

Electrical Safety World | Teacher's guide

www.vectorsafety.co.nz

This guide contains the resources you need to put this website to work for your class. We've included content curriculum-based experiments and information, plus worksheets for each section to help you assess students' understanding of key science and safety concepts.

This website is linked to the NZ Curriculum and suitable for Years 3 – 6 (levels 2, 3 and 4) in **Health and Physical Education** and **Science**.

Learning area: Science	
Strands:	<ul style="list-style-type: none"> • Nature of Science <ul style="list-style-type: none"> • Investigating in Science • Communicating in Science • Physical World <ul style="list-style-type: none"> • Physical inquiry and physics concepts
Learning intentions:	<ul style="list-style-type: none"> □ Investigate and describe what electricity is, its role and sources of electricity Activities - Student worksheet #1, Student worksheet #5 □ Begin to use a range of scientific conventions and vocabulary in relation to electricity and electrical equipment □ Investigate simple electrical circuits Activities - Experiment: Complete a circuit □ Investigate and describe insulation and conductors Activities - Experiment: Conductors & Insulators, Experiment: Electricity & water
Learning area: Health and physical education	
Strands:	<ul style="list-style-type: none"> • Personal Health and Physical Development <ul style="list-style-type: none"> • Safety management • Healthy Communities and Environments <ul style="list-style-type: none"> • Rights, responsibilities, and laws
Learning intentions:	<ul style="list-style-type: none"> □ Identify electrical risks and their causes, and describe safe practices to manage these Activities - Student worksheet #2, Student worksheet #3, Experiment: Conductors &

	<p>Insulators, Experiment: Benjamin Franklin was lucky, Game: Make the Safe Choice</p> <ul style="list-style-type: none">□ Access and use information to make and action safe choices around electricity and electrical equipment, at home, at school and in the community Activities - Student worksheet #2, Student worksheet #4, Game: Find the Hidden Dangers□ Understand responsibilities and actions, and use simple guidelines and practices, to ensure personal safety and the safety of others around electricity Activities - Student worksheet #3, Student worksheet #4, Game: Make the Safe Choice, Home Safety Inspection Checklist
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Section 1: Website overview

Electrical Safety World uses information, experiments, games, and activities to teach students the principles of electricity and the practices of electrical safety.

This site is geared for a range of interests and reading levels and can be used by students in primary and intermediate school (students can click on highlighted vocabulary words to access pop-up definitions). Non-readers will need adult assistance to play the games.

The site features four main areas:

- ***Games***—Interactive games that simulate common indoor and outdoor electrical hazards, giving students a chance to put safety principles into practice.
- ***For Kids***—Key science and safety content organised into thematic sections. Each section is self-contained and includes relevant experiments or activities.
- ***For Parents***—Tips for how to get the most out of this site with kids. Includes handy Home Safety Inspection Checklist
- ***For Teachers***— Tools and tips for educators.

Other helpful features include: **Tell Me More**, a section for students doing reports and research which covers energy efficiency, energy production, renewable resources and the pioneers of electricity; a **Safety Certificate** (provided on the following page) that students can use to track their progress through the website and a handy **Glossary**.



Electrical
Safety World

I HAVE COMPLETED ALL SEVEN CONTENT AREAS OF THE ELECTRICAL SAFETY WORLD WEBSITE



- THE TRAVELS OF ELECTRICITY
- TREE & POWER LINE SAFETY
- HOW ELECTRICITY CAN HURT YOU
- TELL ME MORE
- IN CASE OF EMERGENCY
- HOME SAFETY INSPECTION
- SURVIVOR STORIES

*I promise to use what I have learned to stay safe around
electricity, and to help keep my family and friends safe, too!*

Your Signature: _____

Your Parent's Signature: _____

Your Teacher's Signature: _____

Vector

Section 2: Electricity FAQs

1. What is electricity?

Electricity is a form of energy that starts with atoms. Atoms are too small to see, but they make up everything around us. An atom has three tiny parts: protons, neutrons, and electrons. The centre of the atom has at least one proton and one neutron. At least one electron travels around the centre of the atom at great speed. Electricity can be created by forcing electrons to flow from atom to atom.

2. How is electricity generated?

Most electricity used in New Zealand is produced at power stations. Various energy sources are used to turn turbines. The spinning turbine shafts turn electromagnets that are surrounded by heavy coils of copper wire inside generators. This creates a magnetic field, which causes the electrons in the copper wire to move from atom to atom.

