



GOVERNMENT OF TAMIL NADU

STANDARD THREE

TERM - I

VOLUME 2

**MATHEMATICS
SCIENCE
SOCIAL SCIENCE**

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Department Of School Education

Untouchability is Inhuman and a Crime

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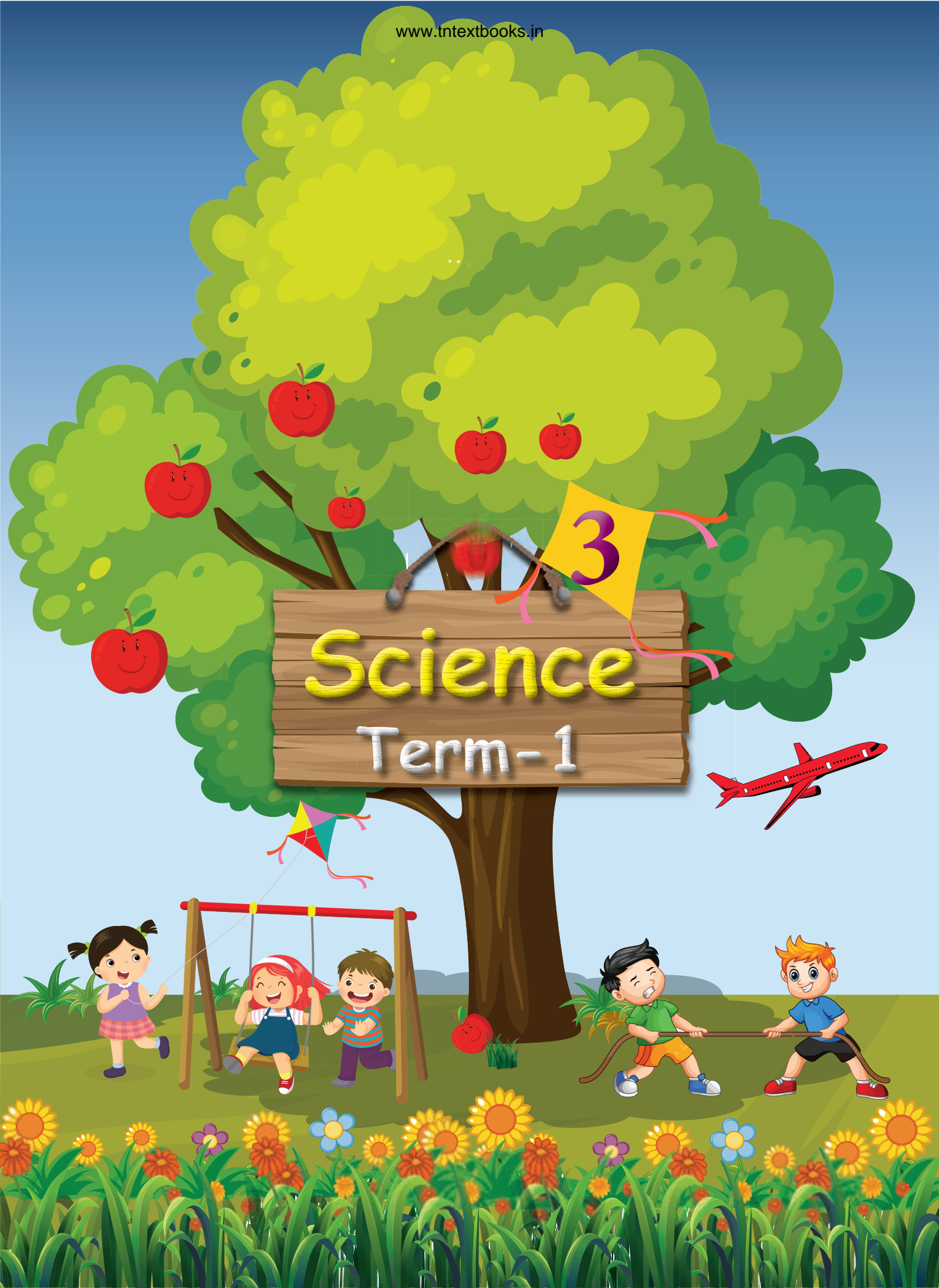
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E-Book



Evaluation



Digi Link

Unit 1

My Body



Learning Objectives

After learning this lesson, students will be able to

- ❖ know the benefits of hand washing
- ❖ understand self-hygiene
- ❖ acquire the habit of using toilets and avoiding open defecation
- ❖ know the precautions to protect the sense organs
- ❖ recognize the differences and similarities in people's appearance and abilities
- ❖ understand good touch and bad touch
- ❖ grasp the importance of physical exercises



Tick (✓) the items used for personal hygiene.



I. Cleanliness



Mithra is watching TV with her parents. An advertisement in the TV shows a toilet with germs. Mithra asks her dad what they are. He explains to her about germs.

Do you know about germs?

Germs are microorganisms that affects our body. They are found in all the places. If we do not maintain cleanliness, the germs will infect us and cause many diseases to us.

1. Hand Washing

Dialogue between Shruthi and her mother.

(After playing outside, Shruthi returns home)

Shruthi: Mom, I am so hungry. Give me something to eat.

Mother: Shruthi, go and wash your hands.

Shruthi: No Mom, I want to eat first. Then I wash my hands.

Mother: No, you must wash your hands.

Shruthi: Mom, is it necessary to wash hands before eating?

Mother: Yes, look at your hands. Is it clean or dirty?

Shruthi: My hands are too dirty, Mom.

Mother: Where does the dirt stick in your hands?

Shruthi: Under the nails, in the ridges...

Mother: Yes, these are the places where the germs are hiding.

Shruthi: Is it so?

Mother: Yes, it is important to wash your hands. It is a simple habit that keeps you healthy.



(Mom starts explaining the importance of simple hand washing technique)

Let us Do

Steps of Hand Washing

-  Wet your hands
-  Apply enough soap (coin size)
-  Rub the palms
-  Rub the back of each hand together
-  Rub both hands holding all fingers (interlocked)
-  Rub the back of the fingers
-  Rub the tip of the fingers
-  Rub the thumbs and the ends of the wrists
-  Rinse both hands properly with enough water



Benefits of Hand Washing

- Kills or removes germs
- Lowers the risk of diseases like Diarrhoea
- Prevents eye infections
- Reduces the risk of respiratory infections



Let us draw - Germy Hand

1. Trace your hand in a white sheet using pencil.
2. Draw the pictures of small germs in the hand.
3. Colour the germs.



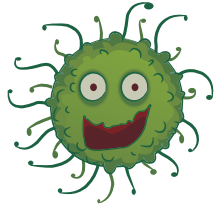


Let us Write



Complete the Worksheet

Name : _____



Germs

Do germs make people sick?



Yes



No

Can you see germs?



Yes



No

Where are the germs found?

1. _____

2. _____

What can I do to avoid the spread of germs?

1. _____

2. _____



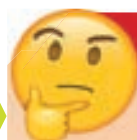
Think Zone



Preethi often bites her nails. Is it a good habit? Give reason.



Global Hand Washing Day is observed on **October 15**.



Think and Discuss



Arun usually eats food or snacks without washing hands properly.

Is it correct? Give reason.

2. Using Toilets



In the world, nearly one billion people have no access to toilet at all and they are forced to do open defecation. Open defecation spreads diseases such as cholera and diarrhoea. Groundwater is polluted by toilets and it also causes diseases. Children also get affected by **intestinal worms** which causes **anaemia**. So, it is necessary to use toilets.



World Toilet Day is observed on November 19.

Why is it important to have a toilet?

Having a toilet

- ◆ prevents diseases like cholera.
- ◆ offers privacy.
- ◆ is convenient.
- ◆ is safe.

Effects of open defecation

- ◆ Water borne diseases
- ◆ Diseases caused by insect carrier
- ◆ Pollution

What should we do to wash out the intestinal worms?

We should use toilet and avoid open defecation. We should wash our hands after using the toilet. These will help us to have a healthy life.



National De-worming Day is observed on February 10.



More to know

Sulabh international Museum of Toilets is in Delhi, India. It exhibits different toilet models from 50 countries across the world - spanning from 3000 BC till the 20th century.



3. Bathing

Discuss with group

- ✓ Why do we take bath?
- ✓ Why is it important to take bath daily?
- ✓ Why do we use soap to clean our body?



