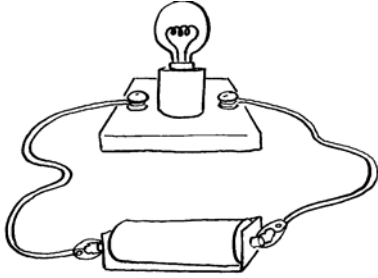
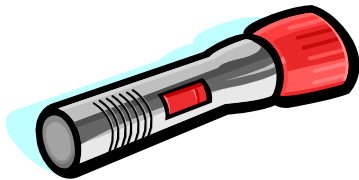
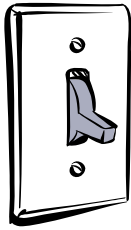


Week 4 – Testing circuits

Focus + Resources	Lesson Notes
<p>Lessons 1 and 2</p> <p>Objectives</p> <ul style="list-style-type: none"> To interpret drawings of circuits, making correct predictions about whether they will work or not and explaining these To explain how a switch is used to turn a light or buzzer on and off <p>Key Ideas</p> <ul style="list-style-type: none"> An electrical device will not work if there is no battery or a break in the circuit A switch can be used as part of a circuit to start and stop the flow of electricity. <p>Resources</p> <ul style="list-style-type: none"> Folens Big Book 2, page 16 Star Science – Using Electricity WES Science Workbook 5 Science Success, page 46 Small items such as rubber, pencil, pencil sharpener, spoon (plastic and metal), small card, paper faster, safety pin, small piece of wood, small plastic toy <p>Vocabulary as for last 3 weeks, plus <i>switch, conducts, complete, broken, flow, copper, wire</i></p> <p>Extension Activity The extension activity for this week is built into the last part of Lesson 2.</p> 	<p>Lesson 1</p> <ul style="list-style-type: none"> Is the circuit complete? Look again at page 16 in the <i>Folens Big Book</i>. Three more incomplete circuits, where the bulb will not light, are illustrated. Talk about why each of these is not a complete circuit. Look at the first one. Both wires are connected to the same end of the battery so the power from the battery is not flowing through the circuit. <i>What is missing in the next one?</i> (only one wire between battery and bulb). <i>How about the last one?</i> (both clips to same side of light bulb). Turn to Activity 5.8 in <i>Science Workbook 5</i>. Your child has to spot complete and incomplete circuits and provide explanations. In the last two he has to draw the missing component. Offer help if needed but let him tackle it independently at first. Why won't they work? Turn to page 10 in <i>Using Electricity</i>. Look at the circuits with your child. <i>Which ones need to be changed to make them work? What needs to be done?</i> Switching on and off. Give your child a torch and ask him to make it light. What does he have to do? (Turn on the switch). <i>Were you able to turn on the light or buzzer in the same way in the circuits you made last week? What would you need to do so?</i> Turn to page 46 in <i>Science Success</i> and ask your child to read this. This reviews what is needed for a circuit and introduces the idea of a switch. Establish that you can put a switch in a circuit which will turn the electricity on and off. When the switch is on, the circuit is completed. When it is off the circuit is broken and the light goes out. <i>What type of material does a switch need to be made of?</i> (Something that conducts electricity.) Discuss the word 'conduct'. We use this to describe a material that lets electricity flow through it easily. You have found that copper wires are used in electrical wiring because electricity can flow easily through copper. <i>Is this true of all metals?</i> In the next lesson you will be investigating suitable materials to use for your switch. Switches. Finish by asking your child to show you a variety of switches on the appliances at home. Establish that we use switches both in devices powered by batteries and those that are plugged into the mains. <hr/> <p>Lesson 2</p> <ul style="list-style-type: none"> Does it conduct electricity? Ask your child if he can remember what 'conduct' means (in terms of electricity). Review the fact that some materials will conduct electricity and some will not. Set up your circuit again with the battery, bulb in bulb holder and one side of the circuit connected with the crocodile clips. From the other side of the bulb and battery, fix two wires with bare ends. If these ends are joined, the current will flow and the bulb light.

Science Term 3

Week 4, Lesson 2 continued



- Let your child try putting a variety of materials between the two wires to see if they will 'conduct' electricity. Make sure you include a paper clip as one of the objects he tests. He should find that most metals (including the paper clip) will do so but that most other materials will not.
- **Make a switch.** One type of switch is shown on page 46 in *Science Success* but it is possible to make a very simple switch without any special equipment. *Does the switch need to be a good conductor of electricity?* (If your child has understood the previous work, he should be quite sure that it does). *What objects did he find in his testing that might make a possible switch?* He may suggest several but if so, pick up the paper clip and ask if this could be one of them. Turn to Activity 5.9 in *Science Workbook 5*. This provides the framework for your child to make a circuit with a switch. Keep *Science Success* open at page 46 so your child remembers how a circuit will look with a switch in it and offer help if needed. You will probably need to confirm how the circuit needs to be connected.
- **Switching on the buzzer.** Ask your child if he can make a circuit with a switch to operate the buzzer. This should be just the same as with the bulb but he needs to remember that the buzzer has to be the right way round.
- **More switches.** If your child is interested and wants to go further you could suggest that he tries to set up a circuit with both a buzzer and a bulb and with two switches so that each can be switched on and off. This will take some support but may be an interesting and challenging activity.

Week 4 – Additional Teaching Points

Preparation for the lesson

- Make sure you have the buzzer as well as the rest of the electrical components from the WES Science Kit for this week. You will also need a range of small items which can be put into a circuit to test whether they conduct electricity. These could include small items such as rubber, pencil, pencil sharpener, spoon (plastic and metal), small card, paper faster, safety pin, small piece of wood, small plastic toy.

Teacher tips

- Experimenting with bulbs, buzzers and switches this week will help your child to think of ideas for next week's project. You can give support as required this week but make sure your child always has the chance to give his own views and make his own suggestions. He may need to work through some wrong conceptions in order to reach an understanding of what has been covered.
- Answers to Activity 5.8 in *Science Workbook 5* are in the Term 3 Appendix.

Switching on, switching off

Activity 5.9

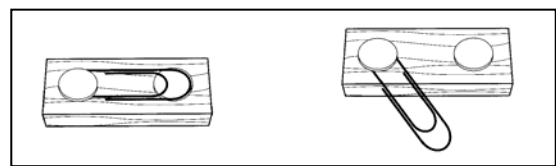
Week 4

What you need:

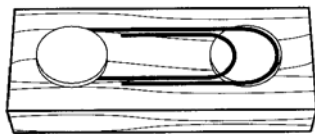
- 1.5V battery + holder
- Small bulb in bulb holder
- 1 wire with crocodile clips
- 2 pieces of wire with bare ends
- Small piece of wood or cork
- 2 drawing pins
- Paper clip

What to do:

- Push one drawing pin into your block of wood.
- Put the other drawing pin through the paper clip and then push this into the block of wood as shown.
- Connect the two wires with bare ends to the drawing pins, then connect the other ends to the bulb and battery.



Complete your circuit by joining the other side of the bulb and battery.



When the paper clip is touching both drawing pins the circuit is completed and the bulb lights

What happens when the paper clip is only touching one of the drawing pins?

