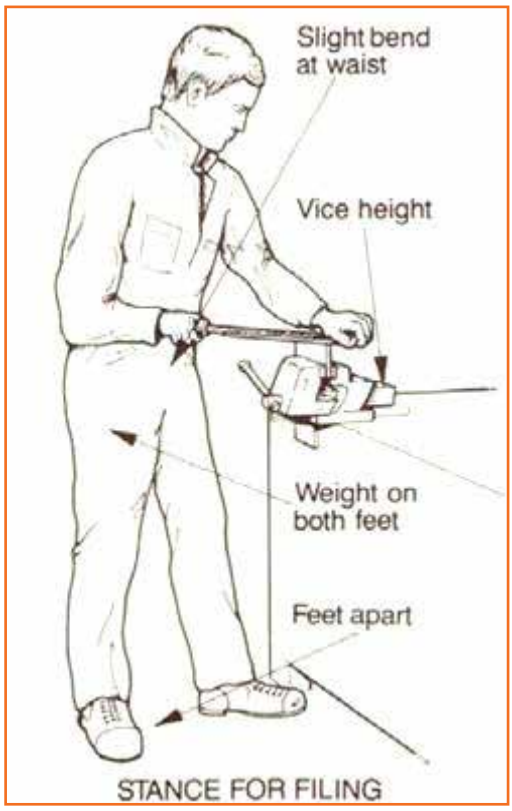

Fig 4.3.12: *Doing filing*

Ask

- You could ask the classification and types of flies.
- Ask about classification of files.
- Ask about proper use of files.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of files

Skill Practice	Time	Resources
Use of files	1 hour	Files
		Woekpiece

Do

- Ask them to do the practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.3.6: Torque wrench

Say

- A torque wrench is a tool used to apply a torque to a fastener like a nut or bolt.
- It comes in the form of a socket wrench with some exceptional mechanisms.

Do

- Show the torque wrench to the students.
- Demonstrate the use of torque wrench.

Elaborate

A torque wrench is used where the tightness of bolts and screws is critical. An operator can also measure the torque applied to the fastener by this tool, so that the applied torque match to the required specifications for a particular application. This allows correct tension and loading of all parts.

Fig 4.3.13: *Torque wrench*

Ask

- Ask about torque wrenches
- Ask about different types of torque wrenches available in market.

4.3.7: Maintenance tools

Resources to be Used

- Available objects such as a duster, pen, notebook, hydraulic nuts, pullers, lifting equipments and accessories etc.

Say

- Induction heaters, hydraulic nuts and pullers are some maintenance tools generally utilized.
- Induction heaters does not create the smoke, fumes or oil waste caused by other heating methods and they are fast and heat can be controlled easily.
- Tapered bore bearings are easily and quickly installed or removed using hydraulic nuts.
- Pulling of bearings, bushings, gear wheels, couplings or other press-fitted work pieces can be done with a variety of hand and hydraulic pullers.

Do

- Show induction heaters, hydraulic nuts and pullers.
- Demonstrate operation of induction heaters, hydraulic nuts and pullers.

Elaborate

Maintenance tools

- **Induction heaters:** These heaters are fast in order to avoid overheating of bearing with seals to temperatures higher than 90ºC (200ºF) refer manual for correct temperature and time settings. To know the time settings trial runs are necessary.
- **Hydraulic nuts:** Bearing can be precisely positioned on the shaft by creating a smooth, controllable force due to pressure generated by the piston. Bearing internal clearance reduction is controlled and chance of damage to bearing or other components are reduced with this.
- **Pullers:** Hydraulic pulling devices can usually apply more force than hand pullers.

  When using hydraulic or hand pullers:

  - Size and capacity of puller must be selected such that it matches to the job.
  - Maximum withdrawal forces which are calculated must be less than puller capacity.

- Make sure all puller leg are fully occupied and correctly secured around the work piece.
- Force must always be applied gradually.
- Avoid use of hammer when operating the spindle of hand pullers.

Say

- Many lifting equipments and accessories are available for safe lifting machines and equipments.
- Wire ropes have a central core which is wrapped around by a number of strands formed by combining many individual wires.
- An eye blot is used to connect cables to objects and it has thread on one end like in a screw and a loop on other end.

Do

- Show available lifting equipments.
- Demonstrate use of wire slings and eye bolts.
- Explain safety tips for the use of wire slings and eye bolts.
- Demonstrate correct use of wire slings and eyebolts.

Elaborate

Wire slings: The characteristics of the wire rope sling are decided by number of wires in the strands and their methods of arrangement. Safe Working Load is marked on pressed metal sleeve on wire rope and it shall have a thimble.

Eye bolts: Plain (shoulder less) eye bolts and shoulder type eye bolts are the two major types available.

- Eye bolts are totally drilled on the load and length shall be 1-1.5 times the bolt diameter.
- The bolt hole shall fit into the bolt.

Demonstrate

- Explain the safety points while using wire slings.
- Demonstrate the use of wire slings.

Steps – Safe use of Slings

Step 1: Ensure the strength of floor to take the load by preparing it.

Step 2: Centre of gravity of load should be below and aligned to lifting point. Remove or secure the loose parts of load. Hook slings to lifting points or shackles and firmly lock it to the load.

Step 3: Do not exceed the SWL or rated angle.

Step 4: Slings or accessories must fit freely and actions such as hammering, forcing or wedging them to bring them to a position must be avoided.

Step 5: Congestion of the hook when attaching more than one sling to it can be avoided by using a shackle to join the slings.

Step 6: Before starting the lifting ensure the load is free and not fixed or bolted somewhere.

Step 7: Ensure the absence of power lines and other overhead obstructions in lifting path.

Step 8: When lifting, lowering or controlling loads avoid trapping of fingers, toes etc by clearing them from load.

Step 9: To check if the load is balanced, stable and secure make a trial lift by raising the load a little and if any slinging arrangement is required lower the load and do it before the actual lift.

Step 10: The lifting area must be kept clear and barricade properly and trespass is not allowed.

Step 11: To hold the load without crushing strong supports must be used.

Step 12: Slings must not be dragged over floors etc or they must not be dragged while they are under the load.

Step 13: If manufacturer doesn't permit avoid the contact of slings with chemicals or heat.

Step 14: Never use damaged or contaminated slings.

Step 15: Store all lifting equipments and accessories properly after the lift is finished.

Tips

Wire slings safety tips

- Suitable wire rope slings must be used.
- Avoid damaged wire rope slings for lifting.
- Weight must always be less than or equal to Safe Working Load.
- Conduct regular inspections to reduce errors
- Never raise the load quickly.

- Angle between the slings is important when more than one wire rope sling is used as it affects the tension on slings.

Eye bolts safety tips

- Eye bolt must not be connected to hook directly; use shackles to connect.
- Vertical lifting is the only activity which uses plain eye bolts.
- Shoulder eye bolts cannot be used at angles less than 45' while lifting.
- To confirm the attachment of shoulder to the surface washers may be used.
- Pair of eye bolts cannot share a sling.

Ask

- Ask about what are maintenance tools.
- Ask about operating principle of induction heater.
- Ask about working mechanism of puller.
- Ask about different lifting accessories and tools.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of bearing maintenance and lifting tools

Skill Practice	Time	Resources
Use of puller, eye bolt, induction heater and locking nut	1 hour	Bearing, puller, eye bolt, induction heater and locking nut

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 4.4: Using of measuring instrument

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about different measuring instruments
2. Know about how to use measuring instruments properly

Resources to be Used

- Available objects such as a duster, pen, notebook, measuring instruments etc.

Ask

- You could ask the definition of Unit
- You could ask the body parts of a micrometer
- You could ask the different types of rules available
- You could ask the concept of vernier caliper
- You could ask the following concepts
  1. Height Gauge
  2. Feeler Gauge
  3. Dial indicators
  4. Bore Gauge
  5. Thread Gauge
- You could ask to explain the calibration process

Notes for Facilitation

- You could ask about the SI unit of different physical quantities like length, mass, time etc
- You could ask how can the accuracy of a spirit level can be checked

4.4.1: Measurement

Say

- Measurement is the comparison of one quantity with standard quantity
- A unit of measurement is a definite magnitude of a physical quantity (length, Mass and Time).
- A unit of measurement is definite

Ask

- You could ask the definition of Unit.
- Ask about systems of measurement.
- Ask about different types of units.

Elaborate

A unit of measurement is a definite magnitude of a physical quantity (length, Mass and Time). Example: 10 liter, 200 meter, 20 kg

However, now-a-days SI (International System of Units) is used across the globe as a standard system of measurement. It is an extension of MKS system of measurement.

S. No	Unit	Length (L)	Mass (M)	Time (T)
1.	C G S	Centimeter (cm)	Gram (gm)	Second (sec)
2.	F P S	Foot (ft.)	Pound (lb)	Second (sec)
3.	M K S	Meter (m)	Kilogram (Kg)	Second (sec)

SI system has 7 fundamental units and 2 supplementary units, there are a number of derived units.

S. No	Measuring	S I Units
1	Length	Meter
2	Mass	Kilogram
3	Time	Second
4	Intensity of Electric current	Ampere
5	Thermodynamic Temperature	Kelvin or degree Celsius
6	Quantity of substance	Mole

Few Derived units in SI system are:

S. No	Physical units	S I Units
1	Area	Sq. mtr
2	Volume	Cu.mtr
3	Speed	m/sec
4	Acceleration	m/sq sec
5	Density	Kg/cu.m
6	Force	Newton
7	Pressure	Pascal

4.4.2: Measuring instruments

Say

- A measuring instrument is a gadget for measuring a physical amount. In the physical sciences, quality confirmation and engineering, estimation is the movement of getting and contrasting physical amounts of certifiable items and events.
- Measuring instruments are classified into types:
  - Precision instruments and
  - Non Precision instruments
- Least Count shows the level of precision of estimation that can be accomplished by the measuring instrument.

Do

- Show different precision and non-precision instruments.
- Give the example of least count calculation.

Ask

- You could ask about precision instruments
- Ask about non-precision instruments

Elaborate

A measuring instrument is a gadget for measuring a physical amount. In the physical sciences, quality confirmation and engineering, estimation is the movement of getting and contrasting physical amounts of certifiable items and events. Set up standard articles and events are utilized as units, and the procedure of estimation gives a number relating the thing under review and the referenced unit of estimation. Measuring instruments, and formal test strategies which characterize the instrument's utilization, are the methods by which these relations of numbers are gotten. All measuring instruments are liable to shifting degrees of instrument mistake and estimation vulnerability.

4.4.2.1: Steel rule

Say

- Steel Rule is a flat and thin linear measurement instrument. It is the most commonly used measuring instrument.
- There are different types of rules available. Few commonly used are: Engineer's rule, Folding rule,
  - Flexible rule & Hook rule

Do

- Show different steel rules
- Demonstrate the use of steel rule

Elaborate

Steel Rule is a flat and thin linear measurement instrument. It is the most commonly used measuring instrument. Steel rule is manufactured from stainless steel. The edges of the rule are accurately ground to form straight edges. Steel rules are available in different sizes like 150 mm, 300 mm and 600 mm. usually; the reading accuracy is around 0.5 mm.

Fig 4.4.1: *Steel rule*

4.4.2.2: Vernier caliper

Say

- A Vernier Caliper is a precision measuring instrument used to measure inside and outside diameter of shafts and thickness of parts having accuracy of 0.02mm.
- The vernier calipers measure reading of the distance directly with precision and high accuracy. These calipers consist of calibrated scale with fixed jaw and movable jaw with a pointer.
- The Least Count of a Vernier Caliper can be calculated using the formula LC = 1 MSD - 1 VSD (Value of one Main Scale Division - Value of one Vernier Scale Division).

Do

- Show vernier caliper.
- Show the parts of vernier caliper.
- Demonstrate how to take the reading from vernier caliper.

Elaborate

For using vernier caliper, move the position of the pointer on the scale. At the point where the pointer is between two markings, take the reading on the scale. This is basic caliper; expansion of vernier scale on the instrument gives more exact reading; this is the vernier caliper.

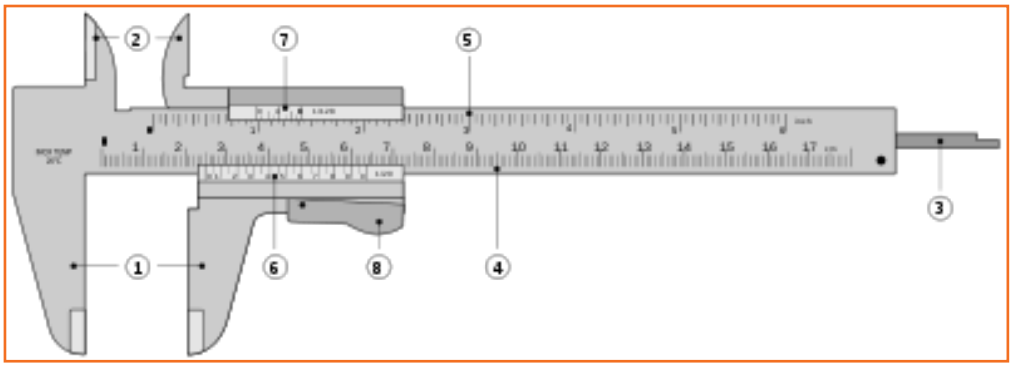

Fig 4.4.2: *Vernier caliper*

Parts of a vernier caliper:

1. **Outside Jaw -** To measure outer dia. and width of an object.
2. **Inside Jaw -** To measure inner dia.
3. **Depth Probe -** To measure depth of an object.

4. **Main Scale -** Scale set apart in millimeter (mm)
5. **Main Scale -** Scale set apart in inches
6. **Vernier Scale -** Interpolated estimations in millimeter
7. **Vernier Scale -** Interpolated estimations in millimeter
8. **Retainer -** Used to lock movable parts

Demonstrate

- Explain the parts of vernier caliper.
- Demonstrate how to do measurement from vernier caliper

Steps: Using vernier caliper

STEP 1: First loose the locking screw of caliper and check the vernier scale for its proper working by moving the slider and ensure that caliper is reading 0 when closed fully. If you find caliper is not showing 0 reading, then adjust the jaws of caliper till that you get a 0 reading. If it is not adjusting at 0 reading, then add or subtract the correct offset in final reading for getting 0 reading.

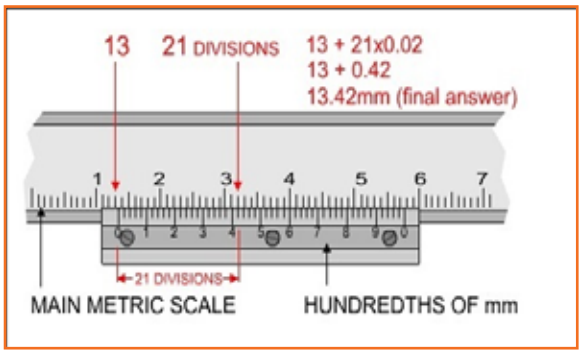

Fig 4.4.3: *Vernier Scale*

STEP 2: Close the jaws delicately on the object which need to be quantify (For instance a round steel ball).

STEP 3: The primary metric scale is perused first and for instance says this demonstrates there are 13 entire divisions before the 0 on the hundredths scale. Thusly, the main number is 13.

STEP 4: The 'hundredths of mm' scale is then perused. The most ideal approach to do this is to tally the quantity of divisions. This is 21 divisions on the hundredths scale.

STEP 5: Then 21 is multiplied by 0.02 giving 0.42 as the appropriate response (every division on the hundredths scale is comparable to 0.02mm).

STEP 6: The 13 and the 0.42 are included to give the last estimation of 13.42mm (the diameter across of the bit of round area steel).

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.

- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using vernier caliper

Skill Practice	Time	Resources
Using vernier caliper	2 hours	Vernier caliper
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.4.2.3: Micrometer

Say

- A micrometer is a gadget assimilating an aligned screw broadly utilized for exact estimation of segment in mechanical trades and machining.
- Micrometers utilize the rule of a screw to expand little separations (that are too little to measure normally) into big rotation of the screw that are sufficiently enormous to read from a scale.
- Explain the body parts of a micrometer.

Do

- Show micrometer.
- Show the parts of micrometer.
- Demonstrate how to take the reading from micrometer.

Elaborate

A micrometer is a device incorporating a calibrated screw widely used for precise measurement of component in mechanical engineering and machining as well as most mechanical trades. They are used to measure very small distances.

Body parts of a Micrometer

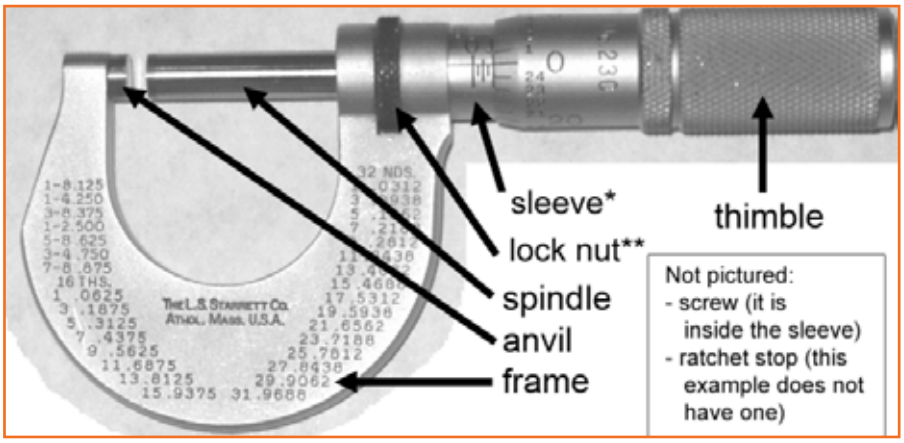

Fig 4.4.4: *Micrometer*

- **Frame -** The C-formed part that clasp the anvil and barrel in steady connection to each other. It is thick since it needs to limit flexion, magnification, and compression, which can misinterpret the estimation.
- **Anvil -** The gleaming part that the spindle pushes toward, and that the model leans against.
- **Sleeve / barrel / stock -** The stationary cylindrical part with the straight scale on it.
- **Lock nut / lock-ring / thimble lock -** The rough part (or lever) that one can fix to hold the spindle stagnant, for example, when instantly holding a measurement.
- **Screw –** It is the main part of instrument, stays inside the barrel.
- **Spindle -** The gleaming round part which pushes the thimble towards anvil.
- **Thimble –** This part turns by the thumb
- **Ratchet stop -** Applied pressure can be limited by the device in the end of the handle by slipping at an aligned torque.

Demonstrate

- Explain the parts of micrometer.
- Demonstrate how to do measurement from micrometer.

Steps: Using Micrometer

The fundamental working standards of a micrometer are as per the following:

STEP 1: The measure of turn of a precisely made screw can be directly associated to a specific measure of axial movement (and the other way around), through the steady known as the screw's lead. A screw's lead is the distance it moves ahead axially with one entire turn (360°).

STEP 2: With a fitting lead and real diameter of the screw, a given measure of axial movement will be intensified in the consequential circumferential movements.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using micrometer

Skill Practice	Time	Resources
Using micrometer	2 hours	Micrometer
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.4.2.4: Height gauge

Say

- A digital height gauge is precision measuring device used specifically for measuring height of two points.
- Advanced electronic (digital) height gauges can be used to carry out different tasks like measuring step heights, internal/external diameters and centre-line distances.

Do

- Show height gauge.
- Show the parts of height gauge.
- Demonstrate how to take the reading from height gauge.

Elaborate

The electronic height gauge has a precision of up to 0.0254 mm and claims consistency of ±0.00254 mm. The conventional height gauges are similar to Vernier Callipers, except that the fixed jaw is shaped like a base. The scale is graduated on both sides, one side being graduated for internal measurement. The main scale for external measurement starts at 1 inch. This allows for the combined width of the base and movable jaw, when the jaws are in contact. The gauge can be converted into a form of scribing block (to mark the work piece) by attaching an extension arm, beveled to a sharp edge, to the movable jaw.

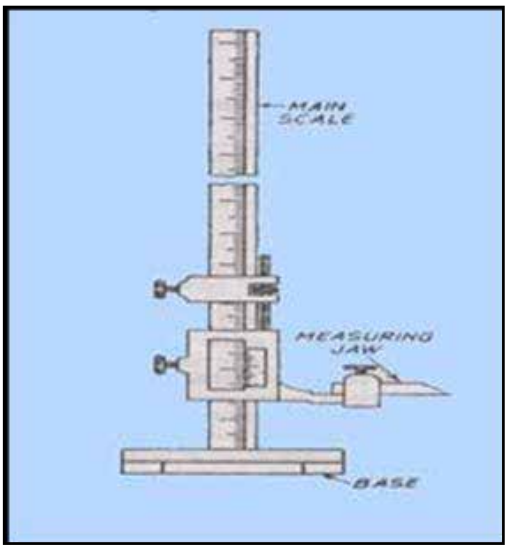

Fig 4.4.5: *Height gauge*

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.

- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using height gauge.

Skill Practice	Time	Resources
Using height gauge	2 hours	Height gauge
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.4.2.5: Feeler gauge

Say

- A feeler gauge is a measuring tool used to measure gap widths. They are used to measure the clearance between two parts.
- They are made of number of small steel strips of different thicknesses with measurements marked on each piece.

Do

- Show feeler gauge.
- Show the parts of feeler gauge.
- Demonstrate how to take the reading from feeler gauge.

Elaborate

- Feeler gauges are flexible enough that, even if they are all on the same hinge, several can be stacked together to gauge intermediate values
- Feeler gauges are used for valve clearances, setting spark plug gaps and ignition point gaps in engines.
- Feeler gauges are generally available in Metric and Inch Grades.

Fig 4.4.6: *Feeler gauge*

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using feeler gauge.

Skill Practice	Time	Resources
Using feeler gauge	2 hours	feeler gauge
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.4.2.6: Dial indicator

Say

- Instruments use to measure small linear distances is called dial indicator. They are also known as dial gauges.
- Variation in tolerance of machined part can be checked by dial indicator.
- It's typical measurement range is 0.25 mm to 300 mm.

Do

- Show dial indicator.
- Show the parts of dial indicator.
- Demonstrate how to take the reading from dial indicator.

4.4.2.7: Bore gauge

Say

- This gauge is used to measure inside diameter of hole, pipe, cylinder etc. and calibrated in .001 inch or .0001 inch. If it is connected with a micrometer, it gives the accurate measurement of a bore size.
- Dial indicator on top of the shaft
- A measuring sled at the base. The measuring sled consists of:
  - o 2 hardened steel anvils (1 fixed, 1 movable).
  - o The movable anvil is connected to a push rod inside the instrument which operates dial gauge on other end.

Fig 4.4.7: *Bore gauge*

Do

- Show bore gauge.
- Show the parts of bore gauge.
- Demonstrate how to take the reading from bore gauge.

Demonstrate

- Explain the parts of bore gauge.
- Demonstrate how to do measurement from bore gauge.

Steps – Using bore gauge

Setting the bore gauge to zero by micrometer

Step 1: Set a micrometer to the size bore you will be testing.

Step 2: Set up the dial bore gauge with the extensions necessary for the bore diameter.

Step 3: Place the bore gauge between the micrometer's spindle and anvil.

Fig 4.4.8: *Use of bore gauge*

Step 4: Rock the dial bore gauge back and forth and side to side in the micrometer.

Step 5: Note the minimum reading and zero the dial indicator to that reading.

How to use a dial gauge

Step 1: **Zero the gauge:** This is proficient by measuring across the gauge with an external micrometer set to the exact bore size. This is ready to use when the zero aligns with the needle.

Step 2: **To measure depth, insert the gauge into the bore:** For proper inserted in the pipe make rock it back and forth.

Step 3: **Look at the reading:** This is the lowest reading, which is taken when the gauge is square on the bore, and the indicator needle reverses its direction. It can be either more or less than the zero mark, and will indicate an oversize or undersize bore

Fig 4.4.9: *Calculating diameter using bore gauge*

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using bore gauge.

Skill Practice	Time	Resources
Using bore gauge	2 hours	Bore gauge
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.4.2.8: Thread gauge

Say

- To measure the pitch of a screw thread a thread gauge is used. Determining the pitch of a thread that is on a screw or in a tapped hole thread pitch gauges are used as a reference tool.
- This tool is not used as a precision measuring instrument. It allows the user to find the profile of the given thread and quickly categorize the thread by shape and pitch.

Fig 4.4.10: *Thread Gauge*

Do

- Show thread gauge.
- Show the parts of thread gauge.
- Demonstrate how to take the reading from thread gauge.

Demonstrate

- Explain the parts of thread gauge.
- Demonstrate how to do measurement from thread gauge.

Steps – Using thread gauge

To find the number of threads per inch or the distance between threads in metric connections a thread pitch gauge is used.

Step 1: Put the gauge on the threads until the fit is snug.

Step 2: The teeth of the pitch gauge that fit perfectly into the threads will match the size of the thread gauge.

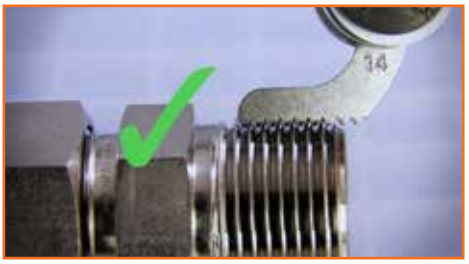

Fig 4.4.11: *Correct use of thread Gauge*

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using thread gauge.

Skill Practice	Time	Resources
Using thread gauge	2 hours	Thread gauge
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.4.2.9: Spirit level

Say

- A spirit level is usually used to level machines.
- The accuracy of a spirit level can be checked by placing it on any flat surface, marking the bubble's position and rotating the level 180°.
- The position of the bubble should then be symmetrical to the first reading. Machinist's levels provide screw mechanisms to center the bubbles.

Fig 4.4.12: *Spirit level*

Do

- Show spirit level.
- Demonstrate the use of spirit level.

Elaborate

Checking Horizontal Levels

To check the horizontal levels, place the spirit level in the centre of the surface or object correctly. If air bubble will sit between the two lines of scale, then the surface or object is level.

If the bubble sits on the left side of the lines, this means the surface or object is high from left side and vice-versa for opposite side.

Checking Vertical Levels (Plumb)

- If you need to check that something is vertical, position the rear edge of spirit level against the surface or object.
- If you are checking something quite tall like a wall, fencepost or door-frame you should use the longest spirit level you can – alternatively use a small level together with a long straight-edge which you should position against the vertical surface that you are checking.
- Now, look at the vial which is at right angle to the base of the spirit level – if the bubble is between the lines, then the surface or object is vertical.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using spirit level.

Skill Practice	Time	Resources
Using spirit level	2 hours	Spirit level
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

4.4.3: Calibration of measuring instrument

Say

- Calibration involves ascertaining and documenting deviation of the measured value from a retraceable, highly accurate test standard. The measured value obtained from a measuring instrument is thus compared with the known value of the test standard under specified reference conditions using reproducible measuring procedures.
- Calibration does not involve any manipulation of the measuring instrument, which remains entirely unchanged.
- Adjustment involves the correction or balancing of a measuring instrument in order to eliminate systematic measurement deviation.
- Retraceability of a calibration procedure means that the calibration sequence is reproducibly documented from the individual device under test all the way up to the national standard for the respective measured quantity.

Do

- Explain calibration process.
- Demonstrate how to check the calibration of measuring instrument.

Elaborate

Measuring instruments must be retraced to national standards at regular intervals by means of calibration, and if necessary adjusted, and plainly labeled with their calibration status. If it is determined during calibration that the measuring instrument does not fulfill the specified requirements, the operating company must evaluate the validity of previously obtained measurement results and implement appropriate measures with regard to the measuring instrument itself, as well as all affected products.

Calibration of an instrument is checked at several points throughout the calibration range of the instrument. The calibration range is defined as “the region between the limits within which a quantity is measured, received or transmitted, expressed by stating the lower and upper range values.

Calibration process

1. The calibration process begins with the design of the measuring instrument that needs to be calibrated.
2. The design has to be able to “hold a calibration” through its calibration interval. In other words,

the design has to be capable of measurements that are "within engineering tolerance" when used within the stated environmental conditions over some reasonable period of time.

3. Having a design with these characteristics increases the likelihood of the actual measuring instruments performing as expected.
4. The next step is defining the calibration process. The selection of a standard or standards is the most visible part of the calibration process. Ideally, the standard has less than 1/4 of the measurement uncertainty of the device being calibrated.
5. The test equipment being calibrated can be just as accurate as the working standard.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 4.5: Diagnosing the common defects of tools

Unit Objectives

At the end of this unit, you will be able to:

1. Know about identification of defects in tools

Say

- Management has to establish a system to check the condition of tools for any defect or damage on regular basis.
- If found tools are damaged and are not in a condition of repairing, then discard the complete tool on immediate basis from the work area.
- Defective tools can do severe and hurting injuries.
- **Check problems like:**
  - Un-operative guards
  - The on/off switch is not working properly
  - Insufficient grounding of power tools
  - No ground wire (on plug) in tools
  - Wrong grinder wheel
  - Cracked blade of tool
  - Wedged back the guard on power saw

Do

- To ensure safe use of hand tools, remember:
  - Double check all tools before using
  - Never use a defective tool
  - Make sure that all defective tools are repaired before using
- Don't use power tools if there is any defect in them.

Ask

- You could ask about the points to be remembering to ensure safe use of hand tools.
- You could ask why special care should be paid to the cleanliness of tools.

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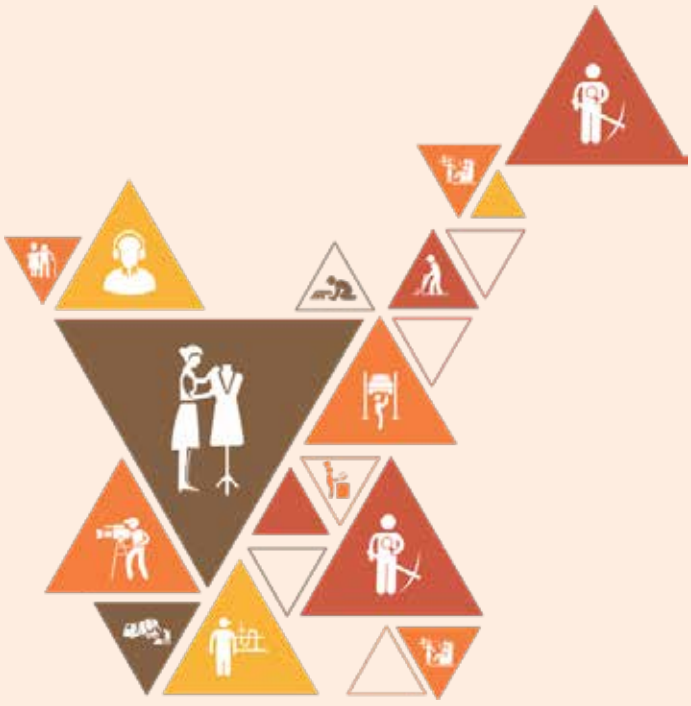
5. Bearings

Unit 5.1 – Bearings

Unit 5.2 – Types of bearings

Unit 5.3 – Operating conditions of bearings



ISC/N0929

Key Learning Outcomes

At the end of this module, students will be able to:

1. Discuss about bearings
2. Discuss about functions of bearings
3. Know about parts of bearings
4. Discuss about types of bearings
5. Know about ball bearings
6. Know about roller bearings
7. Know about operating conditions of bearings

UNIT 5.1: Recognition of electrical machines and their use

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about bearings
2. Know about parts of bearings
3. Know about functions of bearings

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster and bearings.
- PC with LCD Projector or Flip Chart
- Participant Manual

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Bearings are highly engineered, precision made components that enable machinery to move at extremely high speeds and carry remarkable loads with ease and efficiency.
- Bearings are found in automobiles, airplanes, computers, construction equipment, machine tools, DVD players, refrigerators and ceiling fans.
- A bearing's smooth performance is assured by a combination of four basic working parts: Outer race, Inner race, rolling elements and separator.
- A bearing is designed to:
  - Reduce friction
  - Support a load
  - Guide moving parts – wheel, shafts, pivots

Elaborate

Parts of a bearing

- **The outer race, or cup**, is smoothly and accurately machined outer ring of bearing and it protects the bearing's internal parts.
- **The inner race, or cone**, is the inner ring that sits directly on the shaft
- **The rolling elements** permit easy movement of the shaft within its housing by acting as a cushion between the outer and inner races to reduce the friction. According to the type of load, conditions under which bearing is operated and applications for which the bearing is used there are two types of bearings ball bearings and roller bearings.
- **The separator** is a metallic holder that uniformly separates and holds the rolling elements and it stays between the inner and outer races.

