Unit 4

Things Around Us

About the Unit

This unit at the preparatory stage aims to familiarise students with various things around them—how things work and how things are made. In Grades 3 and 4, students have engaged with local toys like (spinners and paper boats) to understand how they work. They have also learned about how things are made by exploring the processes of bricks, paper, etc.

While making things with locally available materials students learn useful methods of sustainable development, including refuse, reduce, reuse, repurpose and recycle (the 5Rs) so that they can make responsible decisions. By making things with their own hands, they develop a deeper appreciation for the materials we use in everyday life, and also learn to connect and care for their environment.

In Grade 5, this unit invites students to explore how everyday things, like energy and cloth, are made and used. Through simple activities and local examples, they learn how energy enables movement and light, how threads become fabric, and why reusing things and clean energy matter. It helps them see the unseen processes behind familiar things in their homes and surroundings.

Note to the Teacher

The unit consists of two chapters: Chapter 7 'Energy—How Things Work' and Chapter 8 'Clothes—How Things are Made'.

Chapter 7: Energy—How Things Work

- 'Energy—How Things Work' introduces students to the concept of energy by connecting it with everyday experiences. They learn about the different forms of energy used at home and society. Through hands-on activities and examples, students explore how energy makes things work, and the importance of using clean and efficient energy. The simple hands-on activities enable students to play and learn about energy, and its possible uses.

Chapter 8: Clothes—How Things are Made

- 'Clothes—How Things are Made' explores how cloth is made; starting from natural patterns like birds weaving nests, to human methods of spinning, weaving and stitching. Through hands-on activities and stories from across India, students learn how threads become fabric, discover local traditions like handloom and embroidery, and understand the value of reuse, recycling and creativity in everyday materials.

How to Facilitate

- Teachers may use the chapter to help students connect everyday objects, like clothes, fans or stoves to larger ideas of work, energy and making.
- Encourage students to observe and document local practices—how people cook, keep warm or cool, stitch, or reuse cloth in their homes or community.
- Help students see weaving, stitching, and energy use as a part of local knowledge and skills, embedded in their family, neighbourhood and region.
- Explore why people in various regions wear different clothes or use many kinds of fuels—linking local diversity to geography, tradition and availability of resources.
- Encourage students to reflect and take pride in their surroundings, and to recognise how everyday actions and skills in their homes, schools and communities are part of India's encouraging story.

7 Energy—How Things Work

What is Energy?

In a kitchen, we can see a variety of activities.

Let us observe a kitchen for some time. Write your observations and the questions that come to your mind in the table given below.

I Observe	I Wonder
The food is getting cooked.	How is it being cooked?

Similarly, we observe different kinds of activities in nature and society.

From your observation write down at least three things that you have noticed:

- Moving

- Providing light

- Making a sound

- Making things cool

- Making things hot

Discuss

What makes these things move, shine, make a sound or get warm and cold?

As you know, the Sun gives us light and heat. Around us, things move, light up, make sounds, or get warmer or cooler. Something makes this all happen—we call that energy.

Energy is what makes things move, light up, produce sound, do work and change temperature.

We use energy every day in so many ways, to make things move, produce sounds or do work, sometimes

without even noticing. Let us explore how energy works through these simple and fun activities.

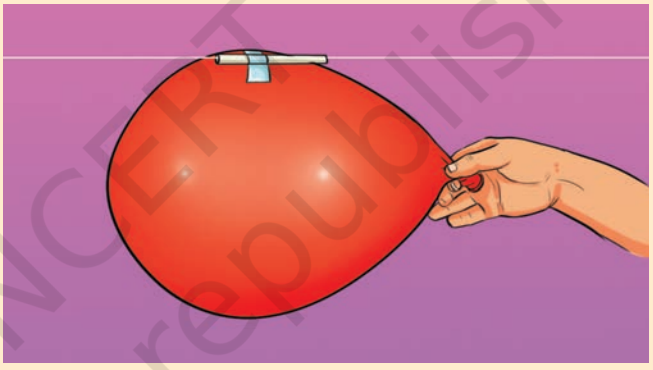
Activity 1

1. Take a balloon and blow into it until it fills up.
2. Hold it tightly.
3. Then, release the mouth of the balloon and observe what happens.