Importance of bathing

- Cleanses the body
- Removes dirt and odour
- Protects oneself from infection
- Improves blood circulation



The fruits of Soapberry tree are Saponin-rich and used as a soap substitute.



World Health Day is observed on April 7.

Safety measures in Bathroom

- ◆ Do not play with water or run around in the bathroom. You may get hurt.
- ◆ Do not touch the sharp objects such as blades, razors and scissors kept in the bathroom.
- ◆ Use hot water under the supervision of an adult only.
- ◆ Do not leave soap bar on the floor. Someone may slip due to it.
- ◆ Do not leave the bathroom floor wet. Dry the floor using a wiper before you leave.
- ◆ Do not touch electric switches with wet hands. You may get hurt with an electric shock.

Put a tick (✓) for correct action and cross (x) for wrong action.



Let us Answer



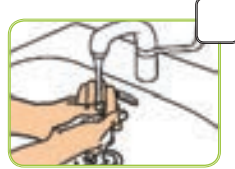
Read the statements given below. Identify whether it is Right (✓) or Wrong (x) and put the suitable symbol.

Wet your hands before washing


☐

☐

Apply soap on hands


☐

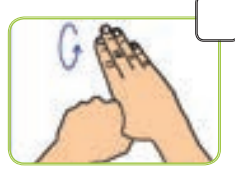
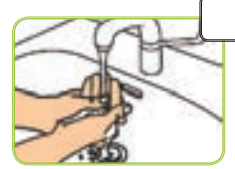
☐

Rub the back of the fingers

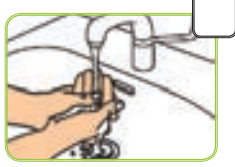

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☐

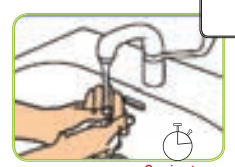
Rub the thumb


☐

☐

Use enough water to rinse the hands


☐

☐

Wash your hands at least for 2 minutes


☐

☐

2 minutes

Use soap for bathing


☐

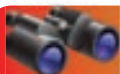
☐

Using toilets is a good habit

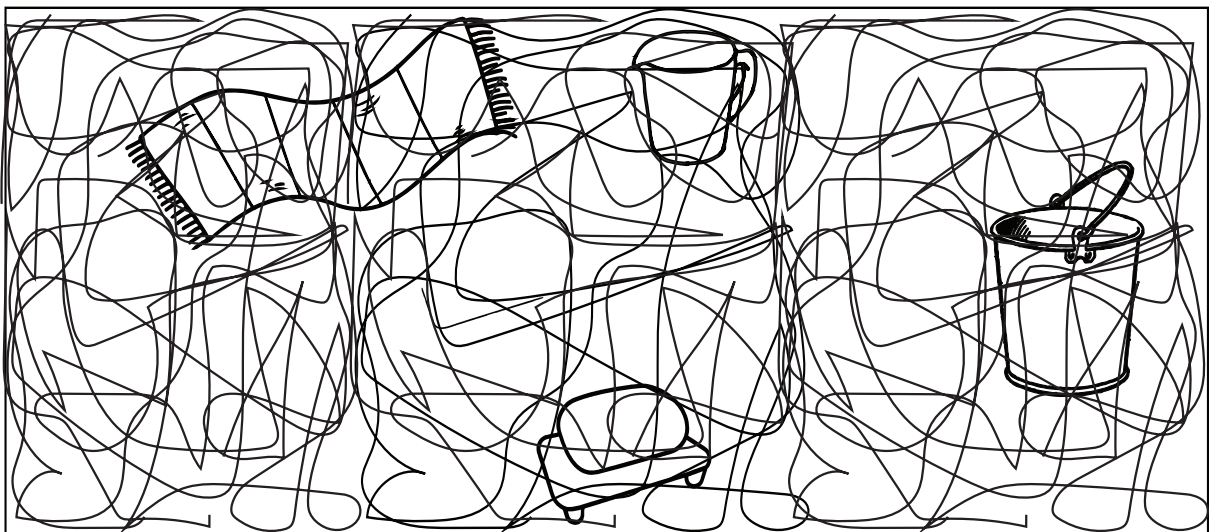
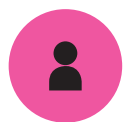

☐

☐

Varun is in the bathroom. He is searching the things to take bath. Help him to find the things by colouring them.



Let us Find



II. Protecting Sense organs



Sense organs help us to observe and understand the world around us. There are five main ways we can do this: through sight (with our eyes), touch (with our skin), smell (with our nose), taste (with our tongue) and hearing (with our ears).

In this section we will discuss the ways by which we can take care of our sense organs.

By nature, all the sense organs have some ways to protect themselves. For example, the eyelids and lashes protect the eyes from dust and other foreign particles.

How should we take care of our sense organs ?



Think Zone

Anu plays with her baby brother. As he cries, she gives him a pencil. On seeing this, Anu's mom was shocked. She quickly takes the pencil back. Do you know why?

EYES



Do's

- ❖ Read with proper light.
- ❖ Watch television from a minimum distance of 6 feet.
- ❖ If you feel your eyes are itchy, wash them with clean and cold water.

Don'ts

- ❖ Read in too dim or too bright light.
- ❖ Play video games or watch TV for long hours.
- ❖ Rub your eyes with your fist.

If you find it difficult to read the classroom board from your place, tell your teacher/parents and consult a doctor. You must follow the suggestions of the **ophthalmologist** or eye doctor.



A condition known as digital eye strain is common among people working at computers all day. This condition leads to dry eyes, eye strain, blurred vision and headache.



EARS



- ❖ Avoid loud noise.
- ❖ Do not listen to music at higher volume when using Earphones or Headphones.
- ❖ Do not clean ears with ear buds.
- ❖ Dry your ears after taking bath.
- ❖ Cover your ears while swimming and bathing.



- ❖ Use earplugs or ear muffs (when you are exposed to loud sound).
- ❖ Consult a doctor if you have pain in ear.

Hearing loss can not be prevented always. But hearing loss due to exposure to loud noises is can be avoided.



Noise levels are measured in decibels (dB). Any sound over 85dB can be harmful to us.



NOSE



- ◆ Do not clean your nose by inserting any object into it
- ◆ If the nose is blocked due to cold it is better to use steam to clear it.
- ◆ Do not pick your nose.
- ◆ We should clean our tongue daily with the tongue cleaner while brushing our teeth.
- ◆ A dirty tongue may cause disease and bad breath.

TONGUE



SKIN



- ◆ Always use a mild soap.
- ◆ Keep your skin dry and clean.
- ◆ Dry your skin by rubbing gently with a clean cloth.
- ◆ Consult a doctor when you feel any itching, skin injury or infection.

Let us Do



Read the given statements carefully. Write 'T' if it is True and 'F' if it is False.

1. Avoid playing video games or watching TV for a long time.
2. Avoid loud noise.
3. Do not clean your nose by inserting any object into it.
4. A dirty tongue may cause disease and bad breath.
5. Dry your skin by rubbing gently with a dirty cloth.

Let us Practice



Make a figure '8' with your eyes

This is a good exercise to practice controlling the physical movement of your eyes.

- Draw a large figure of '8' on the floor, about 10 feet in front of you.
- Trace the figure '8' with your eyes, slowly, without shaking head.
- Do it clockwise for few minutes and anti-clockwise for few minutes