Working of bearing

- **Reduce friction:** Function of bearings is to reduce friction and provide smooth consistent shaft movement by its rolling internal mechanism whether they are used in fleet, automotive or industrial applications.
- **Support a load:** Weight of load and direction of movement of load decide the stress on bearings. Direction of stress on bearing will be the same as direction of movement of load.
- **Guide moving parts:** Bearing guides the movement of rotating parts like critical shafts, wheels and pivots by carrying load and providing easy movement.

Ask

- Ask various working parts of bearing
- Ask from the students how bearing work

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 5.2: Types of Bearings

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about different types of bearings
2. Know about ball bearings and their types
3. Know about roller bearings and their types

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster and different types of bearings.
- PC with LCD Projector or Flip Chart
- Participant Manual

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Ball bearings and roller bearings are two types of bearings according to the type of rolling elements used.
- Ball bearings are also called anti -friction bearings. Ball bearings have many uses in trucks, cars, and off -the-road vehicles.
- There are three accessory components frequently used with ball bearings are snap rings, shields and seals.
- There are four different ball bearing types used in applications:
  - Single row
  - Angular contact
  - Double row
  - Ball thrust

- Roller bearings are of following types:
  - Tapered Rollers
  - Cylindrical Rollers
  - Needle Rollers
- Several kinds of bearings that are manufactured for specific applications, such as magnetic bearings and giant roller bearings.

Elaborate

Ball bearings

There are three accessory components frequently used with ball bearings:

- **Snap rings:** Snap rings are separate components used to locate ball bearings in the housing.
- **Shields:** Shields are circular rims that cover the open space between the two races, on one or both sides of the bearing.
- **Seals:** A seal is a metal-based ring lined with a single, double or triple lip made of rubber, elastomers, synthetic or non-synthetic materials.

Different types of ball bearings

- **Single row ball bearing:** It is a commonly used design and it contains a wide groove formed by cutting a crescent-shaped groove in both the inner and outer. It can handle thrust loads in both directions at high rotating speeds even though it is designed for radial loads. It can accommodate only single row bearing.

  Benefits/advantages

  - Good performance under radial loads
  - Deep groove permits thrust load capacity in either shaft direction
  - By attaching seals contaminants entering the bearing can be prevented.

  Applications

  - Transmission
  - Alternator
  - Differential
  - Steering gear
  - Air conditioner clutch

- **Angular contact ball bearing:** It contains one shoulder on the inner race, the other at the opposite side on the outer race; both of them forming a steep contact angle slanted toward the bearing's axis. These shoulders support high thrust loads combined with a moderate radial load and have high axial rigidity.

  Benefits/advantages

  - High thrust capacity
  - Axial rigidity

- **Double row ball bearing:** Principles of the single row and angular contact bearings are combined in double row ball bearing. Position of grooves in the outer and inner races is such that the load lines through the balls from either an outwardly or inwardly converging contact angle

  Benefits/advantages

  - Thrust capacity in either direction
  - High radial capacity
  - Less axial displacement

- **Ball thrust:** They have high thrust capacity and used mainly for clutch release applications. But produce little axial displacement since load line runs parallel through its balls to the shaft axis. Under heavy loads flat shoulders on the shaft and housing are to be used.

  Benefits/advantages

  - High thrust capacity
  - Minimal axial displacement

Roller bearings

- **Tapered roller bearings:** True rolling motion is achieved with the conical shape of this bearing. They can handle any combination of radial and thrust loads.

  Benefits/advantages

  - Because of conical shape designs without guidance by the cage each roller in the bearing can line up itself properly between the tapered faces of the cup and cone.
  - Since a radial load produces both radial and thrust reaction on a tapered bearing this can support radial and thrust loads at the same time.

  Applications: Following parts of vehicles like automobiles, trucks, tractors, and various farming vehicles uses tapered roller bearings.

- **Cylindrical roller bearings:** Inner race, outer race, cage and rollers are the four roller bearing

parts of cylindrical type. A cage guides rotating movement of equally spaced cylinder shaped rollers on the flat surface of the two races.

Benefits/advantages

- High capacity under radial loads
- Accurate guiding of the rollers
- Limited free axial movement

- **Needle roller bearings:** Needle roller bearing also uses cylinder shaped rollers but with thinner diameter and more number of rollers per bearing. Cage is absent in full complement needle roller bearings. It holds everything in place when one roller pushes against the other during its working time.

  Benefits/advantages

  - Radial loads capacity is high

Specialized bearings: Magnetic bearings and giant roller bearings are examples of specialized bearings. Since magnetic bearings have no moving parts and high stability, it is used in high-speed devices.

Ask

- Ask advantages of different types of ball bearings
- Ask advantages of different types of roller bearings
- Ask the meaning and kinds of specialized bearings

Do

- Show the different ball and roller bearings.
- Tell students to identify the type of bearing.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 5.3: Operating conditions of Bearings

Unit Objectives

At the end of this unit, you will be able to:

1. Know about operating conditions of bearings

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster and different types of bearings.
- PC with LCD Projector or Flip Chart
- Participant Manual

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Tolerance is the amount of deviation from prescribed nominal dimensions permitted by the industry
- Clearance is necessary so that the rollers have room to turn without building up excessive heat and friction during operation.
- In tapered roller bearings, there should be enough clearance in the housing for the cage as well, because if the cage rubs against the housing it can cause the rollers to drag.
- Bearing races are mounted on areas called “seats.” The cup seat is the housing, while the cone seat is the shaft. Within these two seats are upward extensions on which the races rest. They are called “shoulders.”
- The bearing cup and cone seats – the shaft and housing – must be properly aligned.
- To assure proper bearing performance, the condition of the area in which the bearing sits – the shaft and housing – is pivotal.
- Type of load, shaft speed, and amount of friction all contribute to one of the most critical conditions for operation – temperature.
- Using the right type and amount of lubricant for the job is another factor critical to bearing performance.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

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6. Maintenance of bearing

Unit 6.1 – Bearing handling and storage

Unit 6.2 – Bearing inspection

Unit 6.3 – Troubleshooting of bearing

ISC/N0930

Key Learning Outcomes

At the end of this module, students will be able to:

1. Discuss about safe handling of bearing
2. Discuss about safe storage of bearing
3. Know about cleaning requirements of bearing
4. Know about inspection process of bearing
5. Discuss about troubleshooting of bearings
6. Know about bearing damages and their causes
7. Know about counter measures applied against damages

UNIT 6.1: Bearing handling and storage

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about precautions, while handling bearings
2. Know about storage of bearings
3. Know about cleaning of bearings

Resources to be Used

- Available objects such as a duster, pen, notebook, bearings, cleaning solution and equipments, pulling equipments, etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Bearings are a vital component in major industrial equipment. Bearing problems can result in costly downtime, equipment damage and breakdowns
- To attain reliable operation with high equipment performance and the lowest possible maintenance costs, it is essential to follow proper handling practices:
  - bearing storage,
  - removal,
  - cleaning,
  - inspection and
  - installation
- After removing a bearing from a piece of equipment, thoroughly clean it to remove all scale, water, lubricant, debris and any other contaminants. Bearings must be cleaned thoroughly to allow for proper bearing inspection.
- Smaller bearings can be cleaned in a wash tank that circulates a cleaning solution such as kerosene, mineral spirits or a commercial solvent through the bearing.
- For large bearings, or to clean large numbers of bearings, cleaning equipments such as a large tank containing appropriate cleaning solution is required.

Elaborate

Precautions for handling

The main precautions to be observed are as follows:

(1) Clean the bearings and its surrounding area: bearings get harmed by dust and dirt, even if it cannot be seen by naked eye. So keep the bearing and its surrounding in a very clean condition.

(2) Handle with care: Brinelling, breaking, cracking or scratches may occur to the bearing by heavy shocks or impacts during handling and bearing may fail.

(3) Use proper tools: Instead of using general purpose tools always use the proper tool to work on bearings

(4) Protect bearings from corrosion: keep the hands clean and use gloves in order to avoid exposure of bearing to perspiration and other contaminants which causes corrosion

Fig 6.1.1: *Bearing Handling*

For storage of bearing, you have to remember following points:

- Rusting or corrosion of stored bearings must be avoided by keeping the bearing free of even small amount of moisture or chemical from glove or hand, which may result in etched areas and failure.
- Until and unless for installations the package of bearings must not be opened.
- Since condensation of water occurring on concrete floors may damage the bearing by corrosion, the direct storage of bearings on concrete floors must be avoided.
- Quick temperature variation and elevated humidity levels cause creation of condensation So in such cases bearings are preferred to be stored on pallet or shelf
- In case of tapered roller bearings oiled paper or plastic sheets must be placed, between rollers and cup races.

Safe bearing removal tools are:

1. Arbor press;
2. Mechanical (or hydraulic) jaw-type pullers has press-fit edges that can grip parts
3. For removing parts from housing by pushing or pulling using forcing screws , “mechanical (or hydraulic) push-pullers” are used
4. Slide hammer pullers with a weighted sliding handle ,which removes parts from blind holes by striking a “stop” on its own rod
5. Special pullers used for timing gears, crankshaft sprockets, and flywheel pilot bearings.

Demonstrate

- Explain the benefits of cleaning the bearing.
- Demonstrate the process of cleaning the bearing

Steps – Cleaning of bearing

Step 1: In a whole night keep the bearings immersed in a clean vessel or tank containing a specific solvent. Bearing will not be placed directly inside tank; instead it will be either hanged on a wire or kept in a metal basket or metal plate

Step 2: In normal conditions to clean the bearings oils must not be used .Instead recommended solvents are used.

Step 3: Additional washing is done on the bearings again with clean bucket and solvent after the removal of contaminants like dirt and grease. Then drying is done

Step 4: Even though natural ventilation is the safest method used, to make the bearings dry compressed air can also be used but only after ensuring all the dirt is removed from bearings

Step 5: Bearings can be reused after cleaning and detailed inspection of nicks, leftover dirt and damage. Cleaned bearings are immersed in protective lubricant or coated all over with grease, then rotated to make sure the grease is coated in rollers and races.

Step 6: Waterproof paper is used to cover the bearings and secure them in a clean box or carton if available.

Step 7: Whether shields or seals are present on bearings on one side or not, both are washed, inspected and handled in the same method.

Step 8: Instead of washing wipe off the bearings if shields or seals are there on both sides, to prevent dirt from entering. Until reuse cover smooth rotating bearings with a protective lubricant, then wrap them with waterproof paper and store.

Ask

- You could ask the important points to be remember for storage of bearing
- You could ask the there are a number of recommended tools and methods that assure safe, reliable bearing removal.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of shackles

Skill Practice	Time	Resources
Handling and cleaning of bearing	2 hours	Bearing, cleaning material, puller, eye bolt etc.

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 6.2: Bearing Inspection

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about how to do bearings inspection
2. Do inspection of bearings during operation
3. Do inspection of bearings after operation

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Bearings are to be inspected to make sure they are still good to be used in corresponding application when a piece of equipment is taken out of service for usual inspection or maintenance.
- To prevent the entering of debris into bearing even in small quantity that could lead to spalling and premature failure by creating points of high stress, clean the area of inspection from dirt and debris.
- During operation temperature, noise, and vibration of bearings are to be checked. Also to know the top off or replacement time of oil lubricant properties are examined.
- To prevent recurrence of failure carefully examine any change of the bearing after operation and during periodic inspections
- While inspecting bearings, you have to check following parameters:
    - Bearing Temperature
    - Operating sound of bearing
    - Vibration of bearing
    - Lubricant Selection
    - Relubrication
- Damage to the bearing can be detected early by measuring the vibration of the machine.
- Relubrication intervals of grease depend on the type, dimensions, and speed of the bearing, and the type of grease.
- Bearings' operating conditions are evaluated by visually checking each component of bearings after operation or removed during periodic inspection. Abnormality if detected is checked against the failure cases to find the cause and apply a remedy.

Ask

- You could ask the effects of effective lubrication of the rolling-element bearing
- You could ask about the re-lubrication

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 6.3: Troubleshooting of Bearing

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about how to do troubleshooting of bearings
2. Know about common bearing damages, causes and corrective measures

Resources to be Used

- Available objects such as a duster, pen, notebook, damaged bearings etc.

Say

- Bearing damage as a result of improper operation of bearing may show symptoms which are misleading according to degree of damage and in many cases are the results of secondary damage.
- Common bearing symptoms:
  - Too high heat
  - Heavy noise
  - Vibration is high
  - Extreme shaft movement
  - Torque applied to rotate shaft is high
- Bearing failures not attributed to material fatigue are generally classified as premature.
- There are many reasons for bearing failure
  - **Flaking** occurs when small pieces of bearing material are split off from the smooth surface of the raceway or rolling elements due to rolling fatigue, thereby creating regions having rough and coarse texture.
  - **Peeling** is dull or cloudy spots appear on surface along with light wear. From such dull spots, tiny cracks are generated downward to a depth of 5 to 10 µm. Small particles fall off and minor flaking occurs widely.
  - **Scoring** is surface damage due to accumulated small seizures caused by sliding under improper lubrication or under severe operating conditions
  - **Smearing** is surface damage which occurs from a collection of small seizures between bearing components caused by oil fi lm rupture and sliding. Surface roughening occurs along with melting.
  - **Fracture** refers to small pieces which were broken off due to excessive load or shock load acting locally on a part of the roller corner or rib of a raceway ring

- **Cracks** in the raceway ring and rolling elements. Continued use under this condition leads to larger cracks or fractures.
- **Cage damage** includes cage deformation, fracture and wear
- **Denting:** When debris such as small metallic particles is caught in the rolling contact zone, denting occurs on the raceway surface or rolling element surface. Denting can occur at the rolling element pitch interval if there is a shock during the mounting.
- **Pitting:** The pitted surface has a dull luster which appears on the rolling element surface or raceway surface
- **Wear** is surface deterioration due to sliding friction at the surface of the raceway, rolling elements, roller end faces, rib face, cage pockets, etc.
- **Fretting** surfaces wear producing red rust colored particles that form hollows. On the raceway surface, dents called false brinelling are formed at spacing equal to distances corresponding to the rolling elements
- **False brinelling** is the occurrence of hollow spots that resemble brinell dents, and are due to wear caused by vibration and swaying at the contact points between the rolling elements and raceway.
- **Creep** is the phenomenon in bearings where relative slipping occurs at the fitting surfaces and thereby creates a clearance at the fitting surface. Creep causes a shiny appearance, occasionally with scoring or wear.
- **Seizure:** When sudden overheating occurs during rotation, the bearing becomes discolored. Next, raceway rings, rolling elements, and cage will soften, melt and deform as damage accumulates.
- **Electrical corrosion:** When electric current passes through a bearing, arcing and burning occur through the thin oil film at points of contact between the race and rolling elements.
- **Bearing rust and corrosion** are pits on the surface of rings and rolling elements and may occur at the rolling element pitch on the rings or over the entire bearing surfaces
- **Mounting flaws:** Straight line scratches on surface of raceways or rolling elements caused during mounting or dismounting of bearing.
- **Discoloration** of cage, rolling elements, and raceway ring occurs due to a reaction with lubricant and high temperature.

Explain

- Explain each reason of bearing failure discussed above.
- Explain possible causes of each reason of bearing failure.
- Explain counter measures need to taken for avoiding each reason of bearing failure.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of shackles

Skill Practice	Time	Resources
Identification of type of damage in bearing	1 hours	Damaged bearings

Do

- Show the damage bearing one by one
- Call each student one by one and tell them to identify the type of damage in the bearing.
- Wrap the unit up after summarizing the key points and answering questions.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

Notes

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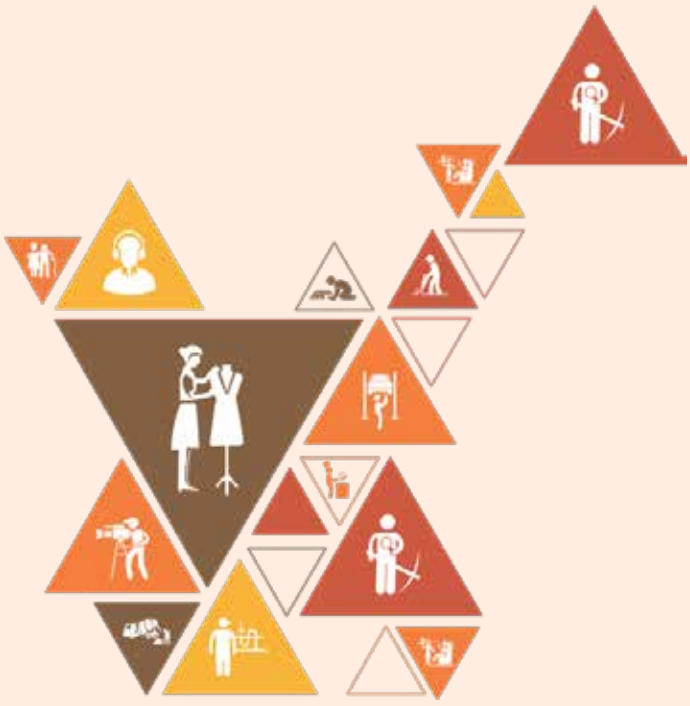
7. Lubrication and seals

Unit 7.1 – Bearing lubrication

Unit 7.2 – Types of lubricant

Unit 7.3 – Seals



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Key Learning Outcomes

At the end of this module, students will be able to:

1. Discuss about lubrication of bearings
2. Know about lubricant selection requirements
3. Discuss about characteristics of good lubricant
4. Discuss about types of lubricant
5. Know about advantages and features of oil
6. Know about advantages and features of grease
7. Know about utility of seals
8. Know about installation process of seals in bearings

UNIT 7.1: Bearing lubricant

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about bearing lubrication
2. Explain the characteristics of lubricant
3. Know about how to select the lubricant

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster etc.
- PC with LCD Projector or Flip Chart
- Participant Manual

Do

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Capture their responses on board and share them wherever necessary.

Say

- Lubrication – Bearings are stored and operated only after coating the contact surfaces of the bearing shaft and housing with grease or oil.
- Function of lubricant is:
  - Separates the rotating parts in a bearing and provides an appropriate film that avoid metal-to-metal contact
  - Absorbs heat from moving parts
  - Reduce corrosion
- Lubricants have four major purposes: Reduce friction, dissipate heat, Protect surfaces from dust and corrosion and help seals protect bearings.
- Bearing design and the conditions under which it is operated operating decides the correct lubricant for each application
- Lubricant selection depends on a combination of factors:

- the type of housing,
- operating temperature,
- operating speed and
- any particular requirement of that bearing type.

- The correct lubricant for each application depends on the bearing design and the operating conditions.

Elaborate

Lubricants have four major purposes:

- **Friction is reduced:** Tremendous friction created at heavy loads and speeds cause wear of moving parts like races and rollers and the housing around them and the bearing, shaft and housing get damaged before their life. Bearing parts failure is prevented by lubricants by smoothen the rubbing action between surfaces and reducing friction.
- **Heat reduction:** The rise of heat due to friction may cause wear of contact surface of races, shaft and housing and later on damage of bearing. Lubricants carry away this heat or dissipate the heat and prevent this damage.
- **Dust and corrosion prevention:** Since smoothness of bearing is mandatory for its operation bearings are lubricated right away after production during packaging to prevent moisture or dust to enter into bearing even in small quantity. Only clean and smooth bearings can operate properly.
- **Protection of bearings by supporting seals:** To prevent contaminants that nick and scratch a bearing and cause wearing of shaft and housing seals are installed on the shaft next to the bearing .Seal helps lubricant retention and dirt exclusion by having a thick coating of lubricant as a barrier.

Special properties of lubricants used in a lot of bearing applications are

- Friction oxidation (fretting corrosion)
- Resistance to chemical and solvent
- Handling of food processes
- Running silently
- Space and/or vacuum
- Electrical conductivity

Ask

- You could ask the factors of lubricant selection depends
- You could ask the purpose of lubricants

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 7.2: Types of lubricant

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about types of lubricant
2. Discuss about features and advantages of oil lubricant
3. Know about oil delivery systems
4. Know about advantages and features of grease
5. Know about grease application process

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster and lubricants.
- PC with LCD Projector or Flip Chart
- Participant Manual

Do

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Capture their responses on board and share them wherever necessary.

Ask

- You could ask the students about the lubricants.
- Invite students to participate. List the student responses on the whiteboard.
- You could ask the students which is the more widely used lubricant
- You could ask the students why lubricant is important
- You could ask the important characteristics for selecting the grease

7.2.1: Types of lubricant

Say

- There are two lubricant types –
  1. Oil
  2. Grease
- Grease is the mostly used lubricant due to the design of equipment and the conditions of operation. Care must be taken while selecting grease due to its variety of available types.
- Right selection of lube for a job must be done by following certain rules.
- A film of oil or light grease is used to lubricate open bearings before use to protect them from corrosion. They are also lubricated while running.
- Sodium or lithium based grease or oil is used in ball and other bearing types for lubrication
- Use a heavier lubricant only if:
  - o conditions of operation needs it;
  - o lube is not able to handle heaviness of the load
  - o It is specially used in the application.

Ask

- Ask the students the functions of lubricant.
- Ask the students the selection criteria of lubricant.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

7.2.2: Oil

Say

- Petroleum or synthetic are the types of oils. Raw material for petroleum oils is crude oil and chemical synthesis is used to produce synthetic oils.
- High viscosity oil will flow less readily than a thinner, less viscosity oil. As viscosity decides the thickness of oil film and rolling and sliding surfaces are separated by oil film to reduce friction and heat, and to minimize wear the viscosity is important feature of liquid
- Oil needs more frequent lubrication intervals than grease due to its lightness than grease. High speed and/or high speed applications like heavy-duty fleet, automotive and agricultural vehicles usually use oil.
- Bearing size, speed, temperature, load and general condition of operation must all be taken into consideration while selecting the right oil for a job.
- Oil lubrication has following features and advantages:
    - For high speeds or high temperatures applications oil is a better lubricant and bearing temperature is reduced by cooling it
    - Quantity of lubricant reaching bearing can be controlled if oil is used; but it is difficult to retain in the bearing and lubricant losses are high in case of oil.
    - Depends on application drip-feed, wick feed, pressurized circulating systems, oil bath or air-oil mist are lubrication methods in case of oil lubricant because it is a liquid.
    - In case of re-circulating systems oil is can be easily kept clean.
- Oil may be introduced to the bearing in many ways. The most common systems are: Oil bath, Circulating system, Oil jet and Oil Mist.

Elaborate

Types of oil delivery systems are:

1. **Oil bath:** For low and moderate speeds oil bath method is acceptable. Rotating components taking the oil distributes it inside the bearing then oil flows back to the oil bath. When the bearing is in stopped condition oil level is not higher than the center point of the lowest rolling element. To reduce churning in high speed applications oil level is kept low.
2. **Circulating system:** Oil reservoir, pump, piping and filter are the contents of a typical oil system. There may be a cooler also. For cooling and lubrication an adequate supply of oil will be present in these systems.

   Using this method multiple bearings will be supplied with lubricant.
3. **Oil jet:** Adequate lubrication with sufficient but not excessive amount of oil is needed for very high-speed operation of bearing to prevent increase in temperature. The efficient method of achieving this is the oil jet method. A high pressure oil jet is supplied to side of the bearing.

4. Oil-mist: Steel mill bearings and high-speed machines with high speed and continuous operation use this. Relatively little oilis used in this method since it closely control of the quantity of lubricant reaching the bearings.

   A mixture of clean and dry air and atomized oil under pressure is supplied to the bearing housing. Environment will be polluted by oil mist going out, resulting in horrible atmosphere and hence its application is restricted and certain precautions must be taken.

Do

- Demonstrate how to lubricate the bearing by using oil.
- Show the oil delivery systems and their working.

Ask

- You could ask the oil lubrication features
- You could ask the points to remember about oil

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

7.2.3: Grease

Say

- Grease contains a thickening agent dispersed in a liquid lubricant with a solid-to-semi fluid structure.
- The successful use of bearing grease depends on the physical and chemical properties of the lubricant, its application, application conditions and environmental factors.
- Grease is easier to use than oil in industrial bearing lubrication applications. Bearings that are initially packed with grease require only periodic re-lubrication to operate efficiently.

Elaborate

Characteristics for selecting the grease

- **Grease consistency:** when sheared or worked is not fixed instead it becomes softer. At higher temperatures grease become fluid and at lower temperatures it becomes thicker. So at low temperatures starting torque is not easy to develop.
- **Operating temperature:** Base oil and thickener and additives used decide the range of temperature over which grease can be used.

Fig 7.2.1: *Grease*

- **Wet conditions:** Bearing damage is heavy when water and moisture are present and they are prevented by grease. Calcium, lithium and non-soap type greases show high resistance to water entry, but rust prevention property of such greases is poor if not properly inhibited.

Grease lubrication features

1. Lubrication cycles are less frequent since there is no minimum level of grease to be maintained. Maintenance time is reduced by this.
2. Simple seal design Is used to retain lubricant in housing or bearing and exclude dirt when grease is used as lubricant
3. Viscosity of grease is higher.

Do

- Demonstrate how to lubricate the bearing by using grease.

Fig 7.2.2: *Apply grease on bearing*

Tips

- If quantity of grease reduces below the desired quantity grease should be added. When contamination, high temperature, water, oxidation or any other factors affects the lubrication properties of grease it should be replaced.
- To protect the bearing surfaces, at stopped condition, it is recommended to fill housings with grease. Surplus grease should be removed and correct level is maintained prior to succeeding operation.
- Grease fitting at one end and a vent at other end of housing is necessary near the top when grease is used in applications. To purge the old grease from the bearing a drain plug should be present near the bottom of the housing.

Ask

- You could ask the grease lubrication features
- You could ask the Points to remember about grease

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Bearing lubrication	1 hours	Bearing
		Grease
		Oil

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 7.3: Seals

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about seals
2. Know about installation process of seals

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster and seal.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Seals are dangerous with grease lubrication because they support the grease free from contamination. Contamination wears on the bearing because grease is trapped.
- Most seals are designed to prevent contaminants from entering the bearing.
- Contaminants can be avoided by a thick coating of lubricant is a barrier, support the seal in lubricant preservation and dust elimination.
- The sealing lip and the outer diameter is inspect after installation to avoid leakage. The sealing lip should not in the groove worn into the shaft from the previous seal.

Demonstrate

- Explain the benefits of seal installation

Steps – Seal installation

Step 1: Lip and shaft of the seal is applied by a thin coat of lubricant.

Step 2: Split the seal along the axis of rotation and place the seal around the shaft.

Step 3: Starts with the divided ends, the housing bore are used to insert the seal. The splits ends of the seal are connected.

Step 4: Operational downwards on equal sides, the housing bore is inserted by the seal, completing at the lowest.

Step 5: When the housing bore is seated by the seal, it should project from the housing surface. To the seal width detailed on the packaging the depth of the bore housing should be machined.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Seal installation	1 hours	Seal
		Bearing
		Machine shaft
		Machine housing

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

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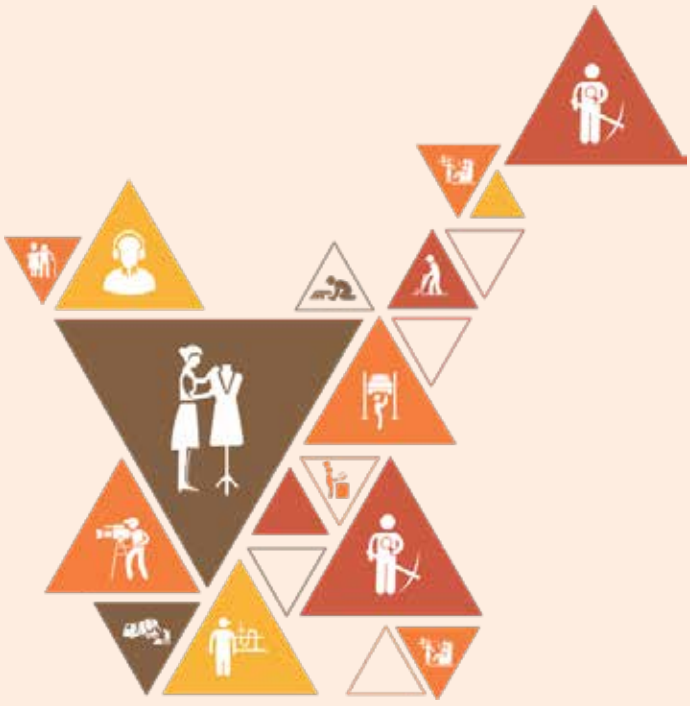
8. Installation and dismounting of bearings

Unit 8.1 – Bearing installation

Unit 8.2 – Bearing alignment

Unit 8.3 – Dismounting of bearing



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Key Learning Outcomes

At the end of this module, students will be able to:

1. Discuss about installation of bearings
2. Know about bearings mounting methods
3. Discuss about bearing alignment
4. Know about methods of bearing alignment
5. Know about dismounting of bearing
6. Know about bearing dismounting methods

UNIT 8.1: Bearing installation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about bearing pre installation requirements
2. Know about bearings installation and mounting methods
3. Know about installation checklist

Resources to be Used

- Available objects such as a duster, pen, notebook, bearings, machines etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Cleanliness, proper tools, and specific mounting guidelines are needed to assure proper installation as well as long-lasting bearing performance
- A bearing cannot operate properly if the shaft or housing is not in good condition
- Check the seal, which will be mounted on the shaft
- Do not remove the bearing from its container until you're ready to install it.
- Press-fit refers to the amount of interference between the race and the seat: the inner race with the shaft, and the outer race with the housing

Ask

- You could ask the methods of mounting the bearing
- You could ask the steps of installation checklist

Elaborate

Pre-installation

1. **Check the shaft and housing:** the shaft or housing must be in good condition for proper functioning of a bearing. Dimensions of shaft and housing bore must be within recommended tolerances. Perfectly round of bearing seat in housing bore, it should not be tapered. Nicks and burrs must be avoided and the shaft and housing also should be clean and free.
2. **Check the seal:** Before mounted on the shaft the seal must be check. Its situation is just as critical to accurate seal placement as it is to bearing operation.

   Proper guidelines must be follow and use only the suggested tools. Always new seal is used in place of used one. The design and size should be same as the original.

Press-fitting the bearing

The quantity of interference between the seat and the race: the outer race with the housing and the inner race with the shaft.

It will rotate with the shaft if the inner race is press-fit. It will rotate with the housing if the outer race is to be press-fit. a truck's front wheel hub is one of the example. Here, the inner race is riding with a slip fit on the shaft, while the outer race is press-fit.

By extending the inner race over a shaft a little bigger than the bore of the bearing a press-fit is accomplished. If press-fits are so much tight that can also damage the bearing. Too much close fitting of a fit squeezes the two races together, saving the rollers or balls from turning correctly and initiating extra wear and heat. The premature bearing failure may cause.

Methods for mounting the bearing:

1. Arbor press: Arbor press: The arbor press is one of the best means of mounting bearings and races. Its action is rapid and pressure can be applied continuously. During bearing installation, ensure to support the inner race with two flat bars placed between the inner race and the press's adaptor plate. Special precautions should be taken when using the arbor press to align the race squarely on the shaft. Too much pressure exerted by the press could easily cause the race to crack or the shaft to become severely scored.
2. Drivers: Drivers may be used for assembling cups, cones and tapered roller bearings. Drivers assure easier assembly by straightening the cups or cones. They also will prevent damage to bearing cages and internal parts. To use the driver method, first separate the cup from the cone. Apply pressure to the races only, and drive each into position. Be careful not to hit the cage. Pressure against the cage will distort and loosen it, causing slanting of the rollers and premature bearing failure.

Demonstrate

- Explain the process of bearing installation in machine housing

Steps – Bearing installation

Step 1: To evade damage to the bearing work only with clean tools, hands and surroundings.