3. What is hydroelectric energy?

Hydroelectric plants use the power of falling water to turn the turbines that help generate electricity. Water stored behind a dam is released and directed through special tubes to flow against the blades of turbines and make them turn. Hydropower provides about 60-70 percent of the electricity generated in New Zealand.

4. How does electricity travel?

Electricity leaves the power station and is sent over high-power transmission lines on pylons. The very strong electric current from a power station must travel long distances to get where it is needed. Electricity loses some of its strength (voltage) as it travels, so transformers, which boost or "step up" its power, must help it along.

When electricity gets closer to where it will be used, its voltage must be decreased. Different kinds of transformers at substations do this job, "stepping down" electricity's power. Electricity then travels on overhead or underground distribution wires to neighbourhoods. When the distribution wires reach a home or business, another transformer reduces the electricity down to just the right voltage to be used in appliances, lights, and other things that run on electricity.

A cable carries the electricity from the distribution wires to the house through a meter box. The meter measures how much electricity the people in the house use. From the meter box, wires run through the walls to power points and lights.

The electricity is always waiting in the wires to be used. Electricity travels in a circuit. When you switch on an appliance, you complete the circuit. Electricity flows along power lines to the power point, through the power cord into the appliance, then back through the cord to the power point and out to the power lines again.

Electricity travels fast (299,460 kilometres per second). If you travelled that fast, you could travel around the world eight times in the time it takes to turn on a light. And if you had a lamp on the moon wired to a switch in your bedroom, it would take only 1.26 seconds after you flipped the switch for electricity to light the lamp 384,560 kilometres away.

5. How is electricity measured?

Volts, amps, and watts measure electricity. Volts measure the “pressure” under which electricity flows. Amps measure the amount of electric current. Watts measure the amount of work done by a certain amount of current at a certain pressure or voltage.

To understand how they are related, think of water in a hose. Turning on the tap supplies the force, which is like the voltage. The amount of water moving through the hose is like the amperage. You would use lots of water that comes out really hard (like a lot of watts) to wash off a muddy car. You would use less water that comes out more slowly (like less watts) to fill a glass.

1 watt = 1 amp multiplied by 1 volt

1 amp = 1 watt divided by 1 volt

6. Do the words ‘shocked’ and ‘electrocuted’ mean the same thing?

No. Someone can be *shocked* by electricity and survive. But when we say someone has been *electrocuted*, it means they have been killed by electricity.

7. Why can you sometimes see a spark if you can’t see electricity?

You can’t see electricity when it is flowing through a circuit. But if electricity leaves the circuit—like when someone is shocked—you can see a spark. The spark isn’t electricity itself. It is a flame that happens when the electricity travels through the air and burns up oxygen particles.

8. When a circuit is open, do electrons go backward, or do they just stop?

Neither. In the wires of an electrical circuit, the electrons are always jiggling around. When a circuit is closed to run an appliance or a light bulb, the electrons jiggle a lot and travel through the wire. When the circuit is open, all the electrons just jiggle where they are—kind of like running in place.

9. Why does electricity try to get to the ground, and what does it do when it gets there?

It's just the nature of electricity to move from an area of higher voltage to an area of lower voltage, if given a path to travel there. The ground is simply the lowest voltage area around, so if you give electricity a path to the ground, it will take it, no questions asked. When electricity goes into the ground, the earth absorbs its energy.

10. Why can a bird stand on a power line and not get shocked?

It is easier for electricity to keep flowing through the power line than to go through the bird. But if a bird with large wings touches a power line and a tree or power pole at the same time, it provides electricity with a path to the ground, and could be shocked. And if a bird touches two wires at once, it will create a circuit—electricity will flow through the bird and likely electrocute it.

11. What is static electricity?

The shock you feel when you touch an object after walking on carpet is static electricity. When you drag your feet across synthetic carpet on a dry day, electrons from the carpet get transferred to your body. If you then touch a piece of metal, such as a doorknob, the electrons jump to the metal and you'll feel a shock.

12. What is lightning?

Lightning is a large discharge of static electricity. During a thunderstorm, clouds build up a charge. When there is a big difference in charge between the cloud and its surroundings, the cloud discharges a lightning bolt.

