



10

Technology in Everyday Life

Students' Learning Outcomes

After studying this chapter, the students will be able to:

1. Enlist and practice safety procedures while carrying out the activities.
2. Make a model of footbridge and bookshelf.
3. Use spirit level / water level to level different objects (table, picture, frame, etc.).
4. Use a plumb line to install a flag pole vertically.
5. Prepare LED light strings working with 12 volt battery.
6. Make a musical instrument from easily available resources.
7. Make moveable wagon, bus, trolley, etc.
8. Use first aid box to dress a wound.
9. Practice shifting a person to hospital.
10. Practice earth quake, fire and flood drill.

Safety Measures

- 1 Keep your area clean. Remove the unnecessary objects around you.
- 2 Workplace should not be wet to avoid slipping.
- 3 Be careful while using sharp tools. Put them at their proper place after use.
- 4 Be careful while working with fire. You should not wear polyester or nylon clothes as they catch fire instantly.
- 5 Avoid electricity operated tools and devices. If necessary, seek help of the teacher.
- 6 Do not use spit for folding or turning pages. Use a piece of foam soaked in clean water.

A Few Principles while Working in a Laboratory

- 1 Wear apron before working in a laboratory.
- 2 Be aware of safety equipments; for example fire tools, water storage and first aid box or shelf.
- 3 The safety equipments should be near the entrance of the laboratory.
- 4 The chemical bottles are all labelled. If there is any without a label, do not try to use it.
- 5 Inform the lab attendant in case of any mishap.

Making Technical Models

Model making is a very useful skill. It promotes working with hands. You may have seen a bridge made up of rope and wooden planks that is used by pedestrians to cross a river or a canal. Let us make a model of such a bridge.

Making Models of Footbridge

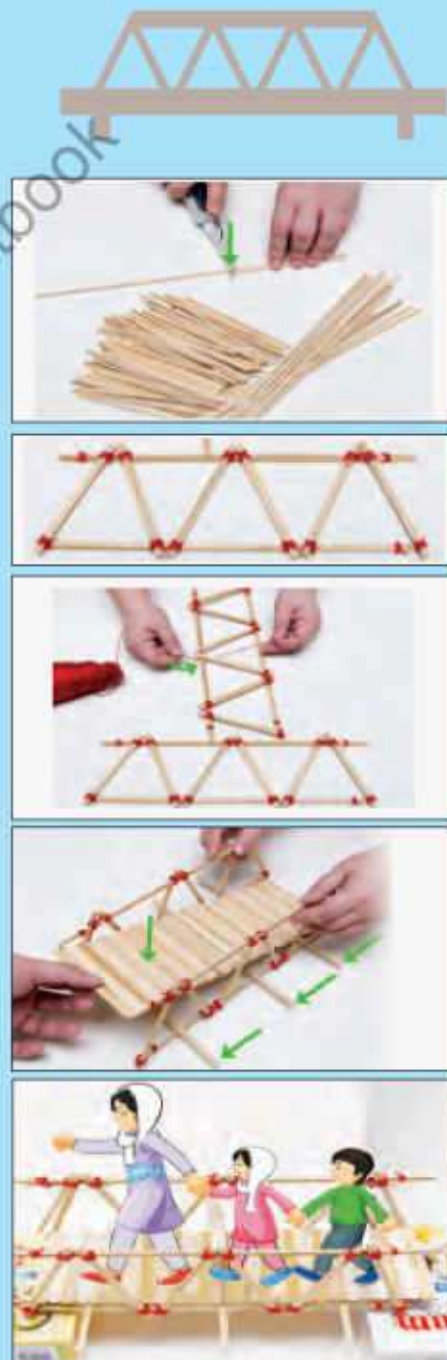
Activity 10.1

Material Required:

Skewers, ice cream sticks, paper, thread, glue. (A skewer is a long thin pointed piece of wood or metal.)

Procedure:

1. Sketch out your design on a paper. It will help you to assess how many skewers you will need.
2. Place your wooden skewers on your sketch and cut them to size.
3. Lay out two skewers for upper and lower supports of a side wall. Putting small skewers on the two supports form triangles at alternating angles. Join them by using thread and glue. One sidewall is ready. Make another sidewall in the same way.
4. Construct the deck by pasting ice-cream sticks on a strip of paper by using glue.
5. Lay out at least two horizontal skewers (beams) on which the two sidewalls can be placed vertically. Fix the walls with these skewers with the help of glue or thread.
6. Apply glue on the beams and fix the deck on it carefully. Let it dry for a few hours. Place the footbridge on two books as shown in the figure. The model of a footbridge is ready.