Step 2: The correct dimensions with clean, smoothness of shaft seat and housing bore play an important role.

Step 3: At the time of mounting the bearing must be open from its packaging. To avoid contamination a protection is provided.

Step 4: The preservative or lubricant applied by the manufacturer should not be removed while installing new bearing. The preservatives castoff on nearly all bearings is totally well-suited with usually cast-off oils and other lubricants.

Step 5: Bearings should be mounted in a clean environment, debris, moisture, free from dust and other contaminants.

Step 6: Protective screens are used around the working area, and offer a clean relaxing surface for the bearing and other components while waiting for installed.

Step 7: Planning of work is most important then before beginning the installation.

Step 8: Be sure that the exact replacement bearing and extra components. Decide what tools will be compulsory; containing correction tools if appropriate, and have them on hand.

Step 9: To perform the installation more fast with few delays plan the work, restrict the quantity of time the bearing is out of the equipment and exposed to contamination and possible hold injury.

Step 10: Nearby place of bearing where to install should be thoroughly clean all machine components, the mounting surfaces and housings must having special attention.

Step 11: A magnetic rod is used to eliminate metal chips that might have become lodged there during maintenance or machining if the equipment has blind holes where air is unsuccessful.

Step 12: Shaft surfaces must be clean and free from nicks or burrs that will support and interact the bearing.

Step 13: The bearings should not be installed on a damaged or worn shaft or in a damaged or worn housing.

Step 14: To clear the radius of the bearing the shaft fillet must be small enough.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Bearing installation	2 hours	Bearing
		Tools
		Machine shaft
		Machine housing

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 8.2: Bearing alignment

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about bearing alignment
2. Know about methods of bearing alignment

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster, bearings, pillow blocks etc.
- PC with LCD Projector or Flip Chart
- Participant Manual

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Ball and roller bearings are precision components and are manufactured with very small internal clearances.
- Once the bearing is seated on the shaft and in the housing, it is necessary to recheck installation and adjust the bearing so it operates properly for the application.
- Two common methods of bearing alignment are pillow blocks and bearing pre load.
- Pillow blocks, also known as plummer blocks, are useful off -the-shelf components which can simplify shaft mounting in some cases.
- Since all engineering components deflect to some extent under load, shaft bearings which have been set up with zero clearance when there is no load on the shaft will almost certainly have some clearance or slackness when the shaft has a load applied.

Do

- Ask the students about the bearing alignment methods
- Demonstrate the bearing alignment methods.

Elaborate

Bearing alignment methods

Since bearing alignment can be as cri cal as installation to bearing performance, it is not surprising why so many manufacturers provide adjustment guidelines. Two of the most common methods follow are:

1. **Pillow blocks:** They are normally available with a range of different rolling contact bearings fitted within the housing – ball or roller, single or double row, self aligning or deep groove type, depending on the application and the probability of misalignment. The housing also makes provision for seals to retain lubricant, while the mounting feet make it easy to attach the housing to a base plate or frame.

2. **Bearing preload:** Since all engineering components deflect to some extent under load, shaft bearings which have been set up with zero clearance when there is no load on the shaft will almost certainly have some clearance or slackness when the shaft has a load applied.

   The right-hand inner race of bearing bears against a shoulder on the shaft. The left-hand inner race is held axially by the nut and washer on the finish of the shaft. Tightening the nut will therefore push the two inner races closer together, squeezing them into the tapered outer races.

   Further tightening of the nut will provide bearing **PRELOAD**. Preload may be regarded as negative clearance. Ideally, the preload should be sufficient to ensure that the bearings do not run slack (i.e. with clearance) under normal operating conditions, since clearance is known to increase the rate of wear of tapered roller bearings.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 8.3: Dismounting of bearing

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about bearing dismounting
2. Know about methods of bearing dismounting

Say

- Dismounting of bearings may become necessary when a machine functions improperly or is being overhauled.
- There are three dismounting methods: mechanical, hydraulic and oil injection.
- **Cylindrical Seating** – A cylindrical seating is just a cylindrical shaft or housing, although special arrangements can exist.
- **Tapered Seating** – Tapered seating include taper shafts, adapters and withdrawal sleeves. Bearings mounted on a tapered seating normally have an interference fit.
- Interference Fit on the Shaft, Interference Fit in the Housing and Interference Fit on Shaft and in the Housing are the mechanical methods of cylindrical seating
- Dismounting with Oil Injection Method are hydraulic methods
- Heating rings and induction heaters are the heating methods
- Mechanical and hydraulic methods are the methods of tapered seating
- **Mechanical Method:** Small bearings on tapered seating can be dismounted using a puller. Since the bearing is mounted with an interference fit on the shaft , the puller should, if possible, grip the inner ring
- **Hydraulic Method:** With the oil injection method, oil under high pressure is injected between the mating surfaces. An oil film is formed, which separates the mating surfaces and appreciably reduces the friction between them.

Do

- Ask the students about the bearing dismounting methods
- Demonstrate the bearing dismounting methods.

Elaborate

Mechanical Methods

1. **Interference Fit on the Shaft:** A puller is used for medium-size and small bearings mounted with an interference fit on the shaft for dismounted. Let the puller hold the internal ring and then eliminate the bearing with a constant force till the bearing bore entirely frees the whole length of the cylindrical seating.

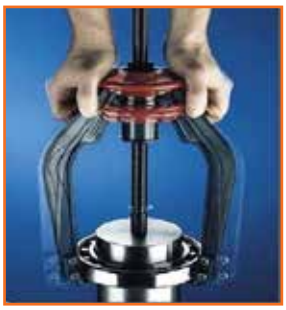

Fig 8.3.1: *Dismounting bearing using puller*

2. **Interference Fit in the Housing:** For fast elimination of bearings from housings a slide hammer assisted puller is recommended. When the puller has to be functional to the internal ring and the bearings are to be re-used, the internal ring should be revolved during dismounting to decrease the threat of damage.

Fig 8.3.2: *Removing bearing from housing*

3. **Interference Fit on Shaft and in the Housing:** The best method is to allow the bearing to be pressed out of the housing with the shaft if non-separable bearings with interference fit both in the housing and on the shaft. No dismounting force is transmitted to the rolling elements by this technique. The reverse method, permitting the bearing to come off the shaft with the housing.

Fig 8.3.3: *Blind pulling*

By the use of puller, small bearings on tapered seating can be dismounted. Since the bearing is riding with interference appropriate on the shaft, the puller should, if possible, hold the internal ring. Always take care while dismounting bearings from tapered seating's using a puller.

Hydraulic Methods

Medium-size bearings with an interference fit on the shaft often require considerable dismounting force.

1. **Dismounting with Oil Injection Method:** In oil injection method, the mating surfaces are detached by a thin film of oil injected under high pressure, thereby almost removing the friction between them. Thus, the dismounting force necessary is considerably decreased. With the oil injection method, high-pressure oil is inserted between the breeding surfaces. The friction can be decrease between them by the oil film formed separates the mating surfaces.

2. **Heating Rings:** When flangeless internal rings of cylindrical roller bearings, or have to be detached infrequently, those with only one flange, heating rings can sometimes be utilized. The inside diameter and raceway diameter of the ring is the same. The 280 °C is required for the heating of ring by using a naked flame or hot plate and then put it over the internal ring and held with the handles.

Fig 8.3.4: *Heating ring*

3. **Induction Heaters:** Induction heaters are available for dismounting the internal rings of cylindrical roller bearings having no flanges or only one flange. The extended ring can effortlessly be detached they heat the inner ring quickly without heating the shaft to any degree.

Fig 8.3.5: *Induction heater*

The oil under high pressure is vaccinated between the mating surfaces with the oil injection method. To reduce the friction between the mating surfaces an oil film is created. This process is mainly used when dismounting bearings fitted straight on tapered shafts, but is also used to dismount bearings on adapter and withdrawal sleeves that have been prepared for the oil injection method.

Demonstrate

- Explain the methods of dismounting the bearings.
- Explain the need of safe handling of bearing during the dismounting.

Steps – Dismounting with oil injection method

Step 1: At the time of manufacturing, the shafts are created with grooves and oil ducts.

Step 2: By heating bearing with an induction heater they can be mounted.

Step 3: By driving oil under pressure between the mating surfaces the dismounting of the bearing will become simple. The component can be detached from the shaft with a lowest of effort once the oil pressure has built up.

Steps – Hydraulic method of tapered seating

Step 1: At the time of manufacturing, the shafts are created with grooves and oil ducts.

Step 2: With the aid of a hydraulic nut bearings are mounted by forceful up the shaft.

Step 3: By injecting oil between the mating surfaces bearings can be dismounted and the bearing will be pushed off after getting enough pressure. A nut is needed to retain the bearing from slipping off the shaft.

Ask

- You could ask the methods of dismounting
- You could ask the steps of hydraulic method of tapered seating
- You could ask the distinguish between cylindrical and tapered seating
- You could ask the explain the mechanical methods of cylindrical seating

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Bearing dismounting	2 hours	Bearing
		Tools
		Dismounting tools
		Machine

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

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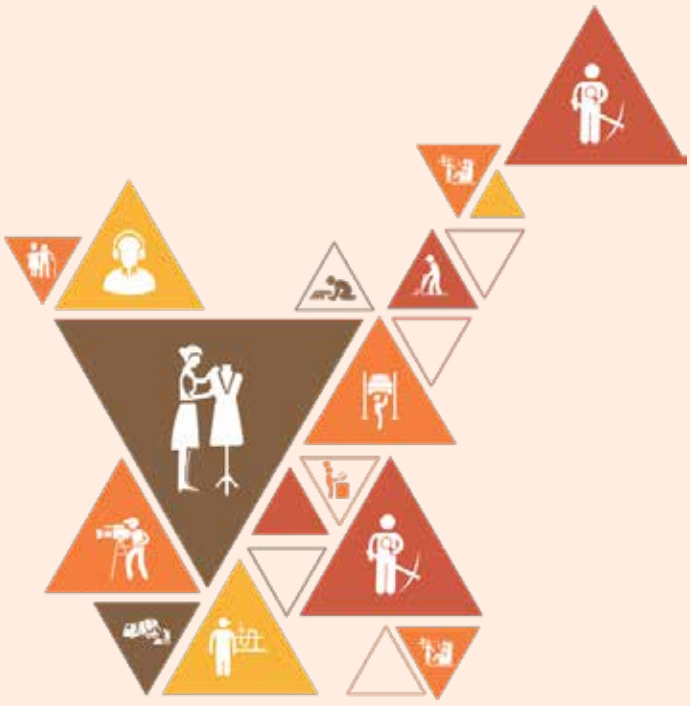
9. Reporting and Documentation

Unit 9.1 – Documentation for health and safety

Unit 9.2 - Documentation of defects



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Key Learning Outcomes

At the end of this module, students will be able to:

1. Know about reporting and documentation requirements
2. Know about accident reporting
3. Know about reporting of defective tools

UNIT 9.1: Documentation for health and safety

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about accident and incident reporting
2. Know about how to write reports properly
3. Know about how to escalate the issues properly

Resources to be used

- Available objects such as a duster, pen, notebook etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- It is of utmost importance to inform about the accidents and incidence straightaway, irrespective of the impact of it.
- Hazard reports can take a number of different forms:
  - the standard hazard report used by workers for all hazards
  - reports of infections
  - near-miss incident reports
  - reports of damage and faulty tools, equipments and machines
  - routine inspection reports
  - Behavior incident reports.
- Reporting of incidents and accidents is required under the Work Health and Safety (WHS) legislation
- Always report an accident to management immediately. There should be a form at each workplace that you (or the person involved) and any witnesses can fill out, where possible, otherwise it can be completed by a health and safety representative (HSR) if necessary.

Elaborate

The form should cover the following areas:

- Description of the occurrence – what was the event that occurred, which required this report to be completed?
- Nature of injury or disease – select the most appropriate description from a range of options.
- What injury or disease happened as a result of the occurrence?
- First aid, medical treatment or hospital admission – this section asks for a description of what was done to treat the injury or disease.
- Part of the body affected – tick off which part or parts of the body were affected as a result of the occurrence.
- Source of injury – what actually caused the person to be injured or acquire a disease? This could be a piece of machinery or other hazardous materials for example.
- Probable cause or causes of injury – how was the source listed above actually responsible for the injury?
- Investigation – this asks a series of questions that seek to find out why the person has been injured or has acquired a disease.
- Notification checklist – this checklist makes sure that everyone who should have been contacted regarding the matter has been contacted and asks whether appropriate action has been taken by the authorities.
- Preventative action – this asks whether or not any action has been taken to prevent the occurrence from happening again.
- Witness details – this part is to be filled out if someone saw the occurrence happen. It is essential if any sort of legal action is to be taken.

Ask

- You could ask the areas covered in form
- You could ask the suggestions for completing appropriate report

Notes for Facilitation

- You could ask the students why reporting and documentation is necessary.
- You could ask from the students about the important things to remember filling reports and documents.
- Assume you got an accident at work place on your knees. File a report and inform the management about the accident.

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Make the fire accident report

Skill Practice	Time	Resources
Fire accident report	1 hour	Checklist

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

UNIT 9.2: Documentation of defects

Unit Objectives

At the end of this unit, students will be able to:

1. Know about reporting of faulty and damage tools

Say

- Like accident or incident reporting, reporting of faulty and damaged machine, tools and equipments is also necessary.
- Any damaged, faulty or malfunctioning tools, equipment should be immediately withdrawn from use and addressed according to organizational policies and procedures
- You should have to check the following details before doing reporting or providing any repair suggestions:
  - Last date of inspection
  - Last date of repair and which part was repaired.
  - Life cycle of the tool, equipment or machine

Elaborate

In machine or equipment faulty or damage report you have to provide following details:

- Name of the tool or machine
- Registration details of machine
- Who does the inspection of toll and machine before the use
- Trouble or hazard from the defective tool or machine
- Defective part name or number
- Remedial action - Tool or machine has to be discontinue or need repair
- Which process is going to affect due to the faulty machine or tool
- Report whether the machine or tool is performing accurately or precisely.
- Report that there limits, fits and tolerances are set or not according to industrial standards.

Ask

- You could ask the details before doing reporting or providing any repair suggestions
- You could ask the details which are to be required In machine or equipment faulty or damage report

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

Notes

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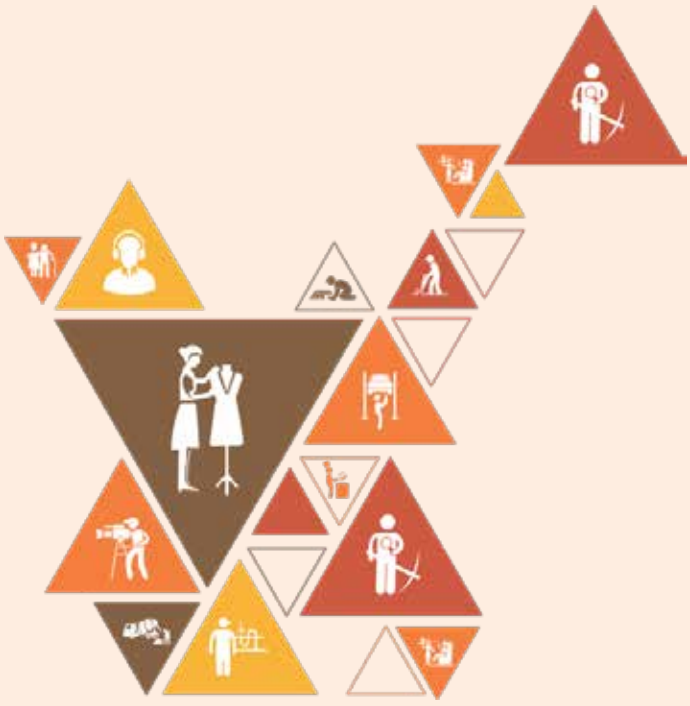
10. Problem identification and escalation

Unit 10.1 – Risk management

Unit 10.2 – Escalation matrix



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Key Learning Outcomes

At the end of this module, students will be able to:

1. Know about identification of problem
2. Know about risk management process
3. Know about escalation matrix and problem escalation process

UNIT 10.1: Risk Management

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about risk management process
2. Know about inspecting controlling and controlling the problems

Resources to be used

- Available objects such as a duster, pen, notebook etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- Risk Management consists of methodical steps for handling hazards in the workplace.
- One major component of risk management is workplace safety inspections. Inspections are a major tool in ensuring that a workplace remains safe.

Elaborate

One major component of risk management is Workplace Safety Inspections. Inspections are at major tool in ensuring that a workplace remains safe. They help to identify and address new problems or unsafe conditions. Do the inspection according to the inspection checklist made by the organization according to their norms and standards.

After inspection, make an inspection report, which includes the following information:

1. Fill in the name of the area inspected if not already indicated on the sheet, the date and inspectors' names in the area provided. Make sure all pages are attached and kept together with the front page.

2. Check either yes or no according to the situation or item listed, or put a check next to each listed control. If you can't check off the presence of a control, or answer no to any of the questions, this indicates action is needed. To better prioritize action, evaluate the hazard's severity.
3. Record suggested remedial action in the comments for the identified action items. State what needs to be or should be done to correct and better control the hazardous situation.

Demonstrate

- Explain the benefits of workplace inspection.
- Demonstrate the process of risk assessment

Steps – Risk assessment

Risk management is the process of:

Fig 10.1.1: *Risk management process*

Step 1: **Identifying** any anticipated problem – Anything that could lead to any harm to any person in the work place, e.g. machine moving, poisonous chemicals, and jobs requiring physical interference.

Step 2: **Evaluating** the issues – Assessing the problem on the basis of their impact, e.g. can it cause a severe injury, sickness or fatality and how likely is this to take place?

Step 3: **Control** the problem or if it's not feasible, controlling the threat arising out of the problem – putting in to practice such strategies that can eradicate or manage the problem, e.g. designing

the equipments differently, putting in machine guards at place, using harmless chemicals, placing heavy objects lifting equipments to reduce manual weight lifting or PPE or inform to supervisor or seniors.

Step 4: **Analyzing** risk evaluation - to keep a check on control measures and adding better control measures. Also need to discover secure ways of doing things.

Ask

- You could ask how to control the problems
- You could ask from the students risk management process

Notes for Facilitation

- You could ask the students what are the important information make an inspection report

Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Make the checklist of inspection according to norms and standards and Conduct the inspection of workplace

Skill Practice	Time	Resources
Inspection	1 hour	Checklist

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

UNIT 10.2: Escalation Matrix

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about problem management process
2. Know about escalation matrix

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- PC with LCD Projector or Flip Chart
- Participant Manual

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- For escalating issues to the concerned department, every organization follows a specific procedure. This procedure is based on escalation matrix.
- Escalation matrix is a complaint logging system (complaint box) allows you to specify multiple user contacts to be notified in the event of issues.
- By using escalation matrix you can notify the right people at the right time about critical alerts irrespective of the business hours. The escalation matrix is time zone specific and it is available 24X7.

Elaborate

- **Key features of escalation matrix are as follows:**
  - The escalation levels are based on schedules.
  - The service is available 24X7 and schedules are allocated accordingly.

- The schedules are ¬me zone specific.
- A matrix can be defined at multiple levels ranging from senior management to lower management.

Problem management process

1. Identify problems as described earlier
2. Logging problems – Log the complaint report to the concerned person via email or procedure specified by organization.
3. Categorize problems – categorize the problems into hazards, accidents, faulty tools or equipments and general problems.
4. Prioritization of problem – prioritize the problem according to its impact or severity into high, low, moderate and critcal.
5. Initially diagnosis the problem and collect data and information regarding that.
6. Escalate the problem to the management through the escalation procedure.
7. Review the remedial action taken by the management to resolve the situation
8. If found any problem again, then notify the management again about the problem and also suggest the remedial action required for it.
9. Close the complaint after solution of problem.

Demonstrate

- Explain the benefits of workplace inspection.
- Demonstrate the process of risk assessment

Steps - Escalation Matrix

Step 1: Complaint of a given category will by default be assigned and notified by email to the Level 1 department of that category.

Step 2: It defines which an issue has to be raised to whom and within which time frame.

Step 3: If the complaint is not resolved within X number of days (X is the time defined for Level 1 department to resolve the issue), the complaint will be escalated to Level 2 department.

Step 4: If the complaint is not resolved within Y number of days (Y is the time defined for Level 2 department to resolve the issue), the complaint will be escalated to Level 3 department.

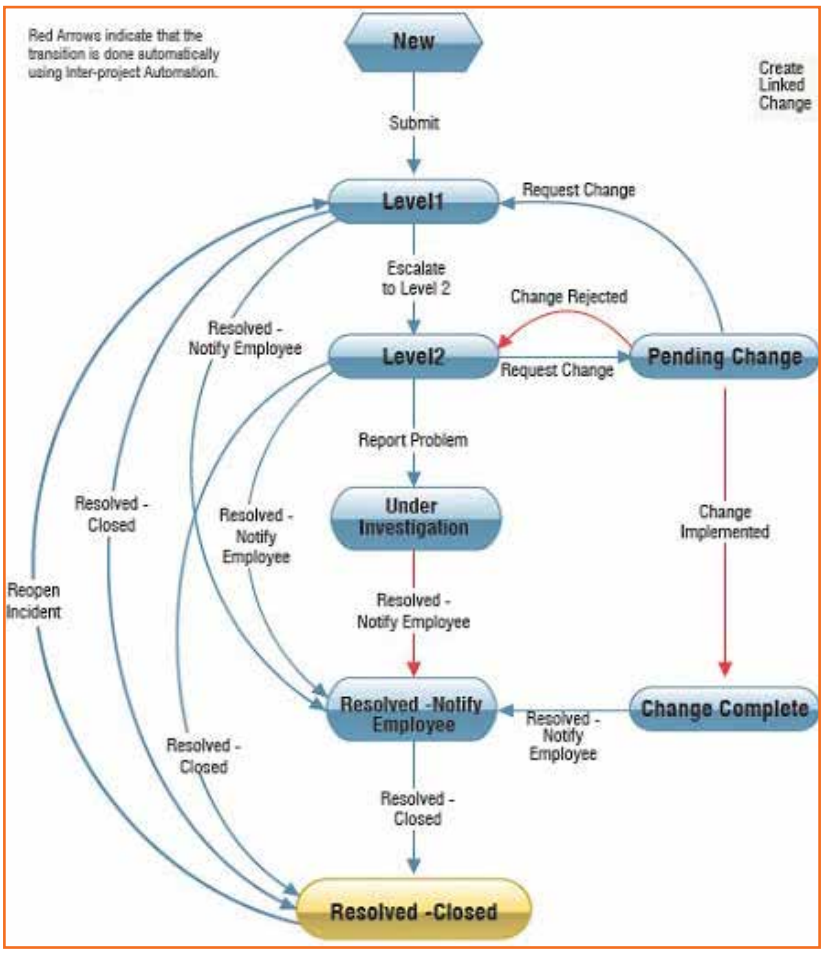

Fig 10.2.1: *Escalation matrix*

Ask

- You could ask what is escalation matrix and its features
- You could ask the process of problem management
- You could ask how does escalation matrix work for complaints

Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

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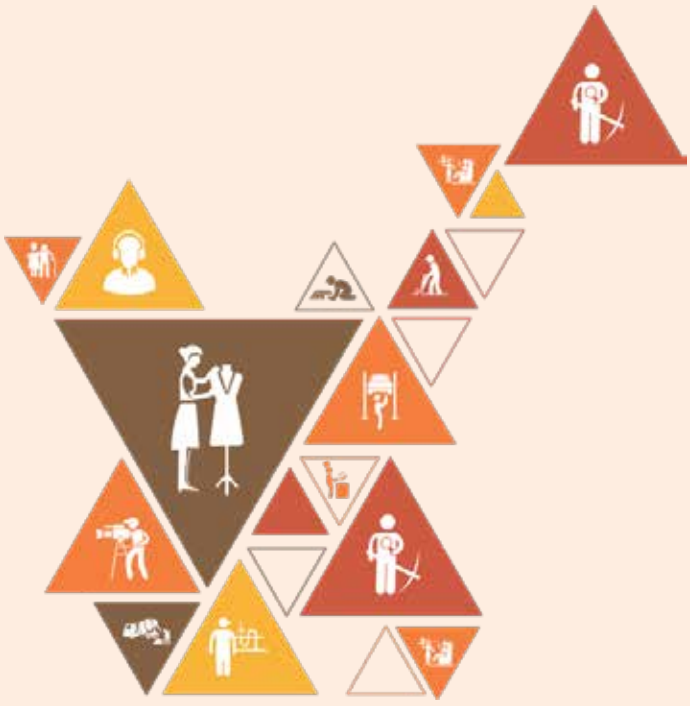
11. Work effectively with others

Unit 11.1 – Ensure appropriate communication with others

Unit 11.2 – Workplace etiquettes



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Key Learning Outcomes

At the end of this module, students will be able to:

1. Know about effective communication with colleagues
2. Know about workplace etiquettes

UNIT 11.1: Ensure appropriate communication with others

Unit Objectives

At the end of this unit, you will be able to:

1. Know about how to communicate effectively with colleagues
2. Know about effective communication

Resources to be used

- Available objects such as a duster, pen, notebook etc.

Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

Say

- The success of the organization depends on each colleague.
- For success of organization learn your co-workers' names and learn them quickly because people loves hear their names.
- It doesn't matter a person is more or less significant because of his/her designation. You should respect every employee.

Notes for Facilitation

- You could ask the students what are the ways of effective communication with colleagues

Team Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Effective communication between 2 persons	1 hour	Communication tools

Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

UNIT 11.2: Workplace Etiquettes

Unit Objectives

At the end of this unit, you will be able to:

1. Know about organization policies and procedures
2. Know about workplace etiquettes

Say

- Workplace etiquettes are also important aspect of organization policies and procedures.
- Work station should be professional and well-ordered with suitable private touches! It reflects good impression on the team mates.
- Make a Positive impression, cooperate with colleagues and work space savvy are some important tips to help you succeed on the job.
- Work station should be professional and well-ordered with suitable private touches! It reflects good impression on the team mates.

Elaborate

Organization policies and procedures while working with colleagues:

- Never use abusive words with the colleagues
- Follow work etiquettes
- Never share secret or confidential information with your colleagues
- Help your colleague in case of emergency or difficult situations
- Coach your colleagues in case of problems and about organization policies and procedures.
- Communicate with them properly.

Notes for Facilitation

- You could ask the role of colleagues in the success of the organization
- You could ask the students how to make a good impression on the job

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12. Employability & Entrepreneurship Skills

Unit 12.1 – Personal Strengths & Value Systems

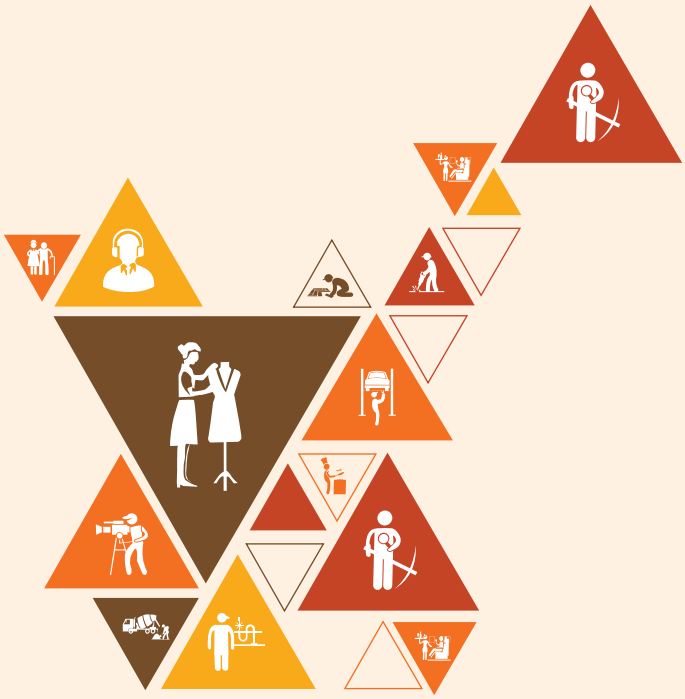
Unit 12.2 – Digital Literacy: A Recap

Unit 12.3 – Money Matters

Unit 12.4 – Preparing for Employment & Self Employment

Unit 12.5 – Understanding Entrepreneurship

Unit 12.6 – Preparing to be an Entrepreneur



Introduction: Employability and Entrepreneurship Skills

This Facilitator's guide includes various activities which will help you as a facilitator to make the sessions participative and interactive.

Ice breaker

- You can begin the module with the following ice breaker:

Five of Anything Ice Breaker Steps:

- Divide the participants into groups of four or five by having them number off. (You do this because people generally begin a meeting by sitting with the people they already know best.)
- Tell the newly formed groups that their assignment is to share their five favourite movies of all time, their five favourite novels or their five least liked films. The topic can be five of anything - most liked or disliked.
- This ice breaker helps the group explore shared interests more broadly and sparks lots of discussion about why each person likes or dislikes their selected five.
- Tell the groups that one person must take notes and be ready to share the highlights of their group discussion with the class upon completion of the assignment.

Expectation Mapping

1. During the first session and after ice breaker session, ask the participants to answer the following question: "What do I expect to learn from this training?"
2. Have one of the participants write their contributions on a flip chart sheet.
3. Write down your own list of covered material in the training on another flip chart sheet.
4. Compare the two sheets, commenting on what will and what will not be covered during the training.
5. Set some ground rules for the training sessions. Ask the participants to put these rules on a flipchart and display it in the class.
6. You may get back to those sheets once again at the end of the last session of the training.
7. Benefits of doing this activity:
   - Participants feel better as their opinions are heard.
   - Participants get to know what they should expect from the training.
   - The facilitator gets to know which points to emphasize, which to leave out, and which to add during the training.
8. Expectations from the participants:
   - Must sign the attendance sheet when they arrive for class.
   - Conduct themselves in a positive manner
   - Be punctual, attentive, and participative
9. Explain the contents that are going to get covered one by one and connect it with the expectation mapping done earlier.
10. By the end of this exercise, the participants should have a clear understanding of what to expect from the session and what are the areas that will not get covered.

Defining Objectives

1. Defining the objectives in the beginning of the units sets the mood for the unit.
2. To begin with the end in mind sets the expectations of the participants as what could be the important takeaways from the session.
3. It is also a way of making participants take responsibility of their own learning process.
4. For the facilitator, the objectives decide a designed path to progress on so that the learning stays aligned and on track.

5. Read the objectives slowly, one by one, and ask the participants to explain what they think it means.
6. At the end of the session, you could again revisit the objectives to find out from the participants about how many objectives have been achieved.

In order to effectively facilitate this workshop:

1. You must have thorough knowledge of the material in the Participant Handbook, and be prepared to answer questions about it.
2. You may also wish to read other material to enhance your knowledge of the subject.
3. There may be issues raised with which you are not able to deal, either because of lack of time or knowledge. You can either state that you will obtain answers and get back to the participants with the information. Incase the query can be turned to an assignment to the class, do so. You can work with the the participants on the assignement.
4. You must have a very clear understanding of what the participants want to accomplish by the end of the workshop and the means to guide the participants.
5. As the facilitator, it is your responsibility to make sure that all logistical arrangements are made for the workshop. This may involve doing it yourself or confirming that someone else has made all necessary arrangements associated with the workshop. Assume nothing and check everything before the workshop begins.
6. To break the monotony and boredom during sessions, introduce mini breaks in the form of stretching exercises, jokes, some group songs or games.
7. Invite discussion from the participants.
8. Probe the participants further and lead them to come to affirmative conclusions.
9. Let the participants answer. No answer is incorrect.
10. Ask one participant to write all the points on the whiteboard.
11. Build the sessions from the answers provided by the class.
12. Prepare for the sessions in advance so that the resources like flipcharts, handouts, blank sheets of paper, marker pens, etc. can be kept ready.
13. Ensure that resources like board, markers, duster etc. is available before your session starts.

