



Simplicity of Electricity

The simplicity
of electricity
is that it never tires
of going down wires.

The invention of plugs
was to stop mugs
who touch wires
becoming electric fires.

The simplicity
of electricity
is that it seems to know
it cannot flow
through plastic.
Fantastic!








TEACHERS' GUIDE: Conductors and Insulators

Topic Sound and Hearing	National Curriculum Reference SC4 1a(until 2014)/ Year 4 'Electricity' (2014 onwards)
Learning Outcomes <ul style="list-style-type: none"> • To identify whether a material is an electrical conductor or insulator • To make a basic switch using an understanding of conductors and insulators • To create an electronic matching game 	
Poem Link The Simplicity of Electricity... <i>'is that it seems to know, it cannot flow through plastic. Fantastic!'</i> Throughout these activities the children can think about which materials the electricity can flow through and which it cannot.	

Activities

Activity Type	Running Notes	Resources
 Quick Fire	Show the children a basic circuit consisting of a battery, buzzer and wires. The circuit should have a visible gap. Ask the children which object(s) (slide 1) could bridge this gap and allow the electricity to flow through. Discuss the children's choice in terms of the materials from which the objects are made. Introduce the vocabulary conductors or insulators if not covered before.	Basic circuit equipment (battery, buzzer, wires/clips) Either slide 1 or demonstrate using a selection of metal and non-metal everyday objects
 Hands On	Demonstrate a method for making an electrical switch using folded card plus a strip of a material (see below). Before making their own switch the children should test the materials to find out if they are conductors or insulators. Remind children the switch they are making can only be used with a small battery NEVER mains electricity.	Card, scissors, glue A selection of materials (e.g. fabric, foil, metallic looking wrapping paper, plastic etc)
 Extended	Provide each child/pair with punched card to create a poem matching or rhyming game (see below). Explain that the game aims to support younger children in either matching rhyming couplets or finding pairs of rhyming words. If they match correctly a buzzer should sound. Show the children how to construct the game (see below) and discuss why foil and sticky tape are used to either allow the electricity to flow or to stop it flowing.	



Science Background

Quick Fire Activity

Conductors are materials that allow electricity to flow through them. Metals are conductors. The other materials shown, such as plastic, are insulators. It is worth emphasising to the children that insulators are very important in keeping us safe. For example, electric wires and plugs are covered in plastic so that the electricity cannot reach us.

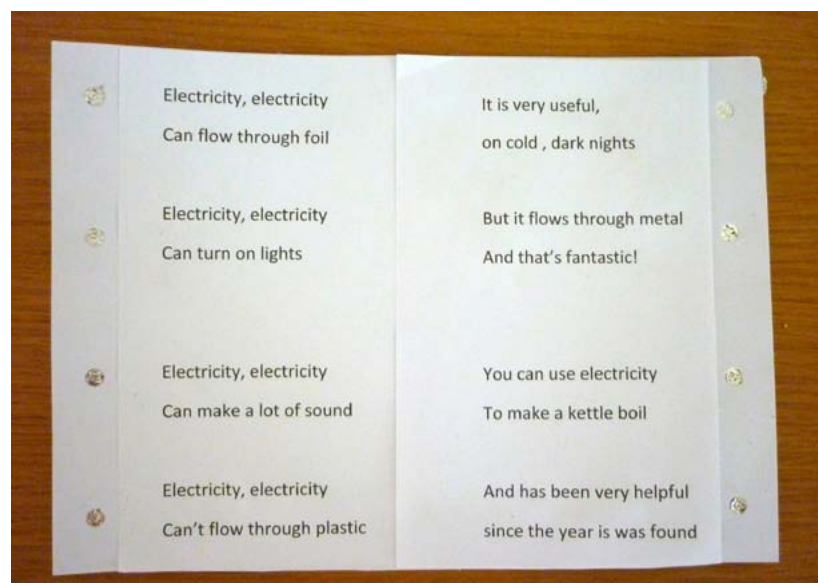
Hands On Activity

The crocodile clips from the circuit should be connected to the lower side of the switch (without the strip). When the switch is pressed down, the conducting strip is lowered and touches the crocodile clips. The circuit is completed and the buzzer should sound. Only the foil strip conducts (not the apparently metallic wrapping paper).



Extended Activity

If no sticky tape was used then the electricity could find other ways to complete the circuit. It would not just flow along one strip of foil. Electricity cannot flow through the sticky tape which ensures that a complete circuit will only be made between the correct pair of holes.



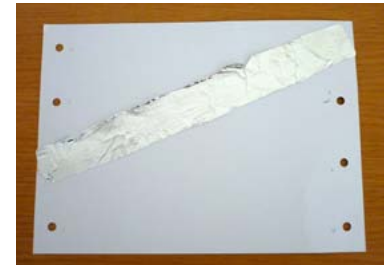
Poem by Timothy Harden



Activity Sheet 1: How to make an electronic matching game

Punch holes down two sides of a piece of card. The number of holes should match the desired number of matching pairs in the game. This may have been done for you.

Glue a strip of foil from one hole to the location of the answer.



Cover the central part of the foil with stick tape. This will prevent electricity flowing between this foil strip and the next one.



Add the next foil strip to join a different pair of holes. Make sure it does not touch the foil from the other strip! Add more sticky tape if necessary.



Continue until each hole on the left is connected to one hole on the right.



Turn the card over. Create a simple circuit with a battery, buzzer and wires.

Connect crocodile clips on the ends of the wires to matching holes. The buzzer should sound.

Create the game on the card.

You could draw and write simple rhyming words, copy out some rhyming couplets from a poem or even create your own rhyming poem about science.





Which object will allow the buzzer to sound?





Create your own switch.
Which material strip will work?





Create an electronic matching pairs game.

