

Lesson 2

Teacher Notes – Conductors and Insulators

Outcomes Written In line With The New South Wales Board of Studies

Personal Development, Health and Physical Education Syllabus	Science & Technology Syllabus	English Syllabus
<u>Stage 3 Outcome</u> SLS 3.13 • Describes safe practices that are appropriate to a range of situations and environments.	<u>Stage 3 Outcome</u> PP S3.4 • Identifies and applies processes involved in manipulating, using and changing the form of energy.	<u>Stage 3 Outcome</u> TS 3.1 • Communicates effectively for a range of purposes and with a variety of audiences to express well developed, well organised ideas dealing with more challenging topics.

Lesson Objective: Students will display an understanding of how electricity can travel from one object to another.

Background Information

A conductor allows electricity to travel along it or pass through it.

An insulator does not allow electricity to pass through it.

Please note that some materials can be both conductors and insulators e.g. some forms of rubber are conductors and some forms of rubber are insulators.

See worksheet for examples of conductors and insulators.

Resources: • Picture 2 – Knife in toaster.
• Worksheet – Lesson 2 Conductors and Insulators.

Lesson Plan Outline

1. Discuss Picture 2 – Knife in toaster. Look for technical language e.g. insulation, power points, switches, conductors. Discuss how electricity runs through wires that are insulated so that it cannot escape. Show the students the power cord connected to the toaster. Explain that you can get electrocuted if the insulation is broken.
2. Discuss conductors and insulators. Ask students for examples from within the room. Take students outside and look for examples of conductors and insulators, challenge students to find examples that can be both conductors and insulators e.g. dry or dead wood is an insulator, green or wet wood is a conductor.
3. Hand out worksheet. Ask students to complete the worksheet.

Answers to worksheet:

Explain the knife is made of metal, which is a conductor of electricity. If the toaster is plugged in and turned on someone attempting to remove toast from the toaster using a metal knife may be electrocuted.

Answers to question 4 could include:

- 1 Putting a piece of metal in a power point.
 - 2 Cutting an electrical cable (which is turned on) with metal scissors.
 - 3 Towing a boat with a tall metal mast, which hits an overhead power line.
 - 4 Digging into an underground cable with a metal shovel.
 - 5 Using a metal screwdriver to fix an appliance that is plugged in and turned on.
 - 6 Sliding a metal appliance over a power-cord causing the insulation to break.
4. Discuss the safety message at the bottom of the worksheet: "Remember metal is a conductor of electricity and can be dangerous."

Lesson 2 – Conductors and Insulators

Name : _____ Class : _____ Date : _____

1. Explain: "Electricity is always trying to go somewhere."

Electricity goes through **conductors**, materials like metal, water, wet things and things with water in them such as animals and people.

It does not go through **insulators**, materials like glass, plastic and most types of rubber. These things can be put around wires to keep electricity away from you.

2. List ten conductors and ten insulators.

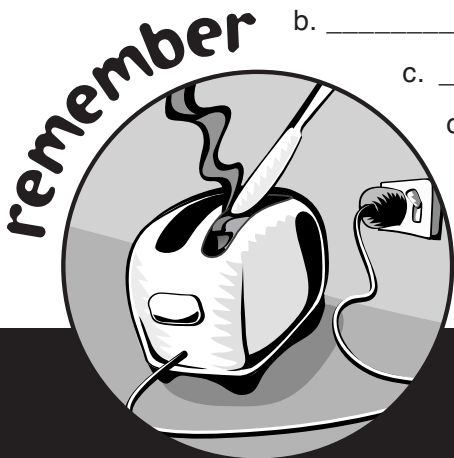
Conductors _____ _____ _____ _____ _____
 _____ _____ _____ _____ _____

Insulators _____ _____ _____ _____ _____
 _____ _____ _____ _____ _____

3. Look at the illustration at the bottom of this page and using information about what you have just discussed, briefly explain what could happen in this picture.

4. List 5 dangerous situations involving electricity and metal.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____



...metal is a conductor of electricity and can be dangerous!

Students will display an understanding of how electricity can travel from one object to another.