1.3. Good Touch, Bad Touch and Don't Touch



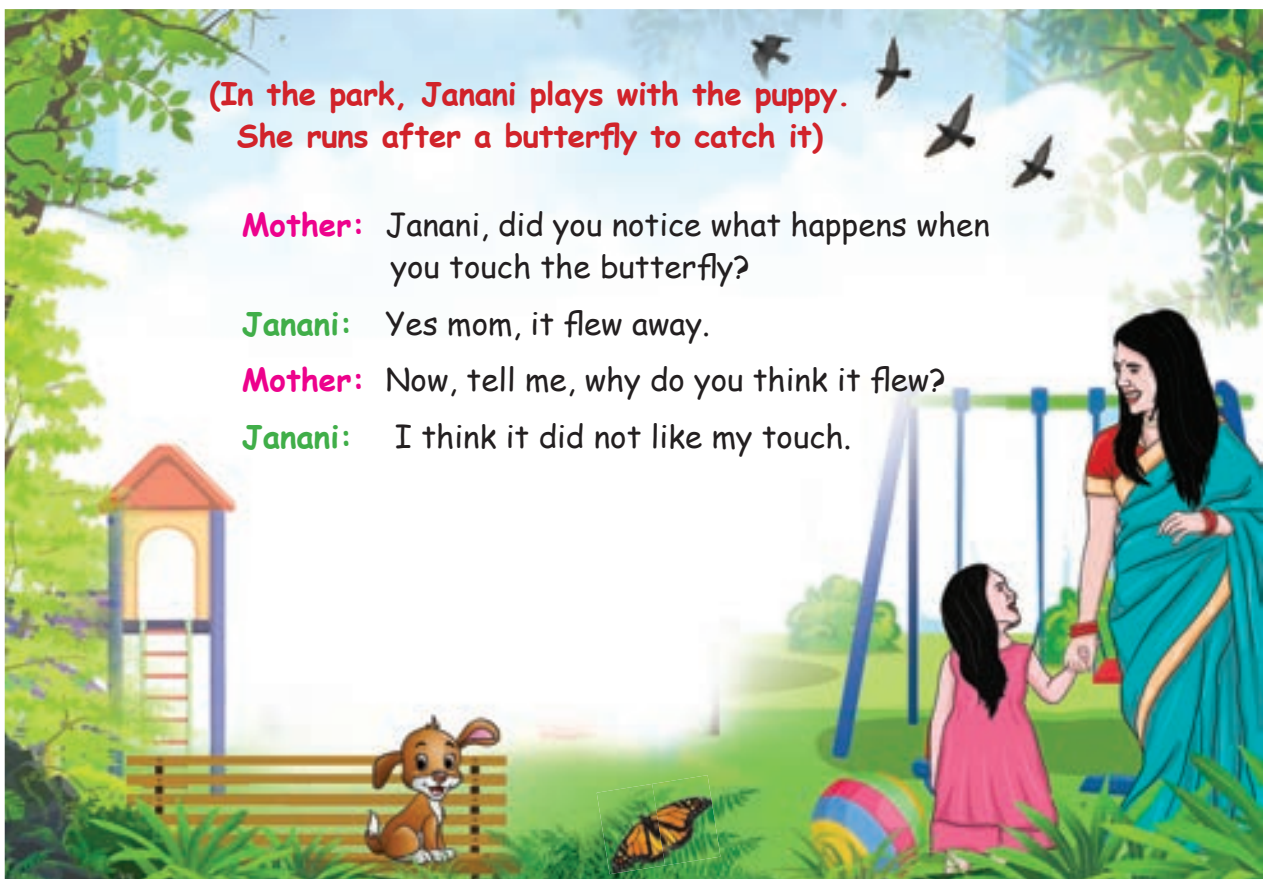
(In the park, Janani plays with the puppy.
She runs after a butterfly to catch it)


Mother: Janani, did you notice what happens when you touch the butterfly?

Janani: Yes mom, it flew away.

Mother: Now, tell me, why do you think it flew?

Janani: I think it did not like my touch.





Mother: Maybe, it did not. But, it wanted to be safe.
Now, I am going to tell you three rules to keep yourself safe.

Janani: Okay, Mom.

Mother: There are body parts that you and others can see and touch like our arms and hands.

But, there are also some body parts that no one should see or touch like our chest, between our legs and our bottom. These parts are called private parts. What are they called?

Janani: _____.

Mother: So now, let me tell you **rule number 1**. It is **never right for anyone to look at, touch or talk** about your **private parts**. And it is never right for someone older to you to ask you to look, touch or talk about their private parts.

Janani: But mom, don't you give me bath daily?

Mother: Very good question! Who else knows that I give you a bath?

Janani: Dad, Grandpa, Grandma and Jagan know that you give me bath.

Mother: Correct, when we are small our mom or dad might touch us to help us to be clean. It is never a secret and it is okay to tell someone about it.

Janani: I got it mom. It is never right for anyone to _____, _____ or _____ about my private parts. But, it is never a _____.

Mother: Very good! Some touches are good or safe, like when we shake hands. But, some touches are bad or unsafe, like when we hit someone. Can we hit someone?

Janani: _____.

Mother: Bad touches might make you feel sad, angry, scared, or confused. If you do not like any touch or if it makes you sad, angry or scared, tell them to STOP! **Scream "STOP!" and run away.** This is **rule number 2.**

Janani: Okay mom. If I do not like any touch, I scream _____ and _____.

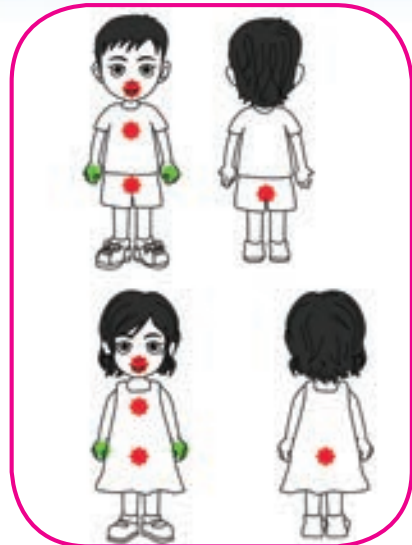
Mother: Very good! Now **rule number 3.** Tell an adult you trust, about the bad touch. **Keep telling until you get the help you need.**

Janani: I should _____ adults I trust till I get _____.

Mother: Janani, remember, no matter who tells you. It is never your fault.

Janani: But mom, would people I know also do 'bad touch'?

Mother: Anyone would do. So it is important that you keep all the three rules in mind even if you know the person. Can you say the rules?



SAFE CIRCLE MEMBERS



Father



Mother



Grandpa



Grandma



Sister



Brother



Teacher



If someone abuses you or hurts you, you can call **1098** and get help.



Let us Discuss



1. You are playing in the park. Someone gives you eatable things / toys. What will you do?
2. If someone touches you, you feel uncomfortable. What will you do immediately? To whom you will inform this?

1.4. Physical or Sensory challenge



Ramu went for shopping with his father. On the way they saw a visually challenged person who tries to cross the road. Ramu's father went to him and asked, "May I help you sir?", And the differently abled person replied, "Yes, I want to cross the road".

Ramu's father joyfully helped him to cross the road. By seeing this, Ramu felt proud of his father, and he also wanted to help the needy. So, Ramu asked his father to teach him how to help differently abled persons.



1.4.1. Differently-abled persons



Think Zone

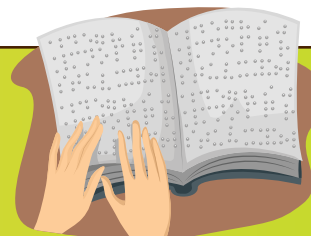
What do you think about this picture?



Not everybody can use all five senses. Some lack the ability to use any one or more of them, such people are called 'Differently-abled'.



Braille is a reading and writing method for visually challenged person. It has a raised pattern that can be read with the fingers.



1.4.2 Let us know how to help them

Helping people is very honourable, and there are plenty of ways by which we can help differently-abled people.

- ◆ Ask first if they need any help from you and follow their lead.
- ◆ Speak clearly and listen to their words well.
- ◆ Use direct words.
- ◆ Never tease them by calling with specific names.
- ◆ Be aware of their personal aids, do not cause any damage to the aids.



Your simple acts can be helpful to them.

- * opening doors for the disabled.
- * making way for them.
- * bring them to cross the road.
- * treat them as normal people.



We do not use the word 'handicapped or disabled'. We use 'differently-abled'

By doing these you can exhibit that you want to help the differently-abled.

Match



1. Orthopedically challenged -



2. Visually challenged -



3. Hearing challenged -



Let Us Discuss



Gopi is travelling in a bus along with his parents. The bus stops in a particular stop and a differently-abled person gets into the bus. If you are Gopi, what will you do? Discuss with your friends.