13. How much energy is in a bolt of lightning?

One lightning strike can carry up to 30 million volts—as much electricity as 2.5 million car batteries.

14. Does lightning ever strike fish?

Yes, it does. Because water conducts electricity, when lightning strikes water it spreads out along the surface. Any fish near the surface of the water get electrocuted.

15. Who holds the world's record for most often to be hit by lightning?

According to the Guinness Book of Records, Roy G. Sullivan, a former U.S. park ranger, was struck by lightning seven times over the course of his 35-year career. Lightning has burned off his eyebrows, seared his shoulder, set his hair on fire, injured his ankle, and burned his belly and chest.

16. Why didn't Benjamin Franklin get electrocuted when he tied a metal key to a kite string and flew the kite in a thunderstorm?

Benjamin Franklin's famous key did give off an electric spark. But lucky for Franklin, the kite was just drawing small electrical charges from the air. If the kite had actually been struck by lightning, Franklin would have been killed.

17. Why shouldn't I use a corded phone or electrical appliance during a thunderstorm?

There is a very small chance that a lightning strike could surge through phone lines or through the wires of an electrical appliance. If you were to touch a phone or appliance at just that moment, you could be shocked.

18. How do batteries create electricity?

A chemical reaction within the battery forces electrons to move.

19. Why don't I get a shock when I touch a battery?

There is not enough voltage in a regular household battery to cause a shock. However, car batteries are powerful enough to shock so you should never tamper with them.

20. Do electric eels really create electricity?

Yes. An electric eel uses chemicals in its body to manufacture electricity. A large electric eel can produce a charge of up to 650 volts, which is more than five times the shocking power of a household power point.

21. How does a defibrillator work?

Inside the cells of the heart, tiny electrical currents fire in a steady rhythm. If that rhythm is disrupted due to disease or injury, a heart attack can occur. A defibrillator shocks every cell in the heart at the same time, so they all start up again in rhythm. It's like each cell is dancing to the same beat.

22. How does a light bulb work?

The wire inside a light bulb is called a filament. It is made of tungsten, a metal that stays solid at very high temperatures. Electricity flows through the tungsten filament, causing it to heat up and glow. The glow gives off light. Inside a light bulb is a vacuum—in other words, all the air has been removed from inside the glass bulb. (If there were air inside, the wire would burn up.)

Section 3: Experiment tips

This section includes guidance and tips for the four science experiments on www.vectorsafety.co.nz –

- Complete a circuit
- Conductors & Insulators
- Electricity & Water
- and Benjamin Franklin was Lucky.

Experiment: Complete a Circuit

Materials:

Students will need: -

- D-cell battery
- 1.5-volt lightbulb
- Two 30cm pieces of insulated solid strand 1-2.3mm² copper wire (with 2.5 cm of insulation removed at each end)
- Lightbulb base
- Masking tape

Bulbs, bases, and wire can be purchased at stores like Dick Smith Electronics. Make sure the lightbulbs and bases match.

Safety first:

- Students should be supervised by an adult while doing this experiment
- A teacher or another adult should be responsible for stripping insulation
- Explain to students that electricity can be dangerous if it is not handled correctly, and emphasise that they should never experiment with the electricity that comes from a power point. It's much more powerful than the electricity made by small batteries and could seriously injure or even kill someone.

Objective:

Students will build a circuit and equate it to the path of electricity that comes from power stations.

Getting it across:

Have students read the information and follow the steps on the page. Make sure they are able to identify the circuit electricity travels from the battery to the lightbulb and back, and the circuit electricity travels from power stations to homes and back. They should be able to equate the wires in the experiment with power lines and electrical wiring in the electric distribution system.

Questions and answers:

- What part of the distribution system is like the wires in the experiment? (*Power lines and electrical wiring.*)
- What happens if you tape only one of the wires to the battery? Why? (*The bulb does not light. The circuit is not complete unless both wires are taped to the battery, allowing electricity to flow in a circle.*)

Experiment: Conductors & Insulators

Materials:

Students will need: -

- D-cell battery
- 1.5-volt light bulb
- *One 30cm piece and two 10cm pieces* of insulated solid strand 1-2.3mm² copper wire (with 2.5cm of insulation removed at each end of wire)
- Lightbulb base
- Masking tape
- Students will also need a variety of things they think might conduct electricity, such as toothpicks, rubber bands, paper clips, plastic, fruit, etc.

