Unit 6

Types of Energy

Have you ever thought in which form of energy is associated with the wind and flowing water ? Energy is in which torm in coal, LPG & CNG ? Weather the energy used in bulb and energy emitted by it are of same type ? Will the tube-light at your home give light with the help of petrol ? How do different equipments works which uses energy ?

In standard 7 you have learnt about sources of energy. There are mainly two sources of energy. Make a list of both the sources of energy. Write the information in the given table.

Renewable sources of energy	Non-renewable sources of energy

Compare the list with your friends and make it complate. Now keep in mind the list during following activities.

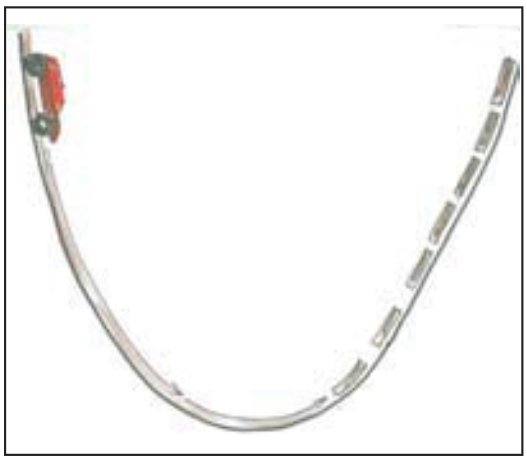
Form of energy :

Energy in any substance can be divided into two types :

1. **Potential Energy**
2. **Kinetic Energy**

What is required ? One and half meter long and 10 cm wide sheet of cardboard or foil and a ball

What to do ?



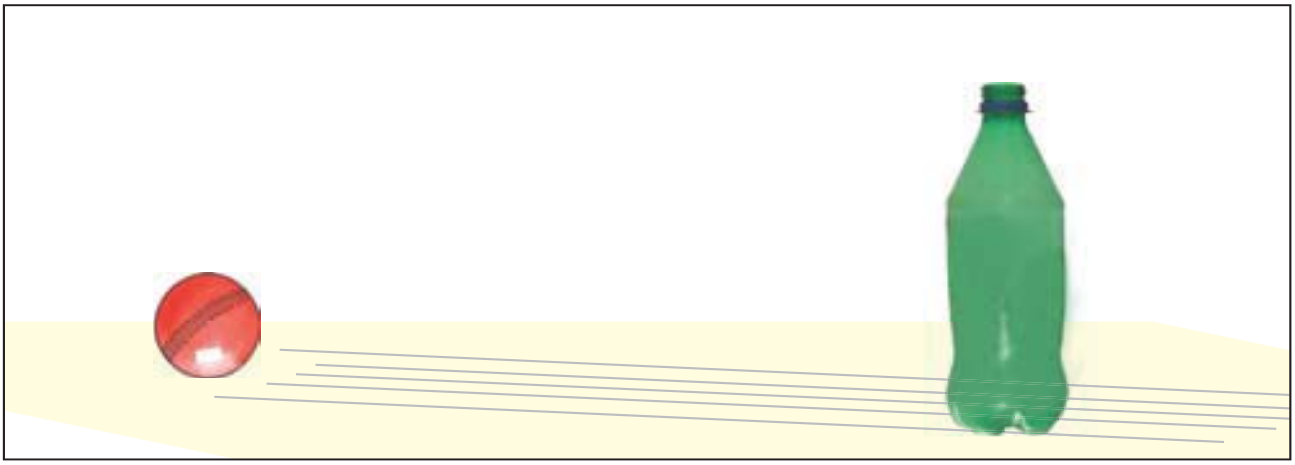
- ➜ Make a sloping structure of the main cardboard as shown in the figure.
- ➜ Now put a small car at one end.
- ➜ Now release the car and observe what happens.
- ➜ You will see that the car goes up at a particular height. So from where does the car gets the energy to climb up the other end ?
- Do the same experiment with the help of a ball.