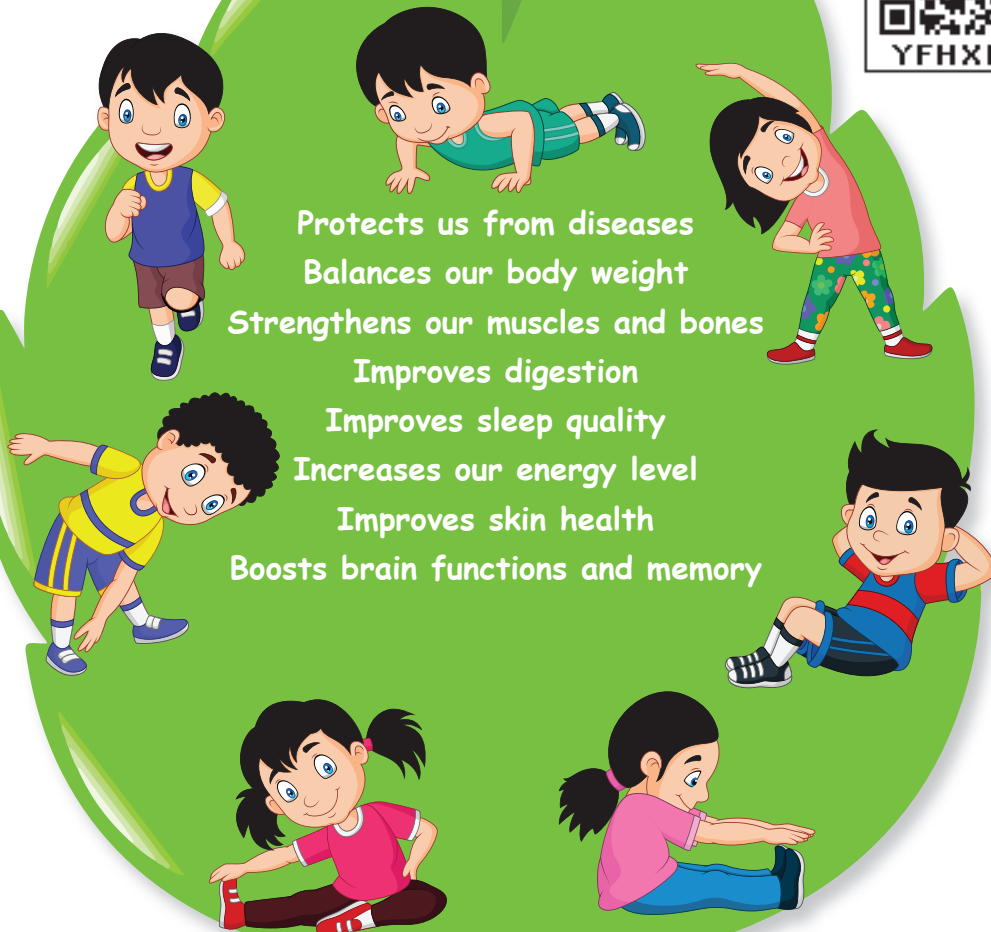
1.5. Importance of Physical Exercise



Parents - teachers meet is going on in Sheela's school. As her parents are out of the town, her grandfather attends the meeting. He is a retired army person and even at the age of 90, he does all his work by himself. Everyone in the meeting wonders "What is the secret behind his good health?" and they asked him for his secret. Grandpa replied that he avoids junk food and takes healthy and fresh food. He does physical exercises like walking, running, jogging, and yoga. He advises all parents and children to do exercises regularly.



Physical Exercise



Find and circle the words related to fitness.

(SLEEP, ENERGY, HEALTHY, RUN, JUMP, PLAY, YOGA)



X	E	M	R	U	N	J
Y	N	D	S	F	P	V
H	E	A	L	T	H	Y
T	R	E	E	S	T	U
Z	G	C	E	K	W	R
K	Y	A	P	L	A	Y
O	A	G	O	Y	Q	N

EVALUATION



I. Fill in the blanks.

1. We should wash our hands _____ playing out (before / after).
2. Intestinal worms cause _____ (anaemia / cold).
3. Eating _____ is good for health (fruits / packed snacks).
4. _____ improves our brain functions (eating junk food / doing exercises).
5. If someone's touch hurts you, then it is a _____ (good touch / bad touch).
6. _____ is the word used to refer to the disabled persons (handicapped / differently-abled).

II. Say 'TRUE' or 'FALSE'.

1. Use soap to wash your hands
2. Open defecation causes cholera.
3. Bathing reduces blood circulation.
4. Show pity on physically challenged people.
5. Always use ear buds to clean your ears.

III. Answer the following questions in a few words.

1. What are the effects of open defecation?
2. Write the benefits of bathing.
3. List out the types of touches.
4. Who are the persons in your safe circle?
5. Name the sensory organs of our body.

IV. Arrange in correct order. (First and last steps are in correct sequence)

1. Wet your hands and apply enough soap.
2. Rub the tips of your finger.
3. Rub both hands by interlocking your fingers.
4. Rub the back of each hand.
5. Rub the palm together.
6. Rub the back of each fingers.
7. Rub the thumb and end of your wrist and rinse both hand with water.

V. Answer the following questions.

1. When do we wash our hands?
2. What will you do when somebody who are not in your 'safe circle' touches you?
3. How can we protect our skin?
4. How do we get intestinal worms?
5. How do you help differently-abled people?

VI. Project work.

Collect proverbs related to self-hygiene, health and sanitation.

Unit 2

States of Matter

Learning Objectives

After learning this lesson, students will be able to

- ❖ know the matter surrounding us
- ❖ differentiate between solids, liquids and gases
- ❖ conduct simple experiments
- ❖ observe the properties of matter
- ❖ describe the nature of the material



Matter

Teacher : Leela, look at the picture and list out the things you see in it.

Leela : Yes madam. Sun, river, boat, house, tree, car, birds, ...

Teacher : Very good. There are many things in this picture. Some of them are natural and some are man-made.



You can see a number of things around you. Everything you can see and touch is made up of matter. Anything that occupies space and has mass is called **matter**.

Let us Do

List out the some of the matter around you.

1. _____ 2. _____ 3. _____ 4. _____



More to know

What is mass?

Mass is a measure of how much matter is in an object.

- The air we breathe, the food we take, and the water we drink all have matter in them.

Do you know that even you are made up of matter?

The space occupied by an object is called its **volume**.

2.1 States and properties of Matter

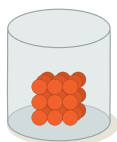
Matter can exist as solid, liquid or gas.



Solid



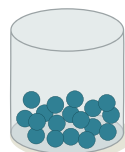
- rigid
- fixed shape
- fixed volume



Liquid



- not rigid
- no fixed shape
- fixed volume



Gas



- not rigid
- no fixed shape
- no fixed volume



SOLIDS

Let us Try

Press a wooden pencil. Is the pencil hard? Yes / No.

Solids are things that have a **definite shape and volume**. They occupy a fixed space. The particles in solids are **packed very tightly**. So they **cannot move freely**. Their shape can be changed only when we break or cut them.

Some examples for solids are given below.



LIQUIDS

Let us Do

1. Place 4 1L bottles of different shapes on the table.
2. Take a bucket with water.
3. Call one child to hold the empty bottles and the other to fill water into them using a paper cup.
4. Ask the other children to fill the table as given below.

	Bottle 1	Bottle 2	Bottle 3	Bottle 4
Number of cups used				
Shape of bottle (Draw)				



Think Zone

1. What is the shape of water in your bottle?
2. What happens if you pour water on the floor or table?

Did each bottle need the same number of cups to get filled?

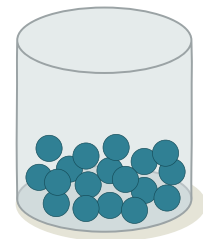
We can see that water takes up the same space in each bottle and the shape of the water is same as the shape of the bottle.

Look at these pictures

Here we can see that the shape of the liquid is determined by the shape of the container.

Pouring kerosene using funnel	Oil in cane/ bottle	Milk in the jug	Juice in glass	Filling Water in the glass
				





Liquids are the things that do not have a **definite shape** but **occupies space**. They have a **definite volume**. They take the **shape of the container** in which they are filled. The water moves from one place to another. This is because the matter in liquid are **loosely packed**. So, liquids can **flow freely**.





Let us Touch and Feel

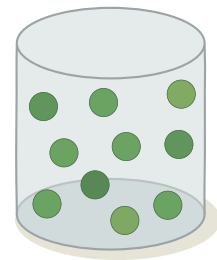
Different types of liquids are placed in separate containers. Students are allowed to touch and feel every type of liquid. They are asked to tell the type of the liquids on the basis of their stickiness/concentration.

Greasy liquid	Sticky liquid	Watery liquid	Thick liquid
			

GASES

When a perfume is sprayed or an agarbatti is lighted, the fragrance spreads all around the room. How?

The matter in gases are **very loosely packed**. So they can **move around freely in all directions**. Hence, gases **do not** have a **definite shape** and **do not** occupy a **definite space or volume**.