General instructions for role playing:

1. You are not being asked to be an actor or to entertain. The purpose of the role play is to provide a situation in which you can practice certain skills.
2. When you read the brief, try to imagine yourself in the situation described and behave in a way you feel to be natural – but be conscious of the fact that your role may require a different approach from that which you might normally use.
3. You (and others) may benefit from the change in approach and behaviour. Therefore, try to use the approach you feel to be most appropriate for the circumstances described in your brief.
4. The brief is just the starting point. It simply sets the scene and the tone of session or activity. Try not to keep referring to the brief as this will affect the spontaneity of the meeting. Allow the role play to develop as you think it might in real life and change your reactions in line with the behaviour and responses of others involved.
5. If you find that you have too little information to answer questions or to describe what has happened in the situation, do feel free to add your own thoughts and ideas. Try to keep these within the framework of the role you are taking and try to make your improvisations as realistic as possible.

UNIT 12.1: Personal Strengths & Value Systems

Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Discuss the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
10. Discuss motivation with the help of Maslow's Hierarchy of Needs
11. Discuss the meaning of achievement motivation
12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
14. Discuss the role of attitude in self-analysis
15. Discuss how to maintain a positive attitude
16. List your strengths and weaknesses
17. Discuss the qualities of honest people
18. Describe the importance of honesty in entrepreneurs
19. Discuss the elements of a strong work ethic
20. Discuss how to foster a good work ethic
21. List the characteristics of highly creative people
22. List the characteristics of highly innovative people
23. Discuss the benefits of time management
24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management

UNIT 12.1.1: Health, Habits, Hygiene: What is Health?

Unit Objectives

At the end of this unit, participants will be able to:

- Explain the meaning of health
- List common health issues
- Discuss tips to prevent common health issues
- Explain the meaning of hygiene
- Discuss the purpose of Swachh Bharat Abhiyan
- Explain the meaning of habit

Resources to be Used

- Participant Handbook

Ask

- What do you understand by the term "Health?"
- According to you, who is a healthy person?

Say

- Discuss the meaning of health and a healthy person as given in the Participant Handbook.

Ask

- When did you visit the doctor last? Was it for you or for a family member?

Say

- Discuss the common health issues like common cold, allergies etc. Refer to the Participant Handbook.
- Let us do a small activity. I will need some volunteers.

Role Play

- Conduct a small skit with volunteers from the class. Consider one of the villagers has been appointed as a health representative of the village, what measures will you as a health representative suggest to the common villagers to prevent common health issues discussed.
- You will need at least 4 volunteers (Narrator, Health Representative, Head of the Village, Doctor).
- Explain the health concerns of the village to the Narrator. The Narrator will brief the class about the skit.
- Give the group of volunteers, 5 minutes to do discuss.
- At the end of 5 minutes, ask the group to present the skit to the class assuming them as the villagers.
- The class can ask questions to the group as a common villager.

Summarize

- Through this activity we got some tips on how can we prevent these common health issues.

Say

- Let us now see how many of these health standards we follow in our daily life.

Activity

- Health Standard Checklist from the Participant Handbook.

Ask

- How many of you think that you are healthy? How many of you follow healthy habits?

Say

- Let's do an exercise to find out how healthy you are.
- Open your Participant Handbook section 'Health, Habits, Hygiene: What is Health?', and read through the health standards given.
- Tick the points which you think are true for you.
- Try to be as honest as possible as this test is for your own learning.

Do

- Ensure that all the participants have opened the right page in the Participant Handbook.
- Read aloud the points for the participants and explain if required.
- Give them 5 minutes to do the exercise.
- At the end of 5 minutes, ask the participants to check how many ticks have they got.

Summarize

- Tell them that they need to follow all the tips given in this checklist regularly in order to remain healthy and fit.

Ask

Discuss:

- Is it necessary to practice personal hygiene every day? Why?
- How does a person feel when they do not practice good personal hygiene? Why?
- Can good personal hygiene help a person feel good about his/her self? How?

Say

- Discuss the meaning of hygiene as given in the Participant Handbook.

Activity

- Health Standard Checklist: Hygiene

Say

- Let's do an exercise to find out if we maintain good hygiene habits or not.
- Open the Participant Handbook and read through the Health Standard checklist given.
- Tick the points which you think are true for you.
- Try to be as honest as possible as this test is for your own learning.

Do

- Ensure that all the participants have opened the right page in the Participant Handbook.
- Read aloud the points for the participants and explain if required.
- Give them 5 minutes to do the exercise. .
- At the end of 5 minutes, ask the participants to check how many ticks have they got.
- Ask them to calculate their score.
- Tell them what each score indicates by reading aloud what has been mentioned in the Participant Handbook.

Ask

- How many of you have heard about "Swachh Bharat Abhiyan"?
- Can you tell the class what it is about?

Summarize

- Tell them about Swachh Bharat Abhiyan as given in the Participant Handbook and request them to take a pledge to keep our country clean.

Ask

- What is a habit?

Say

- Discuss some good habits which can become a way of life.

Summarize

- Tell them about good and bad habits and the reasons to make good habits a way of life.

UNIT 12.1.2: Safety

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss ways to set up a safe work environment
- Discuss critical safety habits to be followed by employees

Resources to be Used

- Participant Handbook
- Safety signs and symbols
- Safety equipments
- Blank papers
- Pens

Say

- There are many common safety hazards present in most workplaces at one time or another. They include unsafe conditions that can cause injury, illness and death.
- Safety Hazards include:
  - Spills on floors or tripping hazards, such as blocked aisles or cords running across the floor.
  - Working from heights, including ladders, scaffolds, roofs, or any raised work area.
  - Unguarded machinery and moving machinery parts; guards removed or moving parts that a worker can accidentally touch.
  - Electrical hazards like cords, missing ground pins, improper wiring.
  - Machinery-related hazards (lockout/tag out, boiler safety, forklifts, etc.)

Team Activity

Safety Hazards

- There are two parts to this activity.
- First part will cover the potential safety hazards at work place.
- Second part will cover a few safety signs, symbols and equipments at work place.
- Use this format for the first part of the activity.

PART 1		
Hazard	**What could happen?**	**How could it be corrected?**

Ask

- How could you or your employees get hurt at work?

Say

- Let's understand it better with the help of an activity. You will be given a handout within your groups. You have to think about the possible hazards of your workplace, what damage these hazards could cause and about the corrective action.

Do

- Divide the class into five to six groups of four participants each.
- Put the format on the board for the activity.
- Give blank papers and pens to each group.
- The group is expected to think and discuss the potential safety hazards in the workplace.
- Ask the group to discuss and fill the format using the blank sheet.
- Give the groups 5 minutes for the activity.
- For the second part of the activity, show the class some pictures of safety signs, symbols and equipments.
- Now they will put down a few safety symbols, signs or equipment against the safety hazards identified.
- Give them 5 to 10 minutes to discuss and draw/note it.
- At the end of 10 minutes the groups will present their answers to the class.

Say

- Now, let's discuss the answers with the class.
- All the groups will briefly present their answers.

Do

- Ask the audience to applaud for the group presentation.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time.
- Tell the group to wind up the discussion quickly if they go beyond the given time limit.

Ask

De-briefing

- What did you learn from the exercise?
- As an entrepreneur, is it important to ensure the safety of your employees from possible hazards? Why?

Summarize

- Ask the participants what they have learnt so far.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the tips to design a safe workplace and non-negotiable employee safety habits.

UNIT 12.1.3: Self Analysis- Attitude, Achievement Motivation: What is Self Analysis?

Unit Objectives

At the end of this unit, participants will be able to:

- Explain the importance of self- analysis
- Discuss motivation with the help of Maslow's Hierarchy of Needs
- Discuss the meaning of achievement motivation
- List the characteristics of entrepreneurs with achievement motivation
- List the different factors that motivate you
- Discuss the role of attitude in self- analysis
- Discuss how to maintain a positive attitude
- List your strengths and weaknesses

Resources to be Used

- Participant Handbook
- Old newspapers
- Blank papers
- Pencils/ pens

Activity

- This is a paper pencil activity.

What are the three sentences that describe you the best?
What do you need to live happily?
What are your strengths and weaknesses?

Do

- Write the three questions on the board/ flipchart before the session begins.
- Give plain papers and pencils/ pens to each participant.
- Tell participants to write the answer for the three questions on the paper.
- Tell them the purpose of this activity is not to judge anyone but to understand more about self.

Say

- Discuss the concept of Self Analysis and motivation with reference to Maslow's Hierarchy of Needs as discussed in the Participant Handbook.

Team Activity

Tower building

- Each group which will create tower using the old newspapers.

Do

- Divide the class into groups.
- Give them some old newspapers.
- The task is to create a tower out of the newspapers.
- The group which will create the highest tower standing on its own will be considered the winning group.
- Groups can use as many newspapers as they want to and in any way they want.

Ask

- What did the winning group do differently?
- If you were given a chance, how would you have made the tower differently?
- How did you feel while making the tower?
- Did you feel motivated?

Say

- Discuss the concept of achievement motivation and characteristics of entrepreneurs with achievement motivation as discussed in the Participant Handbook.

Ask

- Is your attitude positive or negative?

Say

- Let me tell you a story :

It's Little Things that Make a Big Difference.

There was a man taking a morning walk at the beach. He saw that along with the morning tide came hundreds of starfish and when the tide receded, they were left behind and with the morning sun rays, they would die. The tide was fresh and the starfish were alive. The man took a few steps, picked one and threw it into the water. He did that repeatedly. Right behind him there was another person who couldn't understand what this man was doing. He caught up with him and asked, “What are you doing? There are hundreds of starfish. How many can you help? What difference does it make?” This man did not reply, took two more steps, picked up another one, threw it into the water, and said, “It makes a difference to this one.” What difference are we making? Big or small, it does not matter. If everyone made a small difference, we'd end up with a big difference, wouldn't we?

Ask

- What did you learn from this story?

Activity

What Motivates You?

- This is an individual activity.
- It is an exercise given in the Participant Handbook.

Do

- Ask the class to open their Participant Handbook and complete the exercise given in the section What Motivates You?
- Ensure that the participants have opened the correct page for the activity.
- Give the class 5 minutes to complete the activity.

Say

- Discuss the concept of attitude and how to cultivate a positive attitude as discussed in the Participant Handbook.

Summarize

- Close the discussion by summarizing how self-analysis, knowledge about what motivates you and your positive attitude can help in your business as well in life.

UNIT 12.1.4: Honesty & Work Ethics

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the qualities of honest people
- Describe the importance of honesty in entrepreneurs
- Discuss the elements of a strong work ethic
- Discuss how to foster a good work ethic

Resources to be Used

- Participant Handbook

Ask

- What do you understand by honesty?
- Why is it important for entrepreneurs to be honest?
- Do you remember any incident where your honesty helped you in gaining confidence?
- Do you remember any incident where someone lost business due to dishonesty?

Say

- Talk about honesty, qualities of an honest person, and the importance of honesty in entrepreneurs as discussed in the Participant Handbook.
- "Let's understand it better with the help of some case scenarios. You will be given some cases within your groups. You have to analyse the case scenario that has been given to you and then find an appropriate solution to the problem.
- Keep your discussion focussed around the following:
  - What went wrong?
  - Who was at fault?
  - Whom did it impact- the customer or the businessman?
  - How would it impact the business immediately? What would be the long term impact?
  - What could be done?
  - What did you learn from the exercise?

Do

- Divide the class into four groups of maximum six participants depending on the batch size.
- Give one case study to each group.
- Instruct them to read the case carefully.
- Put down the de-brief questions on the board and ask the groups to focus their discussion around these questions.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem. Give the class5-10 minutes to discuss the case and note down their solutions.
- At the end of 10 minutes the team should present their case solution to the class. The presentation can be a narration or a role play.
- Ask the group to select a group leader for their group. The group leader to discuss and assign roles to the group members for the presentation.

Team Activity

Case Study Analysis

Scenario 1

Aakash has a small mobile retail sales and repair shop in Allahabad. He has one of the most popular outlets and has great rapport with his customers.

It's around 11 AM when a customer barges in to the shop and starts shouting at Aakash for giving her a faulty instrument. The screen of her mobile is cracked from one side. Aakash remembered thoroughly checking the handset before handing it over to the customer. The customer threatens to sue him and to go to Consumer Court for cheating her. Now, the problem occurred somewhere outside the shop but as other customers were listening to the conversation, it might impact his business. The situation needs to be managed very sensitively. What would you do if you were in Aakash's place?

Scenario 2

Rajni does beautiful Phulkari embroidery on suits and sarees. She has a small home-based business. She has a huge list of customers on Facebook and WhatsApp who give her orders regularly. Smita is one of her old and regular customers. As her sister-in-law's weddingwas around the corner, Smita wanted to buy few handcrafted Phulkari duppatta. She placed an order for three duppattas via WhatsApp and requested Rajni to send them as soon as possible. When the parcel reached Smita through courier she found that out of the three duppatas, only one was hand embroidered and the other two had machine embroidery on them. Even the length and the quality of the material was not as desired. Smita was heartbroken. It was a complete waste of money and moreover she couldn't wear what she had planned to during the wedding functions. She sent a message to Rajni on WhatsApp, expressing her anger and disappointment.

Smita has also sent a feedback and expressed her disappointment on the social media... this will directly affect Rajni's business. What would you do if you were in Rajni's place?

Scenario 3

Shankar is a tattoo artist who has a small tattoo showroom in a big, reputed mall in New Delhi. Mr Saksham had an appointment for today, at 11:00 am but he reached at 11:50 am. Meanwhile, Shankar had to reschedule his next appointment. After availing Shankar's services, Mr Saksham started yelling in an abusive language, refusing to pay the requisite amount, and finding faults in the services provided by him. Who was at fault in this case? What should Shankar do? Should he confront Saksham or give in to the demands of the client?

Scenario 4

Shailender is an online cloth reseller who does business through social networking sites such as Facebook and WhatsApp. Priyanka made online payment for a dress to Shailander. But she did not receive the dress for a month. When she asked for a cancellation, Shailander started misleading her. For almost 45 days, he kept promising her that he will pay the amount today, tomorrow, day after etc. Even after repeated calls and messages when she did not receive the payment or the dress, she decided to write a post against him on a popular social media platform. As a result, Shailender lost lots of customers and his flourishing business faced a major crisis. How could this situation have been managed?

Say

- Now, let's discuss the problem and solution with the larger group.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Once the presentation is over, the class can ask their questions.

Do

- Congratulate each group for the group presentation.
- Ask the audience to applaud for them.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time. Tell the group to wind up the discussion quickly if they go beyond the given time limit.

Summarize

- Ask the participants what they have learnt from the exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of honesty and work ethics for entrepreneurs.

UNIT 12.1.5: Creativity and Innovation

Unit Objectives

At the end of this unit, participants will be able to:

- List the characteristics of highly creative people
- List the characteristics of highly innovative people

Resources to be Used

- Participant Handbook
- Chart papers
- Marker pens

Ask

- You must be aware of the term 'Rags to riches' and heard stories related to the term.
- What do these stories tell us?
- What was so special about these people?

Say

- Let's have a look at these stories.
- There are some inspiring stories about people which I would like to share with you.
- Narrate these stories to the class.

A.P.J. Abdul Kalam

Who has not heard of A.P.J. Abdul Kalam: Avul Pakir Jainulabdeen Abdul Kalam hailed from a very humble background. His father was a boat owner. To help his family, Kalam would work as a newspaper vendor. With limited resources, he graduated in Physics and studied aerospace engineering. He was instrumental in India's step towards nuclear energy. In 2002, he became the 11th President of India.

Water filter/purifier at source

Two young boys studying in classes 4 and 5, from Lingzya Junior High School, Sikkim designed a simple innovative low cost water purifier.

Inspiration behind the idea: Most people today prefer to use a water filter/purifier at their home.

Both the children have given idea to have filter/purifier at the source of water so that everyone has access to clean water without having to make an investment in purchasing a filter/purifier.

Soring's idea is to have a centralised purification system at the point of distribution like water tank while Subash's idea is to have such purifiers attached to public taps.

Source: http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm

Solar seeder

This is a story of a innovative solar seeder and developed by Subash Chandra Bose, a class 8, student from St Sebasthiyar Matriculation School, Pudukkottai, Tamil Nadu. Subash has developed a solar powered seed drill, which can undertake plantation for different size of seeds at variable depth and space between two seeds.

Source: http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm

Looms for physically challenged

Now this is really inspiring of two sisters, Elakkiya a Class 6 student and Pavithra a Class 9 student of SRC Memorial Matriculation, Erode, Tamil Nadu.

The two sisters have come up with loom for lower limbed physically challenged. In their loom they have replaced the pedal operated system with a motor and a gearbox attached to a pulley mechanism.

Source: http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm

Ask

- If they can, why can't you?
- Discuss concepts related to 'Creativity and Innovation' with the participants as given in the Participant Handbook.

Say

- Recall the stories on motivation.
- What is the inner drive that motivates people to succeed?
- Let's learn more about such creative and innovative entrepreneurs with the help of an activity.

Team Activity

- This is a group activity.

- Think of any one famous entrepreneur and write a few lines about him or her.

Activity De-brief

- Why did you choose this particular entrepreneur?
- What is his/her brand name?
- What creativity does he/she possess?
- What was innovative about their ideas?

Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6 depending on the batch size.
- Give each group a chart paper.
- Tell the participants they have to write a few lines about any one famous entrepreneur.
- Give the participants 10 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.
- Ask each group to read out what they have written.
- Ask the de-brief questions.

Summarize

- Summarize the unit by asking participants if they know of some people who are highly creative and innovative in their approach.
- Ask them to share some experiences about these people with the class.

Notes for Facilitation

- Source for stories on innovations:

http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm

UNIT 12.1.6: Time Management

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the benefits of time management
- List the traits of effective time managers
- Describe effective time management techniques

Resources to be Used

- Participant Handbook

Ask

Does this sound like you?

- I can never get enough time to finish what I am doing in a day.
- I have so many things to do that I get confused.
- I want to go for a walk and exercise, but I just do not have the time.
- I had so much to do, so I could not deliver that order on time.
- I would love to start my dream business; but, I just do not have the time.

Example

- Let's look at these two examples:

Example 1:

Ankita works from home as a freelance writer. She says she can easily put in 8 hours of dedicated work in a day. Because she works from home, she saves money on travel and has a comfortable work routine. But there is a challenge and it is distraction. As she works from home, she can easily just get up and sit down on the sofa to watch TV, wasting valuable time. She may have chores to do, errands to run and bills to pay. She ends up working only two to three hours a day and the result is, her work gets piled up. She is unable to take on more work due to this. Even though her quality of work is appreciated her clients are not very happy about the delay in submission.

Example 2:

Javed has started a successful online selling company from home and makes a good living from his sales. He has set up a small office space in his living room. As both his parents are working full-time, he also has the role of taking care of his two younger siblings. He almost spends half of his day with the younger kids. He does not mind it but it means taking time away from the work. He is still able to manage his online business with these commitments. He wants to spend some more dedicated hours so as to increase his profits. He also wants to look into new business avenues. What should he be doing.

Ask

- Does this happen with you too?
- Do you find it difficult to prioritize your work?
- Are you able to manage your time effectively?

Activity

- Conduct a group discussion based on the above examples.
- Direct the discussion on how to prioritize work and manage time effectively.

Say

- Time management is not only about how hard you work but also about how smart you work.
- Discuss "What is Time Management" with the participants as given in the Participant Handbook.

Ask

- Why is it important to manage time? How does it help?
- What happens when you don't manage your time effectively?
- Do you find it difficult to prioritize your work?

Say

- Discuss the benefits of time management given in the Participant Handbook.
- Let's learn effective time management with the help of an activity.

Activity

Effective Time Management

- This activity has two parts:

PART 1

TO-DO LIST

- You have to make a to-do list.
- List all of the activities/ tasks that you have to do.
- Try to include everything that takes up your time, however unimportant it may be.
- If they are large tasks, break them into action steps, and write this down with the larger task.
- You can make one list for all your tasks or have separate to-do lists for personal and professional tasks.

PART 2

URGENT-IMPORTANT GRID

- You have to make a grid as shown on the board here. .
- This grid has four boxes. As you can see, each box has a different heading.
- At the heart of the urgent-important grid, are these two questions:
  - Is this task important?
  - Is this task urgent?
- Now, you have to think about each activity that you have written in your to-do list and put it into one of the four categories.
- **What do these categories depict?**
- **Category 1: Urgent/Important**
  - This category is for the highest priority tasks. They need to get done now.

- **Category 2: Not Urgent/Important**
  - This is where you want to spend most of your time.
  - This category allows you to work on something important and have the time to do it properly.
  - This will help you produce high quality work in an efficient manner.
  - The tasks in this category are probably the most neglected ones, but also the most crucial ones for success.
  - The tasks in this category can include strategic thinking, deciding on goals or general direction and planning – all vital parts of running a successful business.
- **Category 3: Urgent/Not Important**
  - This is where you are busy but not productive. These tasks are often mistaken to be important, when they're most often busywork.
  - Urgent but not important tasks are things that prevent you from achieving your goals.
  - However, some may be activities that other people want you to do.
- **Category 4: Not Important and Not Urgent**
  - This category doesn't really include tasks, but rather habits that provide comfort, and a refuge from being disciplined and rigorous with your time management.
  - Some may be activities that other people want you to do.
  - These might include unplanned leisure activities as well.

TO- DO list format

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	

URGENT-IMPORTANT GRID

URGENT/ IMPORTANT • Meetings • Last minute demands • Project deadlines • Crisis	**NOT URGENT/ IMPORTANT** • Planning • Working towards goals • Building relationship • Personal commitments
• Interruptions • Phone calls/ E-mails • Other people's minor demands **URGENT/ NOT IMPORTANT**	• Internet surfing • Social media • Watching TV **NOT URGENT/ NOT IMPORTANT**

1	2
3	4

URGENT/ IMPORTANT GRID format

URGENT/ IMPORTANT	**NOT URGENT/ IMPORTANT**
URGENT/ NOT IMPORTANT	**NOT URGENT/ NOT IMPORTANT**

1	2
3	4

Do

- Put down the formats for the to-do list and the urgent/ important grid on the board.
- Instruct the participants to prepare their to-do list first.
- Give the participants 10 minutes to prepare the list.
- Once done, instruct them to divide the tasks in to-do list into the four categories.
- Explain the four categories to the participants giving examples specific to their context.
- As you explain the categories fill the grid with the type of tasks.
- Give the participants 40 minutes to fill the grid.
- Then explain how to balance the tasks between the four categories.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Say

Activity De-brief:

How can we balance tasks between the four categories?

How to manage time through this grid?

- **Category 1: Urgent/Important**
  - Try to keep as few tasks as possible here, with the aim to eliminate.
  - If you spend too much of your time in this category, you are working solely as a trouble shooter, and never finding time to work on longer-term plans.
- **Category 2: Not Urgent/Important**
  - Plan these tasks carefully and efficiently as they are most crucial ones for success.
  - If necessary, also plan where you will do these tasks, so that you're free from interruptions.
  - Include strategic thinking, deciding on goals or general direction and planning in your planning process.
- **Category 3: Urgent/Not Important**
  - Ask yourself whether you can reschedule or delegate them.
  - A common source of such activities is other people. Sometimes it's appropriate to say "no" to people politely, or to encourage them to solve the problem themselves.
- **Category 4: Not Important and Not Urgent**
  - You also want to minimize the tasks that you have in this category.
  - These activities are just a distraction – avoid them if possible.
  - You can simply ignore or cancel many of them.
  - Politely say "no" to work assigned by others, if you can, and explain why you cannot do it.
  - Schedule your leisure activities carefully so that they don't have an impact on other important tasks.
- Discuss the traits of effective time managers and effective time management techniques as given in the Participant Handbook.

Summarize

- Discuss the traits of effective time managers and effective time management techniques as given in the Participant Handbook.

Notes for Facilitation

- Here is a short story. You can conclude the session narrating the story. To make it more interesting you can perform the demonstration described and discuss the short story.
  - One day an expert in time management was speaking to a group of students. As he stood in front of the group, he pulled out a large wide-mouthed glass jar and set it on the table in front of him. Then he took out a bag of about a dozen rocks and placed them, one at a time, into the jar. When the jar was filled to the top and no more rocks would fit inside, he asked, "Is this jar full?" Everyone in the class said, "Yes." Then he said, "Really?"
  - He reached under the table and pulled out a bucket of gravel (small stones). He dumped some gravel in and shook the jar causing pieces of gravel to work themselves down into the space between the rocks. Then he asked the group once more, "Is the jar full?" By this time, the class began to understand. "Probably not," one of them answered. "Good!" he replied.
  - He reached under the table and brought out a bucket of sand. He started dumping the sand in the jar and it went into all of the spaces left between the rocks and the gravel. Once more he asked the question, "Is this jar full?" No!" the class shouted. Once again he said, "Good." Then he grabbed a jug of water and began to pour it in until the jar was filled to the brim. Then he looked at the class and asked, "What is the point of this illustration? “One student raised his hand and said, “No matter how full your schedule is, if you try really hard you can always fit some more things in it!" "No," the speaker replied, "that's not the point. The truth this illustration teaches us is: If you don't put the big rocks in first, you'll never get them in at all." What are the 'big rocks' in your life? Your children; your loved ones; your education; your dreams; a worthy cause; teaching or mentoring others; doing things that you love; time for yourself; your health; your mate (or significant other). Remember to put these BIG ROCKS in first or you'll never get them in at all. If you sweat about the little stuff (the gravel, sand, and water) then you'll fill your life with little things you worry about that don't really matter, and you'll never have the time you need to spend on the big, important stuff (the big rocks).
- End the story with these lines…

  So, tonight, or in the morning tomorrow, when you are reflecting on this short story, ask yourself this question: What are the 'big rocks' in my life? Then, put those in your jar first

UNIT 12.1.7: Anger Management

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of anger management
- Describe anger management strategies
- Discuss tips for anger management

Resources to be Used

- Participant Handbook

Ask

- What is anger? Is anger good or bad?
- Is anger normal or an abnormal behaviour? How can anger harm you?
- Why is it important for entrepreneurs to manage their anger?

Say

- Talk about anger and the importance of anger management in entrepreneurs as discussed in the Participant Handbook.
- Let us do a small activity. This is an individual activity.
- Think of the incidents and situations that angered you and hurt you.

Do

- Instruct them to note down these situations under different categories (as given in the Activity).
- Give the class 3-5 minutes to think and note down their answers.
- At the end of 5 minutes, ask some participants to volunteer and present their answers.
- They can also share these situations with their fellow participants if they do not wish to share it with the entire class.

Activity

- Do you remember any incident which has hurt
  - you physically
  - you mentally
  - your career
  - your relationships.

Ask

- Do you ever get angry?
- What are the things that make you angry?
- Do you remember any incident where your anger management helped you in maintaining healthy relationship?
- Do you remember any incident where someone lost business/ friend/ relationship due to temper (anger)?

Say

- There are a few strategies which can help in controlling your anger. Let's do an activity to understand the anger management process better.
- This is an individual activity.
- Think of the incidents/ situations which trigger your anger (the cause).
- Then think what happened as a result of your anger (the effect).
- You need to come up with some techniques to manage your anger.

Do

- Give the class the anger triggers (the cause) as listed in the activity.
- Put down the activity format (Anger Triggers, Result of your Anger, Anger Management Techniques) on the board and instruct the class to write the answers under different categories.
- Give the class 3-5 minutes to think and note down their answers.
- At the end of 5 minutes, ask the participants who wish to volunteer and present their answers.

Activity

Trigger points and Anger Management Techniques Activity

Anger Triggers

List of triggers that make you angry:
Someone says you did something wrong.
You want something you can't have now.
You get caught doing something you shouldn't have been doing.
You are accused of doing something you didn't do.
You are told that you can't do something.
Someone doesn't agree with you.
Someone doesn't do what you tell him to do.
Someone unexpected happens that messes up your schedule.

Result of your anger:

Write the techniques that you use to manage your anger:
Anger Management Techniques

Say

- Now, let's discuss the problems and solution with all.
- The individual will first briefly describe trigger points to the class.
- Then discuss the result of the anger. Other participants are requested to remain quiet while one is making the presentation.
- Post presentation, other participants may ask questions.

Do

- Congratulate each individual for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief questions after the presentation to the class.
- Keep a check on the time. Ask the participants to wind up the activity quickly if they go beyond the given time limit.

Ask

De-brief questions:

- In the situation described by the presenter, who was at fault?
- How could you have handled this situation alternatively?

Summarize

- Close the discussion by summarizing the strategies and tips of anger management for entrepreneurs.
- Ask the participants what have they learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Encourage the participants to share information about them while presenting the situations to the class.
- Keep the format of the Activity prepared in a chart paper so that it can be displayed during the session.

UNIT 12.1.8: Stress Management: What is stress?

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the causes of stress
- Discuss the symptoms of stress
- Discuss tips for stress management

Resources to be Used

- Participant Handbook

Ask

- You are waiting in the reception for an interview or a very important meeting, suddenly your legs are shaky, your hands are cold, you are feeling nervous. Have you ever been in this kind of situation?
- Have you had days when you had trouble sleeping?
- Have you ever been so worried about something that you ended up with a terrible headache?

Say

- You've probably heard people say, I'm really stressed out" or "This is making me totally stressed."

Ask

- What do you understand by stress?
- What gives you stress?
- How do you feel when you are stressed or what are the symptoms of stress?
- How can stress harm you?
- Why is it important for entrepreneurs to manage stress?

Say

- When we feel overloaded or unsure of our ability to deal with certain challenges, we feel stressed.
- Discuss about stress, causes of stress, and symptoms of stress as discussed in the Participant Handbook.
- Let's understand the causes of stress and how to deal with them with the help of some case scenarios.
- You will be given some cases.
- You have to analyse the case scenario and then find an appropriate solution to the problem.
- This will be a group activity.

Do

- Divide the class into four groups of 5- 6 participants (depending on the batch size).
- Assign one case scenario to each group.
- Instruct them to read the case carefully.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem.
- Explain their discussion should result in getting answers for the following questions:

- What was/ were the cause(s) of stress?
- Was the stress avoidable or manageable under the given circumstances?
- If yes, how do you think that the stress could be avoided (managed)?
- If no, then why not?

- Give the class 10-12 minutes to discuss the case and note down their solutions.
- At the end of 12 minutes, the team should present their case solution to the larger group.
- Ask the group to select a group leader for their group.
- The group leader to discuss and assign roles to the group members for the presentation.

Team Activity

Case Study Analysis

Scenario 1

Akash's alarm doesn't go off and he gets late getting out of the house. He hits traffic and ends up 15 minutes late to work, which his boss notices. He gets to his desk and finds he has to complete 2 reports in next one hour. Just when he is about to begin work, a message pops up "Telecon with the client begins in 10 minutes. Please be in the conference room in 5 minutes."

His is not prepared for the call. He is stressed. He does not want to speak to his boss about this. He is stressed, feeling uncomfortable and sick. Not in a position to attend the call or finish the reports on time.

Scenario 2

While paying his overdue bills, Rahul realised that it's the middle of the month and he has only Rs 500 left in his account. He has already asked all of his friends, and family for loans, which he hasn't paid back yet. He is still contemplating over the issue when his phone rings. His sister's birthday is due next week and she has seen a beautiful dress which she wants to buy but cannot tell the parents as it is a bit expensive. She wishes if Rahul could buy the dress for her. Rahul has promised to buy her the dress for her birthday.

Rahul is stressed, does not understand what to do. He is unable to concentrate on his work and unable to complete the tasks assigned. His team leader has already warned him of the delay.

Scenario 3

Sheela calls the cable company as she has unknown charges on her bill. She has to go through the automated voice mail menu three times and still can't get through to a customer care executive. After 15 minutes of repeated efforts, her call is answered. She explains the entire issue to the customer care executive but before the person could suggest a way out, the call drops.

Now Sheela has to call back and repeat the whole process all over again with a new customer care executive. She is very angry and calls again but cannot connect this time.

She has to leave to office so she decides to call from office and check. When she connects this time she is angry and argues with the executive on the call. All her co-workers around are looking at her as her volume has suddenly increased. She bangs the phone and ends the call.

Her co-worker Neelam enquires what has happened to her. She ignores her and just walks off. She has become irritable and her behaviour and tone with other co-workers is not acceptable.