Here at some height, the car or a ball had some amount of energy. This energy is called potential energy. Now, when the ball or car is released potential energy is converted into kinetic energy, with which it can climb up to a certain height.

1. How does a toy with a key-functions ?

2. Make a list of substance possessing potential energy, e.g. Stretched rubber

What is required ? Plastic bottle, a ball



What to do ?

Place the bottle in the standing position a shown in the figure.

Roll the ball towards plastic bottle.

- **What happened ? Why ?**

- Due to energy associated with moving ball the bottle will fall.
- **Energy possessed by the object due to its motion is called kinetic energy.**

1. Why does a bullet from a gun penetrates wood ?

2. Why the objects are dragged during flood ?

Generally due to position and motion of the object potential energy and kinetic energy is associated with it.

The summation of this potential energy and kinetic energy of the object is called mechanical energy.

e.g. When water is released from the dam on the river its potential energy is converted in to kinetic energy due to which turbine is rotated. In this, kinetic energy is converted in to mechanical energy.

MECHANICAL ENERGY = POTENTIAL ENERGY + KINETIC ENERGY

Energy in the objects can be categorized in different form. Let's take idea about such forms of energy with different activities.

What is required ? Candle, spoon, pieces of wax and a match-box.

What to do ?

- Light the candle and keep it on the table.
- Now take a spoon with wax piece and keep it on the flame of candle.
- What happens to the wax pieces ?

- Energy required to melt the piece of wax was acquired from the flame of the candle. Isn't it ?

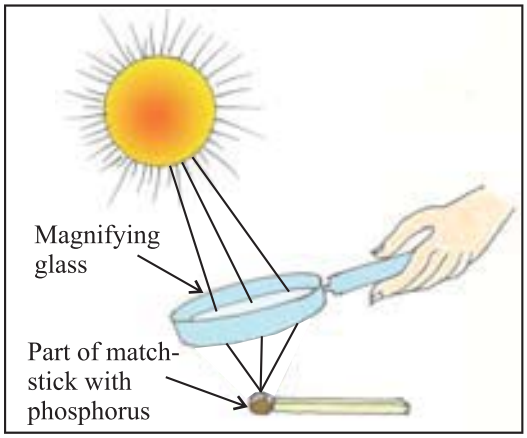
In this way heat is a form of energy. Which we say heat energy. This heat energy is used for cooking purpose. We can also get heat energy from sun. Now, write different uses of heat energy below :

What is required ? Magnifying glass and match-stick.

What to do ?

- Obtain the spot image of the sun-rays using magnifying glass on the floor as shown in the figure.

- Now, place the stick in such a way that the spot of the sun-rays incident on its black part.
- Take care that the magnifying glass should be steady. Observe that what happens in a minute or two.



- Discuss with your friends why the match-stick burns ?
- The energy from the sun reaches on the earth in the form of light.
- The energy associated with these rays is called light energy. Plants get light energy from the sun and using it in the process of photo synthesis prepares it's food. With the help of sunlight we can cook food and water can also be heated.
- Write another use of light energy.

What is required ? Lime stone, glass and water

What to do ?

- Take a glass of water.
- Put two or three pieces of limestone into the glass.
- Observe the water in the glass. Touch the outer side of the glass and try to guess the temperature. What happened ?

Do you feel the glass warm from outside ? From where we get this heat i.e. Heat energy from ?

When you mix water with limestone there is a chemical reaction between lime stone and water. Because of this reaction the energy in the lime stone is released. The energy present in the lime stone is called chemical energy. The fire crackers too have a chemical energy.