Most of the gases are colourless. But when they are mixed with solid particles they show distinct colours.



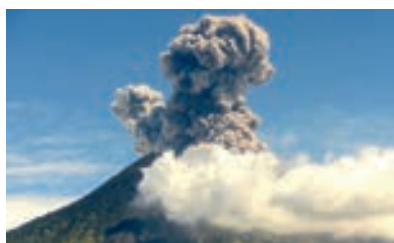
Think Zone

Cooking gas in gas-cylinder has a smell. Why?

Here are some examples for gases



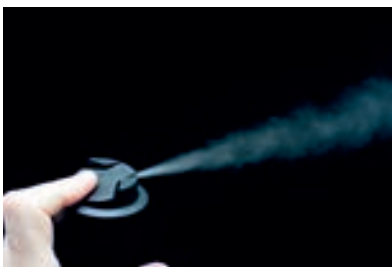
Cloud



Smoke



Gas cylinder (LPG)



Spray



Water vapour



Wind

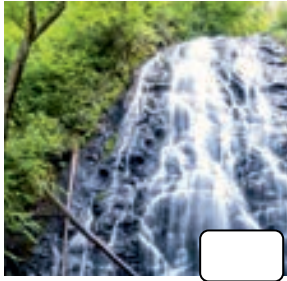


Let us Do



Say whether it is Solid or Liquid or Gas (Put 'S' for Solid, 'L' for Liquid and 'G' for Gas).

Falls



Chair



Air filled balloon



Cake



Juice



Jar with pebbles



Ice cube



Steam from soup in bowl



Pencil



Chocolates



Bucket filled with water



Water in a glass



Milk



Bricks



Biscuits



Fire



Let us Read and Complete the table

Here are some properties of matter:

Fixed shape

No fixed shape

Fixed volume

No fixed volume

Flow all sides

Rigid

Copy the following table. Write each property in the correct column of the table. Some properties may belong to more than one column.

Properties of solids	Properties of liquids	Properties of gases

2.2. Change in States of Matter

Matters change their state as the temperature changes. Solid changes into liquid and liquid changes into gas on heating. Gas becomes liquid and liquid becomes solid on cooling.

Melting

Change of solid into liquid on heating is called **melting**. For example, if ice (solid) is heated, it will change into water (liquid).



Let us Do

- Take some ice cubes in a container. Heat the container and observe the changes.
- Take some cheese in a container. Heat the container and observe the changes.
- Take some jaggery in a pan. Heat the pan and observe the changes.

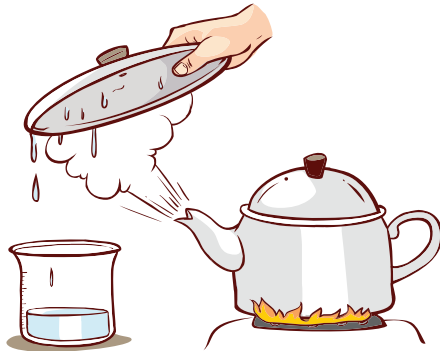


Evaporation

Change of liquid into vapour on heating is called **Evaporation**. For example, if water is heated, it will change into steam.

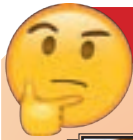
Freezing

Change of liquid into solid on cooling is known as **freezing**. For example, water (liquid) poured in ice-tray and placed in the freezer (fridge), gets cooled and becomes ice (solid).



Condensation

Changes of gas into liquid on cooling is called **condensation**. For example; clouds (gas) on cooling condense and fall as rain (liquid)



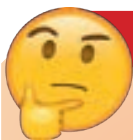
Let us think

What makes the coconut oil freeze in winter season?



Complete the table

State of matter	Add	New state	Process
ice	+ heat		melting
water	+ heat	steam	
clouds	+ cool	liquid	
	+ cool		freezing



Think and answer

One of these cans was in the fridge and the other was not.

- Which can was taken from the fridge?
- How do you know?
- How did water droplets appear on the can A?
- Why are there no water droplets on can B?



Let us Observe



Take a balance. Keep an air filled football in one plate and an empty football in another plate . What happens?

Air filled ball goes down. It is because air has mass.

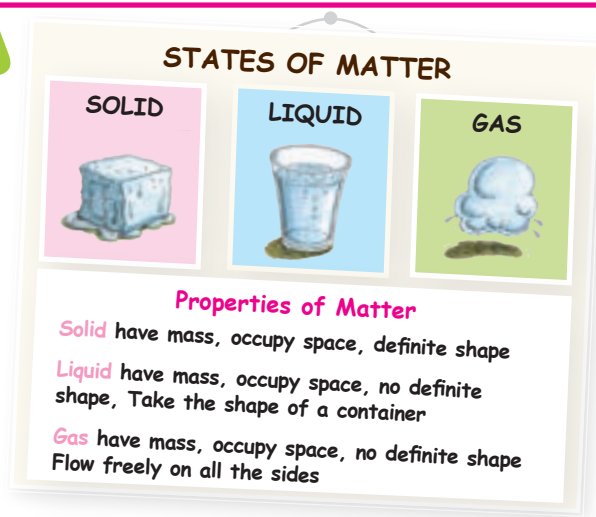


Air is a mixture of gases. You can feel the presence of air when the wind blows.



Let us Prepare - Anchor chart

1. Cut a chart into three pieces each of 15cm x 10 cm.
2. Write the properties of solid, liquid and gas in separate sheets.
3. Draw pictures related to the points.
4. Design the sheets with colourful borders.
5. Paste all the sheets in a large chart paper. Your anchor chart is ready. Hang it on the wall.



Let us Understand



- ◆ Keep a stone on the floor. Does it move by itself?
- ◆ Pour a mug of water on the floor. Does the water flow? Does it flow in one direction?
- ◆ Take an air filled balloon. Prick it with a needle. Does the air rush out?
- ◆ Fill an open vessel with water. Press the surface of the water with your hands. How do you feel?

2.4. Materials Used / Not Used For Heating



Look at the pictures. Write down what you see.

(Wood, Leaves, Paper)



_____ burns



_____ burns



_____ burns

Fuels

- Paper, firewood, dried leaves and charcoal can be burnt.
- Liquids like kerosene, petrol and diesel also burn on heating.
- Domestic gas burns and helps in cooking.

Substances when burnt give out heat. But in some substances, the heat released is very low. Thus, these are not used for heating purpose.

Substances that give out more heat while burning are used for heating purpose. These substances are called **fuels**.

Solid fuels



Coal



Charcoal



Wood

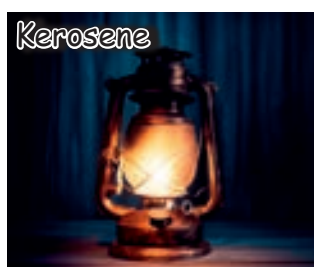


Cow dung

Gaseous fuels



Liquid fuels



Kerosene



Vegetable Oil



Petrol



Electrical energy is also used as fuel for cooking and transporting.

Match the following.

Liquid Fuel

Gas Fuel

Solid Fuel



**EVALUATION****I. Indicate whether the following statements are true or false.**

1. Solids have a definite volume.
2. Liquids can not flow.
3. We can melt any substance by cooling it.
4. Liquids can take the shape of the container.
5. Gases have a definite shape or volume.
6. Matter changes its state when heat is added or removed.
7. A fuel is a substance which gives heat energy on burning.

**II. Fill in the blanks. (Evaporation, Mass, Water, Solid, Stone, Freezing)**

1. The measure of matter in an object is called _____.
2. Change of liquid into vapour on heating is called _____.
3. An example for liquid is _____.
4. The change of liquid into solid on cooling is known as _____.
5. An example for solid is _____.

III. Draw a line to match the objects and their state of matter.

Solid



Liquid



Gas



IV. Answer in a word or two.

1. Which of these is a solid: wood or juice? _____.
2. Which of these is hard : a sponge or a glass or a cloth? _____.
3. What are three states of matter? _____, _____, _____.
4. Name three substances which can change to liquid when they are heated?
5. In which state of matter the particles are very close to each other?
6. What state of matter is rain?
7. Which among the state of matter has definite size but no definite shape?
8. What would cause a liquid to turn into a solid?
 - a) Pouring it into a container
 - b) Heating it until it boils
 - c) Cooling it until it freezes
 - d) Keeping its temperature the same
9. What are some properties of pencil?

