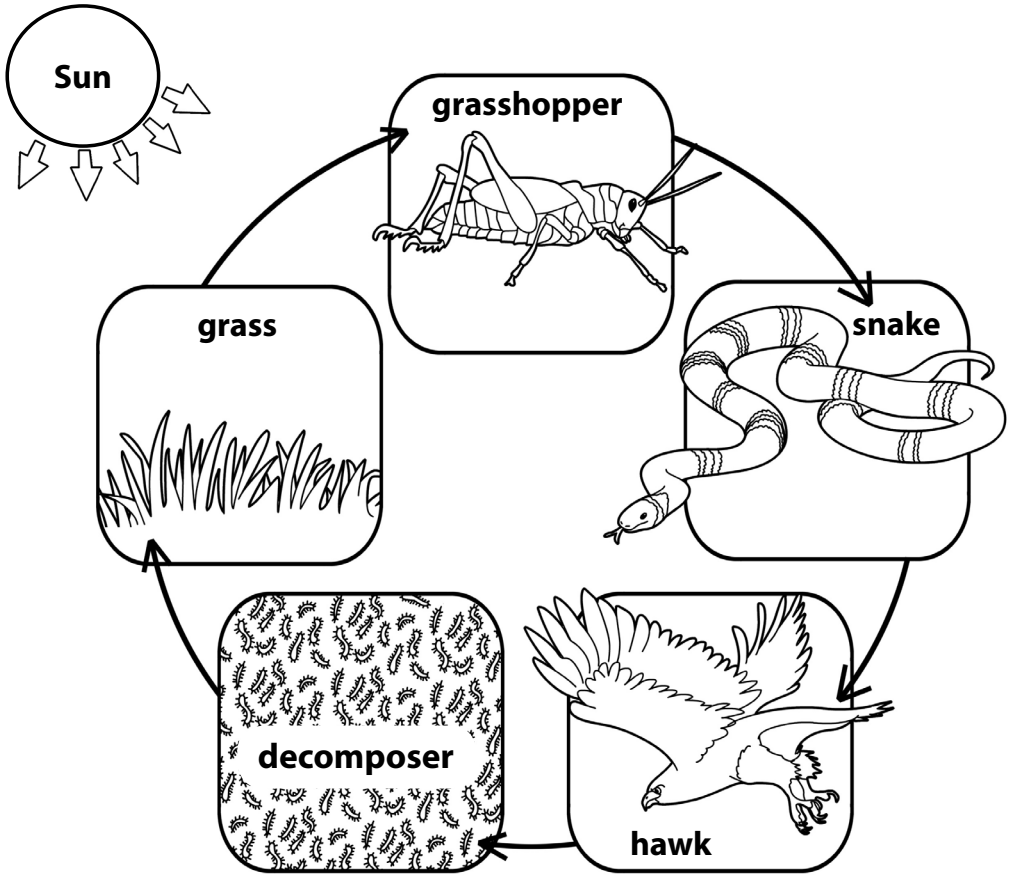
The Energy Chain

Name:

Energy is transferred from the Sun to the Earth, plants and animals. This is known as an energy or food chain.

In this food chain, the Sun gives energy to the grass which is used to make food. The grasshopper eats the grass and the energy is transferred (moved). The snake then eats the grasshopper and the energy is transferred from the grasshopper to the snake. Lastly, the hawk eats the snake and once again there is a transfer of energy from the snake to the hawk.



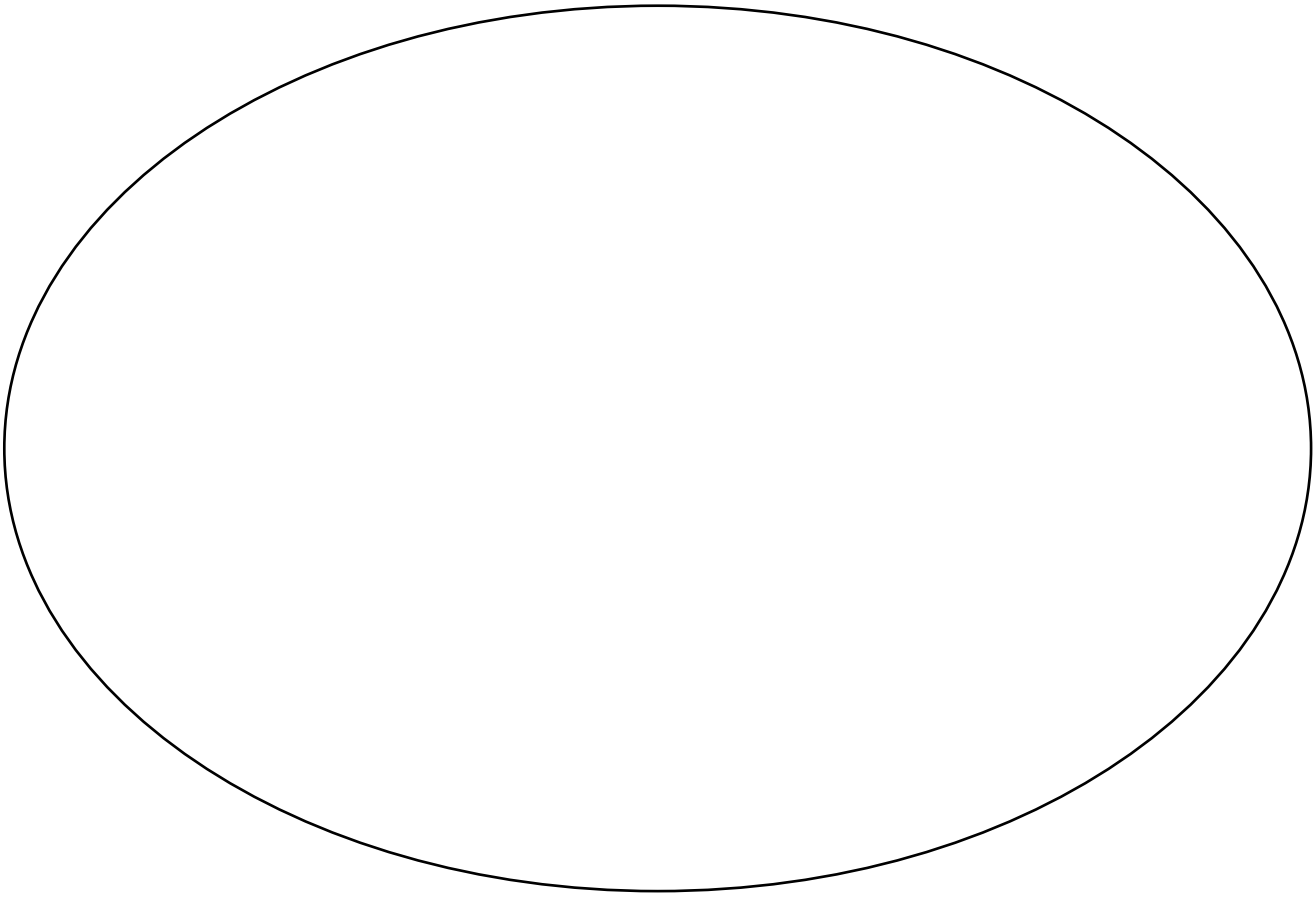
It is called a chain because each organism forms a link in the chain as energy is passed along from one organism to the next. The arrows show the direction of the energy flow from one thing to the next.

