

Conductors and insulators

Outstanding Science Year 4 - Electricity - OS4E007



National Curriculum Statutory Requirements

4E5 - recognise some common conductors and insulators, and associate metals with being good conductors; **LKS2W2** - setting up simple practical enquiries, comparative and fair tests; **LKS2W4** - gathering, recording, classifying and presenting data in a variety of ways to help in answering questions; **LKS2W9** - using straightforward scientific evidence to answer questions or to support their findings;

Learning Objective



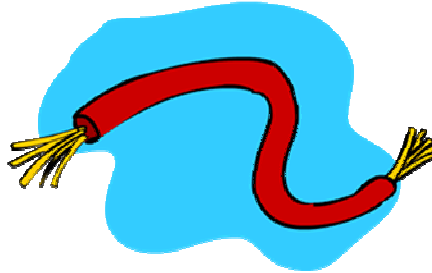
I can investigate which objects are conductors and which are insulators.

Me:   

Teacher:   

Scientific play

Have a look at a piece of wire. It is made of two different materials - one on the inside, and one on the outside. Why is it made of two different materials?



Conductors and insulators

We can group materials according to whether they are **electrical conductors** or **electrical insulators**.

Electrical conductors are materials that allow electricity to flow through them easily. These materials are useful for making electrical circuits because they conduct electricity.

Electrical insulators are materials that do not allow electricity to flow through them. They are poor conductors of electricity. They are still useful, however, because they stop electricity from flowing and help us to control where it flows.

Scientific question

Do all materials conduct electricity?

You will need:

- A bulb (and bulb holder)
- A cell (and cell holder if required)
- 3 wires
- 10 different classroom objects (made from a variety of materials)

Method

Create an electrical circuit as shown in the diagram. The circuit is broken so the bulb will not light up. Choose one of the objects and predict whether it is a conductor or an insulator, recording your prediction in the table. Test the object by using it to complete the circuit. Observe whether the bulb lights up. If the bulb lights up, the object is an electrical conductor. If the bulb fails to light up, the object is an electrical insulator.

Figure 1: How to set up the investigation

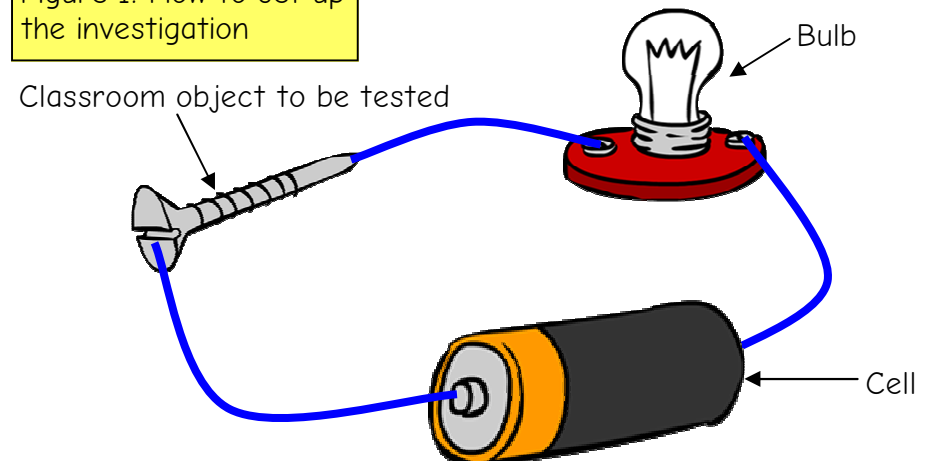
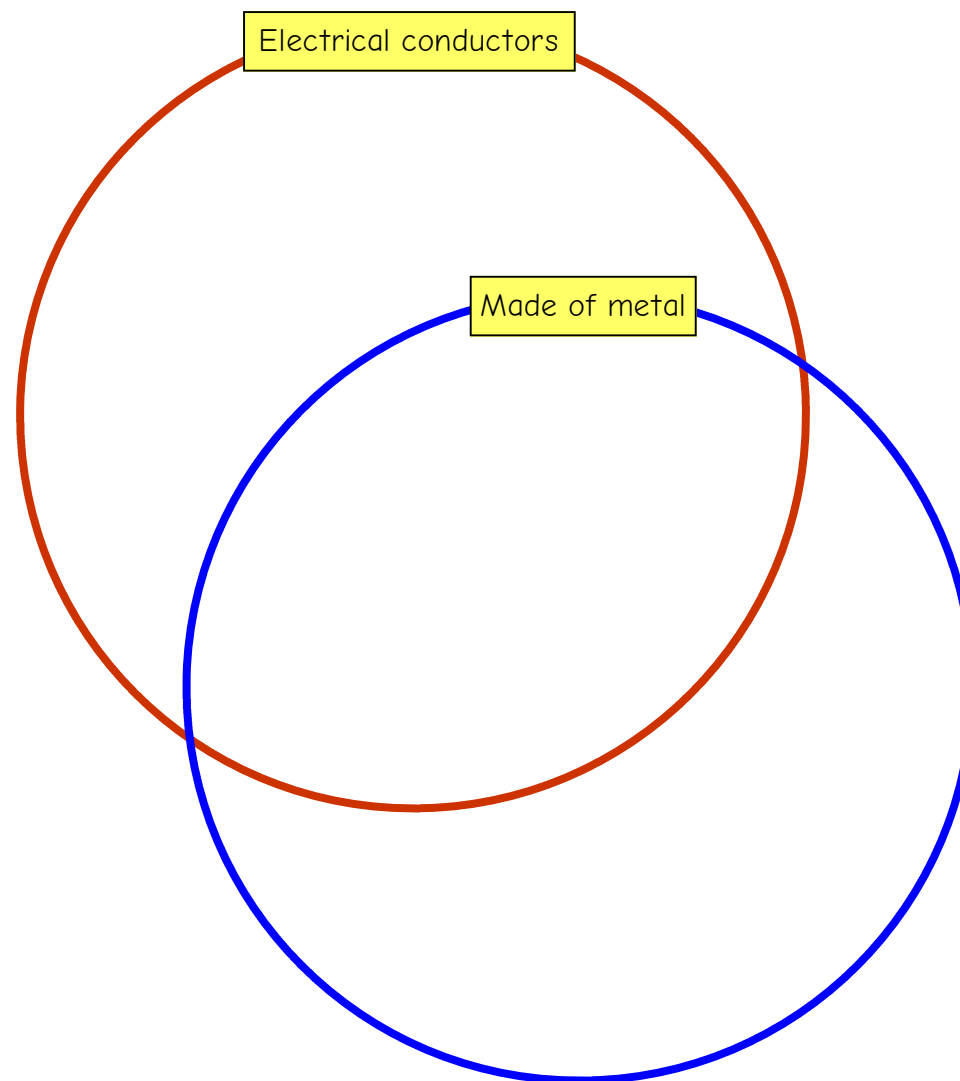


Table showing whether classroom objects conduct electricity

Name of object	Main material (if known)	Does it conduct electricity?	
		Predict	Measure

Venn diagram showing classroom objects



Discussion

Do all materials conduct electricity?

What do the objects that conduct electricity have in common?