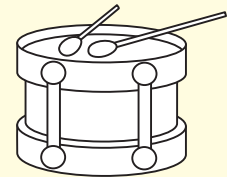
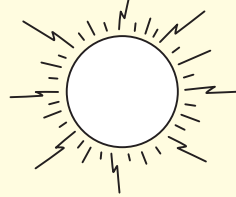
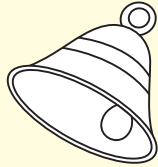


BEFORE WE START, LET'S CHECK

What you already know

Colour the things which give light, red  and which make a sound, green .



What you will know

What are the sources of light?



How is a shadow formed?



What is the difference between a sound and a noise?



What are force and friction?



LIGHT

Can you see anything in the dark? No, you need light to see things. The sun is the main source of light on the earth. But how are we able to see things at night without the sun? The early man discovered fire for this purpose. Now, man has made many objects that give out light.

Objects that give out light are called **luminous objects**. The sun and the stars are natural luminous objects. While torches, bulbs, candles, tube lights, etc. are man-made luminous objects.

Objects that do not give out any light are called **non-luminous objects**. Such objects become visible only when light falls on them.



some luminous objects



some non-luminous objects

Shadow

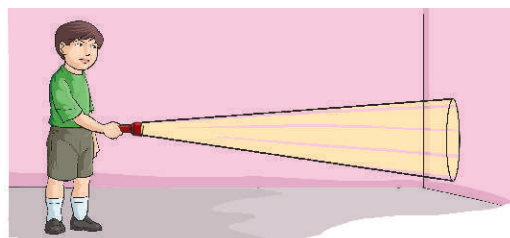
Light always travels in a straight line. You can check this by using a torch. Go to a dark room with a torch. Switch on the torch. You will see a straight beam of light coming out from the torch.

When an object blocks the path of light, a **shadow** of the object is formed. You can see your shadow on the ground on a sunny day.

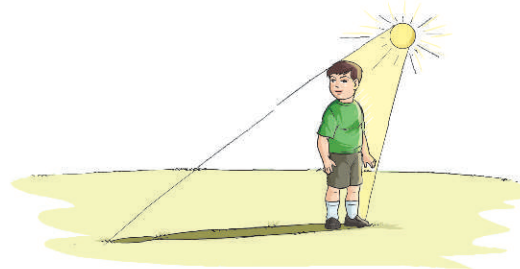
There are three important facts about a shadow:

1. A shadow is always formed on the opposite side of the source of light.
2. A shadow always appears to be black or dark irrespective of the colour of the object.
3. A shadow may be bigger or smaller than the object.

Do all objects cast a shadow? Let's check.



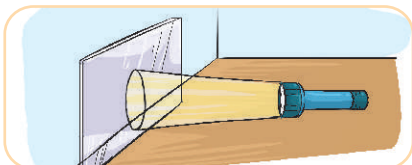
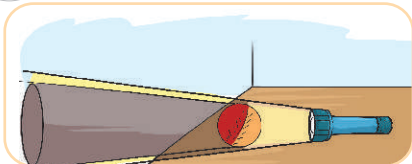
Light travels in straight line.



formation of shadow



Fun and Learn



- Place a ball in front of a wall.
- Switch off all lights and switch on a torch behind the ball.
- The shadow of the ball is seen on the wall.
- Now remove the ball and place a piece of glass instead.
- Switch on the torch again.
- You will not see any shadow on the wall.

You see that a ball forms a shadow but a piece of glass does not. Why? It happens because the piece of glass does not block the path of light. It allows light to pass through it.

So we can divide objects into two kinds.

Some objects like balls, books, etc., do not allow light to pass through them. They block the path of light. Such objects are called **opaque** objects. Shadows are formed only of opaque objects.

Some objects like glass tumblers, colourless thin plastic sheets, etc., allow light to pass through them. They are called **transparent** objects. Transparent objects do not cast shadows.

Eclipse

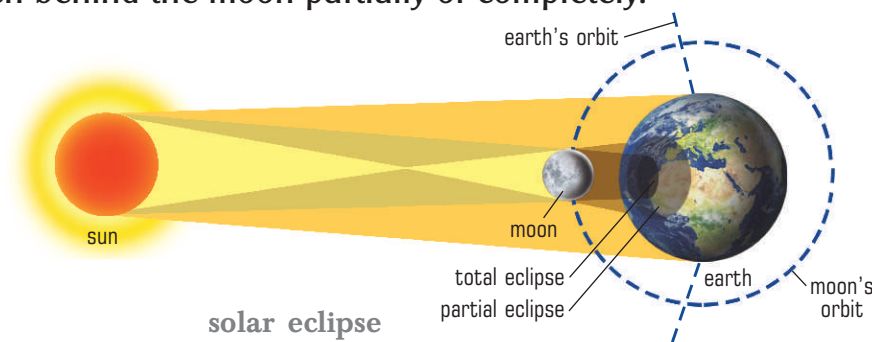
The earth revolves around the sun. The sun's light falls on the earth.