When air rushes out of the balloon, it pushes the balloon forward. This is how the movement of air generates energy.

Extension Activity: Balloon Air Rocket

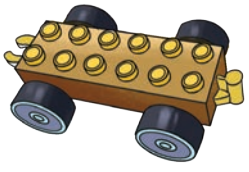
1. Fill the balloon with air, and attach it to a small and light object to make it move.



2. Fill the balloon with air and attach it to a straw with tape. Pass a string through the straw. Now, release the balloon and watch it move along the string.

Think

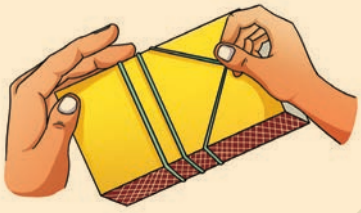
What would you change in the activity to make the toy move faster or slower?



Activity 2

Rubber Band Guitar

1. Make a hole on the top of a cardboard box.
2. Stretch rubber bands around the box and across the hole.
3. Place a ruler or pencil under the bands at one end to raise them.
4. Pluck the bands and listen to the sounds produced.



Plucking the rubber bands makes them vibrate and produce sounds. This is known as sound energy.

Think

What happens if you use thinner or thicker rubber bands? Do they sound different?

Activity 3

Sun-powered Water Warmer

1. Fill two cups with water.
2. Place one cup in the sunlight and another in the shade.
3. Wait for 15–20 minutes and then touch the water in both the cups. What do you notice?

The water kept in the sunlight is warmer because the Sun heats it up. This shows how the sunlight gives us heat energy.

Do you know?

In some places of Himachal Pradesh, Uttarakhand and Ladakh, people often keep their cattle on the ground floor of their houses, while the family lives on the floor above. The heat from the animals helps keep the rooms warm during the winter. This is a clever way to stay warm in cold regions without using extra firewood or electricity.

Sources of Energy

The teacher asked the class, "Did all of you eat your breakfast this morning?". Everyone replied, "Yes!".

Then the teacher said, "Let us do an activity—stand up and stretch your arms. Now, jump! Run in place."

"How are you able to move?", she questioned.

"We are able to move because of energy." All students replied.

The teacher continued, "How do you feel when you are hungry? When we do not eat, we may feel tired, and when we eat, we feel active and ready to play. What do you think could be the reason? This is because the food we eat gives us the energy we need".

Do you know?

Our brain uses energy even when we are simply sitting, sleeping or thinking.

Now, let us think about animals. A dog running, a bird flying… just like us, animals also need energy to move, fly, swim, run, find food and protect themselves.

But from where do they get this energy?

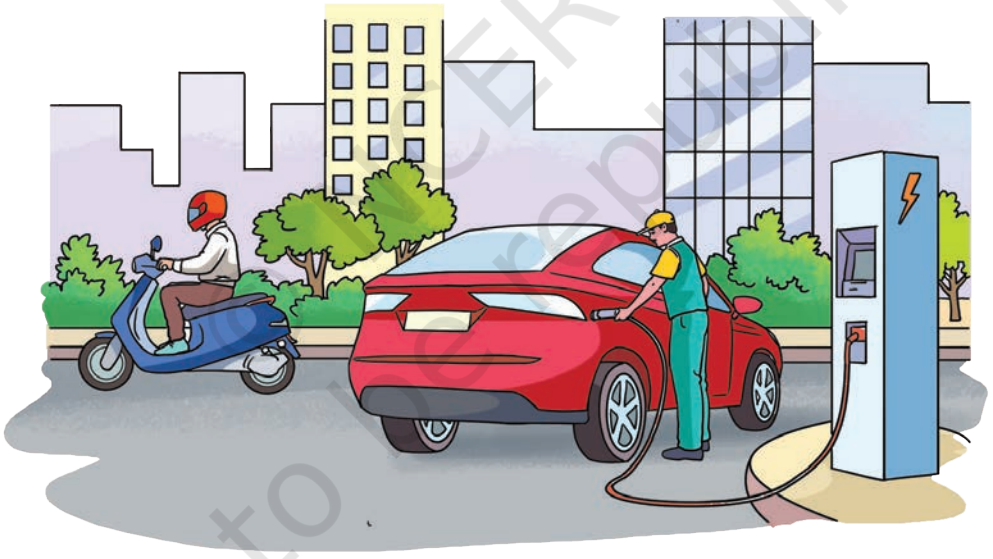
They get it from food too. Food is a source of energy for all living things.