Bulbs, bases, and wire can be purchased at stores like Dick Smith Electronics. Make sure the lightbulbs and bases match.

Safety first:

- Students should be supervised by an adult while doing this experiment
- A teacher or another adult should be responsible for stripping insulation from wires
- Explain to students that electricity can be dangerous if it is not handled correctly, and emphasise that they should never experiment with the electricity that comes from a power point. It's much more powerful than the electricity made by small batteries and could seriously injure or even kill someone.

Objective:

Students will learn the difference between conductors and insulators.

Experiment tips:

Teachers should strip the wires ahead of time and make sure the batteries are fresh. Though the illustration does not show it, use tape to stick the wires to the ends of the battery.

Students are likely to know that metals are good conductors, but they may be unaware that things with a lot of liquid in them also conduct well. Some things to have on hand include lemons, gherkins, and potatoes. When testing these, make sure students stick wires into the wet part of the item.

The key in the conduction of electricity is the movement of electrons. Metals are elements that freely share electrons. In liquids, dissolved ions can carry a charge as well. That is why water helps in the conduction of electricity. Salty water, loaded with sodium and chloride ions, helps even more.

Getting it across:

1. Have students bring in things they think might conduct electricity.
2. Have teams read the information and follow the steps on the page.
3. Students should first test their circuit by connecting it without any trial material.

Questions and answers:

- Ask teams to share their predictions and results. Were the results the same? If not, why not? *(Answers will vary. Be sure the experimental setup was not at fault.)*
- What conclusions can students draw about conductors and insulators? *(Answers will vary. Students might generalise that metals are good conductors or plastic is a good insulator.)*

Experiment: Electricity & Water

Materials:

Students will need: -

- The circuits they made for experiment two: Conductors & Insulators
- A glass jar
- Two nails
- Two alligator clips
- Salt
- Water

Safety first:

- Students should be supervised by an adult while doing this experiment.
- A teacher or another adult should be responsible for stripping insulation from wires.
- Explain to students that anything can conduct electricity when wet.
- Remind students that they can mix water and electricity safely in this experiment because the voltage is so minimal (1.5 V per D-cell battery).

Objective:

Students will demonstrate that water is a conductor of electricity.

Getting it across:

Be sure students add plenty of salt to the water. Then have them predict, experiment, and note their observations. Share results.

Questions and answers:

- Ask students why they think the salt is needed. *(Students will need to add a lot of salt to their water in order for electric current to flow. The voltage of the battery is so low that additional particles must be added to make the water **MORE** conductive. It is the impurities in water that make it a good conductor. Pure water will not conduct electricity. However, pure water is only found in the laboratory. That's why there is so much emphasis on the conductivity of water as regards electrical safety.)*

Experiment: Benjamin Franklin Was Lucky

Materials:

Students will need: -

- The circuits they made for experiment one: Complete a Circuit, modified as shown in the illustration (strip a 2.5cm section of insulation off the middle of each wire)
- 15-cm piece of thicker wire with 2.5 cm of insulation removed at each end

Safety first:

- Students should be supervised by an adult while doing this experiment
- A teacher or another adult should be responsible for stripping insulation from wires
- Remind students that they are able to work with these batteries and wires because the voltage is minimal (1.5 V per D-cell battery). They should never experiment with the electricity that comes from a power point. It's much more powerful than the electricity made by small batteries and could seriously injure or even kill someone].

Objective:

Through creating a short circuit, students will understand that Benjamin Franklin got shocked because he touched two parts of a circuit at the same time.

Getting it across:

1. Have students read the information and follow the steps on the page.
2. Be sure students understand that they should immediately disconnect the thick wire and the battery after they observe what happens. The wires will get hot. This is a clue to why Franklin got shocked.

Questions and answers:

Students' predictions and results will vary.