The energy transfer eventually ends with the dead animals that are broken down and used as food or nutrition by bacteria and fungi. These organisms (decomposers) feed from the dead animals and break down the complex organic compounds into simple nutrients.

Decomposers play a very important role because they take care of breaking down dead material.

Draw your own food/energy chain and include the words:

Sun, rays, animals, plants, energy, reflect, absorb



Plants use the Sun's energy to grow. Have you ever planted a bean and watched it grow? Have you ever wondered why the bean sprouts and grows toward the Sunlight? This is because a plant will always grow towards its source of energy, the Sun. As it grows, a plant stores energy in its roots, stem, leaves and fruit. Animals eat plants to grow. The energy stored in a plant is used by animals for life processes.

Fun Activity - Growing a Bean Plant

THINGS YOU WILL NEED: A bean seed, a plastic bottle, cotton wool, water and Sunlight.

WHAT YOU WILL NEED TO DO: Wet the cotton wool. Put the bean seed on top of the cotton wool and leave it uncovered. Place it in direct Sunlight and watch it start to sprout within 2 -3 days. Make sure that the cotton wool is kept damp.

WRITE A SYNOPSIS: Write a synopsis of your experiment and the outcome.

Energy and Energy Transfer

Name:

How is energy transferred? Can you answer the three questions below?

1. What is energy? _____

   _____

2. What do we need energy for? _____

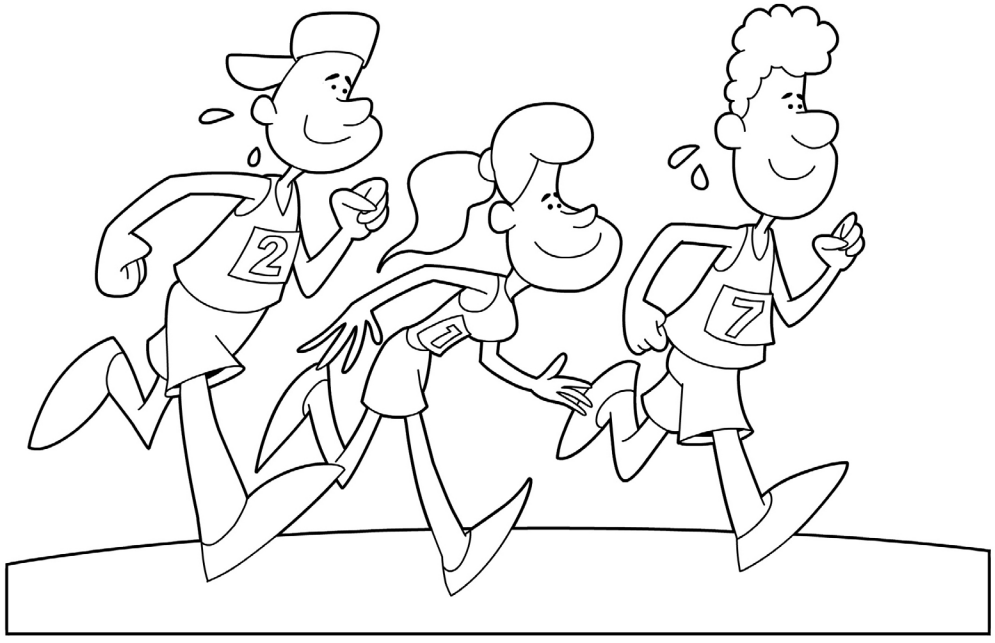
   _____

3. Where does energy come from? _____

   _____

Energy for Life

Scientists say energy is the 'ability to do work'. In other words, we need and use energy to make something happen. Look at the picture below and complete the sentence: The athletes are using energy to _____.



Look around and identify six things that people or animals are doing that require energy:

- _____
- _____
- _____
- _____
- _____
- _____

People and animals use energy for life processes like walking, eating and breathing.

