



Science

Properties and Changes of Materials

Brighter Bulbs

Aim

- I can investigate which electrical conductors make a bulb shine brightest.

Success Criteria

- I can identify electrical conductors and insulators.
- I can explain that some materials are better conductors than others.
- I can plan and carry out an investigation to find the best electrical conductor.

Electrical Conductors and Insulators



Electricity can travel easily through **electrical conductors**, but some materials do not let electricity pass through them. These are known as **electrical insulators**.

Watch this clip to see some materials that are electrical conductors or insulators.



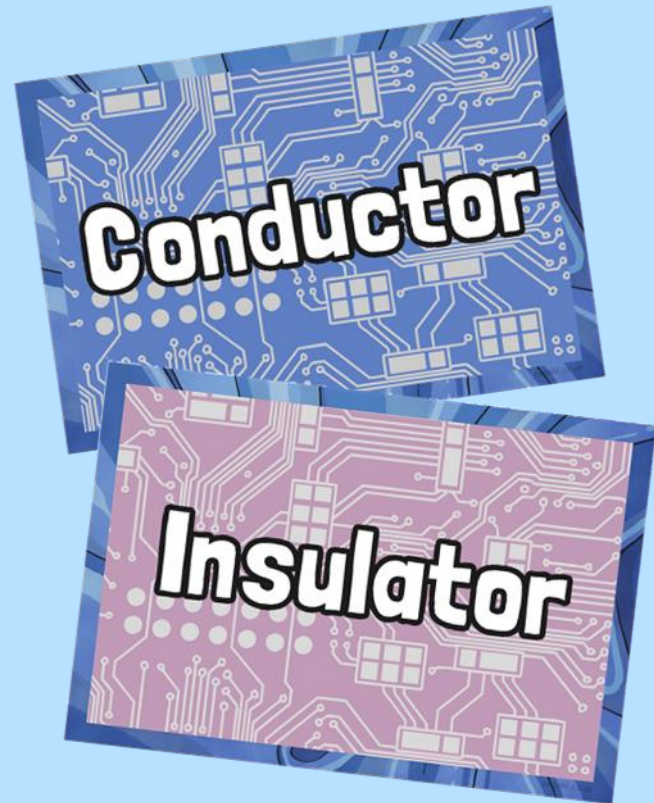
Electrical Conductors and Insulators



We know that metals are electrical conductors, but which other materials conduct electricity?

You are going to play a game to identify electrical conductors and insulators.

- Look at each material and decide if it is an electrical conductor or insulator.
- Hold up your conductor card or your insulator card to show your choice.
- Your teacher will reveal the answer.



Electrical Conductors and Insulators



Tap water

An illustration of a grey metal tap with a cross-shaped handle. Water is flowing out of the spout in a spray. The entire illustration is set against a light blue background within a dark blue rectangular frame.

Electrical Conductor

Electrical Conductors and Insulators



Drinks Can



Electrical Conductor

Electrical Conductors and Insulators



Paper



Electrical Insulator



Electrical Conductors and Insulators



2p Coin

Two copper-colored 2p coins are shown side-by-side. The left coin shows the reverse side with the text "TWO PENCE" and a lion. The right coin shows the obverse with the text "ELIZABETH II D G REG D" and the year "2013".

Electrical Conductor

Electrical Conductors and Insulators



Rubber Gloves

An illustration of several rubber gloves in various colors (pink, blue, green, yellow) with a dotted texture, arranged in a row. A thick black horizontal bar is superimposed over the middle of the gloves.

Electrical Insulator

Electrical Conductors and Insulators



Glass Window



Electrical Insulator

Conductors and Resistance

These items are all electrical conductors.



Some conductors make it easier for electricity to pass through them than others. All materials have some electrical resistance.

Resistance is the opposition to the flow of electricity through a material. Electrical insulators have a very high resistance and it is very hard for electricity to travel through these objects.

Electrical conductors have very low resistance and it is very easy for electricity to pass through them.

Different conductors have different levels of resistance, so even though they can all conduct electricity, some allow electricity to flow through easier than others.

Football Floodlights

A football team need new floodlights to illuminate their football pitch for evening games.

They need to find the best conductors for the circuits in their lights, so that the bulbs in the lights shine as brightly as possible.

They want you to investigate the best electrical conductors, and present your recommendation for which material they should use.





Brighter Bulbs

You will test different materials in a circuit to see which ones conduct electricity best.

You will be able to tell which conductors are the best as they will make the bulb light up the brightest.

You could observe the bulb each time to see how bright it is, or you could measure the light levels using a light sensor.



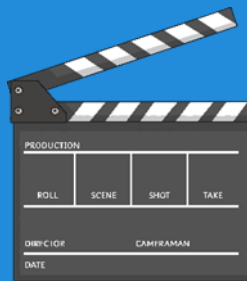
Brighter Bulbs



Use your Brighter Bulbs Activity Sheet to order the materials you test from the worst conductor to the best conductor.

Plan your presentation to the football team on your Activity Sheet.

You may film your presentation to the footballers, or you may present it to your class.



Brighter Bulbs

You need to test the conductivity of different materials to find the best conductor. This conductor will be used in the circuit to power the brightest possible bulb for the new floodlights at a football stadium. Test the materials in a circuit, and put them in order below.

Most conductive / brightest bulb →

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You will present your recommendations to the football team. Plan your presentation below.

1. Introduce your group and what you will be presenting. Hello, we are _____ and we would like to present _____	2. Explain how you tested the materials. To find the best conductor, we tested different materials by _____
3. Give your recommendation for which material they should use to make the circuits for the floodlights. Our tests show that the material you should use in the floodlights is _____ because _____	4. Thank the footballers for watching and give them any more information they may need. Thank you for watching our presentation.

Use these words in your presentation:

metal	circuit	bulb	observe	bright
conductor	sensor	shine	material	

twinkl planit Science Year 5: Properties and Changes of Materials: Brighter Bulbs: Lesson 3

Football Feedback



Thankyou for testing the different materials.

Did all your group recommend the same materials for our floodlights?

We will try out your suggestions.



Were there any differences in your results? Can you give a reason why or why not?

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