Matter and Materials

Unit 2

Learning Objectives

After learning this lesson, the students will be able to

- classify the materials based on their properties
- conduct simple investigations related to materials
- realize the importance of matter and materials in daily life
- differentiate Transparent, Translucent and Opaque objects

I. Materials

K3SUD

Everything in the universe is made up of matter. We need to explore many different materials to make sense of our world.

The matter from which a thing is made of is called Material.
For **example:** Chair is made of wood, Eraser is made of rubber, Candle is made of wax.

Try to Answer

Look at the pictures and identify the materials by which they are made of:
(paper, clay, glass, wood, plastic, metal rubber, wax)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Try to Answer

Match the objects that are made of same material.

A	B	C
		
		
		

II. Properties of Materials

We can measure, see or feel the materials. Different types of material have different properties that make them useful for various purposes. Most materials have more than one property. They can be hard or soft, shiny or dull, smooth or rough and flexible or rigid.

1. Hard and Soft Materials

Materials which cannot be easily compressed, cut, bent or scratched are called **hard materials**.
Example: Brick, bone and steel.

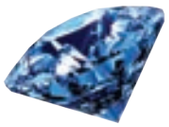
Materials which can be easily compressed, cut, bent or scratched are called **soft materials**.
Example: Foam, clay and skin.

Try to Answer

Write whether the given materials are hard or soft.

Wood	Eraser	Cotton

2. Shiny and Dull Materials



Materials which reflect the light well are called **shiny materials**. Example: Stainless steel, gold and diamond.

Materials which do not reflect the light well are called **dull materials**. Example : Candle, paper and jute bag.

Try to Answer

Collect some objects from your house and classify them as shiny or dull materials.

3. Rough and Smooth Materials

Materials which have ups and downs on their surface are called **rough materials**. **Example:** Brick, rock and tyre.

Materials which do not have ups and downs on their surface are called **smooth materials**. **Example:** Mirror, Silk cloth and tiles.

Try to Answer

Sort the given objects as rough or smooth.

Wet soap	Coir	Feather	Stone

Glass ball	Paperboard	Sand paper	Plastic spoon

4. Flexible and Rigid Materials

Materials which can be bent or stretched easily are known as **flexible materials**. **Example:** Rubber band, electric wire and cycle tube.

Materials which cannot be bent or stretched easily are known as **rigid materials**. **Example:** A stick, wooden scale and stone.

Activity

Test the flexibility.

Give one plastic scale and wooden scale to the students. Ask them to bend. Tabulate their observation (bends, does not bend).

Plastic Scale	Wooden Scale

5. Waterproof Materials

Materials that do not allow water to pass through them are called **Waterproof Materials**.

Example : Raincoat and aluminium foil of tablet strip.

Think and answer

Do you have a raincoat? What is its use?

Activity

Take a glass bowl. Fill three fourth of it with water. Put an orange fruit with peel and an orange fruit without peel. Observe which orange floats? Why?

III. Transparent, Translucent and Opaque objects

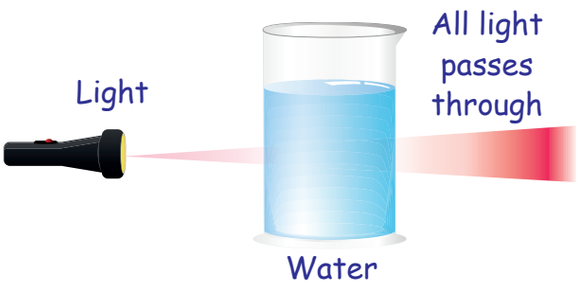
Have you ever seen through the bus window?

SR8XN

Some objects allow light to pass through them. This helps us to see through them as the window of a bus. Let us see how different objects behave with light.

1. Transparent Objects

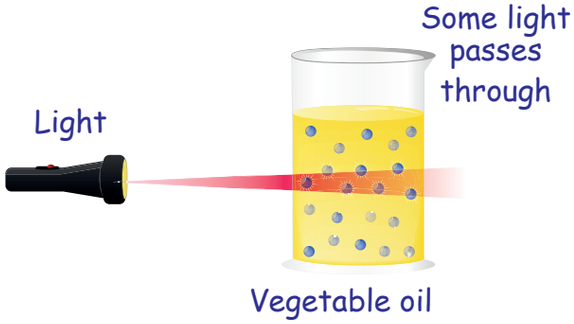
Transparent objects allow the light to pass through them. So, we can see other objects clearly through **Transparent Objects**. **Examples:** Air, glass and pure water.