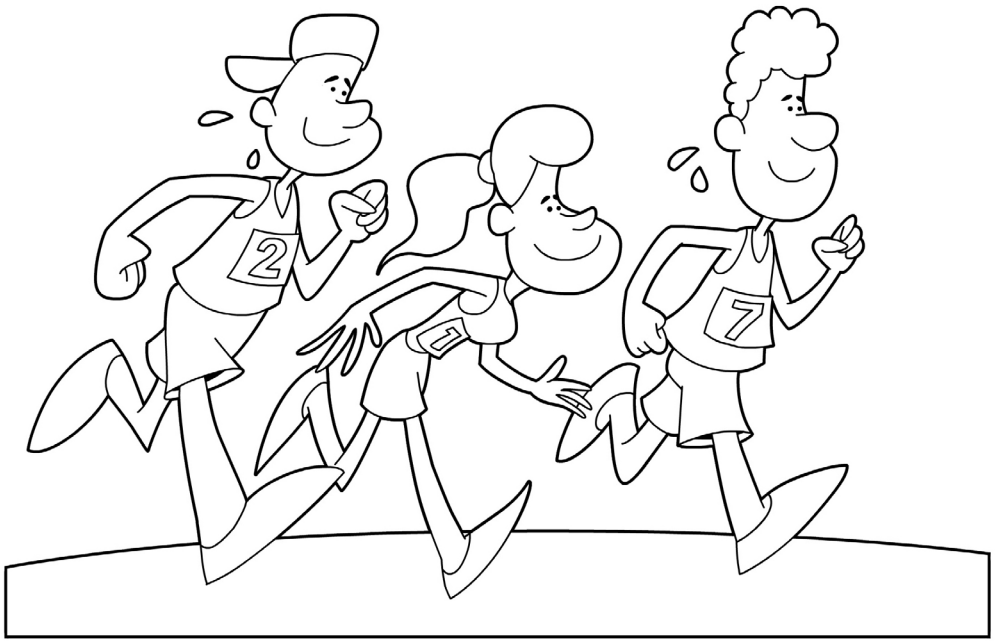
Memorandum

How is energy transferred? Can you answer the three questions below?

1. What is energy? ***Energy is the ability to do work. It is was powers something into action.***
2. What do we need energy for? ***We need energy to live. Energy is needed to power our bodies to walk, eat and breathe.***
3. Where does energy come from? ***In humans, energy comes from the food we eat. Plants get their energy from the sun, and animals get their energy from the plants and other animals they eat.***

Energy for Life

Scientists say energy is the 'ability to do work'. In other words, we need and use energy to make something happen. Look at the picture below and complete the sentence: The athletes are using energy to ***run.***



Look around and identify six things that people or animals are doing that require energy:

Answers will vary. Remember to accept more abstract answers such as the flower or plant is growing. Correct: The Sun provides energy to plants to allow them to grow.

- _____ • _____
- _____ • _____
- _____ • _____

People and animals use energy for life processes like walking, eating and breathing.

Energy From the Sun

Name:

Our energy in food comes from the Sun. This energy is called solar energy. The word 'sol' means Sun. The Sun is the closest star to Earth. A star is a giant ball of gas which releases energy. Some of this energy from the Sun travels to the Earth in rays.

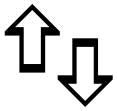
When the rays reach the Earth, some rays will reflect back into space, but the Earth absorbs most of the solar energy. This heat warms the Earth and the air around it. Without the Sun, the Earth would be a cold, dark place with no life.