Making Model of Bookshelf

Activity 10.2

Make a model of a bookshelf using glue and cardboard pieces as shown in the figure.



Spirit Level

Have you ever seen a carpenter who levels the surface of a table top using a spirit level and a planer.



A spirit level is an instrument designed to check whether a surface is horizontal or not. A bubble tube is fitted in it that is filled with a liquid, usually coloured spirit, leaving a bubble in it.

Using Spirit Level

Spirit levels are used by carpenters, masons, frame makers, electricians, plumbers and some other professional workers.

Activity 10.3

1. To check a horizontal surface of a table top, place the spirit level on the surface and observe the bubble.
2. If the bubble is exactly in the middle of the two marked lines on the tube, the surface is perfectly horizontal.
3. If the bubble is not in the centre and it is on any one side, the surface is not horizontal.



For Your Information

In some spirit levels, three bubble tubes are installed as shown in the figure. One tube is meant for horizontal surface, while the other tubes are used to check a vertical surface and an inclined surface at an angle of 45° .



Plumb Line

Have you ever seen a mason constructing a brick wall? How does he check whether the wall is vertical or not? He uses a plumb line for that purpose.

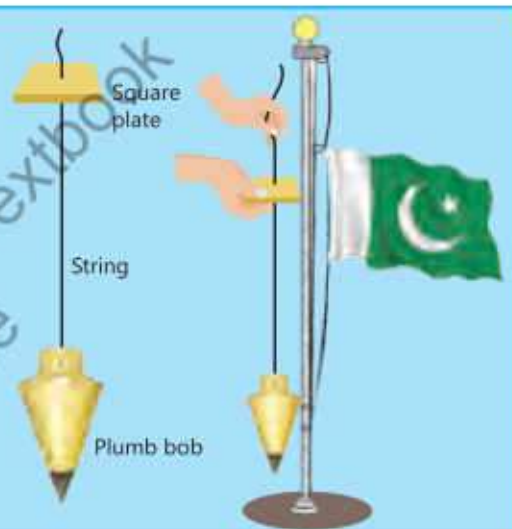
A plumb bob is a weight with a pointed tip at the bottom. One end of a string is tied to it as shown in figure. This is used as a vertical reference line usually called as plumb line. The free end of the string passes through a hole in the centre of a square plate having each side equal to the diameter of the bob as shown in the figure.

Let us demonstrate how a plumb line is used to install a flag pole vertically.

Activity 10.4

1. Fix the pole in the ground vertically.
2. Hold the square plate horizontally in contact with any side of the pole.
3. Allow the bob to fall downward.

Observe the bob carefully whether the hanging bob touches the pole or stays away. The pole will be exactly vertical, when the bob just touches the pole as shown in the figure.



Assembling Technical Devices

Technical devices and machines are now widely used in our homes. They have made our life easy and comfortable. Manuals are provided along with every device. We are able to assemble and use these devices by following instructions written in the manuals.

Preparing LED Light Strings

LEDs are the tiny light emitting bulbs. When a small voltage of 2 to 3 volts is applied across an LED, it starts glowing. Lights of different colours are emitted by different LEDs (Figure 1).

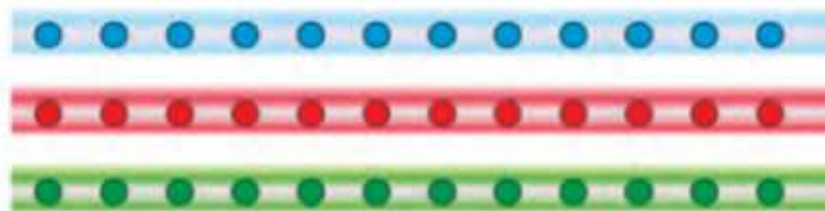


Figure 1

The longer leg (wire) of an LED is positive (+) and the shorter one is negative (–) (Figure 2).

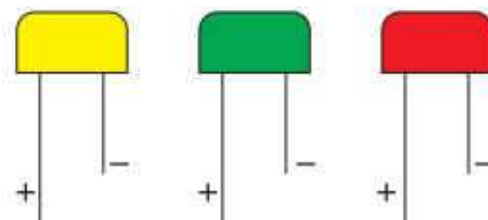


Figure 2

We can prepare decorating LED lights of one or more colours. Here we are going to prepare an LED light string of blue colour that could be lit by 12 V battery.