Scenario 4

Arpit is a young entrepreneur who started doing business through Facebook few weeks back. He had always been into a job. Although Arpit has very few financial liabilities, it wasn't an easy decision to leave a comfortable job at once and look for newer pastures. Arpit's boss warned him of the consequences and the challenges of starting a business when nobody ever in his family had been in business.

He has not been able to get a good deal till now. This is an important life shift for him which comes with unknown variables. Arpit is nervous and is wondering if he has what it takes to fulfill the requirement of his new role, or the new experiences he's likely to face.

Ask

De-brief questions:

- What was/ were the cause(s) of stress?
- Was the stress avoidable or manageable under the given circumstances?
- If yes, how do you think that the stress could be avoided (managed)?
- If no, then why not?

Say

- Now, let's discuss the problem and solution with the larger group.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Post presentation, the other groups may ask questions to the group that has presented.

Do

- Congratulate each group for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time. Tell participants to wind up the discussion quickly if they go beyond the given time limit.

Say

- While it is common and normal to feel some tension. This feeling nervous and tensed can interfere with your thinking process and can have a negative impact on your performance.
- Stress can deplete the most vibrant of souls. It can have a negative effect on every aspect of a person's life including their health, emotional well-being, relationships, and career. However, one needs to understand the causes and types of stress before looking for ways to manage it.

De-brief:

Scenario 1

The cause of stress was lack of time management and the habit of procrastinating. If Akash would have managed his time well, planned alternate ways to get up on time, finished prior tasks on time and planned for client meetings in advance then he wouldn't have faced stress.

Scenario 2

The cause of stress was lack of financial planning. Rahul should have planned his financial resources well in advance and saved some money for the rainy day. Also, differentiating between needs and wants and keeping a check on non-essential expenditure would have saved Rahul from this situation.

Scenario 3

Sometimes, stress is caused due to external factors instead of internal ones. In this case, the stress was unavoidable because we have no control over this customer care system. Every time, you will get in touch with a new executive and will have to explain all over again. This might cause stress but despite being frustrated and angry there is little that we can do about it. All Sheela could do was to find ways to calm herself down through some breathing exercises and meditation, reading some good book or listening to music and then start afresh.

Scenario 4

A positive, major life change can be a source of good stress. Regardless of how good the change is, it can be stressful. Stress caused by a positive and major life change can be beneficial because it causes a person to step out of their comfort zone and learn new skills. Here, Arpit may become a successful entrepreneur or learn new ways to do things differently.

Now let us see this scenario, can I have a volunteer to read out this case to the class.

Do

- Ask one of the participant who can volunteer and read out this scenario to the class.

Scenario 5

Rakesh lives in Kathmandu with his wife and two beautiful daughters Sarah and Sanya. Nepal was hit by a massive earthquake and Rakesh's building collapsed during the earthquake. During evacuation, Rakesh realised that though his wife and Sarah were fine and suffered only minor bruises, Sanya was nowhere in the scene. Panic stricken, he started calling her name and searching her frantically. A little later, he heard a meek voice from beneath the debris. He quickly removed the rubble to find a huge bed. Rakesh was pretty sure that Sanya was trapped underneath. Though he was badly bruised, he gathered all his courage and with all his might, he lifted the several-ton bed to save Sanya's life. Everyone was relieved to see Sanya alive and also extremely surprised to see this father's ability to access superhuman strength.

- Ask the audience to applaud for the participant after the scenario is read completely.
- Discuss the scenario, ask de-brief questions:
  - What kind of stress was Rakesh undergoing in this case?
  - Was the stress avoidable or manageable under the given circumstances?
  - What was the result of the stress?

Say

De-brief:

- Not all stress is harmful; good stress is actually energizing. This was a case of lifesaving stress, or hero stress, which is an important example of good stress. You may have heard stories in which a person performs an impossible feat of physical strength in order to save their life or the life of someone they love. This type of stress causing a surge of adrenaline is good for us.

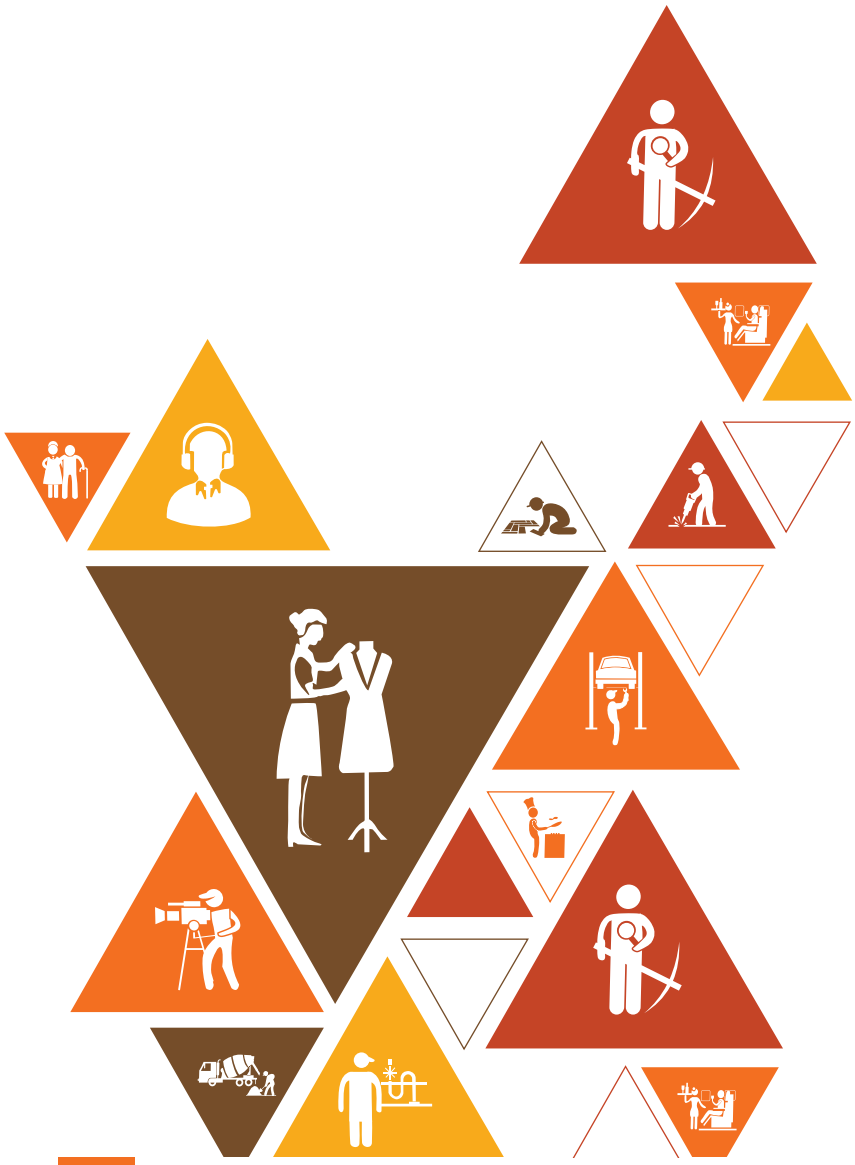
Summarize

- Close the discussion by summarizing the tips to manage stress as given in the Participant Handbook.
- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Keep printed copies of the activities/ scenarios ready for the session.
- Put down the de-brief questions on a flip chart so that it can be displayed in the class during the activity.
- Encourage participation and make the discussions interative.

Notes



UNIT 12.2: Digital Literacy: A Recap

Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Identify the basic parts of a computer
2. Identify the basic parts of a keyboard
3. Recall basic computer terminology
4. Recall the functions of basic computer keys
5. Discuss the main applications of MS Office
6. Discuss the benefits of Microsoft Outlook
7. Identify different types of e-commerce
8. List the benefits of e-commerce for retailers and customers
9. Discuss Digital India campaign will help boost e-commerce in India
10. Describe how you will sell a product or service on an e-commerce platform

UNIT 12.2.1: Computer and Internet Basics: Basic Parts of a Computer

Unit Objectives

At the end of this unit, participants will be able to:

- Identify the basic parts of a computer
- Identify the basic parts of a keyboard
- Recall basic computer terminology
- Recall the functions of basic computer keys

Resources to be Used

- Participant Handbook
- Computer Systems with the required applications

Say

- Let's take a quick recap of the basic computer parts.
- Discuss 'Basic Parts of Computer' and 'Basic Parts of a Keyboard' with the class as given in the Participant Handbook.

Explain

- Explain all the parts of the computer and the keyboard by demonstrating on the real system.

Ask

- Do you know about internet?
- Have you ever used internet?
- Why do you think internet is useful?
- What was the last task you performed on internet?

Say

- Let's look at some basic internet terms.
- Discuss 'Basic Internet Terms' with the participants as given in the Participant Handbook.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of computer and internet for entrepreneurs.

Practical

- Conduct a practical session.
- Ask the participants to assemble in the computer lab.
- Give some hands on practice exercises.

Do

- Group the participants for the activity depending on the batch size and the number of computer systems available in the lab.
- Explain the purpose and duration of the activity.
- Ensure the participants complete the practical exercises assigned.

UNIT 12.2.2: MS Office and Email: About MS Office

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the main applications of MS Office
- Discuss the benefits of Microsoft Outlook

Resources to be Used

- Participant Handbook
- Computer Systems with MS Office

Ask

- What is the most frequent activity that you do on the computer?
- Do you know how to make presentations on the computer?

Say

- Give a brief introduction of MS Office as given in the Participant Handbook.
- Discuss the most popular office products. Explain in brief their application, benefits and working.
- **Microsoft Word** is a word processing program that allows for the creation of documents. The program is equipped with templates for quick formatting. There are also features that allow you to add graphics, tables, etc.
- **Microsoft Excel** is a tool for accounting and managing large sets of data. It can also simplify analysing data. It is also used to create charts based from data, and perform complex calculations. A Cell is an individual data box which will have a corresponding Column and Row heading. This gives the cell a name, referred to as the Cell Reference. There can be multiple pages in each workbook. Each page, or sheet, is called a Worksheet. When you open a new Excel file, it automatically starts you with three worksheets, but you can add more.

Explain

- Explain the working and frequently used features of Office on a real system.

Ask

- What do you know about e-mails?
- Do you have an email id?
- How often do you check your e-mails?

Say

- Communication is vital for every business. The fastest and the safest way to communicate these days are through emails. MS Outlook helps to manage your emails in a better way and also offers a host of other benefits.
- Discuss "Why Choose Microsoft Outlook?" with the participants as given in the Participant Handbook.

Do

- Ask the participants to assemble in the computer lab.
- Explain the working of Outlook on a real system..

Demonstrate

- Demonstrate how to create email id.
- Demonstrate how to write new mails, send mails.
- Demonstrate how to use MS Office application to create a letter and send it as attachment in an email.
- Demonstrate how to use other MS Office applications.

Practical

- Give some hands on practice exercises
- Group the participants for the activity depending on the batch size and the number of computer systems available in the lab.
- Explain the purpose and duration of the activity.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

UNIT 12.2.3: E-Commerce

Unit Objectives

At the end of this unit, participants will be able to:

- Identify different types of e-commerce
- List the benefits of e-commerce for retailers and customers
- Discuss Digital India campaign will help boost e-commerce in India
- Describe how you will sell a product or service on an e-commerce platform

Resources to be Used

- Computer System with internet connection
- Participant Handbook

Ask

- How many of you have done shopping online?
- Can you name at least five shopping websites?
- What is the product that you most frequently buy online?
- Why do you do shopping online instead of going to the market?

Say

- Give a brief introduction of "What is E-commerce". Refer to the Participant Handbook.
- E- commerce emerged in the early 1990s, and its use has increased at a rapid rate. Today, many companies sell their products online. Everything from food, clothes, entertainment, furnitureand many other items can be purchased online.

Ask

- What other types of transactions have you performed on the internet other than buying products?

Say

- Give examples of e-commerce activities from Participant Handbook.

Team Activity

E-commerce examples

- Instruct the participants to list some of the payment gateways that they have used for e-commerce activities.
- Give them 5 minutes to make this list.
- Discuss payment gateways and transaction through payment gateways.
- Conclude the discussion by mentioning how important e-commerce has become in our day to day transactions.

Say

- E-commerce activities can be classified based on the types of participants in the transaction.
- Discuss "Types of E-commerce" from the Participant Handbook.

Do

- Discuss all types of E-commerce by giving examples and names of some popular websites which use them.
- Make the discussion interactive by asking the class to share some popular e-commerce sites of each type.

Say

- E-commerce activities bring a host of benefits for both, retailers and customers.
- Discuss benefits of E-commerce from the Participant Handbook.

Explain

- The majority of the population that uses E-commerce activities lives in tier-1 and tier-2 cities. To encourage the use of digital money in tier-3 and 4 areas, PM Mr. Modi launched the "Digital India Campaign".
- Discuss "Digital India Campaign" from the Participant Handbook.
- By Digital India project the government will deliver services via mobile connectivity and in doing so, is expected to bring the internet and broadband to remote corners of the country. This connectivity will in turn enhance e-commerce activities also. Furthermore, the Indian Government is also modernizing India Post and aims to develop it as a distribution channel for e-commerce related services.

Say

- Now let us discuss how to sell a product using E-commerce.
- Every product has to be sold on a platform on the internet. Think of it as a shop that you have to sell your product. Now this shop can be your own or shared or rented. If the shop is your own or rented there will be only your products in that shop. If the shop is shared, there will be products of multiple sellers in that shop. A common example is a departmental store which has products from multiple brands in the shop.
- Similarly, in E-commerce the shop is the website where your products are displayed. If it is your own website it will exclusively showcase your products. In this case the cost that you will incur will be:
    - Developing the website
    - Hosting the website
    - Maintenance of the website
- If you rent a website it will also showcase your own products but the development, hosting and maintenance parts goes to the owner. This saves time and the cost to manage these activities.
- Smaller companies usually go for renting a website and the bigger ones develop their own website.
- The concept of shared platforms has become very popular in recent times. In this platform the sellers have to register and then they can sell their goods on a common platform. Among the most popular of these are Amazon, Myntra, Flipkart, etc.

Role Play

- Tell the participants to choose a product or service that they want to sell online.
- Tell them to write a brief note explaining how they will use existing e-commerce platforms, or create a new e-commerce platform to sell their product or service.

Ask

- How much money are you carrying in your wallet?
- Do you have a credit/debit card?
- How do you make payments while doing online shopping?

Say

- Demonetization has made carrying cash in the wallet very difficult. People either shop through cards or some other form of digital money.
- So what do you think is digital money?
- In this form the money is both paid and received digitally. There is no hard cash involved. It is an instant and convenient way to make payments.
- There are various types of digital payments. Let us discuss some of them in brief here.
- The first one is the most commonly used system i.e. the cards. Debit card, credit card, prepaid card, all fall under this category.
- Then is the e-wallet or the mobile wallet. This has become the most used form of digital money after demonetization. Examples are Paytm, state bank buddy, Freecharge, etc.
- Many other forms of digital money are also coming up in market like mobile apps, Aadhar card based payment, etc.

Do

- Demonstrate how to make and receive payments through digital models like Paytm and state bank buddy.

Ask

- Why do you think people have started using digital money instead of hard cash? Is demonetization the only reason?

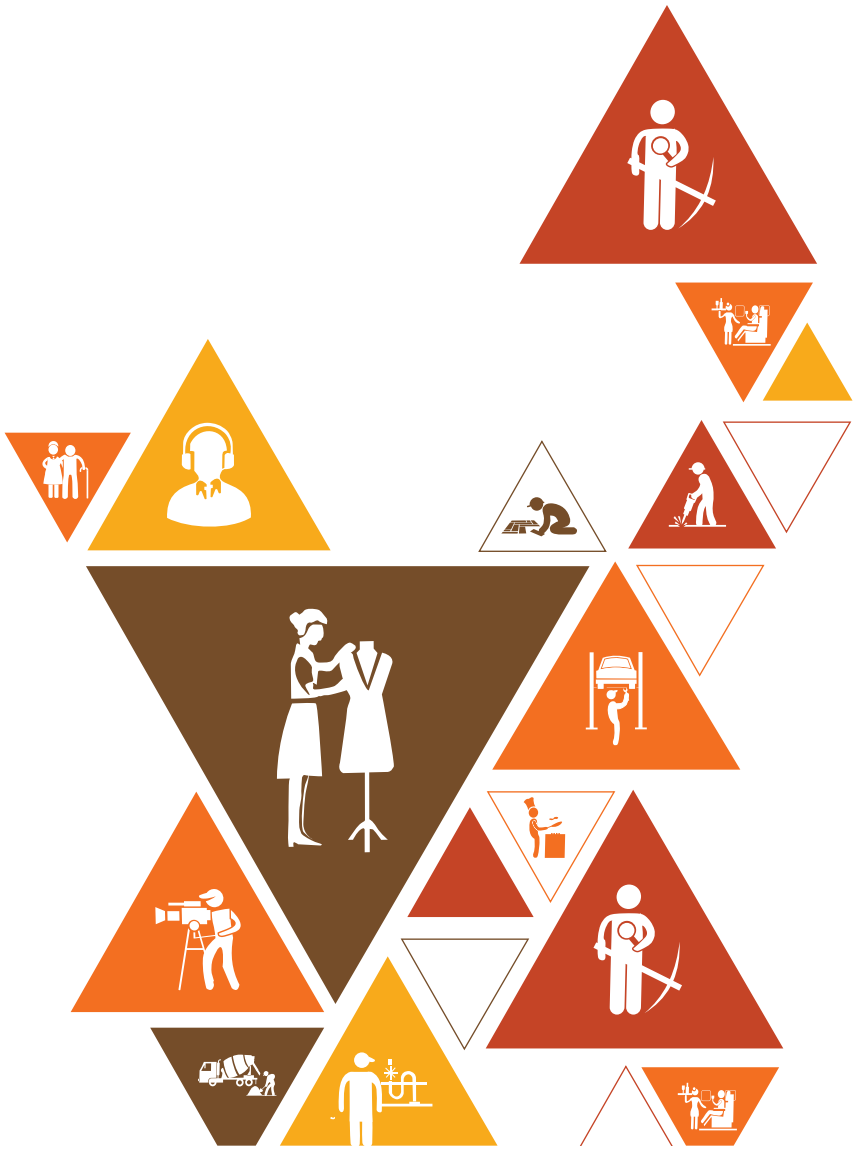
Say

- Digital money gives a lot of advantages over the conventional hard cash. Some of them are:
  - Digital payments are easy and convenient. You do not need to take loads of cash with you, a mobile phone or a card will suffice.
  - With digital payment modes, you can pay from anywhere anytime.
  - Digital payments have less risk.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of e-commerce and digital money.

Notes



UNIT 12.3: Money Matters

Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Discuss the importance of saving money
2. Discuss the benefits of saving money
3. Discuss the main types of bank accounts
4. Describe the process of opening a bank account
5. Differentiate between fixed and variable costs
6. Describe the main types of investment options
7. Describe the different types of insurance products
8. Describe the different types of taxes
9. Discuss the uses of online banking
10. Discuss the main types of electronic funds transfer

UNIT 12.3.1: Personal Finance – Why to Save?

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of saving money
- Discuss the benefits of saving money

Resources to be Used

- Participant Handbook

Ask

- How many of you save money?
- Why do you feel the need to save it?
- Do you plan your savings?
- Where do you keep the money you save?
- How do you use the money that you have saved?

Example

- Let's look at these two examples:

Example 1:

Suhani works in a good company and earns Rs.30, 000 month. She always saves 5000 per month and keeps it aside as a personal saving. She keeps the money at home and has saved quite a lot. One day her mother has a medical emergency and has to be taken to the hospital. Her family is worried about the amount they have to spend for the treatment. It will cost them atleast 40,000.

Suhani says tells her family not to worry and that she has about 50,000, which she has saved over the months.

Example 2:

Jasmeet works in the same company and earns the same as Suhani. She is very fond of shopping and spends most of her money on buying new clothes. At the end of the month, she is always asking her father for money as her pay is finished.

Ask

- Who do you identify with –Suhani or Jasmeet ?
- How do you think Suhani manages to save money which Jasmeet is unable to do?

Say

- We should always set aside some and save some money from our monthly pay. The future is unpredictable. Saving money not only gives you a sense of financial security but it can be used in case of emergencies.
- Discuss “Importance of Saving” with the participants as given in the Participant Handbook.

Ask

- What are the benefits of saving money?
- What does being financially independent mean to you?

Say

- Discuss "Benefits of Saving" with the participants as given in the Participant Handbook.
- Now let us continue with Suhani's story. Suhani has told her family not to worry and that she has about 50,000, which she has saved over the months. The family is happy about Suhani's decision of saving money, which will be of great help for them now.

  Suhani is going to the hospital today to pay the first instalment for the treatment. Suddenly finds only 35,000 in her cash box when she counts and does not remember using it. She has not kept any record and now she is upset.

Ask

- Was it a good decision by Suhani to save a part of her earnings every month?
- Was it a wise decision to keep all her savings as cash in a cash box?
- Could she have managed to save money in a better and more effective manner?
- Do you want to learn how to save money and use it effectively?

Say

- Let's learn personal saving with the help of a group activity.

Team Activity

Personal Finance- Why to save

- This activity has two parts:

PART 1

WAYS TO SAVE MONEY

- You are earning 30,000/- per month. You have recently changed your job and have to move to a metropolitan city. You are now living as a paying guest paying 10,000/- per month. Your other estimated expenditures like travel, food, recreation would be around Rs. 17, 000 per month.
- Make a list of different ways to save money.

PART 2

HOW WILL YOU USE THE MONEY

- After a year how much have you been able to save?
- How will you use the money that you have saved?

Do

- Divide the class into groups of four.
- Instruct the participants to think and prepare a list of the various ways they can save money.
- Give the participants 10 minutes to prepare the list.
- Once done, instruct them to think of how they could use the money they have saved.
- Give the participants 10 minutes to prepare the list.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Activity De-brief

- What were the different ways you could save money?
- How much money were you able to save?
- How will you use the money you have saved in one year?

Say

- Discuss the importance of personal finance and why it is important to save money.

Summarize

You can summarize the session by discussing:

- The importance of saving money.
- Ways to save money.
- How the money saved can be used for different purposes.

UNIT 12.3.2: Types of Bank Accounts, Opening a Bank Account

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the main types of bank accounts
- Describe the process of opening a bank account

Resources to be Used

- Account opening sample forms
- Participant Handbook

Ask

- How many of you save money?
- Where do you keep the money you save?
- How many of you have a bank account?
- What type of account do you have?

Example

- Let's look at the given example:

Reena is in the third year of college but in the evening she gives tuitions for children living in her colony. She earns 15,000/- per month. As her students stay in different parts of the city, she has to walk a lot.

To save time, she decides to buy a second hand scooter for herself. But she has to save money for it. Her class mate advises her to open a recurring deposit account in the bank.

She goes to the bank close to her home. The personal manager gives her some forms to fill. She is confused as she has never done this before. Her elder sister has an account in the same bank. She asks for help from her sister. She goes to the bank the next day with her sister. The personal banker gives her a list of documents that she will need to submit with the form for opening an account. The banker advises her to open a 6 months recurring deposit.

Ask

- Do you try to save money monthly but have to spend it on unforeseen expenditure?
- Have you ever thought of depositing your savings in a bank?

Say

- Before opening a bank account, you need to know the types of accounts we have in India.
- Discuss "Types of Bank Accounts" with the participants as given in the Participant Handbook.

Ask

- Can someone say what are the different types of bank accounts?

Say

- Let's learn about the different types of bank accounts through an activity.

Team Activity

- Divide the class in four groups.
- Label the groups as savings account, current account, recurring account and fixed deposit.
- On a chart paper, ask them to write the key points of their account.

Activity De-brief

- Ask each group to present the key points of their account.

Say

- Now that you know about the four different types of accounts, let's learn how to open a bank account.
- Discuss "Opening a Bank Account" with the participants as given in the Participant Handbook.
- Discuss "Tips" that the participants should keep in mind while opening a bank account as given in the Participant Handbook.

Ask

- What are the main documents required for opening a bank account?
- What are some important points to ask the bank personnel while opening an account?

Say

- Mention officially valid KYC documents (refer to the Participant Handbook)
- Now, let's understand the procedure of opening a bank account through an activity.

Team Activity

Opening a Bank Account

- This activity is done in groups.
- Divide the class in groups of four or six.

PART 1

FILLING A BANK ACCOUNT OPENING FORM

- You have to fill a bank opening form.
- You can refer to the section "Opening a Bank Account" of your Handbook for reference.
- List all the steps that you will be required to fill in the form.
- List the documents that you needs for filling the form.
- Now fill in the form.

Activity De-brief

How did you design the form?

- What all details did you fill in the form?
- What were your KYC documents?
- How would this activity help you in future?

Do

- Instruct the participants to read the section "Opening a Bank Account' of the Participant Handbook.
- Give each group one sample account opening form.
- Give the participants 5 minutes to read the form.
- Give them 15 minutes to fill it.
- Assist them by explaining each category and how to fill it.
- Keep a check on time.
- Tell the group to wind up quickly if they go beyond the given time limit.

Summarize

Note:

- You can summarize the unit through a role play.
  - A person wanting to open an account in the bank.
  - What is the procedure that he will go through?
  - Discuss the key points of different types of bank accounts.
  - How to select the type of account
  - How to fill the account opening form.
- A sample account opening form is given in the following page for reference. Use it for the activity in the class.

Sample Bank Account Opening form.

Photograph

XXX Bank

SAVING BANK ACCOUNT OPENING FORM

Account No.: _____ Date: _____

Name of the Branch			
Village/Town			
Sub District / Block Name			
District			
State			
SSA Code / Ward No.			
Village Code / Town Code		Name of Village / Town	

Applicant Details:

Full Name	Mr./Mrs./Ms.	First	Middle	Last Name
Marital Status				
Name of Spouse/Father				
Name of Mother				
Address				
Pin Code				
Tel No. Mobile			Date of Birth	
Aadhaar No.			Pan No.	
MNREGA Job Card No.				
Occupation/Profession				
Annual Income				
No. of Dependents				

Detail of Assets	Owning House : Y/N Owning Farm : Y/N No. of Animals : Any other :
Existing Bank A/c. of family members / household	Y / N If yes, No. of A/cs. _____
Kisan Credit Card	Whether Eligible Y / N
I request you to issue me a **Rupay Card**.	
I also understand that I am eligible for an Overdraft after satisfactory operation of my account after 6 months of opening my account for meeting my emergency/ family needs subject to the condition that only one member from the household will be eligible for overdraft facility. I shall abide by the terms and conditions stipulated by the Bank in this regard.	

Declaration:
I hereby apply for opening of a Bank Account. I declare that the information provided by me in this application form is true and correct. The terms and conditions applicable have been read over and explained to me and have understood the same. I shall abide by all the terms and conditions as may be in force from time to time. I declare that I have not availed any Overdraft or Credit facility from any other bank.

Place:
Date: **Signature / LTI of Applicant**

Nomination:

I want to nominate as under				
Name of Nominee	Relationship	Age	Date of Birth in case of minor	Person authorised in case to receive the amount of deposit on behalf of the nominee in the event of my /minor(s) death.

Place:

Date: **Signature / LTI of Applicant**

Witness(es)*

1. _____

2. _____

*Witness is requires only for thumb impression and not for signature

UNIT 12.3.3: Costs: Fixed vs. Variables: What are Fixed and Variable Costs?

Unit Objectives

At the end of this unit, participants will be able to:

- Differentiate between fixed and variable costs

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Ask

- What is cost?
- Will a telephone bill fall under the category of a fixed or variable cost?

Say

- Discuss: Fixed and Variable cost with examples.Let us do a small activity.

Team Activity

Identify the type of cost

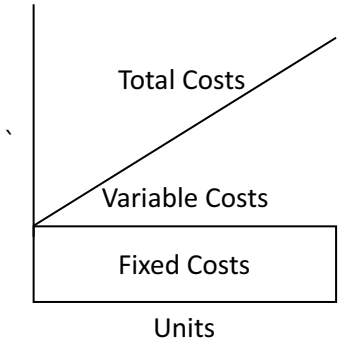
1. Rent
2. Telephone bill
3. Electricity bill
4. Machinery
5. Insurance
6. Office supplies/ Raw materials
7. Employee salaries
8. Commision percentage given to sales person for every unit sold
9. Credit card fees
10. Vendor bills

Do

- Divide the class into two groups. Read out the list of costs given in the activity.
- Read out each item from the cost list and ask the groups in turns to identify whether it is a fixed or variable cost.

Say

- We saw that your utility bills like rent, electricity, telephone etc. are all fixed costs because you have to pay it every month.
- Variable costs is an expense which varies with production output or volume. For example commission, raw material etc.
- Discuss "Cost: Fixed vs. variables" with the participants as given in the Participant Handbook.
- Illustrate the relation between the costs with a graph.



- Let's learn the difference between fixed and variable cost with the help of an activity.

Team Activity

Fixed vs. Variable Costs

- This is a group activity.

- You want to start your own entrepreneur business.
- State the type of business you want to start.
- List down all the cost or requirements for your business.
- How will you differentiate between the fixed and variable cost.

Activity De-brief

- What is the total cost of your business?
- What are the fixed costs?
- What are the variable costs?
- How did you differentiate between the fixed and variable costs?

Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6.
- Give each group a sheet of paper.
- Tell the participants that they have to start their own entrepreneur business.
- Ask them the type of business they want to start.
- Instruct them to differentiate between the fixed and the variable costs of the business they want to start.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Summarize

- Note: You can summarize the unit either by having a role play between a consultant and a budding entrepreneur explaining the differences between fixed and variable costs or by discussing the key points of the unit.

Notes for Facilitation

- Answers for the activity - Identify the type of cost

1. Rent (Fixed)
2. Telephone bill (Fixed)
3. Electricity bill (Fixed)
4. Machinery (Fixed)
5. Insurance (Fixed)
6. Office supplies/ Raw materials (Variable)
7. Employee salaries (Fixed)
8. Commision percentage given to sales person for every unit sold(Variable)
9. Credit card fees (Variable)
10. Vendor bills (Variable)

UNIT 12.3.4: Investments, Insurance and Taxes

Unit Objectives

At the end of this unit, participants will be able to:

- Describe the main types of investment options
- Describe the different types of insurance products
- Describe the different types of taxes

Resources to be Used

- Participant Handbook

Ask

- Ask the participants- "What do you see first thing in when you get your mobile bill? Apart from the amount and due date do you have a look at the taxes you are being billed for?
- Why do you think people get their cars insured or have a medical insurance?
- You have saved money and want to invest it, how would you decide what is the best investment for your money?

Example

- Let's have a look at a few scenarios.

Ranbir has sold his house and deposited the money in his bank. His Chartered Accountant tells him that he will have to re-invest the money otherwise he will have to pay capital tax. What is capital tax and how is it different from income tax?

Jasmeet and Anup are blessed with a baby girl. They decide to have an insurance policy that will mature when their daughter is ready to higher education.

Shivani is working in a corporate office and getting good pay. She will have to pay income tax so she decides to invest her money in tax saving schemes. She goes to the bank manager to discuss the best products in which she can invest.

Say

- Discuss the Investment, Insurance and Taxes as given in the Participant Handbook.

Ask

- How do investments, insurances and taxes differ from each other?

Say

- Let's learn the differences between the three by having an activity.

Say

- We will have a quiz today.

Team Activity

- The activity is a quiz.

Do

- Divide the class into groups of three and give a name to each group
- Explain the rules of the quiz. For each correct answer the group gets 1 mark. If the group is unable to answer the question is rolled over to the next group.
- Explain the purpose and duration of the activity.
- On the blackboard write the names of the groups.
- Ask the questions of the quiz.
- Keep a score for the groups.
- Set guidelines pertaining to discipline and expected tasks.

Summarize

- Summarize the unit by discussing the key points and answering question

Notes for Facilitation

Questions for the quiz

1. What are bonds?

   Bonds are instruments used by public and private companies to raise large sums of money.

2. Who issues the bonds?

   Private and public companies issue the bonds.

3. Why are bonds issued?

   To raise large amount of money as it cannot be burrowed from the bank.

4. Who is the buyer of stocks and equities?

   The general public is the buyer.

5. What types of scheme is the Sukanya Samriddhi Scheme?

   Small Saving Scheme

6. What is the difference between mutual and hedge funds?

   Mutual funds are professionally managed financial instruments that invest the money in different securities on behalf of investors. Hedge funds invest in both financial derivatives and/or publicly traded securities.