FLOW CHART

Sun (solar energy)
giant ball of energy-releasing gas

Energy travels to the Earth
in rays

When the rays hit Earth, some reflect
back into space

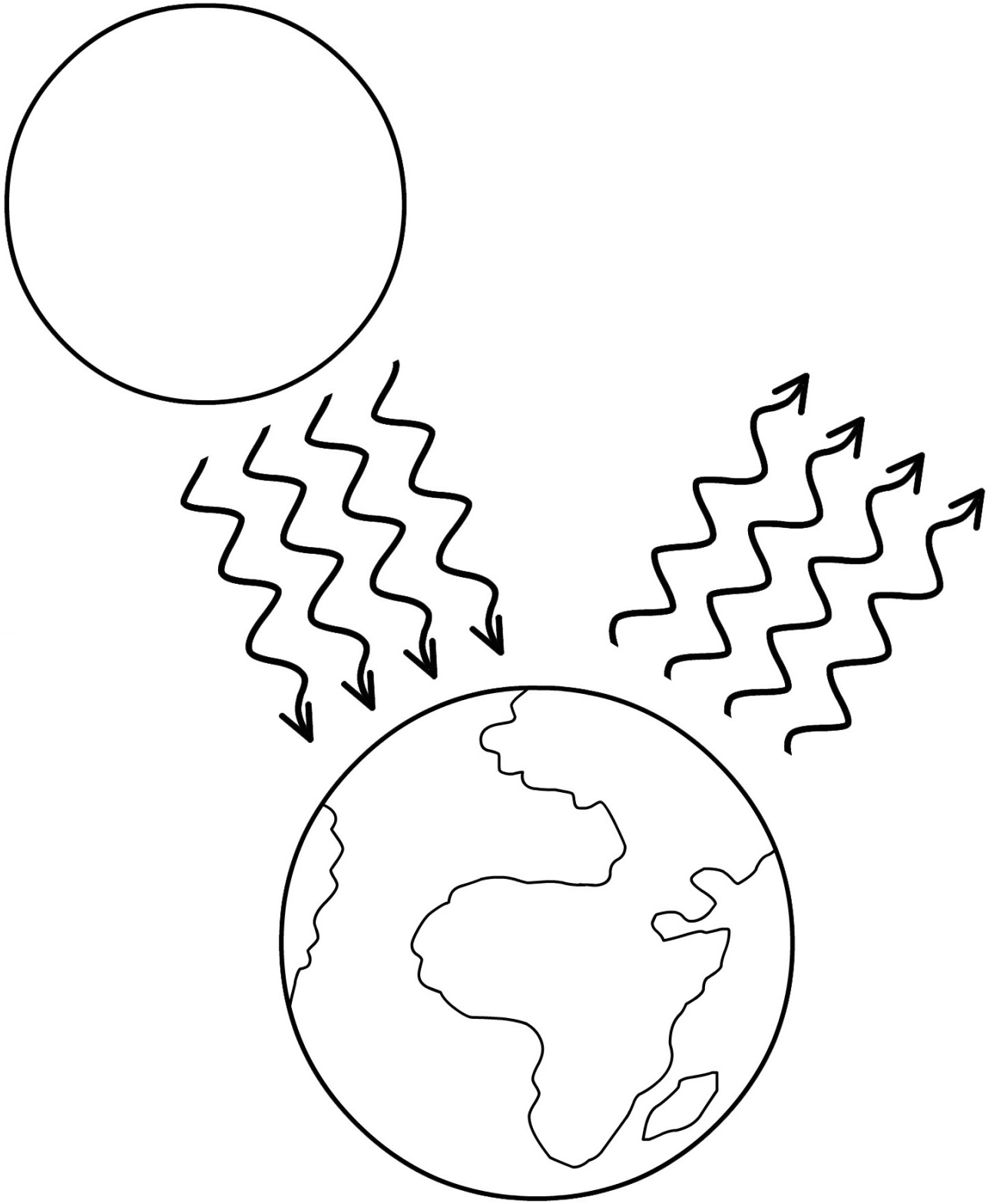


Earth absorbs most of the energy
from the Sun

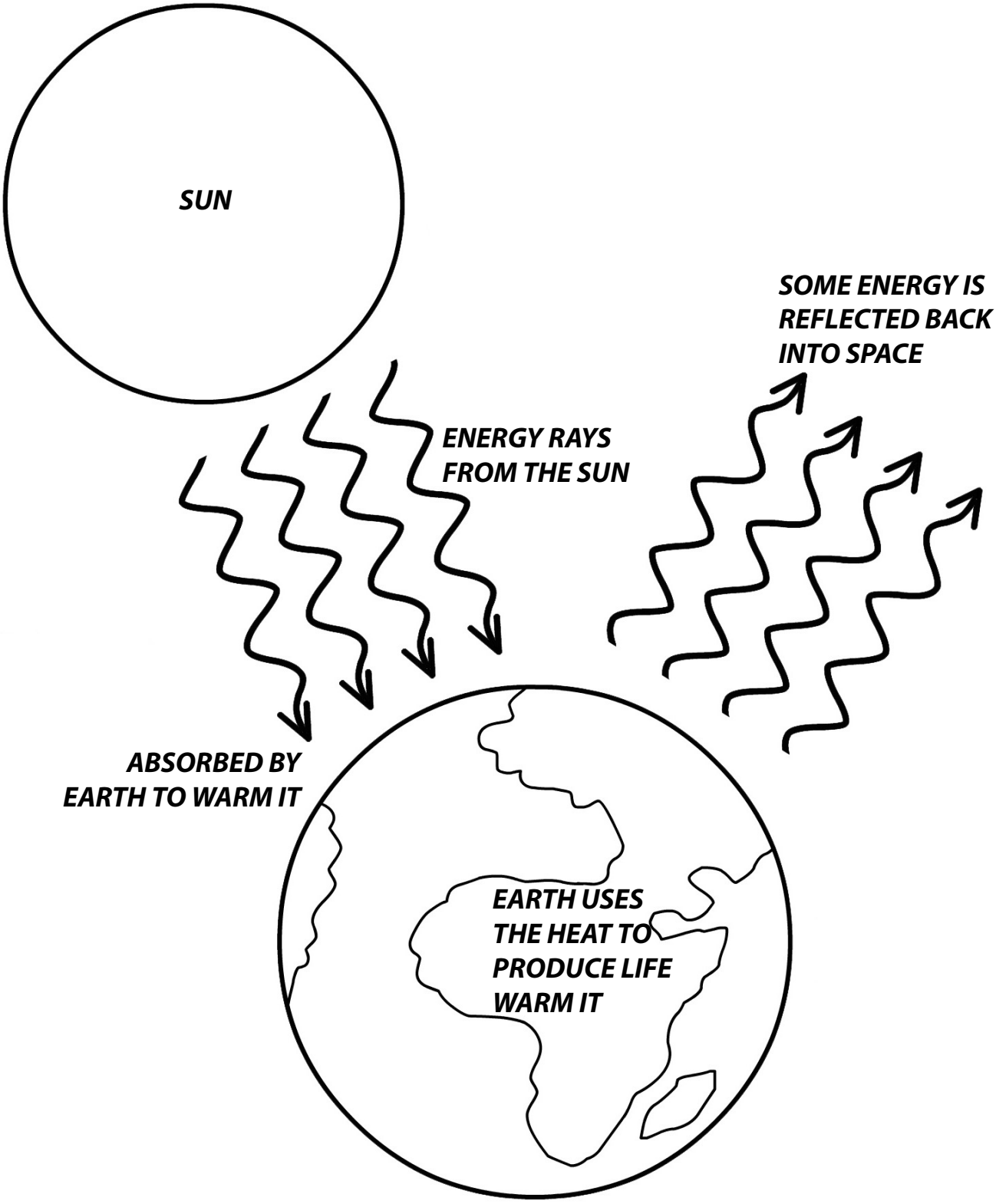
The heat warms the Earth.
Plants and animals use it for life
processes.

Look at the picture and label it to explain what is happening. Use the key words to help you:

Sun, energy, reflect, absorb, warms, Earth, life.