V. Find me. (Liquid, Water, Wood)

1. I am a five letter word. I am an essential need for your life. I remain in all the three states of matter. Who am I ?
2. I am a solid. I am obtained from the trees. I am useful for heating. Who am I?
3. I am one among the three states. I have loosely arranged particles. I become vapour on heating. Who am I ?

VI. Describe the word in one sentence.

1. Solid: _____
2. Liquid: _____
3. Melting: _____
4. Evaporation: _____
5. Freezing: _____

VII. Which change of state is taking place in each description below? Use these words.

Freezing

Evaporation

Condensation

Melting

- a) An ice cube turning to water _____
- b) Water turning to ice in a freezer _____
- c) Change of liquid into vapour on heating _____
- d) A bathroom mirror misting up _____

Unit 3

FORCE



Learning Objectives

After learning this lesson, students will be able to

- ❖ define movements and actions
- ❖ define force
- ❖ know different types of forces
- ❖ know the force of friction
- ❖ understand the need and significance of frictional force



3.1 Simple movements and actions

In our daily life, we do different actions such as pushing, pulling, twisting and turning. By doing these actions we move or change the shape of an object.

- Change in position of an object is called **movement**.
- **Action** is the motion which gives the required result.

Let us look at the pictures below to understand movement and action better



The player hits the ball with hockey stick



Boys are riding bicycle

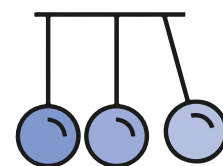
In the above pictures,

What moves? _____, _____

What is the action? _____, _____

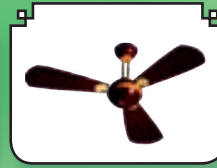
Motion

When an object or a thing moves from one place to another, it is said to be in **motion**.





Let us speak



3.2 Force

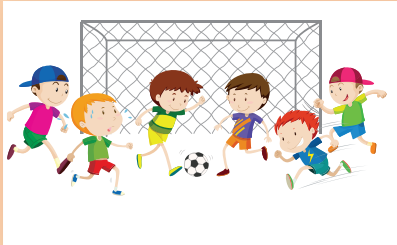
Force is a push or a pull on an object which make it move, changes its shape or stops it from moving.

- Force involves an interaction between two or more objects.
- Force can lift or drop an object.

Without force, we can't move any object.



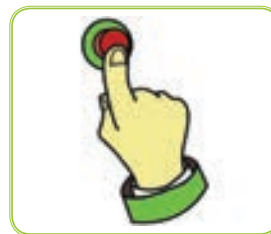
Observe and Discuss



3.2.1 Push



Look and say: What kind of actions do the pictures denote?



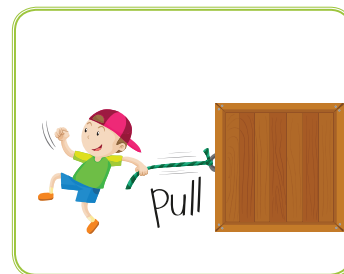
Here, all the pictures show pushing action.

When a force is applied in the direction of an object, it is called **push**.

3.2.2 Pull



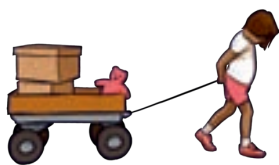
Look and say: What kind of actions do the pictures say?



Here all the actions show pulling action.

When a force is applied in the direction opposite to the direction of an object, it is called **pull**.

Put a tick (✓) mark for the pictures of motion.



Classify the following - Push or Pull?

S.No	Activities	Push / Pull
1	Riding the bicycle	
2	Moving the table towards you	
3	Dragging the chair	
4	Moving a car to start	
5	Opening the window	
6	Stretching the rubber band	
7	Removing the shoe laces	

3.3 Effect of forces



Energy is needed to apply force

Force helps us to do the following things

- Force can change the direction
- Force can change the speed
- Force can stop a moving object
- Force can change the shape

Force changes direction

Here, in the picture, a boy hits the shuttlecock and it reaches the other boy. He hits it again with the racket to move it to the opposite direction.

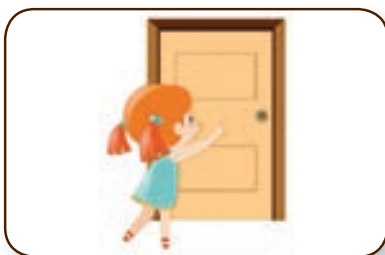


Force changes motion

- The cycle moves forward because force is applied on the cycle by pedaling.
- When we stop pedaling the force is removed and the cycle stops and comes to rest.



Some applications of force in everyday life



Opening the door



Pulling rope in tug of war



Pulling rope from well

Force can change the speed

Force can change the speed of a body which is already in motion by providing more force on it.

Ram and his brother are playing with a toy car. Ram tries to move the toy car and his brother stops it from the opposite direction to slow down the toy car.



Thus, force changes the speed of an object.

Force can stop a moving object



An object stops moving when we apply force in the opposite direction.

- Have you played football game?
- How will you stop the ball?
- The goal keeper applies force and stops the ball.

Force can change the shape

- When an inflated balloon or water balloon is pressed, some force is applied on both sides of the balloon. Thus, it changes its shape.
- While squeezing a plastic water bottle force is applied on all sides of the bottle. Thus, the shape and size of the bottle is changed.



Less force is required in pulling than in pushing.
So it is easy to pull than push an object.

Match the following.



Stops the motion
Changes the direction
Changes the shape
Changes the speed



3.4.Types of force

Contact Force

When a force is applied by touching the object, it is called contact force.

Eg : Lighting a match stick

Contact force is classified into three.

1. Muscular force
2. Mechanical force
3. Frictional force



Non-Contact Force

When a force is applied without touching an object, it is called non-contact force.

Eg. Vacuum cleaner, Magnet.

Non - contact force is classified into two.

1. Gravitational force
2. Magnetic force



Muscular force

The force applied by using the parts of our body is called **muscular force**.

I use my legs to pedal. The force used here is muscular force.



I use my hands to make pots. The force used here is muscular force.



Mechanical force

The force applied by a machine is called **mechanical force**.

Example:

Using bulldozer to dig ground



Grinding using a mixer grinder



Gravitational force

- When you throw a ball up in the air, why does it come down?
- When we jump, why do we come down? Why don't we fly?



Why this happens?

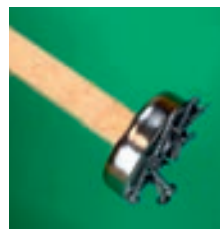
The Earth pulls all the objects towards itself. The force applied by the Earth to pull objects towards itself is called **gravitational force**.

Magnetic force

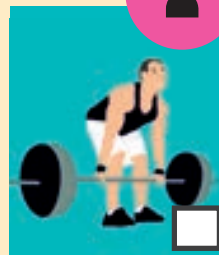
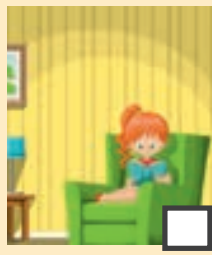
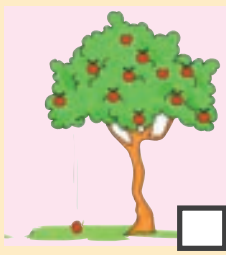
A magnet is a material that attracts things made of iron. The force that attracts things is called **magnetic force**.



Observe the picture and write the kind of force involved here.



Tick (✓) the muscular force.


☐
☐
☐
☐
☐

Frictional force

When we roll down a ball on grass ground, it slows down and finally stops. We know that an object cannot stop without force. The force that stopped the ball is frictional force. Force exerted by the surface when an object moves over it is called **Frictional force**.



Think! Why do we sprinkle powder on the carom board before playing carrom?

3.5 Friction

When we use eraser on a paper, the shape of the eraser changes. Why? It is because of the friction between the eraser and the paper.

Friction is a force actions between two surfaces in contact or when they slide over one another.

Do you Know? Early man accidentally discovered fire by rubbing two flint stones (chikimuki kal) together. The frictional force between two stones created a spark.



Classify



List out the push activities

List out the pull activity

List the frictions here

**EVALUATION****I. Fill in the blanks with suitable words.**

(Push, force, pull, speed, gravitational force, direction, Muscular)

1. A -----is needed to make a stationary object move.
2. The force applied with the help of muscle is called ----- force.
3. ----- and ----- are known as forces.
4. The reason for the fruits to fall from the tree is -----.
5. Force changes the ----- and -----.