7. Why is a loan taken from the bank to purchase real estate?

   To lease or sell to make profit on appreciated property price.

8. Name the two types of insurances?

   Life Insurance and Non-life or general insurance

9. Which insurance product offers financial protection for 15-20 years?

   Term Insurance

10. What is the benefit of taking an endowment policy?

    It offers the dual benefit of investment and insurance.

11. Mr. Das gets monthly return on one of his insurance policies. Name the policy?

    Money Back Life Insurance

12. What are the two benefits of a Whole Life Insurance?

    It offers the dual benefit of investment and insurance

13. Which policy covers loss or damage of goods during transit?

    Marine Insurance

14. After what duration is the income tax levied?

    One financial year

15. What is long term capital gain tax?

    It is the tax payable for investments held for more than 36 months.

16. Name the tax that is added while buying shares?

    Securities Transaction Tax

17. What is the source of corporate tax?

    The revenue earned by a company.

18. Name the tax whose amount is decided by the state?

    VAT or Value Added Tax

19. You have bought a T.V. What tax will you pay?

    Sales Tax

20. What is the difference between custom duty and OCTROI?

    Custom duty is the charges payable when importing or purchasing goods from another country. OCTROI is levied on goods that cross borders within India.

UNIT 12.3.5: Online Banking, NEFT, RTGS, etc.

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the uses of online banking
- Discuss the main types of electronic funds transfer

Resources to be Used

- Participant Handbook
- Computer System with internet connection
- Debit card

Ask

- When was the last time you visited a bank?
- How do you pay your bill for electricity and telephone?
- Have you ever tried to transfer money from one bank account to another bank account using the online banking facility?

Say

- Most of us lead a busy life. Time has become more important than money. In this busy schedule no one has time to stand in bank queues. That's where Online Banking comes in. Online banking or internet banking means accessing your bank account and carrying out financial transactions through the internet.
- Discuss "What is online banking?" from the Participant Handbook.
- There are various advantages of online banking:
  - It saves time, as you need to visit the branch. .
  - You can conduct your banking transactions safely and securely without leaving the comfort of your home.
  - Online Banking also gives you round the clock access.
  - Online Banking makes it possible for you to pay your bills electronically.

Do

- Show them how they can use the internet banking.
- Use the computer system and show the demo videos on how to use internet banking provided on most banking sites. the computer system.
- Tell the class the various features of online banking:
  - Through their website set-up your online account.
  - Choose a secure username and password.
  - Set-up your contact information.
  - Once your information is verified, you are good to go.
  - Once you enter the portal explore all the features and learn your way through the portal.
- Discuss about maintaining the security of the online account.

Say

- One of the biggest advantage that online banking offers, as discussed earlier, is transferring money from one account to another. This transaction is called electronic funds transfer. Electronic transfers are processed immediately with the transferred amount being deducted from one account and credited to the other in real time, thus saving time andeffort involved in physically transferring a sum of money.
- Discuss "Electronic Funds Transfer" from the Participant Handbook.

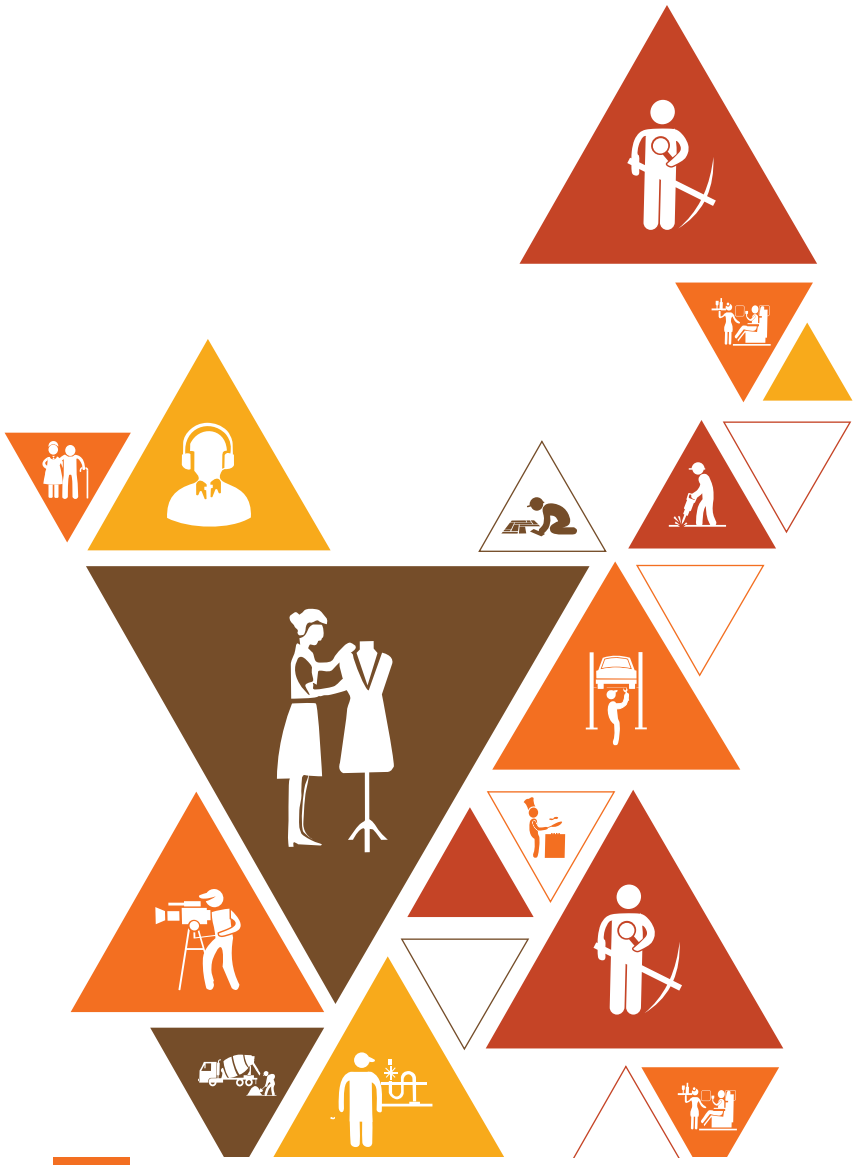
Do

- Discuss how to transfer money from one account to another using online banking (NEFT/ RTGS, etc.).
- Illustrate with an example.

Summarize

- Close the discussion by summarizing the about online banking.
- Ask the participants if they have any questions related to what they have talked about so far.

Notes



UNIT 12.4: Preparing for Employment & Self Employment

Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Discuss the steps to follow to prepare for an interview
2. Discuss the steps to create an effective Resume
3. Discuss the most frequently asked interview questions
4. Discuss how to answer the most frequently asked interview questions
5. Identify basic workplace terminology

UNIT 12.4.1: Interview Preparation: How to Prepare for an Interview?

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the steps to follow to prepare for an interview

Resources to be Used

- Participant Handbook

Ask

- Have you ever attended an interview?
- How did you prepare before going for an interview?

Say

- An interview is a conversation between two or more people (the interviewer(s) and interviewee) where questions are asked by the interviewer to obtain information from the interviewee.
- It provides the employer with an opportunity to gather sufficient information about a candidate and help them select the ideal candidate.
- It also provides the interviewee with an opportunity to present their true potential to the employer, build confidence and help make a decision about the job by asking questions regarding designation, salary, perks, benefits, promotions, transfers, etc.
- Let's do an activity to understand how to prepare for interviews better.

Activity 1

- Introducing Yourself

Do

- Select a participant and ask him/her to answer the following questions: "What can you tell me about yourself."
- Give the participant at least one minute to speak.
- Once he/she is done, ask the rest of the participant what they gathered about the participant who was providing information.
- Now repeat the exercise with five other participants.

Ask

- What information you should include when you are describing or introducing yourself in an interview?
- What information you should not include when you are describing or introducing yourself in an interview?

Say

- Tell the participants that when an interviewer asks you to say something about yourself, he/she is not asking you to present your life history.
- Introduction should be short and crisp, and should present you in a positive light. It should include the following points:
  - Any work experience that you might have
  - A brief summary of your educational qualifications
  - Your strengths and achievements
  - Any special projects that you might have been part of
- The following topics should be avoided during an introduction:
  - Detailed description of your family (unless you are specifically asked to do so)
  - Too much information about your weaknesses
  - Information that is not true

Do

- Congratulate each participant for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time.

Activity 2

- Planning the right attire

Do

- Describe 2 individuals to the participants. One is wearing a casual t-shirt, jeans, and slippers. He has not combed his hair and neither has he trimmed or shaved his beard. The other individual is dressed formally with a shirt and pant, and is well-groomed. He has also worn formal shoes and a belt. Ask the participants which person would they prefer to hire in their organization and why?

Summarize

- Close the discussion by discussing 'how to prepare for an interview' as discussed in the Participant Handbook.
- You can add the following points to it:
  - Tell the participants to create a positive and good impression in an interview. It is important for them to prepare for an interview beforehand.
  - The interviewer analyses not only your technical knowledge in relation to the job, but also whether or not you are a fit for the organization.
  - Every employer looks at the whole package and not just one or two things in isolation. Therefore, the way you dress and the way you present yourself is also important along with your skills and talents.
  - The participants will get only one chance to create a good first impression.

UNIT 12.4.2: Preparing an Effective Resume: How to Create an Effective Resume?

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the steps to create an effective Resume

Resources to be Used

- Participant Handbook
- Blank papers
- Pens

Ask

- When preparing for an interview, what are the most important things that you need to do?
- What documents do you carry with you, when you go for an interview?
- What is a resume?
- Why do you need a resume?

Say

- Resume is not just a sheet of paper with your qualifications printed on it.
- It is a selling tool that will help the employer to see how and what you can contribute for company.
- Talk about the steps involved in creating an effective/attractive resumes discussed in the Participant Handbook.
- Now let's prepare a resume to understand the process in a better way.

Do

- This is an individual activity.
- Give the details of the activity.
- Instruct them to read the activity carefully.
- The participant is expected to make an attractive resume based on the information provided.
- Give the class 25-30 minutes to study the case and create a resume.
- At the end of 30 minutes, the participants should exchange the resume with the person sitting next to him or her.
- Every participant will evaluate the resume prepared with their fellow participants.

Say

- Do you think the candidate should apply for the job posting described in the advertisement?
- We have already discussed the steps involved in creating an effective/attractive resumes.
- Now let's prepare a resume for the candidate details given in the activity.

Activity

Case Study Analysis

- In the first section of the activity, you are being given the information about a candidate who is applying for a particular job.
- In the second section, you are being given the detailed description of the job posting. Create a resume for the candidate to apply for the job posting.
- Use the information that has been provided about the candidate to create this resume.

Candidate Details

Nipesh Singla was born on 20th April, 1988 in Chandigarh, India. He currently resides at 1XX7, Sector XX D, Chandigarh –160018. His mobile number is 988XXXXX01, and e-mail address is nxxxxxxxxxla@gmail.com. Nipesh attended middle and senior school at Government Boys Senior Secondary School, Sector 15, Chandigarh. He has been a very talented boy since school. He was fond of painting and watching old Hindi movies. As part of a school charity program, he volunteered at the children's hospital during his senior years.

In July 2007, he joined Westwood School of Hotel Management, Zirakpur to pursue a diploma course in Hotel Management and Catering. After completing this course, he joined XYZ Group of Hotels as a Housekeeping intern in June 2010 for six months. In this role, he was responsible for cleanliness and maintenance of one floor in the hotel. Taking advantage of his strong interpersonal skills, he also got opportunities to make housekeeping arrangements for corporate meetings. While pursuing education, he gained working knowledge of Microsoft Word, Excel, Access and PowerPoint.

Nipesh is detail-oriented, flexible and adaptable. He has successfully worked with a diverse work force. He gelled well with his peers, both in college and during his internship. After completing the internship, his objective has been to find a job opportunity where he can use his skills and experience. Backed by experience, he is confident about his skills as housekeeping assistant.

Job Posting

* Do you see yourself as a HOUSEKEEPING SUPERVISOR?

What's your passion? Whether you're into cricket, reading or hiking, at IHG we are interested in YOU. At IHG, we employ people who apply the same amount of care and passion to their jobs as they do in their hobbies - people who put our guests at the heart of everything they do. And we're looking for more people like this to join our friendly and professional team.

THE LOCATION:

At the moment, we are looking for HOUSEKEEPING SUPERVISOR to join our youthful and dynamic team at Holiday Inn Amritsar, Ranjit Avenue in Amritsar, Punjab (India). Holiday Inn Amritsar is ideally located in Amritsar's commercial district on Ranjit Avenue with the world famous Golden Temple located only a short distance away. Sparkling chandeliers mark an incomparable arrival experience as you escape to the welcoming environment that is, Holiday Inn Amritsar. The fresh international brand to celebrate and explore Amritsar.

Salary: Negotiable

Industry: Travel / Hotels / Restaurants / Airlines / Railways

Functional Area: Hotels , Restaurants

Role Category: Housekeeping

Role: Housekeeping Executive/Assistant.

Desired Candidate Profile

Friendly, pleasant personality, Service - oriented.

You should ideally be Graduate/ Diploma holder in HM and at least 2 years of experience as a supervisor in good brand with good communication skills, English is a must.

In return we'll give you a competitive financial and benefits package. Hotel discounts worldwide are available as well as access to wide variety of discount schemes and the chance to work with a great team of people. Most importantly, we'll give you the room to be yourself.

*Please get in touch and tell us how you could bring your individual skills to IHG.

Education-

UG: Any Graduate/ Diploma holder

PG: Post Graduation Not Required

Say

- Now, let's share the resume with the fellow participant sitting next to you and evaluate each other's effort.

Do

- Congratulate each participant for making their first attempt towards creating an effective resume.
- As a follow up activity, you can suggest them to prepare their own resume and show it to you the next day.

Summarize

- Close the discussion by showing some effective resume samples to the candidates.
- Ask the participants what they have learnt from this activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Keep printed copies of the activity ready for the session.
- Put down the suggested format of the resume on the board while explaining the steps in preparing a resume.
- Do check the participants' resume and suggest necessary changes.
- Suggested example for the case presented:

Nipesh Singla

#1XX7, Sector XX-D

Chandigarh-160018

Mobile No: 91-988XXXXX01

E-mail: nxxxxxxxxxla@gmail.com

Objective: Seeking an opportunity to use my interpersonal skills and experience to contribute to your company's growth, profitability and objectives.

Professional strengths:

- Proficient in housekeeping
- Experienced in and capable of working with a diverse work force
- Team player and friendly in nature
- Successful working in a multi-cultural environment

- Detail oriented, flexible, and adaptable
- Knowledge of Microsoft Word, Excel, Access and PowerPoint

Educational background:

- Diploma in Hotel Management and Catering, Westwood School of Hotel Management, Zirakpur
- High School, Government Boys Senior Secondary School, Sector 15, Chandigarh

Professional internships:

- Housekeeping Intern, XYZ Group of Hotels, New Delhi (June 2010 – August 2010)
    - Responsible for cleanliness and maintenance of one floor in the hotel.
    - Got opportunities to make housekeeping arrangements for corporate meetings.

Volunteer Work:

- Student volunteer at children's hospital in Chandigarh.

Nipesh Singla

UNIT 12.4.3: Interview FAQs

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the most frequently asked interview questions
- Discuss how to answer the most frequently asked interview questions

Resources to be Used

- Participant Handbook

Say

- Tell the participants you will provide them with interview situation and questions and they have to try to answer them.
- Tell them you will also explain the different ways to approach these questions.

Do

- Divide the class in pairs and ask the participants to perform a role play.
- One partner will play the role of the interviewer while the other will play the role of the interviewee.
- Tell them the interviewer can start the interview by asking the interviewee to introduce himself/herself.
- Call all the pairs one by one in front of the class to enact the role play.
- Follow the same pattern for all other situations.
- Time allotted for each situation is 8-10 minutes.
- Congratulate each participant for giving their input.
- Ask the class to applaud each time a team has completed their role play.
- Keep a check on time.

Role Play

Conduct a role play for the situation given.

Situation 1

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- Then, the interviewer will bluntly ask the following questions:
  - How do you explain this huge time gap in your resume?
  - What is the reason for this?
  - Weren't you looking for a job or is it that no one selected you?

Say

De-brief:

- When you put information on your resume, you should be prepared to answer any questions about it.
- Be present and focused on the questions being asked to you.
- One way of tackling the blunt questions is to tell the interviewer you did not come across an opportunity where you were sufficiently satisfied with both the remuneration offered as well as the profile. Therefore, you waited for the right opportunity to come along while looking for an ideal job.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 2

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- Then, at the end of the interview, ask the interviewee:
  - There are over 200 people who have applied for this job, some with excellent work experience. Why should I hire you?

Say

De-brief:

- There is nothing wrong with stating your strengths and achievements. However, do not come across as arrogant or too boastful.
- You need show the interviewee that you have unique skills or talents to contribute to the company. The interviewer needs to know how you stand apart from the rest of the crowd.
- Tell the interviewer you are looking forward to working with the company and that you are a hard-working individual.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 3

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- Then, lean forward, clasp your hands on the table and in a soft voice ask the interviewee:
  - Did you ever experience any neglect or disregard from your previous office? In other words, did you ever suffer because your office or team displayed favouritism?

Say

De-brief:

- Keep this in mind: Do not criticize anyone during an interview.
- You are free to express your opinion, however, your language, answers, body language, and the tone of your voice should remain constructive and neutral.
- Since criticism will show you in negative light, you should keep your answers honest yet diplomatic.
- You can tackle such questions by saying, “I got along well with most of my faculty and peers.”

Role Play

Conduct a role play for the situation given.

Role Play – Situation 4

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- Then very bluntly ask the interviewee:
  - How long do you plan to stay with this company if you are selected?
- After the candidate responds, ask sarcastically:
  - Do you seriously mean that?

Say

De-brief:

- Don't provide unreal and idealistic answers.
- Your answers should be honest yet diplomatic. In a situation like this, the interviewer does not expect you to provide a specific timeline.
- You can say something like, "I would like to stay with the company as long as I can contribute constructively and develop as an employee, within the organization, professionally and financially."

Role Play

Conduct a role play for the situation given.

Role Play – Situation 5

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- Ask him/her how important he/she thinks it is to be punctual in the corporate world.
- After he/she answers, look up sternly at the interviewee and in a crisp voice, say:
  - You were late for this interview by 10 minutes. That surely does not seem to be in line with what you just said?

Say

De-brief:

- Politely apologize for being late.
- You can add something such as, "I assure you this is not a habit". All your future actions should be in line with this statement.
- Avoid giving any excuses.
- You might feel obligated to provide a justification for your tardiness, but the interviewer is not interested in that.
- Do not over apologize. Once this response is out of the way, turn your focus back to the interview.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 6

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- After asking a few academic or job-related questions, ask the interviewee:
  - If you get this job, what salary package do you expect us to give you?

Say

De-brief:

- If there is no way for you to avoid this question, respond to the interviewer by providing a reasonable and well-thought out salary range.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 7

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- Then, bringing the interview to a close, ask the interviewee:
  - Do you have any questions for me?

Say

De-brief:

- Ask relevant questions.
- Don't bombard the interviewer with questions.
- If you have questions about the result of the interview, you can limit your questions to 1 or 2. Keep them short and relevant like:
  - When will I be informed about the results of the interview?
  - What are the working hours?
  - Will the job require me to travel?

Explain

- Tell the participants to be prepared for answering different types of questions in an interview.
- Stay calm and focused, and take a moment to think about how you should respond. Always maintain a confident tone.
- Even if you don't intend to, your body language conveys your level of discomfort with a particular question. Try to keep your actions, tone, and gestures neutral.
- Maintain your composure while answering personal question.

Do

- Tell all the participants to form pairs again.
- Tell them to use the following list of frequently asked interview questions to conduct mock interviews.
- They will use all or some of these questions to conduct mock interviews with their partners.
- One partner will play the role of the interviewer while the other will play the role of the interviewee.
- After they are through asking and answering the questions, the roles will be reversed.
- The same list of questions will be used again.
- After each mock interview ask the interviewer to provide feedback and clear any doubts that may arise.
- Time allotted for each situation is 30-35 minutes.

Activity

Mock Interview Questions

Mock Interview Questions
Tell me something about your family.
What qualities would you look for in a Manager or a Supervisor?
Why did you apply for this job?
What do you know about this company?
How do you deal with criticism?
How do you plan to strike a good work-life balance?
Where do you see yourself five years from now?
Have you applied for jobs in other companies?
What kind of salary do you expect from this job?
Do you have any questions for me?

Summarize

- Close the discussion by discussing the questions in the both activities.
- Ask the participants what they have learned from this activity.
- Ask if they have any questions related to what they have talked about so far.

UNIT 12.4.4: Work Readiness – Terms and Terminology

Unit Objectives

At the end of this unit, participants will be able to:

- Identify basic workplace terminology

Resources to be Used

- Participant Handbook
- Chart papers
- Blank sheets of paper
- Pens

Ask

- What do you understand by workplace terminology?
- Are offer letter and contract of employment the same?

Say

- Let's start this unit with an activity.

Team Activity

Workplace terminology

- This is a group activity conducted in three parts.

Part 1

Sheila received a call from the recruiter of MND Company. Before she is recruited by the company, think of the recruitment process she will have to go through. Start from the telephone call to signing her letter of acceptance. Write down all the words that come to your mind.

Activity De-brief

- Have the participants read out the words they have written
- Encourage all the participants to participate in the activity

Do

- Divide the class into small groups of 4 or 6.
- Instruct the participants that they will be doing a brainstorming activity.
- Give them one chart paper each. Tell them to divide the chart in two parts.
- Instruct them that they have to use one half of the chart paper now. The other half will be used later.
- The participants have to write all the words that come to their mind related to the recruitment process.
- Give them 10 minutes to do the activity.
- Tell them that there are no right or wrong answers.
- Keep a track of the time.

Say

- You all know quite a few words related to the terms used in the office.
- Let us talk about some new terms that have been missed out.
- Discuss "Work Readiness – Terms and Terminology" with the participants as given in the Participant Handbook.

Ask

- Why is it important to know the workplace terms?
- How do they help?
- Can the words be categorised further?

Say

- Let's now continue the activity.

Team Activity

Terms and Terminology

- This is again a group activity. The members of the group remain the same as in Activity 1.

Part 2

With the help of the new terms you have learned, make a flow chart of the hiring process of MND Company.

Activity De-brief

- Ask the groups to share the flow charts and the new terms they added while preparing the flow chart.

Do

- Instruct the participants that they have to use the 2nd half of the same chart they had used before.
- Using the new terminology and the terms they had previously written on the chart, they have to make a flow chart of the hiring process of the MND Company.
- Give them 10 minutes for this activity.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Say

- Let's go ahead with the activity.

Team Activity

Terms and Terminology

- The activity continues with the same group members.

Part 3

Sheila now works for the MND Company. She is not aware of the company culture and policies. She goes to the HR Department to get her doubts clarified. Can you think of the terms for which she wants clarity? Make a list of those words.

Activity De-brief

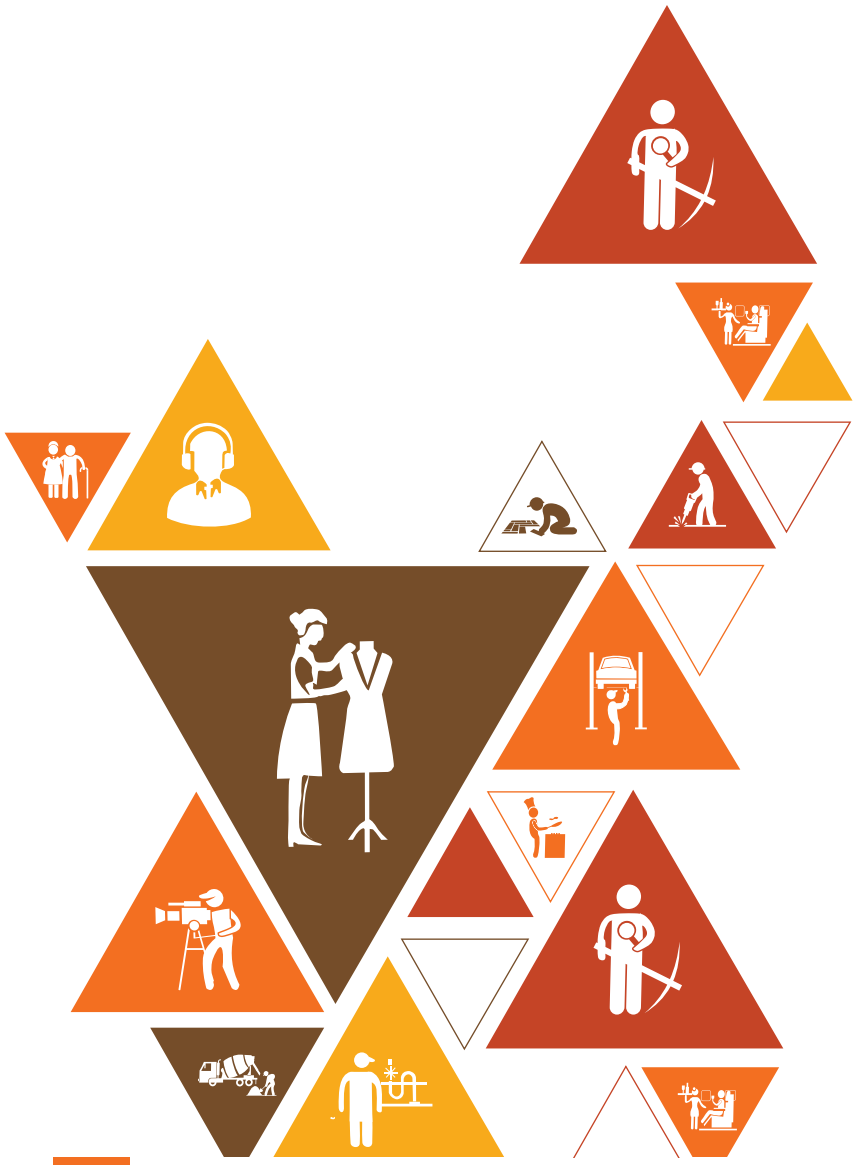
- Ask the groups to share their list of words. Some of the words are benefits, comp. time, deduction, employee training, holidays, lay-off, leave, maternity leave, mentor, notice, paternity leave, and time sheet.

Do

- Instruct the participants to identify the key terms an employee of a company should know. They can use the same chart paper for this activity.
- Give them 5 minutes for this activity.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Summarize

- Note: You can either summarize the key points of the unit or have a role play where an employee has just joined a company and the HR Manager explains the terms of employment.



UNIT 12.5: Understanding Entrepreneurship

Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Discuss the concept of entrepreneurship
2. Discuss the importance of entrepreneurship
3. Describe the characteristics of an entrepreneur
4. Describe the different types of enterprises
5. List the qualities of an effective leader
6. Discuss the benefits of effective leadership
7. List the traits of an effective team
8. Discuss the importance of listening effectively
9. Discuss how to listen effectively
10. Discuss the importance of speaking effectively
11. Discuss how to speak effectively
12. Discuss how to solve problems
13. List important problem solving traits
14. Discuss ways to assess problem solving skills
15. Discuss the importance of negotiation
16. Discuss how to negotiate
17. Discuss how to identify new business opportunities
18. Discuss how to identify business opportunities within your business
19. Explain the meaning of entrepreneur
20. Describe the different types of entrepreneurs
21. List the characteristics of entrepreneurs
22. Recall entrepreneur success stories
23. Discuss the entrepreneurial process
24. Describe the entrepreneurship ecosystem
25. Discuss the purpose of the Make in India campaign
26. Discuss key schemes to promote entrepreneurs
27. Discuss the relationship between entrepreneurship and risk appetite
28. Discuss the relationship between entrepreneurship and resilience
29. Describe the characteristics of a resilient entrepreneur
30. Discuss how to deal with failure

UNIT 12.5.1: Concept Introduction (Characteristic of an Entrepreneur, types of firms/ types of enterprises)

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the concept of entrepreneurship
- Discuss the importance of entrepreneurship
- Discuss the characteristics of an entrepreneur
- Describe the different types of enterprises

Resources to be Used

- Participant Handbook

Say

- Let's start this session with some interesting questions about Indian entrepreneurs.

Team Activity

Quiz Questions

1. Who is the founder of Reliance Industries?
   Dhirubhai Ambani
2. Who is the Chairman of Wipro Limited?
   Azim Premji
3. Who launched e-commerce website Flipkart?
   Sachin Bansal and Binny Bansal
4. Who is the founder of Paytm?
   Vijay Shekhar Sharma
5. Who is CEO of OLA Cabs?
   Bhavish Aggarwal
6. Who is the founder of Jugnoo?
   Samar Singla (autorickshaw aggregator)
7. Who is the founder of OYO Rooms?
   Bhavish Aggarwal

Do

- Tell them that you will ask them few questions about a few entrepreneurs.
- Divide the class in to two groups.
- In turns ask the quiz questions to the groups.
- If the answer is incorrect pass the question to the other group.
- Share the answer if the groups are not able to answer.
- Congratulate the participants who answered correctly.

Ask

- What do you understand by entrepreneurs?
- What is the importance of entrepreneurship in today's scenario?
- What do you think are the characteristics of successful entrepreneurs?
- What are different types of enterprises that an entrepreneur in India can own and run?

Say

- Talk about entrepreneurs, importance of entrepreneurship, characteristics of successful entrepreneurs, and different types of enterprises in India as discussed in the Participant Handbook.
- Tell the participants, stories of successful Indian entrepreneurs- their struggles, the moments of heartbreak, the perseverance and triumph.
- Ask them if they know of any such entrepreneur.

Summarize

- Close the discussion by summarizing about the opportunities for entrepreneurs in India.

Notes for Facilitation

- Check out different Government schemes for small entrepreneurs. Share the information with the participants.
- You can tell them about the government websites like Start Up India, mudra.org.in etc.
- Discuss about various schemes and policies by the Government of India for entrepreneurs.

UNIT 12.5.2: Leadership and Teamwork

Unit Objectives

At the end of this unit, participants will be able to:

- List the qualities of an effective leader
- Discuss the benefits of effective leadership
- List the traits of an effective team

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Do

- Show the picture given below to the class.
- Ask them to quickly write on a piece of paper what comes to their mind after seeing the picture.
- Now ask them, "What do you understand from this picture?"
- Encourage participants to share their thoughts.

Say

- This picture depicts the qualities of a leader and the difference between a leader and a boss.
- A boss focuses on structure and inspires fear whereas a leader follows vision and generates enthusiasm.
- A boss blames employees for the breakdown whereas a leader fixes breakdowns.
- A boss depends on authority whereas a leader depends on goodwill.
- A boss says "I" and a leader says "We."
- A boss drives employees whereas a leader coaches them.
- A boss takes credit whereas a leader gives credit.

Say

- Talk about leadership and leadership qualities for an entrepreneur as discussed in the Participant Handbook.

Ask

- Why is it important for a leader to be effective? How does it help the organization?

Say

- Let us discuss benefits of effective leadership as discussed in the Participant Handbook.
- "Out-of-the-box thinking" is one of the new leadership styles. It means thinking differently and from a new perspective.

Ask

- Do you consider yourself a team player?

Team Activity

Long Chain

- This is a group activity.

Do

- Divide the class into 2 teams.
- Ask each team to create a chain using materials they have in class such as shoe laces, belts, paper, handkerchief, ribbons, etc.
- The team that creates the longest chain wins the game.
- Observe if the participants are interacting with their team or working in isolation.
- Share your observations with the class.

Say

De-brief:

- What did the winning team do differently?
- Who was responsible for the winning team's success?
- How does this activity explain the role of teamwork in entrepreneurial success?

Say

- Tell the class that both the teams performed well.
- Discuss that the objective of this activity was to open communication channels and how this has been achieved.
- The participants should aim to keep the communication channels open when interacting with their peers and team members.
- It will set the pace and enthusiasm required for all the ensuing teamwork activities.
- Talk about teamwork and importance of teamwork in entrepreneurial success as discussed in the Participant Handbook.