Memorandum



Energy and Sound

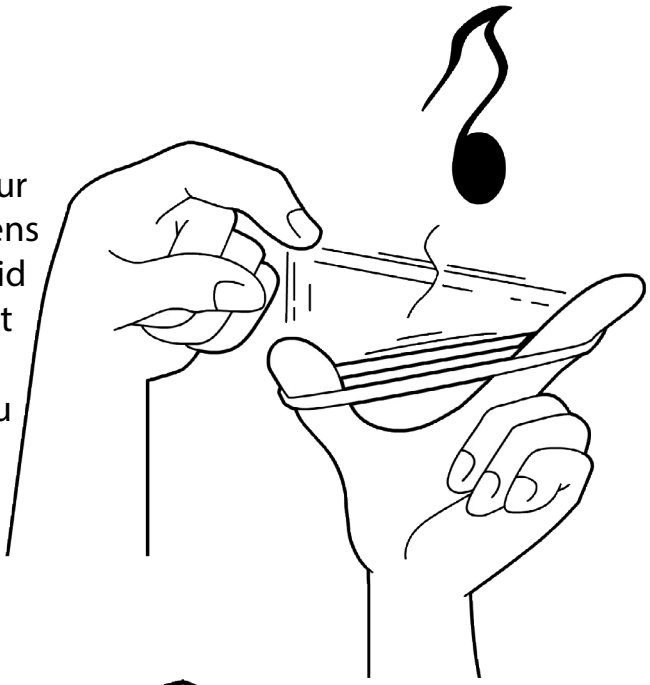
Name:

Vibration and Sound

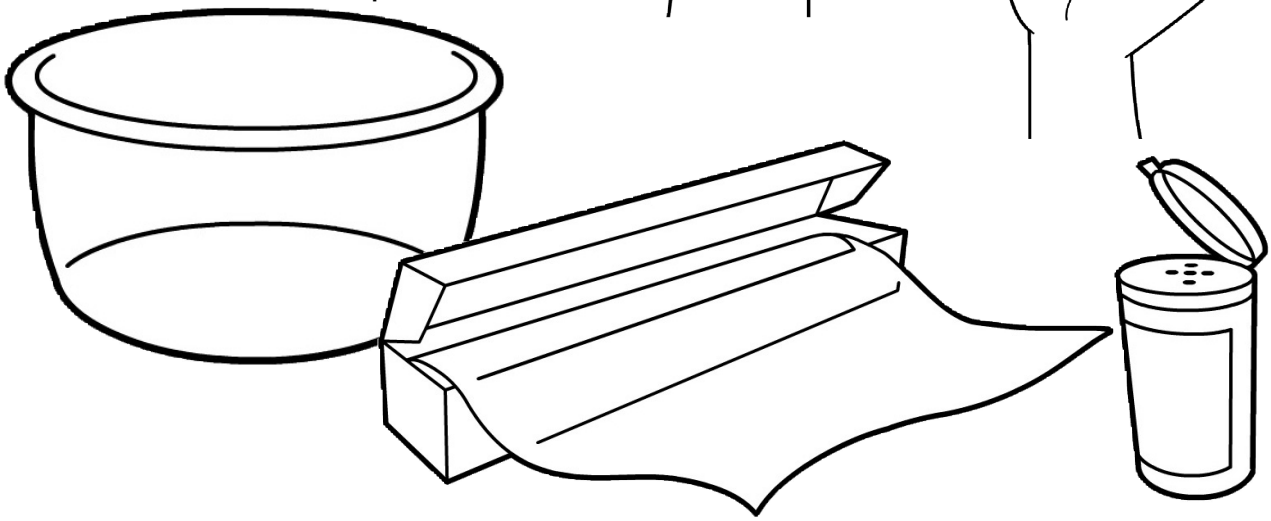
Fun Activity:

Creating sounds and vibrations

Loosely stretch a rubber band between your thumb and forefinger, and see what happens when you pluck it. Did it make a sound? Did it vibrate? You have just made sound and it reached your eardrum through vibrations. See how many different kinds of sound you can make with your rubber band.

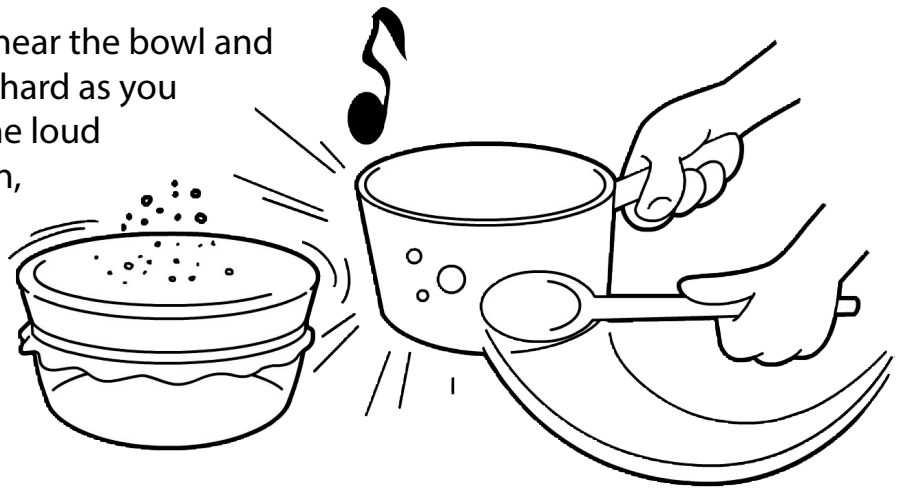


Now, cover a bowl with plastic sandwich



wrap. Pull the plastic tightly across the top until it is flat and smooth. Use a rubber band to secure the plastic wrap tightly. Then, sprinkle some pepper onto the plastic – and make some noise!