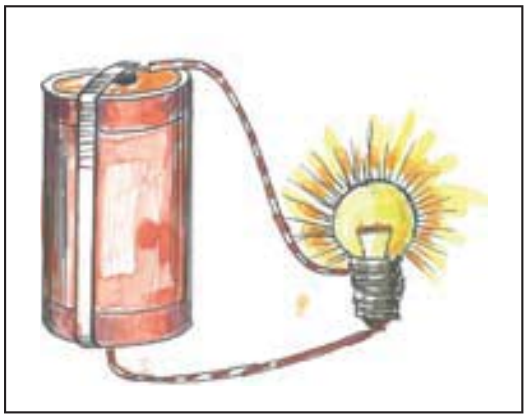
Usually energy in different fuels, electric cell and even in food we eat, the energy is stored in the form of chemical energy.

What is required ? Battery, a piece of wire and a bulb

What to do ?

- As shown in the figure attach the bulb to the battery with the help of a piece of wire.
- What happened ?

  Due to which energy the bulb is light up ?



Due to chemical energy present in battery, we get Electric energy. Electric energy is such type of energy which can be easily transported from one place to another. In your home, which instruments uses electrical energy ? Make a list of such devices. Discuss the list in detail in your classroom.

What is required ? Beaker, balloon, rice pulse, steel plate and a spoon

What to do ?

- Place the balloon on the mouth of the beaker. Make sure that mouth of the balloon is stretched.
- Place three to four pulses on the balloon.

- Now, bring the steel plate near the beaker and make sound with the help of spoon.
- What happens with seeds ?
- How does the pulses get energy to jump ?

Here the seeds jump up and down due to the sound produces by the plate. Therefore the energy associated with the sound is called Sound Energy.

Due to bursting of fire creakers the steel vessels in your house vibrates. Why ?

- **Give other examples of sound energy.**

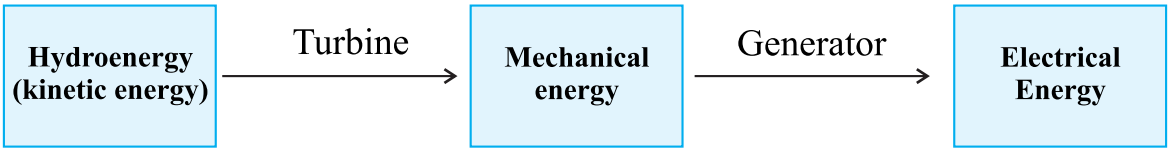
Transformation of energy :

When we pour pieces of limestone in the glass-water, the water becomes warm. Here chemical energy is transformed into heat energy.

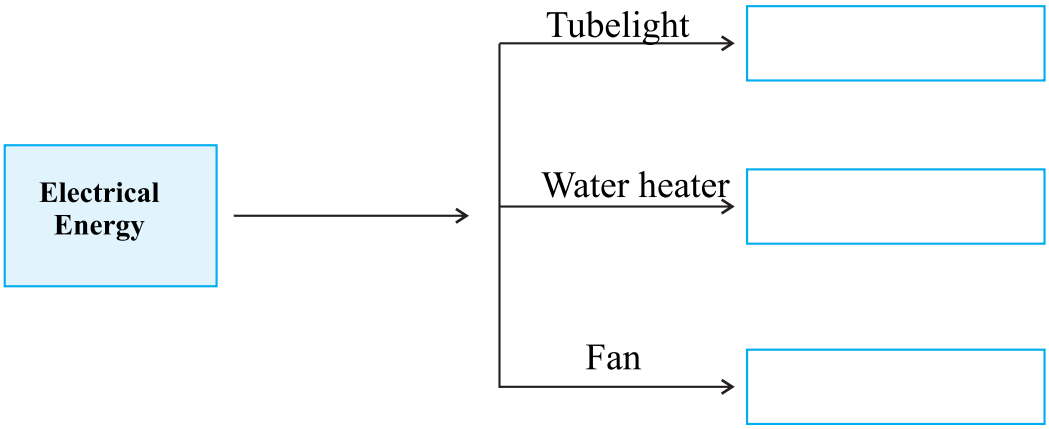
- Write the transformation of energy taking place in case of match-stick burned with the help of magnifying glass.