Summarize

- Close the discussion by summarizing about the importance of teamwork for employees.
  - Teamwork helps in reducing stress for the employees.
  - Teamwork helps employers in generating more number of solutions to a problem and developing improved communication amongst employees.
- Ask the participants what they have learned from these exercises.
- Ask if they have any questions related to what they have talked about so far.

UNIT 12.5.3: Communication Skills: Listening & Speaking: The Importance of Listening Effectively

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of listening effectively
- Discuss how to listen effectively
- Discuss the importance of speaking effectively
- Discuss how to speak effectively

Resources to be Used

- Participant Handbook

Activity 1

Activity – Chinese Whisper

Step 1: Form a circle.
Step 2: Start a whisper chain. Any one participant will whisper a message into his/her neighbour's ear. No one else must hear the message. The message can be serious or downright silly.
Step 3: The next person who first heard the message should whisper the message very quickly to the person sitting next to them.
Step 4: The game goes on until the last person says whatever they heard out loud and the first person reveals the real message.
Compare them and have a great laugh!

Ask

De-brief questions:

- Was the original message the same as the message that is communicated at the end of the game?
- Why do you think there was a difference in the messages?

Say

- No, the original message was not same at the end of game.
- The barriers to communication like language, disturbance and noise, poor listening skills, boredom, poor speaking skills, etc. are the potential reasons this happens.
- There are various aspects to communication. Speaking skills and listening skills are two major components to any communication. There is always some room for improvement in the way we communicate.
- It is important to accept the reality of miscommunication and work to minimise its negative impacts.

Say

- Communication is a two-way process where people exchange information or express their thoughts and feelings
- It involves effective speaking and effective listening.
- If I go to the store to get bread, I exchange money for the bread. I give something and get something in return. Communication takes place in the same manner. You have to provide and receive information for communication to take place.

Ask

- How often do you hear these statements?
  - "You're not listening to me!"
  - "Why don't you let me finish what I'm saying?"
  - "You just don't understand!"
- What do you think the other person is trying to convey to you through these sentences?
- We will not talk about the importance of listening effectively as discussed in the Participant Handbook.

Say

- Let's play a game to understand effective listening process better.

Do

- This is a class activity.
- The participants need to answer the questions they hear.
- Instruct them to listen carefully.
- You will read it at a stretch and if need be repeat it once more.
- Tell the participants to raise their hand if they know the answer to the question asked.
- Keep a check on time.

Activity 2

Riddles:

Is there any law against a man marrying his widow's sister?
If you went to bed at eight o'clock at night and set the clock's alarm to ring at nine o'clock, how many hours of sleep would you get?
Do they have a 26th of January in England?
If you had only one match and entered a dark room that had a kerosene lamp, oil heater, and a wood stove, what would you light first?
The Delhi Daredevils and the Chennai Super Kings play five IPL matches. Each wins three matches. No match was a tie or dispute. How is this possible?
There was an airplane crash. Every single person died, but two people survived. How is this possible?
If an airplane crashes on the border of two countries, would unidentified survivors be buried in the country they were travelling to or the country they were travelling from?
A man builds an ordinary house with four sides except that each side has a southern exposure. A bear comes to the door and rings the doorbell. What is the colour of the bear?

Answers:

There's no law against a man marrying his widow's sister, but it would be the neatest trick in the book since to have a widow, the man would have to be dead.
You'd get one hour's sleep since alarm clocks do not know the difference between morning and night.
Oh, yes. They have a 26th of January in England. They also have a 27th, a 28th, and so on.
First of all, you would light the match.
Who said the Delhi Daredevils and the Chennai Super Kings were playing against each other in those games?
Every SINGLE person died, but those two were married.
You can't bury survivors under any law especially if they still have enough strength to object.
The bear that rang the doorbell would have to be a white bear. The only place you could build a house with four southern exposures is at the North Pole where every direction is in South.

Ask

De-brief question:

- What were the barriers that came into your way of listening?
- How can you overcome barriers to listening?

Say

- There is a difference between hearing and listening.
- If you don't listen properly, the message may be misunderstood.
- Be open-minded while listening to someone.
- It is important to listen effectively and carefully without making assumptions.

Activity 3

Elevator Pitch:

You are in the lift of a hotel and you bumped into your former client who is a famous businessman. He has financed a lot of small business ventures and can finance your new start-up too. After exchanging pleasantries, he asks you what your new company does. You open your mouth, and then pause. Where do you even begin?

Then, as you try to organize your thoughts, his meeting is called, and he is on his way. If you would been better prepared, you're sure that he would have stayed long enough to schedule a meeting with you too.

If you were given another chance, what would you have said to this person?

Do

- Start off the task by providing a beginning sentence to get the story started, and then go around the classroom getting each one to add a new sentence to keep the story going.
- This task should be done spontaneously allowing only a little time to think (30 seconds).
- For example: **There was once a student who was looking for a job after graduation.**

Notes for Facilitation

- Tell the participants to follow these steps to create a great pitch, but bear in mind that you'll need to vary your approach depending on what your pitch is about.

  1. **Identify Your Goal:** Start by thinking about the objective of your pitch. For instance, do you want to tell the potential clients about your organization? Do you have a great new product idea that you want to pitch to an executive or do you want a simple and engaging speech to explain what you do for a living?
  2. **Explain What You Do:** Start your pitch by describing what your organization does. Focus on the problems that you solve and how you help people. Ask yourself this question as you start writing: what do you want your audience to remember most about you? Keep in mind that your pitch should excite you first. After all, if you don't get excited about what you're saying neither will your audience. People may not remember everything that you say, but they will likely remember your enthusiasm.
  3. **Communicate Your USP:** Your elevator pitch also needs to communicate your unique selling proposition or USP. Identify what makes you, your organization or your idea unique. You'll want to communicate your USP after you've talked about what you do.
  4. **Engage with a Question:** After you communicate your USP, you need to engage your audience. To do this, prepare open-ended questions (questions that can't be answered with a "yes" or "no" answer) to involve them in the conversation. Make sure that you're able to answer any questions that he or she may have.
  5. **Put it all Together:** When you've completed each section of your pitch, put it all together. Then, read it aloud and use a stopwatch to time how long it takes. It should be no longer than 20-30 seconds. Remember, the shorter it is, the better!

Example:

Here's how your pitch could come together:

"My company deals with cloth retail online business and we use various e-commerce platforms to sell our products. This means that you can do shopping with ease and spend time on other important tasks. Unlike other similar companies, we have a strong feedback mechanism to find out exactly what people need. This means that, on average, 95 percent of our clients are happy with our products. So, how can you help us in creating our own web portal?

  6. **Practice:** Like anything else, practice makes perfect. Remember, how you say it is just as important as what you say. If you don't practice, it's likely that you'll talk too fast, sound unnatural or forget important elements of your pitch. Set a goal to practice your pitch regularly. The more you practice, the more natural your pitch will become. Practice in front of a mirror or in front of colleagues until the pitch feels natural.

Summarize

- Close the discussion by summarizing how to speak effectively as discussed in the Participant Handbook.

UNIT 12.5.4: Problem Solving & Negotiation Skills

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to solve problems
- List the important problem solving traits
- Discuss ways to assess problem solving skills
- Discuss the importance of negotiation
- Discuss how to negotiate

Resources to be Used

- Participant Handbook

Ask

- What is a 'problem'?
- What do you think are the problems you may face in the process of becoming a successful entrepreneur?

Say

- Discuss the definition of problem as given in the Participant Handbook.
- In a hurdle race the hurdles are the obstacles on the way to reach your goal.
- Similarly, obstacles are the hurdles you may face while reaching your goal i.e. to set-up your own business. Your goal will be to reach the finishing line after crossing these hurdles.

Ask

- What do you do when you face a problem?
- How do you resolve it? You can pick examples from the question asked previously 'the problems they are likely to face in the process of becoming a successful entrepreneur'.

Say

- Discuss how to solve problems as given in the Participant Handbook.

Team Activity

- This is a group activity.
- The groups will solve the problem and come up with the best solution in each case.

1. Unable to arrange for some extra finance for setting up a beauty parlour. The loan sanctioned and disbursed is not enough. You have tried all your contacts, friends and relatives. But unable to manage the extra amount. Bank will not sanction more amount as you have used up the complete sanction limit.
2. You have rented a space for your business and all arrangements are done. You will be operating from the office space rented in two days. Now the owner comes up to you and says he wants to sell the place and wants you to vacate in 15 days.
3. You have just set up your business and need extra human resource. You have tried invieing a few also tied up with an agency for getting the right candidate. But you are unable to get the right candidate. If the candidate is good, you cannot offer the salary demanded. If the candidate agrees to the salary, he/she has other demands like working hours to be reduced, leaves etc. which may not work for your set up.

Do

- Divide the class into three groups. Give one scenario to each group.
- Explain the purpose and duration of the activity.
- Ask the groups to build on the scenario and present their solution as a role play.

Say

De-brief questions:

1. What was the problem?
2. Is there any other alternative solution?
3. Is this the best solution presented?

Ask

- Try to think of some people around you who are able to solve problems very easily. Even you or your friends might be approaching them when there is a problem. What qualities do they have? What personality traits do such people possess?

Say

- Discuss the important traits for problem- solving as given in the Participant Handbook.

Ask

- In order to build a successful organization, you need to hire people who possess good problem solving skills. How would you assess the level of problem solving skills of potential candidates before hiring them?

Say

- Discuss how to assess for problem- solving skills as given in the Participant Handbook.

Summarize

- Ask the participants the things that they have learnt so far.
- Ask if they have any questions related to what they have talked about so far.
- Summarize the discussion on problem solving.

Activity

- The activity is to organise an election event. Select three volunteers from the group. They have to give a speech on their election manifesto to the class. They have to negotiate with the fellow participants and convince them to vote for them. The best negotiator will win the election.

Do

- Ask three participants to volunteer for the activity.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Ask

- Out of the three contestants, whom would you support? Why? What did they say or do which convinced you to make your decision?
- Have you ever tried to negotiate in your personal or professional life?
- Ask the class to share some of their experiences where they have been able to strike a deal by negotiating.

Say

- Discuss "What is Negotiation?" as given in the Participant Handbook.

Ask

- Why is it important to negotiate? As an entrepreneur, where do you think that negotiation skills will be needed?

Say

- Discuss the importance of negotiation while starting a business as given in the Participant Handbook.

Say

- Discuss the important steps to negotiate as given in the Participant Handbook.

Role Play

- Conduct a role play activity.
- Ask the participants to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Do

- Divide them into groups of four (4) (depending on the batch size).
- Give them the hand-outs for role play scenarios.
- Two groups to be given scenarios on problem solving.
- Other two groups to be given scenarios on negotiation.
- The groups will build on the scenarios and prepare for the role play.
- Give the groups atleast 5 mins to discuss and be ready with the role play.
- Invite each group one by one to come and present their role play.

Problem solving Scenario 1

Avinash has a Mobile Repair Store in Allahabad. His outlet is one of the most popular one in the vicinity and he has great rapport with his customers. He is always well-dressed, jovial and full of energy.

It's around 11 AM, when a customer barges in to the shop and starts shouting at Avinash for giving her back the instrument which is still not working. The screen of her mobile is also cracked from one side. Avinash remembered thoroughly checking the handset before handing it over to the customer. The customer threatens to sue the company and to go to Consumer Court for cheating her.

Problem solving Scenario 2

You are running a successful small scale business, Shreeji Aggarbattis,. Your staff members do door to door selling and organise marketing campaigns in local markets. Your brand has established it's name in last few years.

Recently, lot of customers have been coming to you and lodging complaints that your staff members indulge in malpractices. Few of them informed you that a staff member engaged them in a friendly conversation. In the meanwhile, the other gave them lesser packets of aggarbattis than they paid for.

Another set of customers lodged complaint about the misconduct and rude behaviour of a particular staff member.

You often hear from your customers that the orders don't get delivered on time or wrong products get delivered.

You have already been struggling with shortage of staff and such complaints are a serious concern as it is hampering your brand image. What strategies will you adopt to solve this problem?

Negotiation Scenario 1

You have interviewed a prospective new employee who could be a key member of your new entrepreneurial venture. The new person is demanding a salary that is 20% higher than you thought based on your business plan. Finances are tight, yet you believe this person could make a significant impact on future profits. If you paid the required salary for the new person, then you would have to restructure your entire business plan. You've been searching for an individual with this skill level for three months. to the candidate is waiting for your response. Now you have to call him in to make the final negotiations.

Negotiation Scenario 2

You are a young entrepreneur who has just registered his start up project and applied for a bank loan accordingly. You receive a letter saying that your loan application has been rejected as your start up idea did not appeal to the bank and they think that it is not a revenue generating model. You have taken an appointment to meet the manager and show your negotiation skills to get your loan approved.

Notes for Facilitation

Facilitating Role Plays

Preparing for the activity

1. Carefully review the details of the scenario and the character descriptions.
2. Become familiar with the key issues being addressed in the scenario.
3. Study the provided material so that you are ready to address issues related to the situations depicted in the role-plays.
4. Anticipate and know how to address issues participants might raise during the activity.

Conducting the activity

1. Introduce the activity. Emphasize that role-playing provides participants with an opportunity to apply their new knowledge, skills, and tools in situations that simulate actual interactions with customers.
2. Ask participants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each participant should be given the opportunity to play/practice the different roles.
3. Conduct a demonstration so that participants become familiar with the expectations related to the roles and support materials.
4. Give the pairs/ groups 10 to 15 minutes to conduct the role-play (depending on the duration of the session).
5. After all the groups have finished with the role-play, conduct a debriefing session on each role-play.
6. Ask the groups to take five minutes to talk about what happened during the role-play. The groups should discuss the questions given in the debriefing for each role-play. Encourage participants to provide constructive criticism during their discussions.

Summarize

- Wrap the unit up after summarizing the key points and answering questions.

UNIT 12.5.5: Business Opportunity Identification: Entrepreneurs and Opportunities

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to identify new business opportunities
- Discuss how to identify business opportunities within their business

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Ask

- How does an entrepreneur identify an opportunity?
- What do you think are the common queries or concerns faced by entrepreneurs?
- How can you identify new business opportunity?

Say

- Let's talk about opportunity, common queries or concerns faced by entrepreneurs, idea as an opportunity, factors to consider when looking for opportunities, ways to identify new business, and opportunity analysis as discussed in Participant Handbook.
- Let's do an activity to understand ways to identify business opportunities within your business.

Do

- Tell the class that this is an individual activity.
- Tell the participants to create a matrix on their notebooks.
- There will be four boxes in your matrix.
- Strength, Weakness, Opportunity and Threats will be the four headings of the matrix. This is called the SWOT matrix.
- Read out the questions to them and tell the participants they need to answer the questions asked in each matrix.
- Tell them they can also use their own understanding of themselves to fill the SWOT matrix.

Activity

Do your SWOT analysis

Strength What are your strengths? What unique capabilities do you possess? What do you do better than others? What do others perceive as your strengths?	**Weakness** What are your weaknesses? What do your competitors do better than you?
Opportunity What trends may positively impact you? What opportunities are available to you?	**Threat** Do you have solid financial support? What trends may negatively impact you?

Do

- Congratulate everyone for the class activity.
- Ask the audience to applaud for themselves.
- Allot the participants sufficient time to complete this activity, but do keep a check on time.
- Ask de-brief questions to cull out information from the participants.

Ask

De-brief questions:

- What are your weaknesses according to your SWOT analysis?
- Do you think you can change your weakness into strength? How?
- Do you think you can work on your threats? How?

Summarize

- Close the discussion by summarizing ways to identify business opportunities within your business.
- Ask the participants what they have learned from this exercise.
- Ask if they have any questions related to what they have talked about so far.

UNIT 12.5.6: Entrepreneurship Support Eco-System

Unit Objectives

At the end of this unit, participants will be able to:

- Explain the meaning of entrepreneur
- Describe the different types of entrepreneurs
- List the characteristics of entrepreneurs
- Recall entrepreneur success stories
- Discuss the entrepreneurial process
- Describe the entrepreneurship ecosystem
- Discuss the purpose of the 'Make in India' campaign
- Discuss the key schemes to promote entrepreneurs

Resources to be Used

- Participant Handbook
- Chart papers
- Marker pens
- Pencils
- Colour pencils
- Scale
- Eraser
- Other requisite stationery material

Ask

- Do you think that entrepreneurs need support?
- What do you think is an eco-system?
- What do you think 'entrepreneurship support eco-system' means?

Say

- Let's learn what entrepreneurship support eco-system means.
- Discuss 'Entrepreneurship Support Eco-System' as given in the Participant Handbook.

Ask

- Can you define entrepreneurship support eco-system?
- What are the key domains of the support eco-system?

Say

- Let's learn more about these domains by conducting an activity.
- You have to make a poster showing the components of the six main domains of entrepreneurship support eco-system.

Team Activity

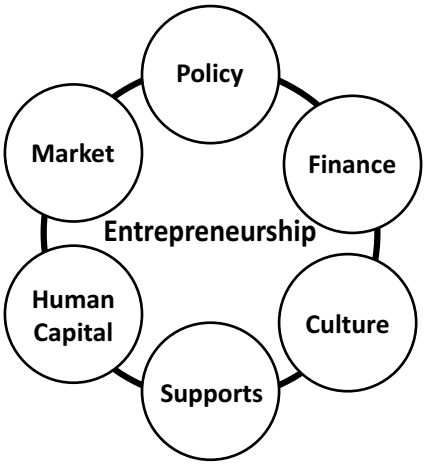
- Making a poster showing the entrepreneurship support eco-system.

Do

- Divide the class into groups of four or six.
- Hand out chart paper and coloured pens.
- Explain the purpose and duration of the activity.
- Go around checking the progress of each group.
- Set guidelines pertaining to discipline and expected tasks.

Activity De-brief

Ask each group to display their poster and explain the key domains of entrepreneurship support eco-system.



Ask

- What kind of government support eco-system is available for entrepreneurs in India?

Say

- Discuss 'Make in India' campaign as given in the Participant Handbook.

Team Activity

- Presentation on key schemes to promote entrepreneurs

Do

- Divide the class into pairs.
- Number each pair from 1-15.
- Assign a scheme, same as their group number, to each group.
- Ask them to read the scheme carefully and present it to the class.
- Explain the purpose and duration of the activity.
- Go around checking the progress of each group.
- Set guidelines pertaining to discipline and expected tasks.

Activity De-brief

- Ask each group to explain the scheme offered by government to promote entrepreneurs.

Summarize

- Summarize the unit by discussing the key points and answering questions the participants may have.

UNIT 12.5.7: Risk Appetite & Resilience

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the relationship between entrepreneurship and risk appetite
- Discuss the relationship between entrepreneurship and resilience
- Describe the characteristics of a resilient entrepreneur

Resources to be Used

- Participant Handbook
- Chart papers
- Blank sheets of paper
- Pens
- Marker pens

Ask

- Can you define risk or explain what constitutes a risk?
- What do you people mean when they say, "This may be a risky proposition"?
- What risks are they talking about?

Example

- Let's have a look at these two examples:

Rohit and his family were travelling by car from Delhi to Nainital. It was their second trip there. Rohit was familiar with the road. His friends told him that the highway after Rampur was in a bad condition. They advised him to take a shortcut and turn left from Moradabad and take the Kaladhungi road. This road is in a better condition.

Since he was going with his family, and did want take the risk of getting lost, he left early. He took the Kaladhungi road and reached Nainital well in time.

Suresh and his family too were travelling by car from Delhi to Nainital. It was their second trip there. His friends too advised him to take a shortcut and turn left from Moradabad and take the Kaladhungi road as this road was in a better condition.

Suresh too decided to take the Kaladhungi road but he left Delhi in the afternoon. It was dark by the time he reached Kaladhungi, and he was sure that he was taking the correct turn. As it was late, he could not find anyone to give him directions. He ended up being in an unknown place that was scarcely inhabited.

Say

- Let's see what type of risks Rohit and Suresh took.
- Discuss 'Risk Appetite and Resilience' with the participants as given in the Participant Handbook.

Say

- Let's learn more about risk appetite and resilience with the help of an activity.

Team Activity

Risk Appetite

- This is a group activity.

- In the previous unit, you read success stories of Mr Dhirubhai Ambani and Dr Karsanbhai Patel.
- Mr Ambani left his job and started his company Reliance with just Rs. 50,000/-.
- Dr Patel kept his job, went door-to-door to sell Nirma, and only when the brand started gaining popularity did he start his own company.
- What types of risk did both of them take?
- What risk factors, do you think, did they keep in mind before launching their company?
- Write the Risk Appetite Statement of both the companies.

Activity De-brief

- Who took a greater risk?
- What are the differences between the Risk Appetite Statement of both the companies?

Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper.
- Tell the participants that they have to evaluate the risks taken by Mr Dhirubhai Ambani and Dr Karsanbhai Patel.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Ask

- Do you think all entrepreneurial ventures are successful?
- What happens if the first venture is not successful?
- Should the entrepreneur stop when faced with challenges or face them?

Example

- Let's have a look at the following example:

Vijay Shekhar Sharma is the founder of Paytm, which is a giant Indian e-commerce. He was born in a middle-class family in Uttar Pradesh. He started his first job at an MNC. He quit after six months and built a company One97 with his friends. As One97 grew bigger, it needed more money because it was running more servers, bigger teams, and had to pay royalty. At that time, the tech bubble popped and technology companies were running in losses. Finally, money ran out. So One97 took loans and then more loans at higher rates of interest, as high as 24 per cent, and became caught in a vicious cycle.

In 2014, Paytm was launched with online wallet services after which, the company enabled online payment transactions. The company got licenses from RBI in 2016 to launch India's first ever payment bank. Moreover, the main motive of Paytm was to transform India into a cashless economy.

After demonetization came into effect, Vijay Shekhar Sharma started promoting online and digital transactions to deal with the cash crunch. In fact, the service of the company's mobile wallet is accepted across India. The logo of Paytm is now popular almost everywhere from tea stalls to major companies.

Say

- Let's see what qualities made Vijay Shekhar Sharma a resilient entrepreneur.
- Discuss Entrepreneurship and Resilience with the participants as given in the Participant Handbook.

Say

- Let's learn more about entrepreneurship and resilience with the help of an activity.

Team Activity

Entrepreneurship and Resilience

- This is a group activity.

- Think of some entrepreneurship ventures that faced challenging times, but later resulted in success stories.
- Who is the founder of that company?
- What challenging times did it face?
- How did it overcome those challenges?
- List the resilient characteristics of the entrepreneur.

Activity De-brief

- Each group to give their presentation.
- Why did you choose this company?
- What is the success story of the company?

Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper.
- Tell the participants that they have to think of an entrepreneur who faced challenging times, but eventually succeeded.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Summarize

- You can summarize the key points of the unit.
- Ask the participants what they learned from the activities.
- Clarify any questions or doubts they might have.

UNIT 12.5.8: Success and Failures

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to deal with failure

Resources to be Used

- Participant Handbook

Ask

- Have you heard the quote 'nothing is impossible'?
- What do you think it means?
- Do you think that all successful entrepreneurs became famous overnight or did they have to struggle or face failure before succeeding?

Example

- Let's have a look at this example.

Shah Rukh Khan, also known as, SRK or King Khan is a force to reckon with. Did he achieve stardom overnight? Shah Rukh Khan, who has seen many struggles in his life – he has slept on streets, struggled to support himself and his sister at a very young age, and lost his parents very early in life, which led to his sister seeking mental health support. Amidst all the chaos and challenges, he kept pushing himself, and today he stands tall as the 'Badshah of Bollywood'. Certainly those years were not easy for him.

When he was young, he stood at Marine Drive and said, “I will rule this city one day”. Failure was not just his companion during or before his stardom, it is still a substantial part of his life. Success does not come easy. What made him a star was his acceptance of failure and the urge to improve.

Say

- How do you define success and failure?
- What is fear?
- Discuss “success and failure” with the participants as given in the Participant Handbook.

Ask

- Have you felt or experienced fear?
- What led you to feel that emotion?
- How did you handle it?

Say

- Let's learn the about success and failure with the help of an activity.

Team Activity

- Divide the class into groups of four.
- Instruct them to think of one scenario where they have to interview a successful entrepreneur.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- They have to choose one person from the group as the interviewee and one as the interviewer.
- Go around and make sure they have understood what is to be done and are discussing the roles properly.
- Check that everyone understands their role. Give clarifications if needed. Give the participants about 5 minutes to discuss and decide their roles.
- Ask the groups to stop the discussion as soon as the time is over.
- Invite each group one by one to come and present their interview as a role play.

Notes for Facilitation

Facilitating Role Plays

Preparing for the activity

1. Carefully review the details of the scenario and the character descriptions.
2. Become familiar with the key issues being addressed in the scenario.
3. Study the provided material so that you are ready to address issues related to the situations depicted in the role plays.
4. Anticipate potential questions that might be raised by the participants and be ready to address them.

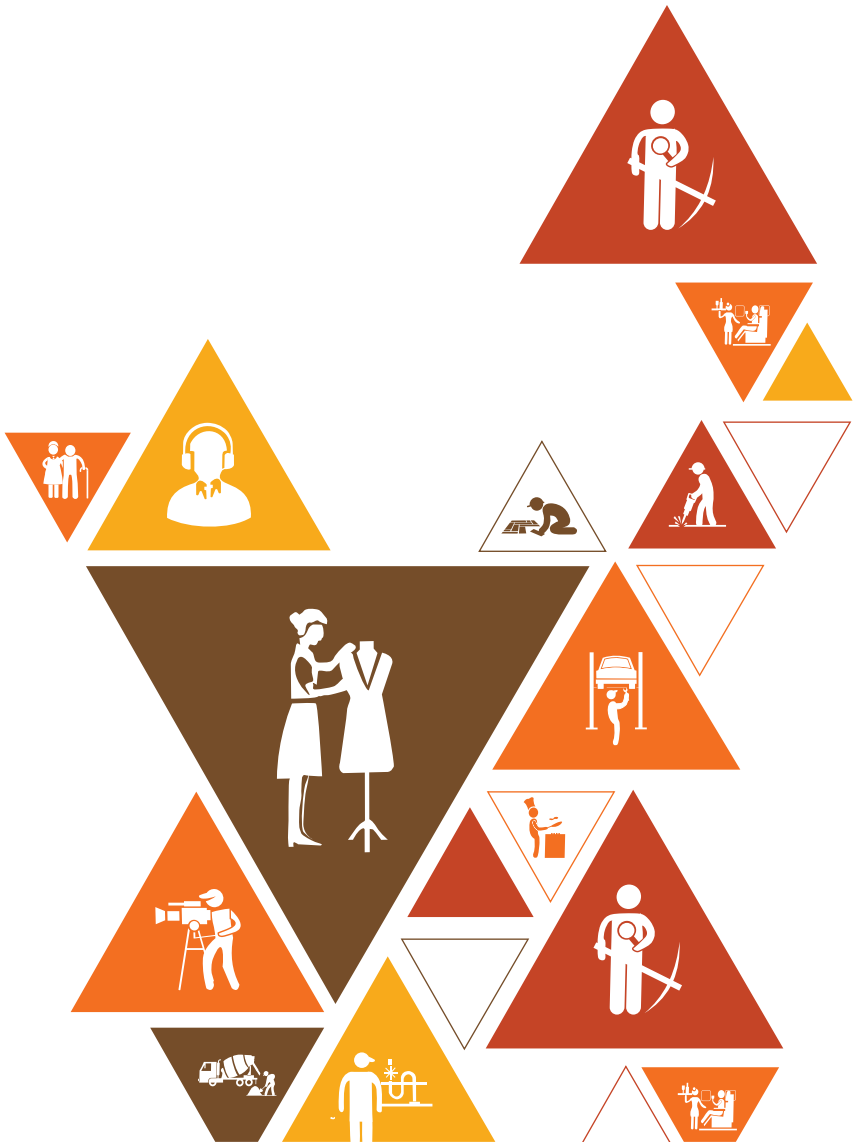
Conducting the activity

1. Introduce the activity. Emphasize that role playing provides participants with an opportunity to apply their new knowledge, skills, and tools in situations that simulate actual interactions with customers.
2. Ask participants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each participant should be given the opportunity to play/practice the different roles.
3. Conduct a demonstration so that participants become familiar with the expectations related to the roles and support materials.
4. To maintain spontaneity of the interactions during the role play, ask the participants not to discuss the details of their roles prior to the role play.
5. Give the pairs 15-20 minutes to conduct the role play.
6. Circulate among the groups to answer any questions that may arise and provide guidance as needed.
7. After all the pairs have finished with the role play, conduct a de-briefing session on each role play.
8. Ask the groups to take five minutes to talk about what happened during the role play. The groups should discuss the questions given in the de-briefing for each role play. Encourage participants to provide constructive criticism during their discussions.
9. Conclude the activity by asking participants to think about whether and how they might use scripted role plays in their real life.

Summarize

- Wrap the unit up after summarizing the key points and answering questions.

Notes



UNIT 12.6: Preparing to be an Entrepreneur

Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Discuss how market research is carried out
2. Describe the 4 Ps of marketing
3. Discuss the importance of idea generation
4. Recall basic business terminology
5. Discuss the need for CRM
6. Discuss the benefits of CRM
7. Discuss the need for networking
8. Discuss the benefits of networking
9. Discuss the importance of setting goals
10. Differentiate between short-term, medium-term and long-term goals
11. Discuss how to write a business plan
12. Explain the financial planning process
13. Discuss ways to manage your risk
14. Describe the procedure and formalities for applying for bank finance
15. Discuss how to manage their own enterprise
16. List the important questions that every entrepreneur should ask before starting an enterprise

UNIT 12.6.1: Market Study/ The 4Ps of Marketing/ Importance of an IDEA: Understanding Market Research

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how market research is carried out
- Describe the 4 Ps of marketing
- Discuss the importance of idea generation

Resources to be Used

- Participant Handbook
- Chart papers
- Markers pens
- Blank sheets of paper

Ask

- Suppose, you want to open a restaurant, what are the factors you will consider?
- How will you promote your restaurant?

Example

- Let's have a look at this example.

  Arjun was an MBA working in a company. But he wanted to start a low cost budget hostel for foreign tourists coming to India. He did a lot or market research before starting the project. Based on the information he gathered, he made his business plan. His hostel is now flourishing and he is thinking of expanding to other tourist destinations.

Say

- Discuss "Market Study" with the participants. Refer to the Participant Handbook.
- Let's learn about market study and research with the help of an activity.

Team Activity

Market Study

- This is a group activity.
- You want to start your own tuition centre.
- What type of research will you do?

Activity De-brief

- Ask each group to come forward and give a brief presentation.
- Encourage other groups to be interactive and ask questions.
- What factors did you keep in mind while doing your research?
- Based on our research would you go ahead and open a tuition centre?

Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6.
- Give each group a chart paper.
- Tell the participants that they have to start their own tuition centre.
- Give the participants 10 minutes to discuss and write the research work they need to do.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Say

- By opening a tuition centre you are offering a service.

Ask

- What factors will you keep in mind before opening it?

Say

- Discuss "The 4Ps of Marketing" with the participants as given in the Participant Handbook.

Say

- Let's learn about the 4Ps of Marketing with the help of an activity.

Team Activity

4 Ps of Marketing

- This is a group activity.
- You have to sell a pen to four different segments:
  1. Rural villagers
  2. Rural middle class
  3. Urban middle class
  4. Upper end rich people (Niche market)

Keeping the 4Ps of Marketing in mind, what marketing strategy will you design to sell the pen?

Activity De-brief

- Ask each group to to present their strategy.
- Encourage other groups to be interactive and ask questions.

Do

- Instruct the participants that this is group work.
- Divide the class into four groups.
- Give each group a chart paper.
- Assign each group a target audience for selling the pens:
  1. Rural villagers
  2. Rural middle class
  3. Urban middle class

4. Upper end rich people

- Tell the participants that they have to design a marketing strategy keeping the 4Ps of Marketing in mind.
- Give the participants 20 minutes to discuss and come up with their strategy.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit

Activity De-brief

- Ask each group to come forward and give a brief presentation.
- Ask each group what they kept in mind while designing their marketing strategy.
- Encourage other groups to be interactive and ask questions.

Say

- Each entrepreneur has an idea of wants he wants to sell. It may be a service or a product.
- Discuss "Importance of an IDEA" as given in the Participant Handbook.