Activity 10.5

Material Required:

32 LED bulbs, 12 V battery, 1 metre long and 5 cm wide cardboard strip, a steel nail, connecting wires, a cutter and pliers.

1. Take the cardboard strip and make 32 pairs of holes in it at equal distances with the help of a steel nail (Figure 3).
2. Insert all LEDs in the holes (Figure 4), keeping positive legs (longer wires) at one side of the strip and the shorter negative legs at the other side.
3. Join all the 8 positive legs of set 1 together. Similarly, join their negative legs together on the other side. Repeat the same process for set 2, set 3 and set 4.
4. Now join the negative side of set 1 to the positive side of set 2. In the same way, join the negative side of set 2 to the positive side of set 3 and negative side of set 3 to positive side of set 4. Finally, connect positive side of set 1 to the positive terminal of the 12 V battery and negative side of set 4 to the negative terminal of the battery. Yes, your LED light strip is ready.



Figure 3

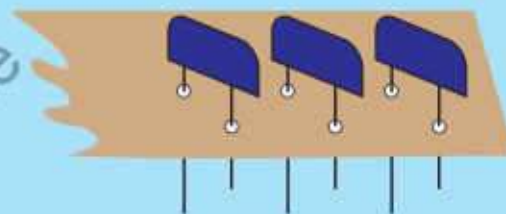


Figure 4

Precautions!

1. Make sure that positive legs of all LEDs are at one side of the cardboard strip and the negative legs on the other side. If an LED is not glowing, change its leg sides and check it again. If still it does not glow, it is a faulty LED. Replace it by a new one.
2. Never connect this LED light string to 220 V A.C. The circuits of LED light strings to be operated with 220 V A.C supply are different.

Observations:

- You will observe that when the battery is connected to the LEDs, these start glowing. When the battery is disconnected, LEDs stop glowing.

Making a Musical Instrument

Activity 10.6

Material Required:

An empty shoe box, cardboard tube or pipe, scissors, rubber bands and glue.

1. Cut a round hole of about 10 cm diameter on the top of an empty shoe box and a small hole on its one side.
2. Make small cuts on the tube and join it with the box as shown in the figure.
3. Stretch two rubber bands on the box on one side and two more on the other side of the tube.
4. Insert two pencils under the rubber bands on the box. Tilt one pencil slightly to make the lengths of the rubber bands effectively different.
5. Pluck the rubber bands with your finger. Do they produce low and loud tones? This is a simple guitar.

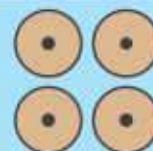
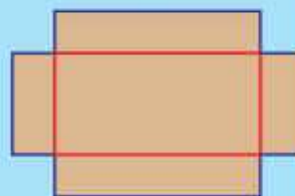


Making a Model of a Movable Wagon

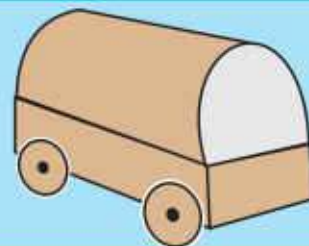
Activity 10.7

You will need a cardboard (any old carton), two thin wooden sticks or reeds, scissors, packing tape, coloured paper and white chart paper.

1. Make a sketch of the floor of a wagon on a cardboard as shown in the figure.
2. Cut the cardboard along the blue line.
3. Fold the cardboard along the red line. Stick packing tape around them. This is the main structure of the wagon.
4. Make round sketches on the cardboard to make wheels. Cut them with scissors and drill hole in their centres.
5. Fix two thin wooden sticks or reeds under the wagon body using packing tape or glue.



6. Fix the four wheels on them.
7. Cut a paper of the size of the wagon. Fold it as shown and fix it over the wagon to make the roof of the wagon. The wagon is ready for a push to move forward.



Activity 10.8

Make a model of a movable bus and trolley yourself as per similar instructions given in the Activity 10.7.

First Aid

First aid is a temporary care given to a person who has got sudden illness or injury. Management of resources for dealing with emergency situation during the earthquake, fire, flood, etc. is called disaster management.



First Aid Box

Dressing a Wound

Activity 10.9

If a person gets some injury or a wound on any part of the body, it must be dressed to prevent it from infection. Following steps can be taken for dressing a wound:

1. Take a pair of sterilized gloves from the First Aid Box and put on your hands.
2. Clean the wound with saline water.
3. Take a sterilized bandage from the First Aid Box and place it on the wound.
4. Press the bandage on the wound to stop bleeding.
5. If the bleeding seeps through the bandage, add another bandage on it and keep pressing it.
6. When the bleeding stops, take a gauze swab from the First Aid Kit and place it on the wound.
7. Take another gauze swab. Add a few drops of pyodine on it and place it over the wound.
8. Apply a bandage over the wound and dress it up properly.