The moon revolves around the earth. The moon reflects the light of the sun.

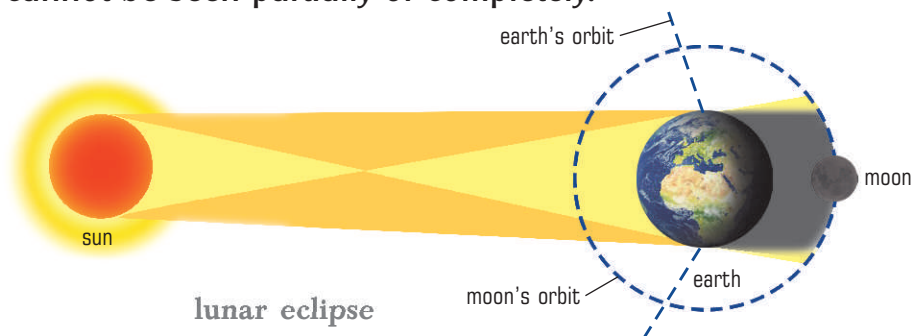
Sometimes, the earth or the moon blocks sunlight and its shadow is formed. This phenomenon is called an **eclipse**.

There are two types of eclipses.

Solar eclipse: It occurs when the moon comes in between the sun and the earth. The moon then blocks the path of sunlight. A shadow of the moon falls on the earth. The sun is hidden behind the moon partially or completely.



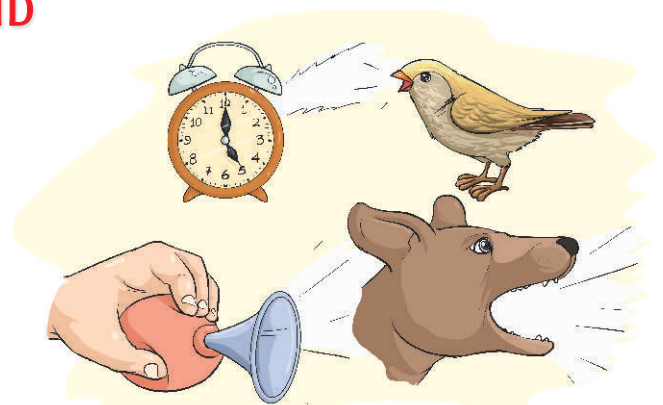
Lunar eclipse: It occurs when the earth comes in between the sun and the moon. The earth blocks the path of sunlight. A shadow of the earth is formed on the moon, and the moon cannot be seen partially or completely.



SOUND

From the time we wake up to the time we go to sleep, we hear a variety of sounds. We hear the ringing of an alarm clock, the chirping of birds, the honking of horns, the barking of dogs, etc. throughout the day.

We also make sounds when we talk. We hear sounds of all kinds with the help of our ears.



Types of sounds

A sound is a form of energy. Every thing, whether living or non-living, can produce a sound.

There are many types of sounds.



Some sounds are low.



Some sounds are high.



Some sounds are soft.

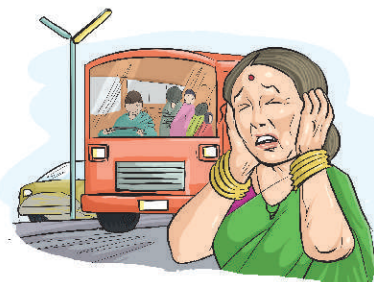


Some sounds are loud.



Sounds that are low and soft are usually pleasant to listen to, while high and loud sounds are unpleasant.

Unpleasant sounds are called **noise**.



Too much of noise is bad for our ears and health. Everyone gets irritated with noise. We should

- * learn to speak in a low voice.
- * play music systems, TV, etc. on low volume.
- * avoid the use of horns as far as possible.

FORCE

In our daily lives, we often push or pull things. A push or a pull is called **force**.



You push a door to open it.

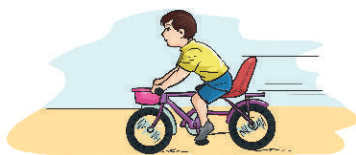


You pull a toy car.



You pull up your school bag.

Force helps us to do many things.



Force can move an object.



Force can stop a moving object.



Force can change the shape of an object.

Friction

Roll a ball along the ground. You will see that the ball moves to a certain distance and then stops on its own. Why does it happen?

It happens because a special kind of force is applied to it by the ground surface. This force is called **friction**.

Friction develops between two bodies when they touch each other.

Friction slows down or stops a moving object.

Friction is less between smooth surfaces and greater between rough surfaces.