Summarize

- Summarize the key points of the unit.
- Ask the participants what they learnt from the activities.
- Encourage them to ask if they have any doubts.

UNIT 12.6.2: Business Entity Concepts

Unit Objectives

At the end of this unit, participants will be able to:

- Recall basic business terminology

Resources to be Used

- Participant Handbook

Say

- Let's recall some basic business terminology.
- Discuss the Business Entity Concepts as given in the Participant Handbook.
- Let's learn some basic business terminology by having an activity.
- We will have a quiz today.

Activity

- The activity is a quiz.

Do

- Divide the class in two groups and give a name to each group.
- Explain the rules of the quiz. For each correct answer the group gets 1 mark.
- If the group is unable to answer the question is passed to the next group.
- Explain the purpose and duration of the activity.
- Ask the questions of the quiz.
- Keep a score of the groups.
- Set guidelines pertaining to discipline and expected tasks.

Summarize

- Summarize the unit by discussing the key points.

Notes for Facilitation

QUESTIONS FOR THE QUIZ

1. What does B2B mean?

   Business to business

2. What is a financial report?

   A comprehensive account of a business' transactions and expenses

3. Who is a sales prospect?

   A potential customer

4. How is working capital calculated?

   Current assets minus current liabilities

5. What is an estimation of the overall worth of a business called?

   Valuation

6. You are buying a house. What type of transaction is it?

   Complex transaction

7. How will you calculate the net income?

   Revenue minus expenses

8. How is Return on Investment expressed?

   As percentage

9. How will you calculate the cost of goods sold?

   Cost of materials minus cost of outputs

10. What is revenue?

    Total amount of income before expenses are subtracted.

11. What is a Break-Even Point?

    This is the point at which the company will not make a profit or a loss. The total cost and total revenues are equal.

12. What is the formula used to calculate simple interest?

    *A = P(1 + rt); R = r * 100*

13. What are the three types of business transactions?

    Simple, Complex and Ongoing Transactions

14. The degrading value of an asset over time is known as .

    Depreciation

15. What are the two main types of capital?

    Debt and Equity

UNIT 12.6.3: CRM & Networking

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the need for CRM
- Discuss the benefits of CRM
- Discuss the need for networking
- Discuss the benefits of networking

Resources to be Used

- Participant Handbook

Ask

- Can your business run without customers/buyers?
- Who is the most important entity in any business?

Say

- The key to every success business lies on understanding the customer's expectations and providing excellent customer service.
- Discuss about CRM and its benefits. Refer to the Participant Handbook.
- Providing excellent customer service entails:
  - Treating your customers with respect.
  - Be available as per their need/ schedule.
  - Handling complaints effectively.
  - Building long lasting relationships.
  - Collecting regular feedback.
- Handle customer complaints proactively. Ask “what happened”, “why it happened”, “how can it be avoided next time”, etc.
- Collecting feedback from the customers regularly will enable you to improve your good/service.
- “Let's understand it better with the help of some case scenarios. You will be given some cases within your groups. You have to analyse the case scenario that has been given to you and then find an appropriate solution to the problem.”

Do

- Divide the class into four groups of maximum six participants depending on the batch size.
- Give one case study to each group.
- Instruct them to read the case carefully.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem.
- Put down the discussion points (de-brief questions) on the board. Give the class 5-10 minutes to discuss the case and note down their solutions.
- At the end of 10 minutes, the team should present their case solution to the class.

Team Activity

Case Study Analysis

Raju runs a business of wooden furniture. He has a huge list of customers on Facebook and WhatsApp who give him orders regularly. Ankita is one of his old and regular customers. She placed an order for a new chester and TV cabinet via WhatsApp and requested Raju to send them as soon as possible. When the parcel reached Ankita through courier she found that chester was broken and the TV unit was chipped from the bottom. Ankita was heartbroken. It was a complete waste of money. She sent a message to Raju on WhatsApp, expressing her anger and disappointment. Raju might lose an old customer forever if he doesn't satisfy the customer. What should Raju do to retain his customer?

Scenario 2

Rajni runs a boutique shop. She sells suits and sarees. She is one of the most successful designer in her city. Rajni swears that all the clothes in her boutique have unique designs. Smita has to attend her cousin's wedding; she goes to Rajni's boutique to buy a saree. Smita wanted a unique designer saree. Rajni customized a saree for her and sent it over the courier. When Smita had a look at the saree she realised her two friends had the same design sarees. She sent a message to Rajni on WhatsApp, expressing her anger and disappointment. Did Rajni make a false promise? Were her designs copied? What could happen to Rajni's image after this incident? What would you do if you were in Rajni's place?

Scenario 3

Shama is a beautician who offers parlour services to ladies by making home visits. Recently, Shama got her name registered on an e- commerce website. Two days earlier, she got a message from Mrs Sushma. The appointment was fixed for next day, 11:00 am and the remuneration for the services was decided beforehand. When Shama reached there at 10:50 am, Mrs Sushma was not at home. When Shama called her, she asked her to wait for a while. Mrs Sushma reached home at 11:45 am. Meanwhile, Shama had to reschedule her next appointment. After availing Shama's services, Mrs Sushma refused to pay the requisite amount and started finding faults in the services provided by her. Who was at fault in this scenario? What should you do in case the customer behaves unreasonably? What would you do if you were in Shama's place?

Scenario 4

Shailender is the manager of a car showroom. He proactively takes part in all the transactions that happen in his showroom. Vinita wants to buy a new car. She has chosen a car from Shailender's showroom. The salesperson has given her a very good discount and has also promised free service for one year. Vinita goes to the showroom and asks to complete all the formalities to purchase the car. When she sees the final bill she realize that she has not received the promised discount neither was there any mention of the free services. She immediately demands to see the Shailender. When Shailender's head asks how much discount Vinita was promised, he realised the discount will make the sale in loss. The car showroom owner might lose a customer and deal due to false commitments made by his manager. Besides, the customer might tell this to other people, creating a bad name and image for the showroom. If you owned that showroom, how would you have convinced your customer?

Say

- Now, let's discuss the problem and solution with the class.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Present the solution as a role play.
- Post presentation, the other groups may ask questions from the group that has presented.

Do

- Congratulate each group for the presentation/ role play.
- Ask the audience to applaud for them.
- Keep a check on time. Tell the group to wind up the discussion quickly if they go beyond the given time limit.

Say

- If your customers are happy with you they will give referrals which will help to grow your business.
- One more way of growing business is 'Networking'.
- Discuss Networking and its benefits. Refer to the Participant Handbook.

Activity

Group Discussion

- Conduct a group discussion in the class on how they can do networking for their business.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of CRM and Networking for entrepreneurs.
- Close the discussion by summarizing the importance of CRM and Networking for entrepreneurs.

UNIT 12.6.4: Business Plan: Why Set Goals?

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of setting goals
- Differentiate between short-term, medium-term and long-term goals
- Discuss how to write a business plan
- Explain the financial planning process
- Discuss ways to manage your risk

Resources to be Used

- Participant Handbook
- Chart papers
- Blank papers
- Marker pens
- Ruler

Ask

- Remember we had written SMART Goals in a previous session? Let's try and recall why it is important to set goals?
- While framing SMART goals, we talked about 'T' in SMART, which was 'Time Bound'? What do we mean by time bound goals?
- What time limit did you set for your goal- 3 weeks, 3 years, 10 years?

Say

- Talk about short term, long term and medium term goals, as discussed in the Participant Handbook.

Ask

- As you are planning to become an entrepreneur, you must have thought of an idea for a start-up. What is your business idea?

Do

- Ask few participants to share their business ideas.

Ask

- Have you created a business plan for your business idea?
- Do you think it is important to have a business plan in place? Why/ why not?

Say

- Talk about 'Why Create a Business Plan' as discussed in the Participant Handbook.
- Let's understand it better with the help of an activity.

Team Activity

Writing a business Plan

- This is a group activity.
- Give the groups the required resources such as chart paper and markers.
- This activity is divided into two parts:
  1. Create a business idea
  2. Develop a business plan
- The group will discuss and come up with a new business idea and present their idea to the class.
- In the second part of the activity the group will develop a business plan for the business idea.
- The business plan prepared will be presented by the groups to the class.

MY BUSINESS PLAN
Executive Summary: What is your Mission Statement?
Business Description: What is the nature of your business?
Market Analysis: What is your target market?
Organization and Management: What is your company's organizational structure?
Service or Product Line: What is the lifecycle of your product/ service?
Marketing and Sales: How will you advertise and sell your products?
Funding Request: How much fund is required and from where?

Say

- Teams will need to brainstorm for this part of the activity.
- Use the blank papers for the second part of this activity
- Make your business plan on a chart paper based on the following parameters:
  1. Executive Summary
  2. Business Description
  3. Market Analysis
  4. Organization and Management
  5. Service or Product Line
  6. Marketing and Sales
- Explain each parameter in detail as done in the Participant Handbook.
- Discuss each parameter with the business idea examples of the groups.
- Groups will discuss and develop the business plan for their business idea.

Say

- Now, let's share our plan with the class.
- Each group will briefly describe the plan to the class.
- Post presentation, the other groups may ask questions to the group who have presented their plan.

Do

- Congratulate each group for sharing their points.
- Ask the audience to applaud for them.
- Keep a check on time. Tell group to wind up the discussion quickly if they go beyond the given time limit.

Say

- Along with a business plan, you need to create a financial plan and evaluate the risk involved with your start up.
- Discuss 'Financial Planning' and 'Risk Management' in detail as given in the Participant Handbook.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Keep the business plan format ready in a flipchart to display it during the activity.

UNIT 13.6.5: Procedures and Formalities for Bank Finance

Unit Objectives

At the end of this unit, participants will be able to:

- Describe the procedure and formalities for applying for bank finance

Resources to be Used

- Participant Handbook
- Bank loan/finance form sample

Ask

- While preparing a business plan in the last session, we discussed financial planning to arrange financial resources for your start-up. Therefore, how will you collect funds to start your business?

Say

- While most entrepreneurs think 'product' is the most difficult thing to decide for a business, start-up capital poses an even a bigger obstacle. Though there are various ways of funding the business, to convince investors to invest money is the most challenging.
- Some of the funding options available in India are:
  - **Bootstrapping**: Also called self-financing is the easiest way of financing
  - **Crowd funding**: Funds are collected by consumers pre-ordering or donating for starting the business.
  - **Angel investors**: Individual or group of investors investing in the company
  - **Venture capitalists**: Venture capitals are professionally managed funds who invest in companies that have huge potential. They usually invest in a business against equity.
  - **Bank loans**: The most popular method in India.
  - **Microfinance Providers or NBFCs**
  - **Government programmes**
- Let us know discuss the most popular method i.e. bank finance in detail here.

Do

- Discuss the list of documents that are required to apply for a loan like letter of introduction, business brochure, references of other banks, and financial statements.
- Explain the details to be filled in a loan application form.
- Divide the class into groups. Give each group a loan application form.
- Ask the groups to discuss and fill the form.

Summarize

- Close the discussion by summarizing the important documents needed for bank loan.
- Ask the participants if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Checklist of documents is provided as resources for the session.
- You can make some copies and distribute it during the group activity.
- Download sample loan application forms from any nationalised bank's website. Print sufficient copies to circulate it amongst the groups.

CHECKLIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH LOAN APPLICATION (Common for all banks)
1. Audited financial statements of the business concern for the last three years
2. Provisional financial statements for the half – year ended on _____
3. Audited financial statements of associate concern/s for the last three years
4. Copy of QIS II for the previous quarter ended on _____
5. Operational details in Annexure I
6. CMA data for the last three years, estimates for current year and projection for the next year
7. Term loan/DPG requirements in Annexure II
8. List of machinery in respect of machinery offered as security in Annexure III
9. Additional details for export advances furnished in Annexure IV
10. Property statements of all directors/partners/proprietor/guarantors
11. Copies of ITAO of the company for the last three years
12. Copies of ITAOs/WTAOs of the directors/partners/proprietor and guarantors
12. Copies of certificate from banks and financial institutions certifying the latest liability with them
14. Copy of board resolution authorizing the company to apply to your bank for the credit facilities mentioned in application
15. Copy of memorandum and article of association (in case of limited company)/partnership deed (in case of partnership firm)
16. Cash budget for the current year and next year in case of contractors and seasonal industries

UNIT 13.6.6: Enterprise Management – An Overview: How to Manage Your Enterprise?

Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to manage their own enterprise

Resources to be Used

- Participant Handbook

Ask

- Having set-up a business, do you think it is possible to do everything on your own?
- Does one require trained persons for help?
- What does management mean?

Say

- Let's have a look at this example:

  Kapil had a small business that was beginning to pick up pace. He wanted to expand his business, and therefore employed few more people. One day, as he was walking past Ramesh, one of his new employees, he overheard Ramesh talking rudely to a customer on the phone. This set him thinking. Kapil realised that he should have regular team meetings to motivate his employees and speak with them about any problems they might be facing during work. He should also conduct training sessions on new practices, soft skills, and technology, and develop work ethics manual for managing his enterprise.

Say

- Was Kapil correct in his approach or he should have scolded Ramesh instantly in front of his other employees?
- Discuss "Enterprise Management – An Overview" with the participants as given in the Participant Handbook.

Say

- Let's learn how to effectively manage an enterprise or business through an activity.

Team Activity

Enterprise Management

- This is a group activity.
- Design a matrix listing the topics and key words that are needed to run an enterprise effectively and smoothly.

Activity De-brief

- Have each group present their matrix.
- Encourage participants of the other groups to ask question about each other's presentation.

Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper and coloured pen.
- Tell the participants that they have make a matrix they need to fill.
- They have to write the main topics and key words that will them effectively manage their enterprise.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Summarize

- Ask the participants what they have learned from this exercise/activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of effective management to run an enterprise as given in the Participant Handbook.

UNIT 13.6.7: 20 Questions to Ask Yourself before Considering Entrepreneurship

Unit Objectives

At the end of this unit, participants will be able to:

- List the important questions that every entrepreneur should ask before starting an enterprise

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Ask

- Why do you want to become an entrepreneur?

Say

- It is very important to know why you want to become an entrepreneur. Your personal goals for becoming an entrepreneur play a key role in the success of your business. Your goals should be clear well before you start your business.
- Apart from the goals, the other aspects of business that you need to bear in mind are the potential problems that you may face to set-up, your areas of interest, and all the other dimensions of the business.
- Let's understand it better with the help of some questions that every entrepreneur should ask before starting their own business.
- Open the Participant Handbook section named '20 Questions to Ask Yourself Before Considering Entrepreneurship'. You have to answer the questions individually.
- Then, we will have a class discussion on all the questions.

Do

- Read out the questions one by one in front of all the participants.
- Participants have to answer all the one by one questions.
- Give the class 10-15 minutes to note down their answers.
- At the end of 15 minutes, open the discussion for all the questions.
- Moderate the discussion by focusing on the relevant points.
- Keep a check on time and don't let the discussion get sabotaged or lose track of time. Ensure all the questions are covered and discussed.

Summarize

- Ask the participants what they have learned from this exercise/activity.
- Ask if they have any questions related to what they have talked about so far.

Notes

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

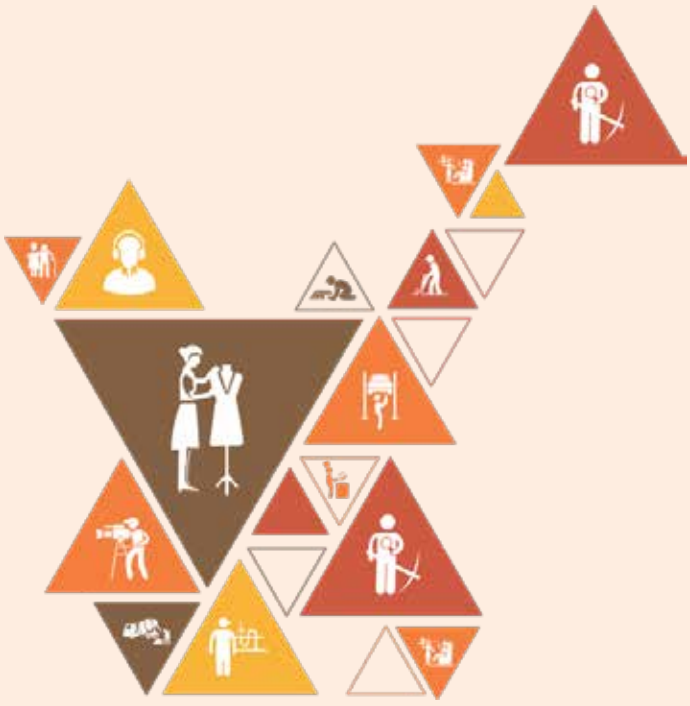
N·S·D·C
National Skill Development Corporation
Transforming the skill landscape

INDIAN IRON & STEEL SECTOR SKILL COUNCIL

13. Annexures

Annexure I: Training Delivery Plan

Annexure II: Assessment Criteria



Annexure I
Training Delivery Plan

Training Delivery Plan			
Program Name:	Certificate Course in Bearing Maintenance		
Qualification Pack Name & Ref. ID	Bearing Maintenance - ISC/Q0906		
Version No.	1.0	**Version Update Date**	30-12-2015
Pre-requisites to Training (if any)	Minimum qualification – 10th Pass		
Training Outcomes	**By the end of this program, the participants will be able to:** 1. Understand the assigned job of bearing maintenance 2. Prepare for bearing maintenance operation 3. Carry out the assigned bearing maintenance operation 4. Use basic health and safety practices at the work place 5. Works effectively with others		

Sl. No	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/ Aids	Duration
1	Over view of Iron & Steel Industry	Icebreaker	• Introduce each other • Build rapport with fellow students and the facilitator		Group Activity: Passing the Parcel	Available objects such as a book, pen, duster etc.	0.5 hours
2	Over view of Iron & Steel Industry	Overview of steel industry and steel industries in India	• Understanding Iron & steel industry • Understanding types of Iron & Steel Industry • Understanding products of Iron & Steel industry • Activities in Iron & Steel Industry	NA	Facilitator-led-discussion Videos	PPTs of Iron and steel manufacturing, Charts showing the same	3.5 hrs

3	Occupational, Health and Safety (OHAS)	Hazards at the site, control measures, PPE, safe working at heights and confined spaces, safe working practices	• Understanding the Occupational health & Safety • Understand What is hazard • Working at Heights, confined spaces	ISC/N0008 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC12, PC13 KB3, KB4, KB5, KB6, KB7, KB8, KB9, KB10, KB11, KB12, KB13	• Facilitator-led-discussion • Skill Practice (Activity)	PPTs for OHAS related to Job Role, Display Material for PPEs related to Job Role, Safety Material	12 hrs
4	Occupational, Health and Safety (OHAS)	Problem escalation, escalation matrix, accident reporting	• Documentation for Health and safety • Problem escalation	ISC/N0008 PC25, PC26 KB21, KB22	• Facilitator-led-discussion • Skill Practice (Activity)	PPTs for OHAS related to Job Role, Display Material for PPEs related to Job Role, Safety Material	2 hrs
5	5S & House keeping	5S safety system, waste management and housekeeping practices	• Identification of bottlenecks in functioning of work place • Various methods of housekeeping both pre-work & post-work as well	ISC/N0008 PC10, PC11, PC12	• Facilitator-led-discussion • Skill Practice (Activity)	PPTs of 5S, Display Charts of 5S, Audit Checklists of 5S	12 hrs
6	Understand the assigned job of bearing maintenance	Engineering drawing, reading and interpreting drawings	• Understand the assigned job of bearing maintenance in accordance with the instructions / checklist • Understand the engineering drawings of the equipment for bearing maintenance • Seek clarifications with respect to the equipment, drawings, if any	ISC/N0929 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10 KB1	• Facilitator-led-discussion • Skill Practice (Activity)	PPTs for various types of bearings/ drawing, Blue prints	20 hrs

7	Understand the assigned job of bearing maintenance	Tools and measuring instruments required, types of bearings and maintenance	• Understand the assigned job of bearing maintenance in accordance with the instructions / checklist • Identify the tools, tackles and bearings that are required to carry out the assigned job of bearing maintenance	ISC/N0929 PC11, PC12, PC13, PC14, PC15, PC16, PC17 KB2, KB4, KB5, KB6	• Facilitator-led-discussion • Skill Practice (Activity)	Samples for bearings and respective machines Hand tools and lifting machines, pullers, various measuring instruments	44 hrs
8	Prepare for bearing maintenance operation	Bearing handling, bearing inspection	• Reach the site and inspect the equipment for scheduled bearing maintenance and/or defects and identify cause of problem	ISC/N0930 PC1, PC7, PC8, PC9, PC10, PC11, PC12 KB1, KB2, KB3, KB4, KB5,	• Facilitator-led-discussion • Skill Practice (Activity)	Precision measuring tools, pullers, lifting tools etc. marking tools	35 hrs
9	Prepare for bearing maintenance operation	Bearing lubrication and bearing troubleshooting,	• Prepare tools, tackles, spares, material required for bearing maintenance • Bearing lubrication	ISC/N0930 PC2, PC3, PC4, PC5, PC6, KB6, KB7, KB8, KB9, KB10	• Facilitator-led-discussion • Skill Practice (Activity)	Precision measuring tools, pullers, lifting tools etc. marking tools	21 hrs
10	Carry out bearing maintenance operation	Bearing maintenance, Bearing installation	• Conduct routine maintenance or rectify the problem, as appropriate • Ensure lubrication of bearings and monitor vibration, temperature using appropriate equipment	ISC/N0931 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9 KB1, KB2, KB3, KB4	• Facilitator-led-discussion • Skill Practice (Activity)	PPTs for various types of bearings/ drawing, Blue prints & samples for bearings and respective machines Hand tools and lifting machines, pullers, various measuring instruments	60 hrs

11	Carry out bearing maintenance operation	Bearing alignment and dismounting	• Conduct tests to ensure fitness • Bearing alignment • Methods of bearing alignment • Bearing dismounting methods	ISC/N0931 PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC22 KB5, KB6, KB7, KB8, KB9, KB10	• Facilitator-led-discussion • Skill Practice (Activity)	PPTs for various types of bearings/ drawing, Blue prints & samples for bearings and respective machines Hand tools and lifting machines, pullers, various measuring instruments	73 hrs
12	Use basic health and safety practices at the workplace	Fire safety, use of fire extinguisher, fire drill, emergency rescue and first aid techniques	• Health and safety procedures • Fire safety procedures • Emergencies, rescue and first aid procedures	ISC/N0008 PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC22, PC23, PC24, KB14, KB15, KB16, KB17, KB18, KB19, KB20	• Facilitator-led-discussion • Skill Practice (Activity)	PPE, Different Type of Safety Sign, First Aid Box, Safety instrument and clothing, Step Ladder, Sample Accident reports, Fire Extinguishers, Items required for fire extinguisher and fire Safety	12 hrs
13	Work effectively with others	Effective communication, team work, workplace etiquettes	• Ensure appropriate communication with superiors, peers and others as applicable at work place • Demonstrate appropriate behaviour and etiquette at work place	ISC/N0009 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, KA1, KA2, KA3, KA4	• Facilitator-led-discussion • Skill Practice (Activity)	Communication skills PPTs, Posters Team management posters	12 hrs

Annexure II
Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for Fitter – Electrical assembly	
Job Role	**Bearing Maintenance**
Qualification Pack	**ISC/Q0906**
Sector Skill Council	**Indian Iron & Steel Sector Skill Council**

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on these criteria.
5	To pass the Qualification Pack , every trainee should score a minimum of 60% in every NOS.
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

				Marks Allocation	
Assessment outcome (NOS Code and Description)	Assessment criteria PC)	Total Marks	Out Of	Theory	Skills Practical
1. ISC/N0929: Understand the assigned job of bearing maintenance	PC1. Interpret the checklist and understand the bearing maintenance job requirements	**250**	15	5	10
	PC2. Identify classifications of bearings e.g. single row radial ball bearing, roller bearing, angular contact ball bearing, self aligning bearing, special bearing races, cylindrical roller bearing, single/double row tapered roller bearing, thrust bearing etc.		20	5	15

	PC3. Understand the cleaning procedure of bearing and related parts		15	5	10
	PC4. Understand the dimensions and related parts of bearing		10	0	10
	PC5. Plan, as appropriate to carry out the bearing maintenance job		15	5	4
	PC6. Understand sections, views, scale of measurement used in the engineering drawing of the equipment		15	5	10
	PC7. Understand the symbols used in the engineering drawings		15	0	15
	PC8. Understand other specifications and identify the sequence of activities required for bearing maintenance/ changing		15	5	10
	PC9. Read and interpret engineering drawings to ensure correct limits, tolerance and fits of bearings		15	0	15
	PC10. Identify any clarifications that he wants to seek with respect to the given equipment drawing		15	0	15
	PC11. Identify and seek clarifications with respect to bearings with all related parts		15	5	10
	PC12. Recognise whom to contact for clarification on engineering drawings		10	0	10
	PC13. Escalate the concern to the supervisor or shift-in-charge, if needed		15	5	10
	PC14. Identify tools, tackles & equipment (lifting equipment, various sizes of spanner, dial gauge, Venire calliper, filler gauge, torque range, bearing heating furnace etc.) required to perform the bearing maintenance operation		15	5	10
	PC15. Identifying the different types of bearings for maintenance and changing		15	5	10
	PC16. Ask helper to carry tools required to the desired work site		15	5	10

	PC17. Report to stores / supervisor in case of non-availability of tools & tackles or stock-out of spares		15	5	10
	NOS Total Marks	**Total**	**250**	**60**	**190**
2. **ISC/N0930:** **Prepare for bearing maintenance operation**	PC1. Reach the site with desired tools, tackles and equipment	**200**	15	5	10
	PC2. Plan for job duration and understand the process as per SOP		15	5	10
	PC3. Arrange necessary instruments to carry out maintenance (dial gauge, spirit level, vibration measuring instrument and tools for dismantling and assembling e.g. spanners, torque wrench, power tools etc.)		15	5	10
	PC4. Identify the root cause of the problem, if any (radial run out of assemble bearing, face run out with race way, face run out with bore, race way parallel with face, outside face inclination and thickness variance)		15	5	10
	PC5. Identify and collect bearings as per drawing		15	5	10
	PC6. Plan for storage of new bearing and old bearing at job site		15	5	10
	PC7. Ensure not to store multiple bearings on top of each other		15	5	10
	PC8. Ensure not to store large bearings in upright position		15	5	10
	PC9. Understand the hazardous area of work and necessary precautions to be taken to execute the job as well as safe handling of equipments		15	5	10

	PC10. Prepare tools, tackles, the list of spares (lifting equipment, various sizes of spanner, dial gauge, Venire calliper, filler gauge, torque range, bearing heating furnace etc.) required for completion of bearing maintenance/change job and ensure availability at work site		20	5	15
	PC11. Ensure that tools and tackles match the standard specifications		15	5	10
	PC12. Ensure tools, tackles and equipment required for assembly are free from physical damage and ready for bearing maintenance/ changing operation		15	5	10
	PC13. Report damaged / defective components of equipment and bearings as per the escalation matrix		15	5	10
	NOS Total Marks	**Total**	**200**	**65**	**135**
3. **ISC/N0931: Carry out the assigned bearing maintenance operation**	PC1. Interpret the SOP and plan for handling the parent equipment, dismantling, assembling of bearing	**100**	15	5	10
	PC2. Understand the checklist and ensure all assembly check points are measured and correctly recorded		15	5	10
	PC3. Dismantle the equipment, as needed for bearing maintenance and changing activities		10	0	10
	PC4. Correct the defects in the bearing or replace the defective bearing		15	5	10
	PC5. Assemble the bearing related parts according to the drawings		10	0	10
	PC6. Fasten mechanical components/ subassemblies together using screws, bolts, and collars using hand/ power tools for bearing replacement		10	0	10
	PC7. Set and adjust linkages, tensions and clearances of assembled components to specification using gauges and hand tools		10	0	10
	PC8. Re assemble the bearing related parts post correcting the defect		15	5	10

	PC9. Understand and ensure all necessary steps are completed before start-up of the machine		10	0	10
	PC10. Identify and use appropriate vibration and temperature measuring instruments		15	5	10
	PC11. Understand different types of bearings (anti friction, frictional bearing and their classification) the procedure of lubrication		15	5	10
	PC12. Assemble, dismantle and measure gaps of different anti friction bearings e.g. ball bearing, roller bearing, taper roller bearing etc.		15	5	10
	PC13. Assemble, dismantle and measure gaps of Babbitt bearing		15	5	10
	PC14. Understand and conduct hand scraping of Babbitt bearing		10	0	10
	PC15. Ensure lubrication of bearings prior to starting use of equipment		15	5	10
	PC16. Record and monitor that temperature and vibration are at desirable levels		15	5	10
	PC17. Identify any deviations from desirable levels and take necessary actions to correct them		15	5	10
	PC18. Ensure alignment of bearing related parts and with the engineering drawings		15	5	10
	PC19. Check bearing vibrations to ensure they are within desired limits		10	0	10
	PC20. Test the machine to ensure it is fit to use before handover		10	0	10
	PC21. Record the test results in the prescribed format of the organization		15	5	10
	PC22. Ensure all activities are complete according to checklist		15	5	10
	PC23. Communicate to supervisor on completion of given job and/or in case of any deviations from checklist		10	0	10
	NOS Total Marks	**Total**	**300**	**70**	**230**

4. **ISC/N0008:** **Use basic health and safety practices at the workplace**	PC1.	Use protective clothing/ equipment for specific tasks and work conditions	**150**	9	4	5
	PC2.	State the name and location of people responsible for health and safety in the workplace		6	1	5
	PC3.	State the names and location of documents that refer to health and safety in the workplace		2	1	1
	PC4.	Identify job-site hazardous work and state possible causes of risk or accident in the workplace		8	4	4
	PC5.	Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		6	1	5
	PC6.	State location of general health and safety equipment in the workplace		6	1	5
	PC7.	Inspect for faults, set up and safely use steps and ladders in general use		6	1	5
	PC8.	Work safely in and around trenches, elevated places and confined areas		6	1	5
	PC9.	Lift heavy objects safely using correct procedures		6	1	5
	PC10.	Apply good housekeeping practices at all times		2	1	1
	PC11.	Identify common hazard signs displayed in various areas		6	5	1
	PC12.	Retrieve and/or point out documents that refer to health and safety in the workplace		5	1	4
	PC13.	Use the various appropriate fire extinguishers on different types of fires correctly		9	4	5
	PC14.	Demonstrate rescue techniques applied during fire hazard		8	8	8

	PC15. Demonstrate good housekeeping in order to prevent fire hazards		2	1	1
	PC16. Demonstrate the correct use of a fire extinguisher		6	1	5
	PC17. Demonstrate how to free a person from electrocution		6	1	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		8	3	5
	PC19. Demonstrate basic techniques of bandaging		6	1	5
	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		7	2	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		6	1	5
	PC22. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		6	1	5
	PC23. Demonstrate the artificial respiration and the CPR Process		6	1	5
	PC24. Participate in emergency procedures		6	1	5
	PC25. Complete a written accident/ incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26. Demonstrate correct method to move injured people and others during an emergency		2	1	1
	NOS Total Marks	**Total**	**150**	**45**	**105**

5. **ISC/N0009:** **Work effectively with others**	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	**100**	10	5	5
	PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	5	5
	PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		10	0	10
	PC4. Display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	5	5
	PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	5	5
	PC6. Display appropriate communication etiquette while working		10	0	10
	PC7. Display active listening skills while interacting with others at work		10	0	10
	PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	5	5
	PC9. Demonstrate responsible and disciplined behaviors at the workplace		15	5	10
	PC10. Escalate grievances and problems to		5	0	5
	NOS Total Marks	**Total**	**100**	**30**	**70**

Do

- Explain each Guideline for Assessment in detail
- Explain the score that each trainee needs to obtain
- Recapitulate each NOS one-by-one and take participants through the allocation of marks for Theory and Skills Practical.
- Explain the Allocation of Marks. Explain that they will be assessed on Theory and Skills Practical.
- Explain that for the first NOS, <22> marks are allotted for Theory and &<78>for Skills Practical.

Notes

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