Next, hold a pot and spoon near the bowl and hit the bottom of the pot as hard as you can. What do you notice? The loud noise you made is a vibration, which gets transmitted through the air, to the plastic. The plastic vibrates, and makes the pepper bounce.



Making Sounds

Sound is found everywhere around us. Understand some simple things that we need to know about sound:

- We can make many sounds with our voice and body
- Different objects make different sounds
- Sound can travel through air and objects
- Sound can be high or low pitch
- Sound can be fast or slow
- Sound can be loud or soft
- We can use different sounds to enrich songs or storytelling or movies

Activity:

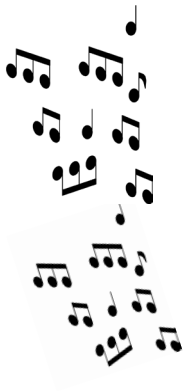
Observing sound energy around us

1. Close your eyes and listen to your surroundings.
2. Write down three different sounds that you hear.

_____

_____

_____



Here's a sound I can make with my mouth (click click)

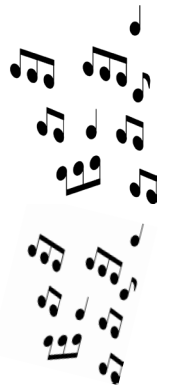
(try and click your tongue)

Here's a sound I can make with my mouth (click click)

It's as silly as can be

Can you make this sound with me?

Here's a sound I can make with my mouth (click click)



How is sound actually made? It is made by vibrations, which move in waves to our ears.

Sound can come from different sources, like birds calling, clapping hands, singing, stereo's or a musical instrument.

Different vibrations will make different sounds.

Key words

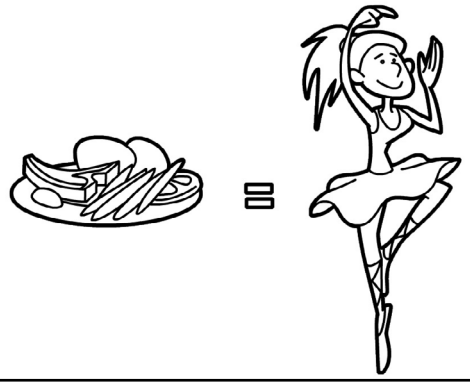
movement sound vibrations waves heat source

Energy Around Us

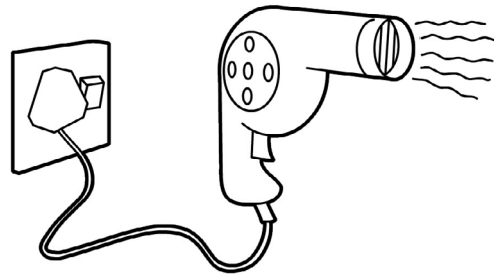
Name:

INPUT AND OUTPUT ENERGY(1)

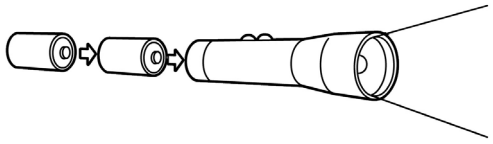
Whenever anything happens, energy is transferred from one thing to another. People, machines and appliances need energy input to work. This gives them an energy output to do the work. Look at the following examples of input and output energy.



stored energy: food
energy output: movement (dance) and heat



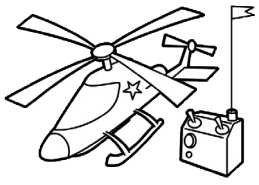
energy input: electrical
energy output: heat, sound and movement energy.

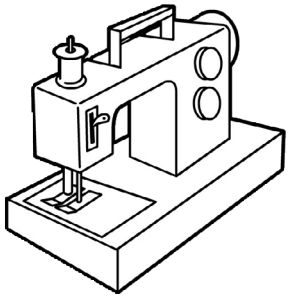


energy input: electrical
energy output: heat, sound and movement energy.

Activity: Investigating the input and output energy of appliances.

1. Look at the pictures of different items.
2. They all need input energy (electricity) and output energy which is transferred to its surroundings, such as heat, sound, light or movement.
3. Look at each picture and write down the type of output energy that it transfers to the environment.
4. Remember appliances may transfer more than one type of energy to its surroundings.





INPUT AND OUTPUT ENERGY (2)

Energy is all around us.

Let's find out what this means and what it looks like.

Look at the picture below and record all the places where energy is being used.

List the uses of energy in the table below.

Movement	Heat	Light	Sound

Can you see how much energy is used on a daily basis?

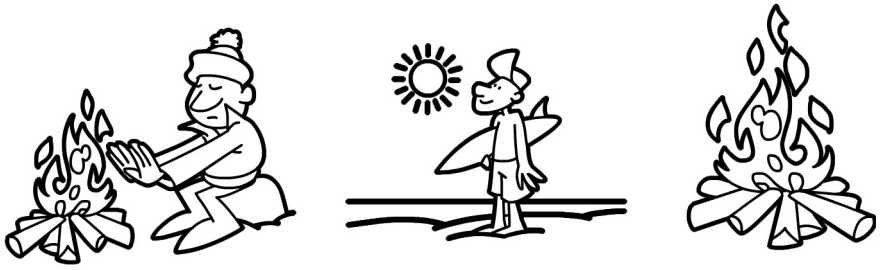
We can break this energy use into different categories: **light, heat, movement and sound energy.**

Note: Multiple answers apply. Check the learner's answers carefully to ensure they have understood the concepts.

