

Light energy


Like all stars, the Sun changes the **L**energy stored inside it into heat and light energy. A burning candle converts the chemical energy in wax into heat and light energy. Some living things are also able to change the chemical energy in their bodies into light energy.

Luminous objects

Light can be produced only from other forms of energy. All objects that convert energy to produce their own light are said to be **luminous**.


An example of a luminous living thing is the firefly. When a male firefly wants to attract a mate, it flashes its light and performs a dance. Females watch from near the ground and respond by flashing their lights.

Most of the living things that produce their own light live in the ocean. Some fish living in the dark depths of the ocean produce their own light to attract prey.



The firefly's light comes from a chemical reaction that takes place in special light cells in its abdomen.

Non-luminous objects



The Moon (on the right) and the statue (on the left) are not luminous. In fact, most things that you see are not luminous. We see **non-luminous** objects because light from luminous objects bounces from them. The bouncing of light from an object is called reflection. You see the Moon because it reflects light from the Sun — and some of that reflected light enters your eyes. You see the statue because it reflects light from the Sun or (if it were indoors) the lights in the room.

We are able to see things when light coming from them enters our eyes. The light energy is then changed into electrical energy by special **cells** called **receptors** at the back of each eye. That energy is then sent to the brain which tells us what we are looking at.





Glowing in the dark

Glow-in-the-dark stickers and toys are made with a chemical called phosphor, which **absorbs** light energy. It then slowly releases the light energy as one colour — usually green. Because the light energy is released more slowly than it is absorbed, when you turn off the lights in your room, the sticker or toy continues to release light for quite some time. This process of absorption and slow release is called **phosphorescence**.



Activities



REMEMBER

1. How is light energy produced?
2. What type of energy is used to produce light in a firefly?
3. Why do fireflies need light energy?

THINK

4. Which of the following objects are luminous?
 - (a) The Sun
 - (b) The Moon
 - (c) A human eye
 - (d) An unlit candle
 - (e) A burning candle
5. You can see luminous objects in the dark. Why can't you see most non-luminous objects in the dark?
6. Name at least two non-luminous objects that you can see in the darkness of night and explain why you can see them.

7. What form of energy allows light to be produced in a glow-in-the-dark sticker?

8. Light energy travels through empty space and air at a speed of 300 000 km/s.

How long does light take to travel the 150 million km from the Sun to the Earth?

INVESTIGATE

9. Find out what the word 'incandescent' means. Make a list of luminous objects that are incandescent.

ICT

10. Light produced by living things is called **bioluminescence**. Go to www.jaconline.com.au/sciencealivevic/salevel5 and click on the Living Lights link to find out more about the many fascinating creatures that use chemicals in their body to produce light.



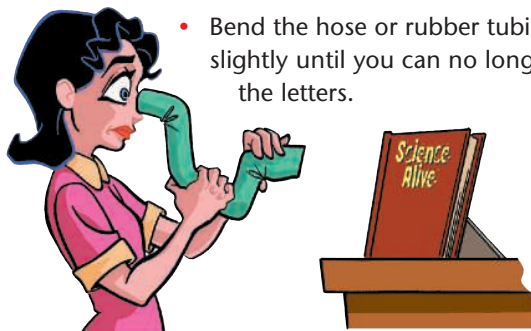
Does light travel in straight lines?

You will need:
small length of hose or rubber tubing.

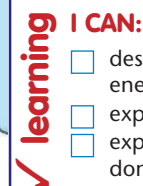
- Look at a few letters on this page or a poster on the wall through a straight length of hose or rubber tubing.



- Bend the hose or rubber tubing slightly until you can no longer see the letters.



1. What do you see when you bend the tubing?
2. Explain in words why you can no longer see the letters.
3. Draw a diagram to show why you can't see the letters.
4. Does the light reflected from the letters travel in straight lines?



- describe light as a form of energy
- explain how light is produced
- explain how we see objects that don't produce their own light.