Energy from Fuel

We see vehicles move on our busy roads.

Think

What do cars and scooters need to keep running?



Fuels such as, petrol and diesel are the sources of energy for vehicles, just like food is ours.

Write

How is food cooked in your house?

Cochin International Airport in Kerala is the world's first airport to be entirely powered by solar energy.

We use fuel in our homes too. Cooking gas is a fuel. In some places, people use wood or coal to cook food. But burning wood or coal creates smoke and pollution, so we must use it carefully.

Discuss

1. What kind of fuel do you use at home for cooking?
2. What are the problems using too much wood or coal?

Activity 4

Understanding How Fuel Works

1. Place two diyas (lamps) on a flat surface.
2. In Diya 1—place a cotton wick without any oil, and in Diya 2—place a cotton wick and pour some oil around it.
3. Light the wicks in both the diyas under adult supervision.
4. Observe what happens to the diyas.
   (a) Which diya burns longer? Why?
   (b) What is acting as a fuel here?

The oil is the fuel. We use different fuels in our daily lives for many activities, such as cooking, lighting diyas and running vehicles.

Electricity

What are the things in your home that need electricity to work?

Activity 5

Walk around your home or classroom. Identify five things that run on electricity. Fill in the following table.

S. No.	Device	What it does?	What it requires? (light/ sound/heat/movement/ cooling/other)
1.	Fan	Blows air	Movement
2.			
3.			
4.			
5.			
6.			

From the above examples, did you notice that electricity can be used for movement, and producing sound, light and heat?

Traditional houses in India had small windows and thick walls. This kept the house cool in summer and warm in winter.

Think

What would your day be like if there was no electricity at all?

Our lives have become so easy with electricity. Not only our homes and schools, but many industries also use electricity to run machines. They help produce many things that we need—like clothes, toys, books, food, and even the scooters or cars that we use!

Electricity is very useful, but it can also be dangerous if it is not used carefully.

Do you know?

Energy efficiency means using less energy to do the same work. This helps save resources and reduce waste. For example, using LED bulbs instead of incandescent or fluorescent bulbs gives the same amount of light, but uses less electricity.

Safe Use of Electricity

- Do not touch wires or parts of electrical devices when they are plugged in.
- Do not put your fingers or other things such as, pens or sticks into electrical sockets.
- If you see broken wires or fallen electric poles, stay away and tell an adult about it immediately!
- Don't play near electric boxes or transformers.
- If something looks unsafe or strange, do not try to fix it yourself; always tell an adult!

Most of the electricity we use comes from burning fuels like coal. However, burning coal creates a lot of smoke and harmful gases that pollute the air. This polluted air is not good for our health and the environment.

Nevertheless, there are other sources we can use to produce electricity that do not cause pollution. Can you find out what these sources are?

Generating Energy from the Sun, Wind and Water

Think

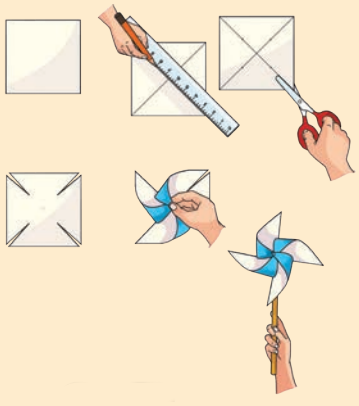
Place a small damp cloth in the Sun. Keep another damp cloth in the shade. Which one do you think will dry first? Why?