Shifting a Person to Hospital

Hospitals are places where patients are treated properly. How can we shift a person who has been injured during an accident to the hospital?

Following steps should be taken:

Step 1

- Support and shift the injured person to some safe place.



Step 2

- Check if there is bleeding or fracture at any part of his / her body.
- If there is bleeding, apply a bandage using some piece of cloth at the injured part to stop/reduce bleeding.



Bandage to stop bleeding

Step 3

- Call an emergency ambulance service for help to shift the injured person to the hospital.
- Share the location where the ambulance service needs to reach for picking up the injured person.
- Also let them know of a nearby hospital where the patient can be shifted for emergency treatment.



Step 4

- On arrival of the ambulance, shift the injured person in it.

Step 5

- Inform the relatives of the injured person at his / her home and inform them about the hospital where he / she is being shifted.

Activity 10.10

The teacher is requested to provide training to students and conduct a demonstration / rehearsal activity so that students can learn and practise for shifting a person to a hospital.

Earthquake / Flood / Fire Drill

During the earthquake, we need to follow as indicated:



Drop

Cover

Hold on



If you are in classroom



If you are in the lawn

When you are out of danger:



Hold on

Stand up

Exit

Activity 10.11

1. The teacher is requested to provide training to students and conduct a demonstration / rehearsal activity so that students can learn and practise an earthquake drill.
2. Coordinate with Rescue 1122 Unit to arrange a training session by them.

Fire Drill

During a fire, we need to follow the emergency procedures as under:

Activity 10.12

1. On hearing the fire alarm, we should stop what we are doing.
2. Make a line behind the teacher and exit the building.
3. Stand outside the building / classroom.
4. Ask the staff, if you need help.

For Your Information

Fire Extinguisher

If there is a fire extinguisher in your school then read the printed instructions on it. Use it carefully in case of emergency.



Key Points

1. Making a technical model is a useful skill.
2. Spirit level is used to check the level of horizontal surfaces.
3. A mason uses a plumb line to keep a wall vertically straight.
4. It is essential to know the correct operating method and various precautions for assembling and operating machines and technical tools.
5. The knowledge of first aid and natural disaster management practices can save substantial, financial and life losses.



Weblinks: Use the following weblinks to enhance your knowledge about the topics in this chapter.

Show case	https://video.nationalgeographic.com/video/short-film-showcase/00000157-70ff-d277-afdf-feff45fd0000
LED decorating light	https://spaceplace.nasa.gov/blue-sky/en/

Exercise

1. Tick (✓) the correct answer.

i. We check the horizontal surface level by using a:

- | | |
|------------------|----------------|
| (a) plumb line | (b) metre rule |
| (c) spirit level | (d) triangle |

ii. What does a mason use to keep a wall vertical?

- | | |
|----------------|------------------|
| (a) Metre rule | (b) Spirit level |
| (c) Triangle | (d) Plumb line |

iii. Saline water is used for:

- | | |
|---------------------|--------------------------|
| (a) cleaning wounds | (b) drinking by patients |
| (c) washing hands | (d) taking a bath |

iv. Sterilized gauze is used:

- | | |
|--------------------------------------|----------------------------|
| (a) for checking blood pressure | (b) as bandage on wound |
| (c) for finding the body temperature | (d) for cleaning workplace |

v. The emergency phone call number is:

- | | | | |
|----------|----------|----------|----------|
| (a) 2211 | (b) 1133 | (c) 1122 | (d) 0911 |
|----------|----------|----------|----------|

2. Write short answers.

- i. What do you need to make a model of a footbridge?
- ii. What is the difference between the functions of spirit level and plumb line?
- iii. What is an LED?
- iv. You have to install a picture frame on the wall. How can it be kept straight horizontally as well as vertically?
- v. What is meant by first aid?

3. Constructed Response Questions:

- i. What sort of tools and equipments are required to make a wooden model?
- ii. How does a musical instrument produce sound?
- iii. Why is it necessary to join long wires of LEDs and short wires together while preparing a light string?

4. Investigate:

You are provided 6 volt battery, one strip of cardboard and 12 blue colour LEDs. How will you make a light for decoration?

5. Project:

Make a model of a cot (charpai) by using two reeds of different thickness, glue, knife, steel pins and nylon strings, etc.



