

Year 6 Science

In Year 6, students explore how changes can be classified in different ways. They learn about transfer and transformations of electricity, and continue to develop an understanding of energy flows through systems. They link their experiences of electric circuits as a system at one scale to generation of electricity from a variety of sources at another scale and begin to see links between these systems.

Physical Sciences

Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources (**ACSSU097**).

- recognising the need for a complete circuit to allow the flow of electricity
- investigating different electrical conductors and insulators
- exploring the features of electrical devices such as switches and light globes
- investigating how moving air and water can turn turbines to generate electricity
- investigating the use of solar panels
- considering whether an energy source is sustainable

Use and Influence of Science

Scientific knowledge is used to solve problems and inform personal and community decisions (**ACSHE100**).

- discussing the use of electricity and the conservation of sources of energy
- investigating how electrical energy is generated in Australia and around the world



Insulators and Conductors

Classifying materials using their ability to conduct electricity.

Background

Electrical conductivity measures the ability of a material to conduct electricity in a circuit. Conductors are materials that electricity easily passes through and that do not resist the flow of electricity. Examples of conductors are copper, aluminium, steel, silver, gold, electrolytes. Not all materials conduct electricity well, those that do not allow electricity to pass through them are known as insulators.

The Experiment

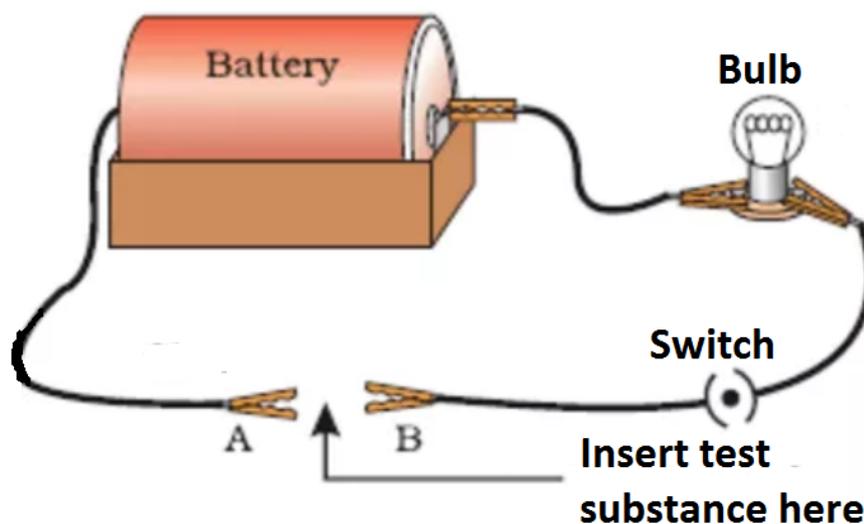
Aim: to classify materials as electrical conductors or insulators

Equipment & chemicals:

- ▶ A Dry Cell Battery
- ▶ Assorted materials to test (list below)
- ▶ 4 wires with alligator slips
- ▶ A 3 V bulb and holder
- ▶ A switch

Procedure:

- ▶ Assemble the circuit as per the diagram below
- ▶ Test the circuit is correctly wired by touching the alligator clips together and close the switch
- ▶ Test each of the materials by attaching the alligator to either end of the sample and close the switch
- ▶ Observe the brightness of the bulb and record your results in the table



Results:

Test Material	Did the bulb glow?		How brightly did the bulb glow?	Was the material a Conductor or Insulator?
	✓	✗		
'Gold' Coin				
'Silver' Coin				
Plastic pen				
Wood of pencil				
'Lead' of pencil				
Steel paper clip				
Dry paper				
Wet paper				
Copper				
Eraser				
Aluminium foil				
Gold ring (if available)				

Discussion:

Were all conductors as good as each other in conducting electricity? _____

Which of the tested substances would be the best to use for conducting a flow of electricity? _____

Are insulators useful when using electricity? Explain your answer and give an example.

Conclusion:

Write a statement which describes the *types* of materials that you found to be (i) Conductors and (ii) Insulators