Let us look at some more examples. You may take help from elders or your teacher to do the following activities.

Activity 6

Pinwheel

1. Take a square piece of paper.
2. Draw its two diagonals with the help of a ruler.
3. Now, you have four equal parts.
4. Cut halfway along each of the four lines.
5. Fold each corner and pin it to the stick as shown in the image.



In hilly areas, watermills called gharaats use flowing water to grind grains.

6. Now, hold your pinwheel in the wind. If there is no wind, hold it up and run with it.

What happens to your pinwheel?

Activity 7

Sunlight in Focus

1. Take a piece of paper and a magnifying glass.
2. Place the paper in direct sunlight and use the magnifying glass to focus the light on it.

Tip: The activity has to be done under adult supervision.

3. What happens to your paper?

Activity 8

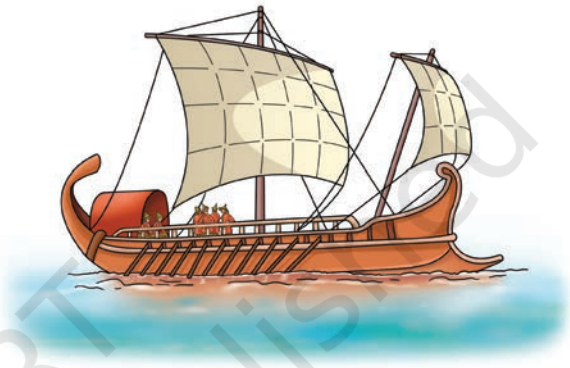
Water Wheel

1. Take an empty paper cup and five spoons.
2. Make five holes around the cup and insert the spoons.
3. Then, insert a pencil or straw through the bottom of the cup.
4. Observe that the cup moves around the pencil like a wheel.
5. Balance your wheel on a container as shown in the image.
6. Now, pour water onto your wheel.
7. Does the water make the wheel move?

Do you know?

Ancient ships had massive sails that used wind energy to travel across the vast seas. Long ago, traders from places like Gujarat and Tamil Nadu sailed to Africa, Arabia, and Southeast Asia using the power of the wind.

The pinwheel rotated, the paper burned and the water wheel spun—all these activities show us that the wind, the Sun, and water are sources of energy that make things work.



Think

Have you ever seen *papads* being dried in the sunlight and clothes hung out to dry?

Write

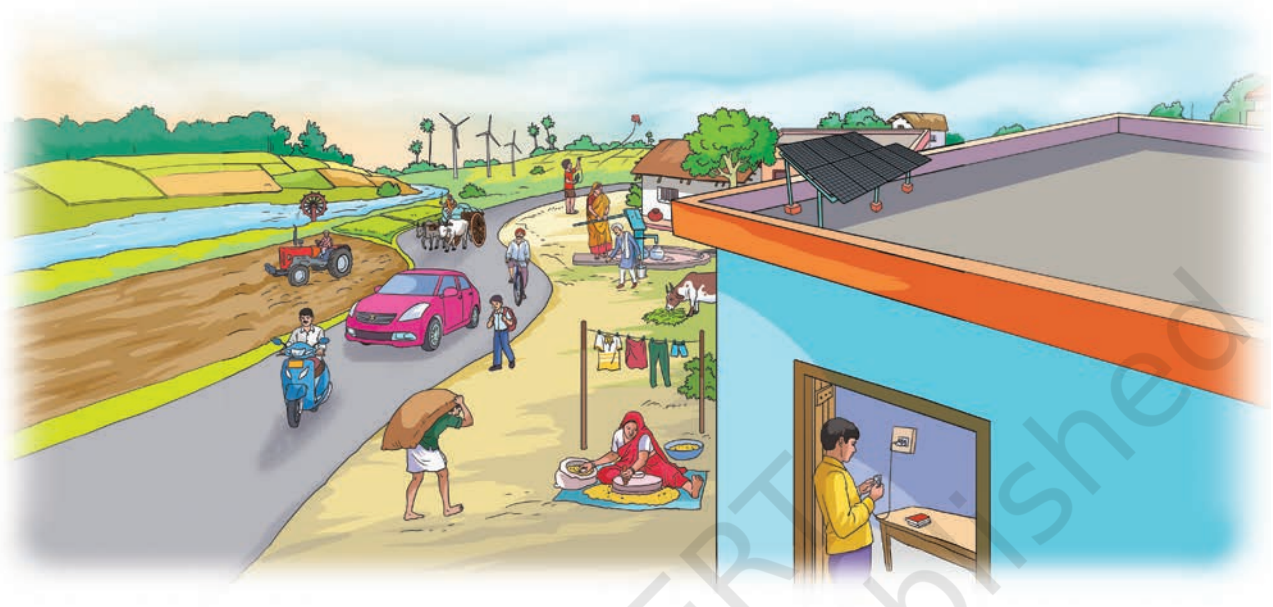
Can you think of more examples where we use the Sun, the wind or the flowing water?