- Write the transformation of energy in case of electric bulb lighted with the help of battery.

In this way, there are many other devices, which work due to the transformation of energy in our day to day life. Transformation taking place in case of Hydral Electricity is as shown in below chart.



When this electrical energy is supplied in our house, than in which different form it is transformed ? Note down below ?

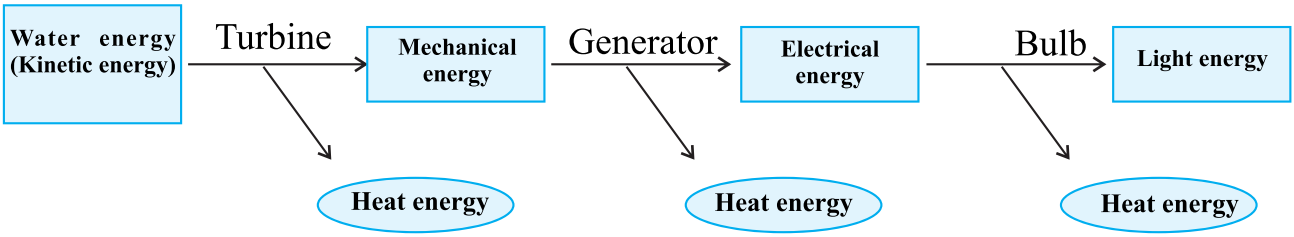


Now, write down the transformation of different types of energy given below and fill in the blanks.

Scooter	→	**Chemical Energy**	**into**	
Man	→		**into**	
Plants	→		**into**	
Bulb	→		**into**	
Television	→		**into**	

In this way, different devices as well as living things work due to the transformation of energy. But one question arises that, is there a loss of energy due to the transformation of energy ?

When you switch on the bulb you get light energy. As well as bulb gets heated, isn't it ? Can we use this heat energy ?



In the above chart we can see different types of energies are transformed in the form heat energy. They are shown in ⬭ in the chart. This heat energy cannot be used. This heat energy is called loss of energy. During different stages of transformation of energy this type of energy loss takes place. In this way we can say that, we should use energy in such a way that transformation has least stages, isn't it ? In this way, we should also take care of saving energy ?

Law of conservation of energy :

Here we have seen that energy is wasted and we cannot use it. For example, the heat energy produced in bulb cannot be used. Moreover electrical energy is also used in bulb. This used energy is transformed into light energy plus heat energy. Means there is only change in the form of energy. In this way, **'Energy can neither be created nor destroyed, it is only converted from one form to another form. Total energy in the universe remain constant.'** This statement is called law of conservation of energy.

Transformation of energy from one form to another form results into the loss of energy. Due to this reason, we get less amount of energy in use. In this way we should make use of energy carefully. We should switch off the lights and fans at home or at school when, we do they are not required.

Write different steps you take to save energy in your day to day life, discuss it with your friends.

Q.1 For the following examples, write the type of energy is transformed into which form of energy :

1. Bulb is on
2. Candle is light up
3. Sparkle is light up
4. The bomb burst
5. Wind mill is rotating
6. Coal is burnt
7. Iron is switched on
8. Plant cook it's food

Q.2 **Decide yourself that weather the loss of energy takes place in following conditions. If energy is lost then give your suggestions to avoid loss of energy :**

1. Daily Kajal do her homework at night.
2. Different televisions are there in a family per person.
3. All members of Jaimin's family eat together.
4. All teachers of school stay in the same society but they use individual vehicle to go to school.
5. All students go to school in school bus.
6. Biogas plant is constructed in your village.

Q.3 **With discussion in your classroom, note down the measures to step energy loss.**

Q.4 **Explain difference between potential energy and kinetic energy.**

Q.5 **Explain law of conservation of energy with an example.**

Q.6 **Give five examples of energy transformation.**

Q.7 **In your house mainly which energy is used ? From where it comes ?**

Q.8 **Where the solar energy is used in your village/city ?**