Glossary

Amphibians:	The vertebrates that can live both on land and in water; their development takes place in water.
Animalia:	A kingdom that contains organisms that cannot make their own food.
Atom:	The smallest particle of a substance.
Bacteria:	Single celled organisms that live in all types of environments; these may be beneficial or harmful.
Biodegradable:	A substance or object capable of being decomposed.
Biodiversity:	The variety of living organisms at any particular place.
Birds:	Vertebrates having feathers and beak and their development takes place through eggs.
Chemical change:	A change that occurs in a matter resulting into a new substance.
Classification:	The arrangement of organisms into separate groups according to their similarities and differences.
Close circuit:	A complete path for the electric current to flow through it.
Condensation:	The change of water vapours into liquid.
Conductor:	The material which allows the electric current or heat to pass through it.
Core:	The central part of the Earth.
Crust:	The outermost layer of the Earth.
Dicot plants:	The flowering plants whose seeds have two cotyledons.
Echinoderms:	Spiny-skinned invertebrates which are found only in the sea.
Electric circuit:	The path of electric current.
Electric current:	Flow of electric charge.
Electromagnet:	A temporary magnet made when electric current passes through a coil around an iron rod.
Evaporation:	The process of turning water (liquid) into vapours.
First Aid:	An instant treatment given to an injured person.
Fish:	Vertebrates that live in water, breathe through gills and have scales on their bodies.
Freezing:	When a liquid becomes solid on cooling.
Fungi:	A kingdom that contains many celled organisms that obtain food by absorbing nutrients from the place where they live.
Fuse:	A piece of thin wire inserted in an electric circuit or appliance for safety purpose.
Humus:	The matter in the soil made up from dead plants and animals.
Insects:	Invertebrate animals having jointed legs.
Insulator:	The material which does not allow to pass electric current or heat through it.
Luminous objects:	The objects which emit their own light.
Magnetic Compass:	A device used to find the directions at any place.
Magnetic objects:	The objects which are attracted by a magnet.
Mammals:	Animals that give birth to young ones and feed them on milk.
Mantle:	The part of the Earth in between the crust and core.

Melting:	When a solid becomes liquid on heating.
Micro-organisms:	All those too small organisms that can be seen only under a microscope.
Microscope:	An instrument used to see objects that are too small to be seen by the naked eyes.
Molluscs:	Soft bodied invertebrates; in some of them the body is enclosed in a shell.
Monera:	A kingdom that contains single celled organisms such as bacteria.
Monocot plants:	The flowering plants whose seeds have one cotyledon.
Noise:	An unpleasant sound.
Non-biodegradable:	A substance or material not capable of being decomposed.
Opaque object:	The object which does not allow light to pass through it.
Open Circuit:	It is an electric circuit with switch OFF and current does not flow through it.
Pathogen:	Microorganism that causes diseases.
Physical change:	A change that occurs in a matter resulting into no new substance.
Planet:	A heavenly object which revolves around another bigger heavenly object due to its gravity.
Plantae:	A kingdom that contains organisms that are usually green in colour and make their own food.
Plumb line:	A device used to keep a wall vertically straight.
Pollination:	The transfer of pollen grain from anther to the stigma.
Protista:	A kingdom that contains organisms that have characteristics of both plants and animals such as bacteria.
Reproduction:	The biological process by which new offsprings are produced by their parents.
Reptiles:	Vertebrates with thick, scaly and dry skin, whose development takes place through eggs.
Satellite:	A heavenly body which moves around the Earth or any other planet.
Shadow:	The dark shade formed behind an opaque object when light falls on it.
Spirit level:	A device to check the level of a horizontal surface.
Sponge:	Invertebrate aquatic animals that have bodies full of pores.
Static electricity:	The kind of electricity which does not flow in a circuit.
Translucent object:	The object which allows light partially to pass through them.
Transparent object:	The object which allows light to pass through it.
Virus:	Small infectious particles having characteristics of both living and non-living organisms.
Worms:	Invertebrate animals that have thin and soft bodies.



قومی ترانہ

پاک سرزمین شاد باد کشورِ حسین شاد باد
تُونشانِ عزمِ عالی شان ارضِ پاکستان
مرکزِ یقین شاد باد
پاک سرزمین کا نظام قوتِ اخوتِ عوام
قوم ، ملک ، سلطنت پایندہ تابندہ باد
شاد باد منزلِ مُراد
پرچمِ ستارہ و ہلال رہبرِ ترقی و کمال
ترجمانِ ماضی، شانِ حال جانِ استقبال
سایہٴ خدائے ذوالجلال

