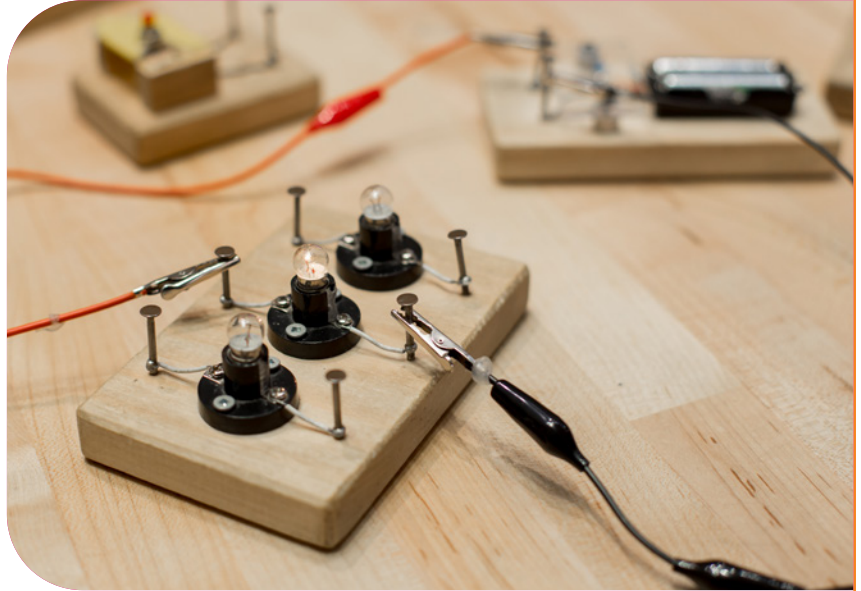


YEARS 5-8

Electrical circuits

OVERVIEW

Explore electrical circuits, their components and how they work. Learn about energy sources, conductors, insulators and how electricity flows.



NZ CURRICULUM LINKS

LEARNING AREAS:	ACHIEVEMENT OBJECTIVES:	LEVELS:	YEARS:
Science	Physical World: Physical inquiry and physics concepts Nature of science: Communicating in science	3-4	5-8
Technology	Technological knowledge; technological products.	3-4	5-8
English	Speaking, writing and presenting; ideas.	3-4	5-8

TEACHER INFORMATION:

Learning sequence



INTRODUCING
KNOWLEDGE



EXPLORE AND
INVESTIGATE



CREATE AND
SHARE



REFLECT AND
EXTEND



MAKE A
DIFFERENCE

Learning intentions

Students are learning to:

- Recognise what an electrical circuit is.
- Identify what conductors and insulators are.
- Explore electricity and circuits through experimentation.

Success criteria

Students can:

- Describe the essential components of an electrical circuit
- Identify which objects are insulators or conductors
- Build and experiment with simple circuits

Resources needed

Slideshow: [Electrical Circuits](#)

Circuit making equipment (see page 4 for examples)

Google Doc Student Worksheet: [Conductor or insulator?](#) and page 4

Additional Support

Science Learning Hub article: [Electricity- electrons, circuits and conductors](#)

Video: [Conductors and insulators by Mr Bradley](#)

An electrical circuit is a closed path of conductive materials, where electrons flow in a current.

Circuits are everywhere in our modern lives. They are in electronics and devices and in anything that uses electricity. Understanding circuits helps us to understand how the technology around us works.

Vocabulary

Battery, wires, device, bulb, conductor, insulator, source, current, circuit.

LEARNING EXPERIENCE

Note: These are suggestions only and teachers are encouraged to adjust the activity to suit the needs and interests of their students.



INTRODUCING KNOWLEDGE

Allow approximately 15 minutes

- If students are new to learning about energy and electricity, consider taking them through our introductory slideshow: [Exploring energy and electricity](#)
- Students can share their prior knowledge about circuits with a partner. Ask students what a circuit is and what the different parts of a circuit could be.
- Discuss real world applications of electrical circuits with the students, such as games, toys, computers and electronics. Ask them to think about where circuits might be found in the following places: at home, school, local business, local sports arena or library.



EXPLORE AND INVESTIGATE

Allow approximately 20 minute

- Set up a circuit according to the diagram below.
- Make predictions about which objects are conductors (let electricity flow through them) or insulators (won't let electricity flow through them). Record thoughts on the table on page 4 or slide 15 of the [Electrical circuits slideshow](#). Then test the materials listed and note down results on the Student Worksheet: [Conductor or insulator?](#) (see page 4).

THINKING LIKE A SCIENTIST:

Will all materials let electricity pass through them? What is a conductor?

Any text highlighted in **orange** represents a link to further material. If you have printed this resource, please return to schoolgen.co.nz/for-teachers/resources to access the linked material.



Student Worksheet

Conductor or insulator?

Test the materials listed below to see if they can conduct electricity.

Put the objects in your circuit, between the paper clips and see if the circuit bulb still works. If it does, the object is a conductor! If not, it's an insulator!

Try twice or three times to make sure you're correct. Then, record your results in the table.

Material	Prediction (conductor or insulator?)	Result
Cotton		
Plastic peg		
Steel wool		
Aluminium foil		
Paper		
Glass		
Pencil		
Coin		
Other:		
Other:		

Make a copy of this worksheet to edit

[Link to google docs version](#)





CREATE AND SHARE

Allow approximately 30 minutes

- View and discuss the slideshow: [Electrical circuits](#). This slideshow introduces students to circuits, conductors and insulators and the basics of building and labelling circuits.
- After viewing, try the labelling activity on slide 12/13 about parts of a circuit.

Label the circuit

Drag the yellow labels below into the correct position in the diagram on the right.

Battery (energy source)

Wire

Switch

Bulb

genesis school-gen

- Discuss electrical safety with students. Reflect on how to stay safe around electricity. Why is it important to have insulating materials in electrical devices? (Insulators help reduce the risk of electrical fires or shocks by keeping the electricity in the designated area).
- Provide students with a variety of circuit components (wires, batteries, bulbs, switches etc...). These can be bought in kits or separate components from many electronic stores and educational websites.

Examples of electric circuit kits available in New Zealand:

- [Creokit kits](#)
- [Snap circuits STEM set](#)
- [Brainbox kit](#)

Each year, the Genesis School-gen Trust gifts STEM equipment to schools to give students hands-on experiences. Find out more about the School-gen Trust and how your school can apply [here](#).



REFLECT AND EXTEND

Timing will vary

Extending learning

- Encourage students to apply their imaginations to the engineering design process and participate in advanced circuit building:
 - [Build a toy workshop video](#)
- Have fun creating circuits around your classroom, connecting them together to reinforce new learning.



MAKE A DIFFERENCE

Allow approximately 45 minutes

Students can use their findings to explore how they could use less electricity in the home, school or in the work environment.

Create posters or digital presentations which explain how to use their new knowledge to save energy, or be safe around electricity.

We hope you have enjoyed this educational STEM resource.

School-gen is a Genesis community initiative to get kaiako, tamariki and whānau enthused about STEM.

For more free resources please visit our [Genesis School-gen website](#) and follow us on Facebook and Instagram @schoolgennz