The image shows the simple ways in which we can use energy from the Sun, wind and flowing water in our daily lives without plugging anything.

Solar panels capture sunlight and turn it into electricity. Windmills spin with the wind to make electricity. Fast-moving rivers or falling water can also be used to generate electricity.

Electricity generated using natural sources of energy like wind, water or the Sun's energy, does not pollute the planet with smoke or waste, and is called clean energy.

Did you know that even our vehicles can run on electricity?



Write

Energy All Around Us

List actions that you see in the picture above and fill in the following table.

Activity	Source of Energy
A child carrying a school bag.	Food

Activity 9

Energy Flow Game

- Prepare paper slips with names or pictures of energy sources: the Sun, wind, water, food, fuel and electricity.
- The second paper slips should indicate types of energy, like heat, light, movement and sound.
- The last paper slips should contain the uses or examples of where this energy is used—drying clothes, lighting a bulb, turning a turbine, cooking, running, etc.

Step 1: Assigning a Role

Give each student one card, where they will either be:

- A source of energy (the Sun, wind, etc.)
- Type of energy (heat, light, etc.)
- Use (for example, helps plants grow, moves a car, etc.)

Step 2: Walk Around and Find Your Match

Students should walk around the class trying to find the two others who complete their energy chain.

For example:

* Sun → Heat → Helps dry clothes
* Wind → Movement → Turns turbine to make electricity

Step 3: Present to Class

Once matched (source—type—use), each group should quickly explain their match to the class, for example, "We are the heat of the Sun and we help to dry clothes."

Do you know?

Our body stores energy for future use. We can still run or walk even if we skip a meal because our body uses the stored energy. Have you ever used a torch or a toy that uses batteries? Batteries contain stored energy.

Energy is what makes our world active and alive. From humans and animals using food to move, to vehicles using fuel, and electricity lighting up our homes—energy is at work everywhere! We get clean energy from the Sun, wind and water which does not harm or pollute the Earth.

Now, we understand where energy comes from and how it helps us. Let us use and save it wisely. Choose clean sources of energy whenever possible.

Do you know?

Vaastu Shastra, the ancient Indian system of design and architecture, helps plan buildings in harmony with nature. It guides the placement of rooms, doors, and windows to make the best use of natural energy like sunlight, wind and heat. Open spaces like courtyards and well-placed openings help homes stay bright, air and reduce the use of energy in different seasons.

Let us reflect

1. What will happen if there is no electricity in your house for a day?
2. Why is it better to use solar or wind energy instead of coal?
3. Give two examples where you have seen energy being stored.
4. What is the one thing you can do at home to save energy?
5. Find out how many kilometres a vehicle travels per litre of petrol or diesel. Ask about different vehicles. How will you compare them?
6. Look around your home or classroom. List any three objects that use energy and mention their source of energy.
   For example: Object; Fan → Energy Source: Electricity
7. Create and share:
   (a) Draw or make a simple plan of a 'clean energy home' that uses solar, wind or any such source of energy.
   (b) Make 'my energy diary' for one day, record the number of times you have used the electricity fuel and so on.