Lesson 1: Helping heat energy to move

Heat energy always moves from the hotter object to the cooler object. When heat energy moves quickly through a material, the material is called a thermal conductor.

6 How does heat move between materials?

Heat energy passes through the base of the pan to reach the water.

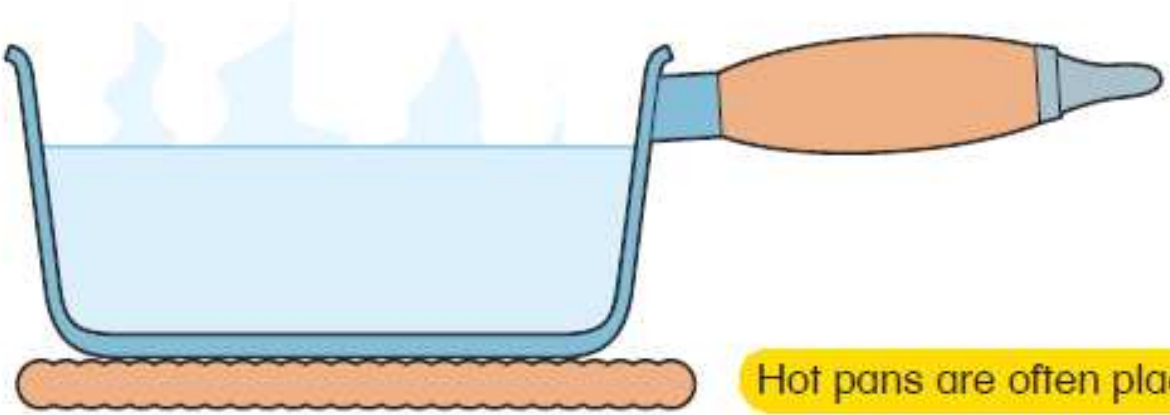
7 What is the source of energy in the picture?

8 How does the heat energy reach the water?

Lesson 2: Comparing heat flow

Some materials allow heat to travel through them quickly. We have learned that they are good thermal conductors. A material that does not allow heat to flow through it quickly is called a thermal insulator.

1 Why has the hot pan been placed on a mat?



Hot pans are often placed on mats.

2 What is the mat made of?

3 Give examples of good materials for a pan handle.

Lesson 3: Stopping heat energy from moving

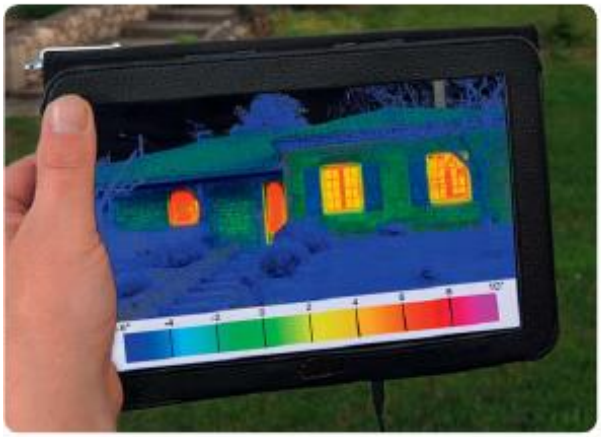
I am learning that air is a poor conductor of heat energy.

A layer of air can slow down heat energy getting in or out of a container. This is because gases are good thermal insulators.

Key words

• **insulation**	مادة عازلة
• **conduction**	توصيل
• **glazing**	تزجيج

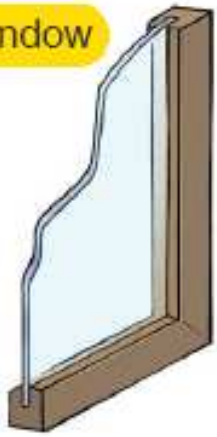
1 What do thermal images show?



Thermal image of a house with single-glazed windows. The red, orange and yellow colour shows areas of highest heat loss.

Thermal image of the same house when fitted with with double-glazed windows.

Single-glazed window



Double-glazed window

2 What is between the two layers of glass in a double-glazed window?

Review: Circuits and energy

Understanding heat flow and how insulators and conductors work helps to maximise energy and reduce waste.

When it is cold, understanding how insulators work is important.

8 Explain how wearing a jacket at night time in the winter desert is a good insulator.

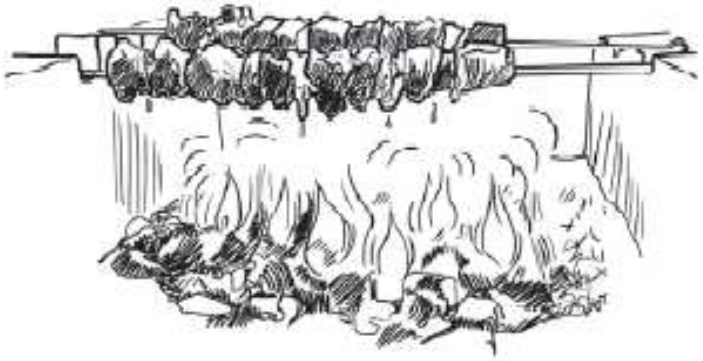
When it is hot, understanding how heat moves is also important.

0 Why does the ice melt in the drink, when outside during the day?

1 What is heat transfer?

Assess yourself

1 Draw an arrow on each of the diagrams below to show the movement of heat energy.



2 Complete the sentences using some words from the box.

insulator	conductor	metal	wood

A material that heats up very quickly is known as a thermal _____. A material that heats up more slowly is known as a thermal _____. An example of a good conductor is _____.

3 Put a tick (✓) in the boxes next to the **two** good thermal **insulators**.

- a wooden spoon ☐
- a plastic bottle ☐
- a metal skewer ☐

4 Explain how double-glazing can help to keep a house warm.