- Why is this called a 'short circuit'? (*Because the electricity travels a shorter route than the intended circuit. Electricity is not able to complete its intended path because the circuit is grounded somewhere.*)
- Why did Benjamin Franklin get shocked? (*His arms functioned like the thick wire in the experiment. Electricity travelled through his body instead of through the circuit.*)

Section 4: Student worksheets

There are six worksheets: -

1. The Travels of Electricity
2. How Electricity Can Hurt You
3. Tree & Power Line Safety
4. In Case of Emergency
5. Tell Me More
6. Answer Keys for All Worksheets

These one-page worksheets review the key safety principles from the main thematic sections of *Electrical Safety World*. Here are some ideas for how to use them with your class:

- For younger students, use the questions to orally review basic electrical safety information with the whole group.
- For older students, assign a section or sections of the site to individual students or small groups, and ask students to use the worksheets like a treasure hunt, completing them as they find the answers in each section.
- After all students have completed all sections of the website, organise the class like a game show. Contestants can continue to answer questions until they get one incorrect, at which point a new contestant takes their place.

Electrical Safety World: Student Worksheet #1

The Travels of Electricity

Name: _____

Date: _____

1. You can move faster than electricity can. (True or False)
2. Circle three objects from the list below that conduct electricity:

an aluminium ladder

rubber lineman's gloves

a copper wire

a metal bench

a fibreglass ladder

a glass insulator

What these objects have in common is that they are made of

_____.

3. Insulators are important for safety around electricity because

_____.

4. Plugging too many things into a power point can overload it and cause

_____.

5. Guess whether the power lines to your building are overhead or underground. Now look outside. Were you right? _____.

6. Use the following items — a D-Cell battery, a lightbulb and two pieces of wire — to draw a complete electric circuit that will allow the bulb to light up.

Electrical Safety World: Student Worksheet #2

How Electricity Can Hurt You

Name: _____

Date: _____

1. Electricity always takes the easiest path to the _____

- a) sky b) tree c) ground

2. You have to be touching the ground directly to be shocked by electricity.

(True or False) _____.

3. You should never touch anything electrical while you have wet hands or while standing in water because

_____.

4. Draw a picture of a dangerous situation inside or outside a home that could result in someone being shocked by electricity.

5. Now, explain something people could do to correct the shock hazard you just drew.

Electrical Safety World: Student Worksheet #3

In Case of Emergency

Name: _____

Date: _____

1. What can happen if you throw water on an electrical fire? What should you do instead for an electrical fire?

_____.

2. If you touch someone who has been shocked and they are still contacting the source of the electricity, what could happen to you?

_____.

3. What is the only safe thing to do if you see a fallen power line?

- a) jump over it
- b) stay far away from it and tell an adult
- c) move it with a stick

4. What is the safest thing to do if you are in a car with a power line on or near it?

- a) climb out the car window
- b) stay in the car
- c) get out of the car as fast as you can
- d) get onto the car roof and stay there

5. List 3 things that would be useful to have in a safety kit during a power failure.

- 1. _____
- 2. _____
- 3. _____

6. If you see lightning or hear thunder and can't get indoors, you are safest

- a) under a tree
- b) in a hardtop car
- c) on a wooden bench
- d) in a wooden boat on a lake

Electrical Safety World: Student Worksheet #4

Tree & Power Line Safety

Name: _____

Date: _____

1. What are two problems that could happen if a tree branch touches a high voltage power line?

_____.

2. True or False: Even if they are not sparking or humming, fallen power lines can kill you if you touch them or the ground nearby. _____

3. Why is it important to call the local electricity supplier before planting a tree or doing other types of deep digging?

_____.

4. True or False: Anyone can trim trees near high-voltage power lines if they get the local electricity supplier's permission first. _____

5. If your kite gets caught in a tree near a power line, why is it dangerous to try to get it down?

_____.

Electrical Safety World: Student Worksheet #5

Tell Me More

Name: _____

Date: _____

1. Explain what "renewable" means, and give two examples of renewable energy resources.

2. What role does an electromagnet play in generating electricity?

3. Name three electrical inventors and their inventions.

4. If you could invent any sort of device to make kids' lives easier or more fun, what would it be? Draw a picture of your invention.

5. What is one way you could reduce energy waste at home or at school?

Section 5: Student worksheets answer keys

These worksheet answer keys correspond to the student worksheets from the main thematic sections of *Electrical Safety World*:-

- The Travels of Electricity
- How Electricity Can Hurt You
- Tree & Power Line Safety
- In Case of emergency
- Tell Me More

Electrical Safety World: Student Worksheet #1 Answer Key

The Travels of Electricity

1. False. Electricity travels at the speed of light. You cannot move faster than electricity.
2. An aluminium ladder, a copper wire, and a metal bench conduct electricity. What these objects have in common is that they are made of metal.
3. Insulators are important for safety around electricity because they are materials that do not allow electricity to pass through them easily. Insulators keep electricity from leaving power lines and appliance power cords so it cannot shock you.
4. Plugging too many things into an power point can overload it and cause a shock and fire hazard.
5. Answers will vary.
6. Illustrations will vary but should show a path that provides a complete, uninterrupted loop from the battery to the bulb and back to the battery.