2. Translucent Objects

Translucent objects allow some light to pass through them. So, we cannot see objects clearly, but we see them as blurred images through them.

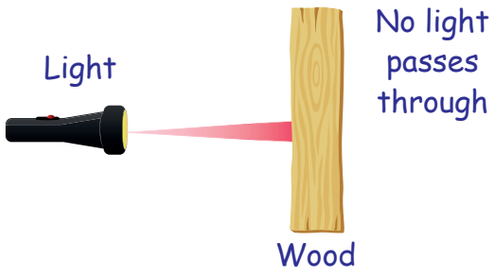
Examples: Paper soaked in oil, snow and vegetable oil.



3. Opaque objects

Opaque objects do not allow light to pass through them. So, we cannot see through these objects.

Examples : Wood, stone and metals.



Think and answer

Why should we build the walls of the house with bricks (opaque material) instead of glass (transparent material)?

Activity

Complete the Worksheet

Name : Class :

Date : Unit : 2. Matter and Materials

Complete the sentence in you own words.

1. Transparent objects allow _____
2. Translucent objects allow _____
3. Opaque objects allow _____

Try to Answer

Write whether the objects are transparent, translucent or opaque.






IV. Reflection of Light

We sea the world around us with the help of **light**. Where do we get light from? Light may come either from the Sun or from other sources like an electric lamp or a bulb. The objects that give off light are called **light sources.**

When light falls on a transparent material it passes through it. However when light falls on a polished surface of an opaque material, it does not pass through it. It bounces back. The bouncing of light by any smooth or polished surface is called reflection.

When you look into the mirror, you can see your own face on the mirror. What you see is a reflection of your face in the mirror. We also see reflections of other objects that are in front of the mirror. These reflections are formed by light and they are called **images.**

Try to Answer

Try to see your face on some materials like mirror, exam pad, new stainless steel plate, table top and water in a plate. What are the materials that show your face clearly? Do you know why?

Activity

Reflection of Light

Material Required/Needed

A plane mirror and a torch light

How to do?

1. Make your room dark by closing the door and windows.
2. Ask your friend to hold a mirror in his/her hand at one corner of the room.
3. Stand at another corner with a torch in your hand.
4. Switch it on.
5. Direct the light from the torch onto the mirror.
6. **Answer the following from your observation:**

   a) When you change the angle of the mirror, what happens to the light?

   b) Are you able to direct the reflected light using the mirror?

More to know

Mirrors can reflect sound waves too. So they were used in the **Second World War** to detect sounds coming from enemy aircraft.

Evaluation

KG3F5

I Find the odd one.

1. brick, coir, silk cloth, pine apple
2. stone, rubber band, cycle tube, electric wire
3. sun, candle, torch, pen
4. umbrella, sponge, rain coat, jerkin
5. glass bottle, exam pad, paper plate, wooden board

II Fill in the blanks.

1. Materials which can be compressed or cut easily are called _____.
2. Gold and diamond are the examples of _____ materials.
3. Materials which can be bent or stretched easily are called _____.
4. _____ objects allow all the light to pass through them.
5. _____ is the natural source that stimulates sight and makes things visible.

III Match the following.

1. Light source	-	Glass
2. Waterproof	-	Vegetable oil
3. Transparent	-	Sun
4. Translucent	-	Metal
5. Opaque	-	Rain coat

IV Say True or False.

1. We cannot compress, cut or bend the rough materials easily.
2. Dull materials reflect light.
3. Sand paper is a good example for smooth materials.

4. Opaque objects do not allow light to pass through them.

5. Mirrors change the direction of light that fall on them.

V Answer the following.

1. When can you say a material is waterproof material?
2. What is a light source?
3. What is the difference between transparent and opaque materials?
4. Define reflection.
5. Classify the objects given below as transparent, translucent or opaque materials.

(Air, Rock, Water, Aluminium foil, Mirror, Snow, Wooden board, Polythene bag, CD, Oil soaked paper, Glass tumbler and Coloured glass)

Transparent Materials	Translucent Materials	Opaque Materials

VI Projects

Collect some rough and smooth materials from your surrounding.