Words to Remember

luminous object	– an object that gives out light
non-luminous object	– an object that does not give out light
shadow	– the shape formed when an object blocks the path of light
opaque object	– an object that does not allow light to pass through it
transparent object	– an object that allows light to pass through it
eclipse	– a phenomenon in which the moon or the earth blocks the path of sunlight and its shadow is formed
noise	– an unpleasant sound
force	– a push or a pull
friction	– the action of one object or surface rubbing against another

Points to Recall

- * We cannot see anything without light
- * Some objects are luminous, that is, they give out light. The rest are non-luminous.
- * When an object blocks the path of light, its shadow is formed.
- * A shadow is always formed on the opposite side of the source of light
- * Only opaque objects cast shadows, transparent objects do not
- * A shadow of the moon on the earth causes a solar eclipse.
- * A shadow of the earth on the moon causes a lunar eclipse.
- * We make and hear sounds of many kinds.
- * We should not make or hear unpleasant sounds called noise.
- * A push or a pull is called force.
- * Force can move an object, stop or slow down a moving object, or change the shape of an object
- * Moving things slow down or stop on their own because of friction.

Exercises

A. Tick (✓) the correct option.

1. Which of the following is a luminous object?

(a) fan



(b) bed



(c) lamp



(d) sofa



2. Which of the following is a non-luminous object?
 (a) bulb ☐ (b) cooler ☐ (c) tube light ☐ (d) candle ☐
3. The shadow of a red balloon will be
 (a) orange ☐ (b) pink ☐ (c) red ☐ (d) black ☐
4. Which of the following is a transparent object?
 (a) a wooden spoon ☐ (b) an iron pan ☐
 (c) a glass tumbler ☐ (d) all of these ☐
5. Which of the following is a kind of force?
 (a) push ☐ (b) pull ☐ (c) friction ☐ (d) all of these ☐

B. Fill in each blank with the correct word.

1. A _____ (*solar* / *lunar*) eclipse occurs when the earth comes in between the sun and the moon.
2. A shadow is formed on the _____ (*same* / *opposite*) side of the source of light.
3. The sound of a musical instrument is _____ (*pleasant* / *unpleasant*).
4. We should play music on _____ (*high* / *low*) volume.
5. Friction is _____ (*less* / *more*) between smooth surfaces.

C. Answer in one or two words only.

1. What is the main source of light on the earth? _____
2. Name one naturally non-luminous thing. _____
3. What is the colour of all shadows? _____
4. During a solar eclipse, which heavenly body is in the middle? _____
5. What are loud and unpleasant sounds called? _____

D. Answer in one sentence only.

1. What is a luminous object?
2. What is the size of the shadow of an object?
3. When do we make sounds?
4. What is noise?
5. What is force?

E. Answer in two or three sentences.

1. When are shadows formed?
2. What kind of objects do not cast shadows and why?
3. How can we reduce noise?
4. Write three things that force can do.
5. Why does a ball rolling along the ground stop after some time?



BRAINSTORM

1. Would we be able to walk if there were no friction?
2. 'Sneeze' is a word refers to a sound that people make. Write four more such words.
3. The moon looks bright. Is it a luminous object?



TELL YOUR TEACHER

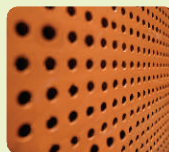
Read the following activities. Tell your teacher what right or wrong thing each child is doing.

- It is a bright sunny day. Neha's mother is going to the market for shopping. Neha also wants to go. So she goes to her room and puts on her sunglasses.
- Mr Sharma is Raja's neighbour. He has been very ill for the last three days. Raja is having a birthday party today. He and his friends are making a lot of noise.
- Bobby is ringing the doorbell of his neighbour again and again and then running away.

FIND OUT



Why do the shoes of a football player have studs on their soles?



Why do theatres and auditoriums have small holes in their walls?

Project

Take a sheet of chart paper. Draw two large circles on it side by side. Write 'Luminous Objects' below one circle and 'Non-luminous Objects' below the other. Now collect pictures of five luminous objects and five non-luminous objects. Paste the pictures on the circles suitably. Write your name in a corner and submit it to your teacher.



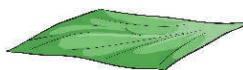
Activity Time

Making and playing a plastic drum

Things you need:



a plastic bowl



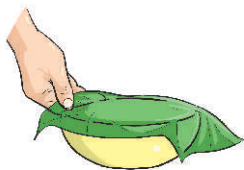
a plastic sheet



a large rubber band



a pencil



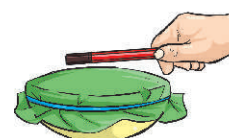
1. Put the plastic sheet on the rim of the bowl.



2. Fix the sheet across the bowl putting the rubber band on it.



3. Stretch the sheet tightly across the bowl.



4. Strike it gently with a pencil. The sound of a drum is produced.

Virtual Tour

For more information visit:

- http://www.bbc.co.uk/bitesize/ks2/science/physical_processes/shadows/read/1/
- <http://easyscienceforkids.com/all-about-force-push-and-pull/>