II. Match the words with their pictures.

Hitting a ball
Lifting a car
Muscular force
Friction
Pulling
Mechanical force

**III. Answer the following questions.**

1. How do you open the door?
2. Name the types of force.
3. Which force is involved in collecting water from well?
4. What is push?
5. What kind of force is used to make clay pot?

IV. Sujatha places a magnet near some objects. What are the objects that will be attracted from the list given below?

(note, pin, coin, rubber, shirt, comb, tumbler, nail)

V. Think and answer.

Raja throws a ball, a stone, a paper and a leaf up in the air? What kind of force is involved here? What will happen to them?

Unit 4

Science in Everyday Life



Learning Objectives

After learning this lesson, students will be able to

- ❖ apply the knowledge of scientific principles in day-to-day life
- ❖ observe the science that works in the kitchen
- ❖ learn about the value of cooking items and their medicinal properties
- ❖ explore scientific investigations in everyday life
- ❖ measure the boiling point of water and milk



Introduction

What is
Science?

Is Science
important in
our life?



Do you think science is separable from our day to day life?

Science is the study of the natural world around us. We learn science by observing, experimenting and describing.

Science is all around us. Examples of science can be observed from the time we wake up till we go to sleep and even while one is sleeping.

Science influences most aspects of everyday life, including food, energy, medicine, transportation and leisure activities.

How science is involved in daily life?

- ❖ Even in our sleep our body is working continuously. We also see dreams in our sleep.
- ❖ When we eat food, our digestive system is at work.
- ❖ Medicine, vessels and furniture we use are the products of science.

4.1 KITCHEN SCIENCE

If one wants to explore science in its everyday use, then kitchen is the right place to start. To understand how water boils or how idlis are made, we need to know science.

Boiling Water



a)



b)

What do you infer from the above pictures?

The **first** picture shows **boiling water** and the **second** shows **boiling milk**.

What is boiling?

Heating a liquid until it becomes gas is called boiling. Boiling the water means to heat the water until it becomes gas and mixes with the air.

Boiling Point

The **boiling point** of a substance is the temperature at which the liquid boils. At this temperature, the liquid changes into gas.

Benefits of boiling water

- ◆ Destroys germs ◆ Improves digestion
- ◆ Prevents us from the infection of waterborne diseases

Cooking Idli

Idli is a common and usual breakfast of Tamil Nadu.

- ◆ What process is involved in the preparation of idli batter?
- ◆ What type of cooking process is involved in making idli?

Do you know the ingredients used for making idli?

1. Rice (Boiled rice)
2. Black gram (Black Lentils)
3. Fenugreek (Vendayam) and
4. Salt

Idli batter produced from above things is fermented for 8 hours before use.

Idli is cooked by the method called **Steaming**.

Idli is prepared using idli cooker.

Idli Making



Soaking rice and blackgram in water



Grinding



Allowing it to ferment



Steaming in idli cooker



Advantages of Steaming

- ◆ Easy cooking method.
- ◆ Steamed food is easily digested.
- ◆ Steamed food retains Vitamin C and E.

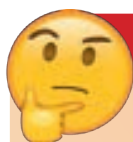
Idiyappam

We cook idiyappam by steaming. Idiyappam is prepared from rice.



Let us Taste - Varieties of Idlies

In order to attract the children and customers, caterers make varieties of idli by mixing the batter with beetroot grate or carrot grate and serve them as beetroot idli or carrot idli.

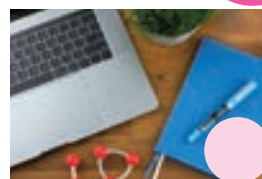
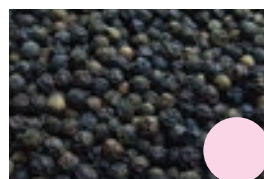


Let us think



The doctor advises patients to have idli or idiyappam. Can you guess why?

Tick (✓) the item which you see in your kitchen.



Tick (✓) the food items which are made by steaming.



Arrange the pictures in correct order.



4.1.2 Home appliances - Pressure Cooker

How would our life be without the following?

1. A light bulb - _____
2. A fan - _____

Things like light bulb and fan are called home appliances.

It is not easy to run our life these days without home appliances. Home appliances are machines that make life a lot easier and convenient. In this section, we will learn about a few such appliances.



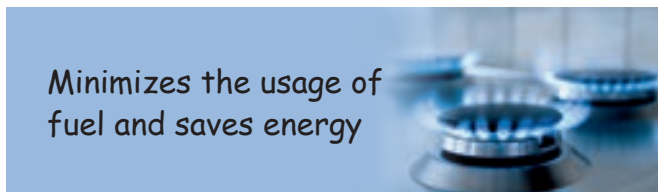
- ◆ Look at the picture and name it.
- ◆ Can you list the uses of pressure cooker?

Cooking food using water in a sealed vessel (cooker) is called **pressure cooking**.

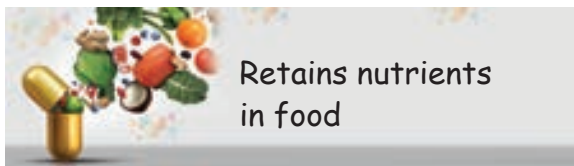
Benefits of Pressure Cooker



Saves time



Minimizes the usage of fuel and saves energy



Retains nutrients in food



Preserves the appearance of food



Pressure-cooking can cook foods four times faster than ordinary cooking.

Let us Discuss



1. Which one takes less time to cook pulses?
a. pressure cooker b. mud pot
2. List out the food items prepared by using pressure cooker.
Discuss with your friends.

4.1.3 Other Home Appliances



Let us learn about some common home appliances and their uses .

Common Home Appliances and their Uses



Gas stove

Cooks faster by controlling heat



Mixer

Grinds hard spices, makes chutney and prepares juices



Grinder

Grinds food grains to produce batter



Vegetable Cutter

Chops vegetables



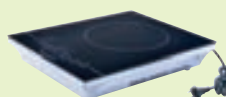
Kettle

Boils water and heats tea and coffee



Electric cooker

Heats and cooks food by using electricity



Induction Stove

Used as a substitute to stove



Coffee Maker

Makes coffee or tea



A **Refrigerator (Fridge)** is a popular home appliance for preserving food. It works on the principle of cooling.

The fridge has a pump that transfers heat from the inside of the fridge to its outside. This helps it to keep things cold.

The cold temperature inside the fridge slows down the bacterial growth in food and thus preserves the food for a longer time.



Safety Measures in Kitchen

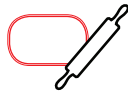
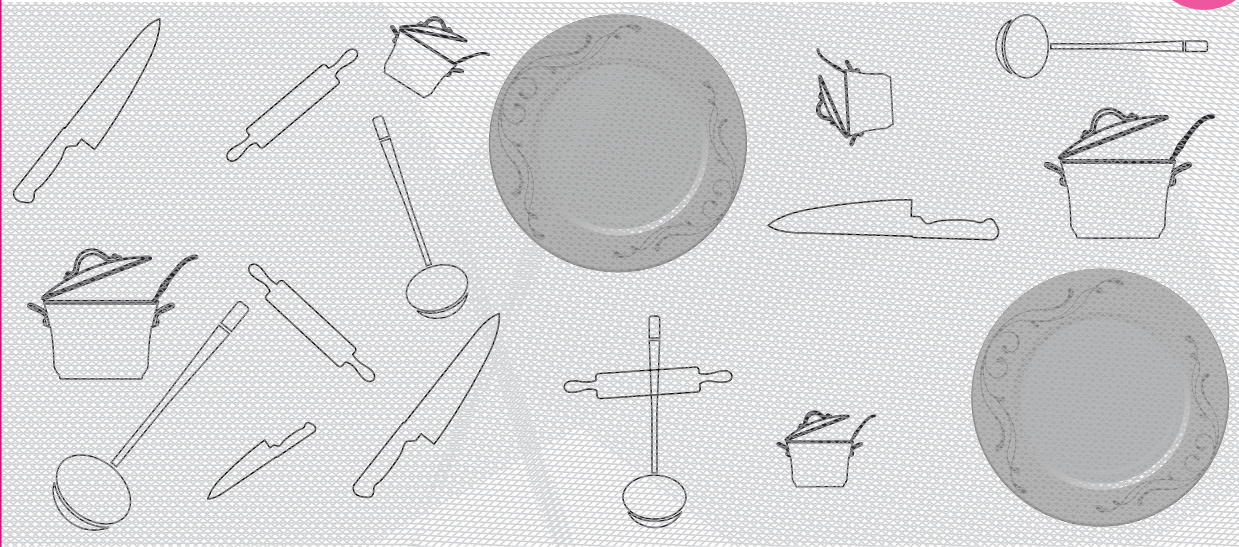
- ◆ Never play with kitchen utensils such as knives, match boxes and glasswares.
- ◆ Use a cloth to hold hot pans.
- ◆ Inform an adult in case you smell cooking gas leakage
- ◆ Turn off the gas stove, microwave oven and any other electrical gadget immediately after use.