Heat Energy

Name:

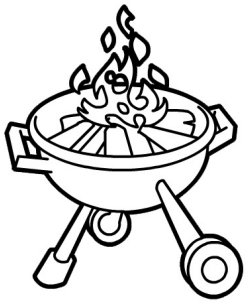
It is wonderful to feel the warmth of the Sun on your skin on a hot summer day, or to be able to warm your hands around a fire on a cold winters night. What you feel is heat. The Sun provides us with light, but it also gives us heat.



Anything that gives us heat is called a heat source.

Activity:

Put a tick in the box to indicate which of the following objects are heat sources and a cross next to those which are not.



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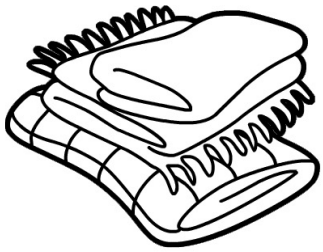

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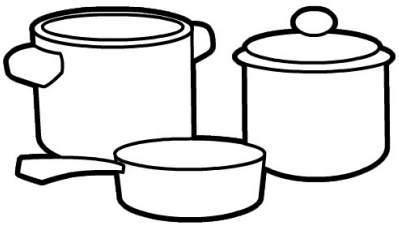

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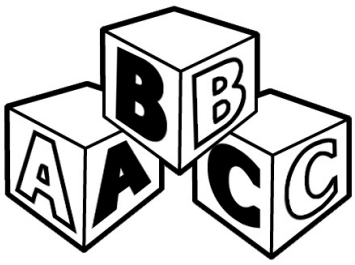


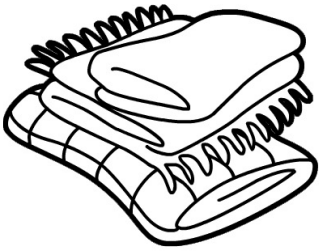
☐

Memorandum

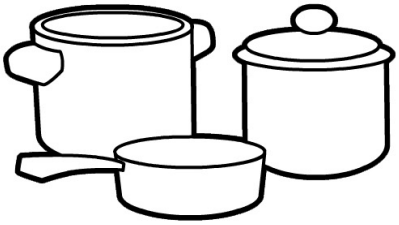
Activity:

Put a tick in the box to indicate which of the following objects are heat sources and a cross next to those which are not.

✓



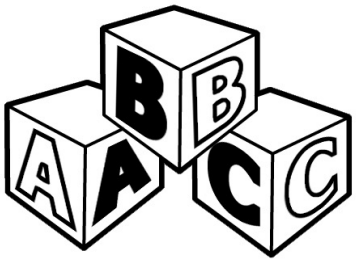
✓



✗

Note to educator:
If learners are confused, explain that pots are heat conductors, not a heat source. The electric or gas stove they are heated on is the source.

✓



✗

Light Energy

Name:

Light comes from a light source. Anything that produces light is called a light source.

Activity:
look at the pictures below and write down which light source it comes from.

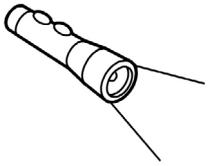

_____


_____


_____


_____


_____


_____

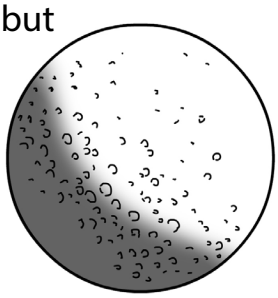
Answer: stars, fire, candles, torches and electric bulbs are all light sources.

Light is energy that travels in rays. Some of these rays we can see, so we call that visible light. Some of the rays we cannot see, but we can feel their effect on us, for example ultraviolet and infrared rays. Ultraviolet rays burn our skin when we are in the Sun and we can feel the heat of infrared rays on our skin.

All living things need light energy from the Sun to survive. Your own body is a good example of this because it needs Sunlight to make Vitamin D. If you do not have sufficient Vitamin D, your body cannot absorb calcium and your bones cannot grow and get strong.

DID YOU KNOW?

We presume that the moon is a light source, but it does not provide light like the Sun, it only reflects the light from the Sun to us.



Where do we find Energy?

Name:

Energy is all around us. It takes on many different forms, is used in many different sources and can be transferred (changed) from one form to another.

Let's find out what this means and what it looks like.

Look at the picture below and record all the places where Energy is being used
It take on many different forms, is used in many different sources and can be transferred (changed) from one form to another.

We know that more than one form of Energy can be used at the same time.

List the items in the picture under the type of Energy they use.