Match Column A with Column B.

	A		B
a		-	
b		-	
c		-	
d		-	
e		-	



Count and colour the objects.



10.2 Medicine in the kitchen



In the past times, kitchen medicine was practiced in every house. Housewives knew how to treat some of the ailments of the family members and manage emergencies with what was available in the kitchen.

Is it not amazing to know that we have a pharmacy in our kitchen? Let us learn a few useful things we can use from the kitchen as medicines.

Importance of some kitchen medicines

Garlic



Garlic is called the poor man's antibiotic. It helps to balance blood pressure and reduces symptoms of common cold.

Asafoetida

It improves digestion. It is used as a remedy for diarrhoea and dysentery.



**Ginger**

It helps to improve digestion. It also reduces nausea.

Turmeric

It is a common anti-infectant and it helps to heal wounds.

Black Pepper

It is a great remedy for colds, coughs.

Cloves

It helps to relieve toothache.

Try in your home**Coriander juice**

This juice is made from the coriander leaves. It helps to reduce chest congestion. It is rich in iron and vitamins A, B and C.

**Preparation of coriander tea**

This is made from coriander seed powder. One tablespoon of powder is mixed to two or three cups of water. Jaggery is added and they are boiled for 5 minutes. It improves digestion.



What are your favourite food items? Do you know the ingredients of them? Do they have any medicinal value? If so, fill in the table.



My favourite food	
Ingredients	Medicinal value

10.3 Simple Scientific investigations in Daily Life



The curiosity of science starts from home. It is promoted by simple scientific investigations of the things that the children see around them or use daily like, why the leaves are green in colour? What is the difference between the sun and the moon? How does the television work?

Shall we learn about few simple investigations?

10.3.1 Real and Shadow

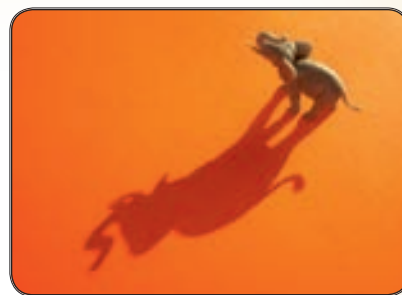


For what ?

To learn how the shadows are formed.

How?

1. Make the classroom dark.
2. Light a candle.
3. Place a toy near the candle. What do you see?
4. Move the toy away from the candle. What do you see? Move the toy closer to the candle. What do you look at?
5. Experiment and see what happens to the shadow if the light source is dim?



Complete the sentence:

- ◆ Moving the toy closer to the candle made its shadow _____.
- ◆ While moving the object away made its shadow _____.
- ◆ The big candle is bright and gives _____ shadow.
- ◆ The small is dim and gives _____ shadow.

Lava in a Cup

You will Need: A tall glass cup, 1/4 cup vegetable oil, 1 teaspoon salt, water, food colour.

What to do?

1. Fill the glass about 3/4 with water .
2. Add about 5 drops of food colour (Red).
3. Slowly pour the vegetable oil into the glass.
See how the oil floats on top.
4. Sprinkle the salt on top of the oil.
5. Watch blobs of lava move up and down in your glass! Add another teaspoon of salt to keep the effect going.





What happens when you

add oil to water?	
add colour to the mix?	
add salt to the mix?	

First of all, the oil floats on the top of the water because it is lighter than the water. Since the salt is heavier than oil, it sinks down into the water and takes some oil with it, but when the salt dissolves, the oil goes up again. Is it not interesting?

10.4 Measuring Temperature of Water and Milk using Thermometer



- Have you seen this device?
- Where have you seen this?
- Do you know the use of thermometer?

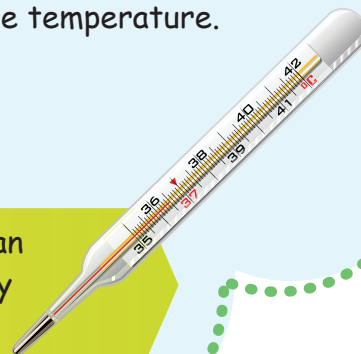
Usually, our body temperature is lower in the morning; it increases during the day and is highest in the evening. Other than this, a rise in body temperature is usually caused by an infection. Using a thermometer to check our temperature can help us manage any illness.

What is a thermometer?

Thermometer is an instrument used for measuring body temperature. It consists of a narrow, sealed glass tube, marked like a scale. The markings show the temperature.



Daniel Fahrenheit, a German physicist, invented mercury thermometer in 1714.



Let us measure the boiling point of water using thermometer

Boiling point of water is 100°C

Things Needed : Water and thermometer

Procedure :

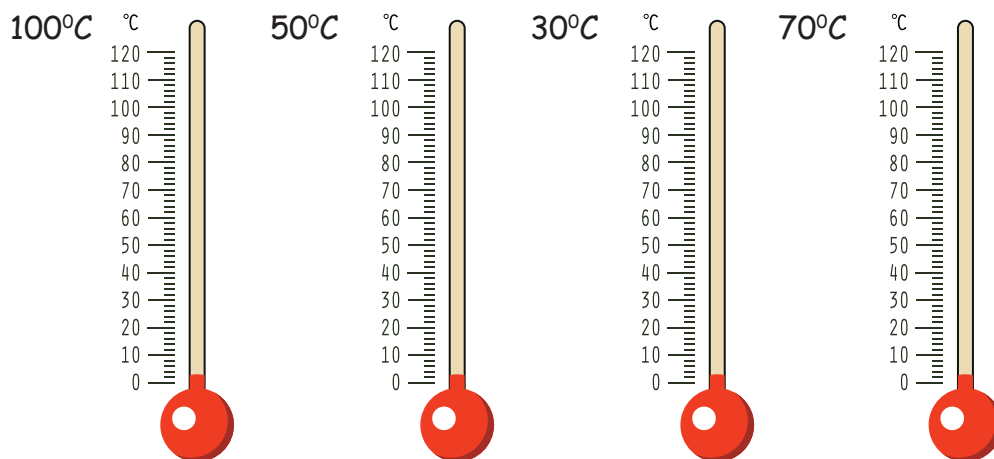
Heat the water. Measure the initial temperature, when the water starts to boil. Allow it to boil for few more minutes, measure the temperature.

The temperature remains the same when the boiling point reaches 100°C and continues to boil for some more time.

Similarly, the boiling point of milk can also be measured using thermometer.



Colour the thermometer to match the temperature written in the box.



EVALUATION

I. Say whether the following statements are true or false.

1. When we boil water, bacteria are destroyed.
2. Idli is cooked by the process called steaming.
3. Thermometer is used to measure pressure.
4. Refrigerator helps to keep things cold.
5. Garlic relieves hiccups and nausea.
6. Boiling point of water is 100°C .



II Circle the name of the things from which idli is made.

Rice	Groundnut	Chilli	Black gram	Red gram
Water	Salt	Pepper	Sugar	Fenugreek



III. Match the home appliances and their functions.



Makes coffee

Preserves vegetables

Boils water

Makes batter of food grains

Cooks faster



IV. Which of these are safe to do at home? Put (✓) or cross (×) in the box.

1. Touching electrical appliances
2. Playing with sharp objects
3. Playing in kitchen
4. Keep safe distance from the gas stove and cylinder

☐
☐
☐
☐

V. Answer in a word or sentence.

1. How do you store fruits and vegetables for a longer period?
2. Name the instrument used to measure temperature.
3. How is idli prepared?
4. What is the use of black pepper?
5. Which kitchen medicine is called the poor man's antibiotic?

VI. Answer the following.

1. Write the uses of boiled water.
2. Write the advantages of pressure cooker.

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