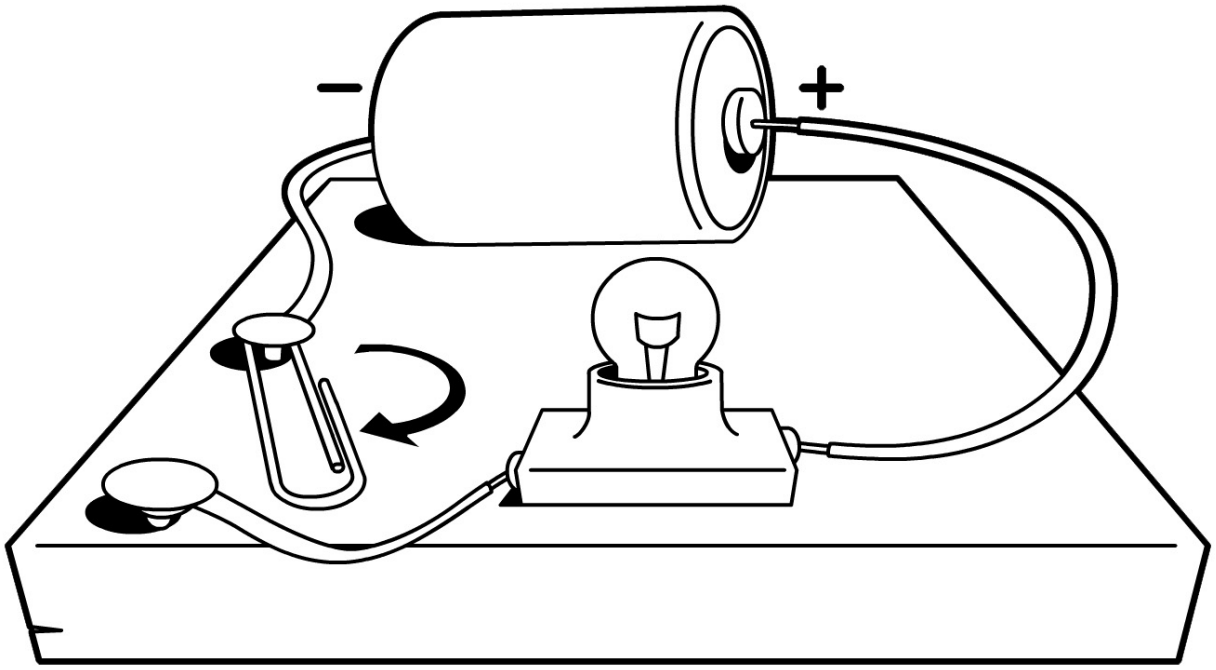
Movement	Heat	Light	Sound

Transfer of energy from a source

Name:

Energy can be transferred (moved) from one part of a system to another part.

Take electricity for example. We use electricity every day. Electric energy can be transferred from a source to the appliance. Look at the picture below and see how the electric energy causes the bulb to light up and shine. The electricity is the **source** and the **appliance** is the light bulb.



Can you think of other examples of energy transfer from a source to an appliance?

When energy is transferred from its source to an appliance, resulting in that appliance working and using that energy as either light, movement, heat or sound, we call this input and output energy.

Key learning points:

- Energy is all around us.
- Energy comes from heat, light, sound, movement and stored energy
- Energy can be stored in food, petrol, wood, oil and other chemicals.
- Energy is transferred from a source to an appliance.

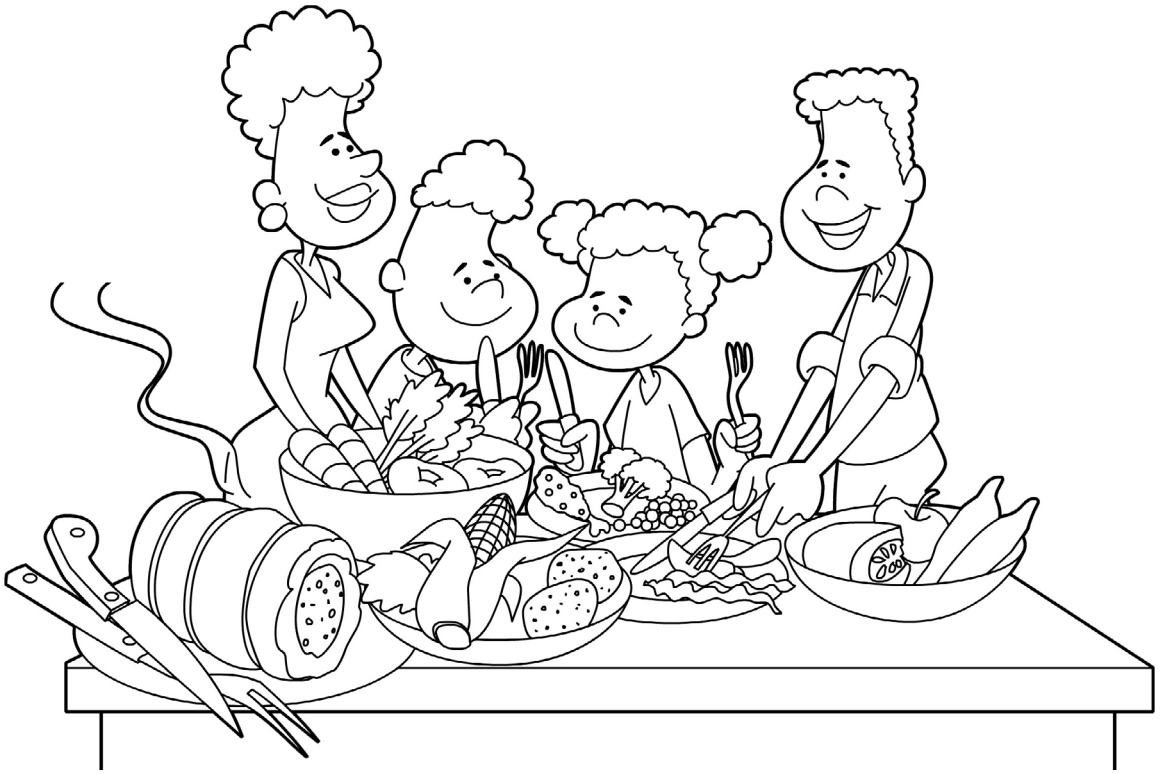
Note: Answers will vary - check for accuracy.

Food as a stored energy

Name:

Where Do We Get Our Energy From?

We get our energy from the food we eat. We eat plants and meat from animals to give us energy. But where does this energy in the food come from? Energy in our food comes from the Sun. The plants use the Sun to make food for themselves, animals and people.



What foods do you eat daily that provide you with energy?

Write them down in the space provided below.

_____

_____

_____

_____

Key words

energy
Sun
food
life
processes

Key learning points:

- Energy is the ability to do work
- We need energy to make things happen
- Both animals and people use energy to carry out life processes
- We get our energy from the food we eat
- The Sun provides the energy in the food we eat