Electrical Safety World: Student Worksheet #2 Answer Key

How Electricity Can Hurt You

1. Electricity always takes the easiest path to the ground (c).
2. False. You do not have to be touching the ground directly to be shocked by electricity. You could be touching something that is touching the ground, like a ladder.
3. You should never touch anything electrical while you have wet hands or while standing in water because water conducts electricity and you could be shocked.
4. Illustrations will vary; they should clearly show electrical hazards.
5. Answers will vary but should include prevention or correction of electrical hazards depicted in question 4.

Electrical Safety World: Student Worksheet #3 Answer Key

In Case of Emergency

1. Water conducts electricity so if you throw water on an electrical fire it could make the fire bigger and spread it, or you could be shocked. You should tell an adult to use a multipurpose fire extinguisher instead.
2. If you touch someone who has been shocked and they are still contacting the source of the electricity, you could be shocked, too.
3. b) If you see a fallen power line, the only safe thing to do is to stay far away from it and tell an adult. If you jump over it or try to move it with a stick you could be seriously hurt or even killed.
4. If you are in a car with a power line on or near it, the safest thing to do is
b) stay in the car.
5. Items that would be useful to have in a safety kit during a power failure include: torch, matches, extra batteries, radio, can opener, extra food, first aid supplies, extra water, etc.
6. If you see lightning or hear thunder and can't get indoors, you are safest
b) in a hardtop car.

Electrical Safety World: Student Worksheet #4 Answer Key

Tree & Power Line Safety

1. If a tree branch touches a high-voltage power line, the branch could catch fire, a power failure could occur, or someone could climb the tree and be shocked by the power line.
2. True: Even if they are not sparking or humming, fallen lines can kill you if you touch them or the ground nearby.
3. It is important to call the local electricity supplier before planting a tree or doing other types of digging to make sure that when you dig a hole you will not contact underground power lines and other utilities.
4. It is false that anyone can trim trees near high-voltage power lines if they get the local electricity supplier's permission first. Only specially trained, qualified tree trimmers are allowed to work on trees near high-voltage power lines.
5. If your kite gets caught in a tree near a power line, it is dangerous to try to get it down because you might contact the power line while trying to get the kite, and then electricity could travel through you on its way to the ground and you could be shocked.

Electrical Safety World: Student Worksheet #5 Answer Key

Tell Me More

1. Renewable means something can be replenished in a short period of time, so it will never be all used up. Biomass, geothermal energy, hydropower, ocean energy, wind power, and solar energy are examples of renewable energy resources.
2. When electromagnets spin near copper wire it creates a magnetic field, which causes the electrons in the wire to move from atom to atom. The movement of electrons creates electric current.
3. Students' answers may include the notable inventors and inventions listed on this site: Thomas Edison and the incandescent light, Michael Faraday and the generator, Benjamin Franklin and the lightning rod, Ernest Rutherford who split the atom, Ampere who discovered most rules of electricity, or Volta who invented the electric battery. Or, students may describe less-prominent inventors and inventions not listed on this site.

4. Students will draw various inventions to make kids' lives easier or more fun.

5. There are many ways to reduce energy waste at home or school. Answers will vary but should demonstrate students' understanding of how to use electricity less and/or how to use it more efficiently.

Section 6: Home Safety Inspection Checklist

A home safety inspection checklist has been provided for students to take home and work through individually or with a parent.



Home Safety Inspection



Is your home safe? Print out this checklist and do this inspection with your parents or another adult. If you find any hazards, tick **NEEDS FIXING** and then ask an adult to have them fixed.

	True	Needs Fixing
Power points are not overloaded with lots of plugs.	<input type="checkbox"/>	<input type="checkbox"/>
Electric cords are in good condition.	<input type="checkbox"/>	<input type="checkbox"/>
Electric cords do not run under rugs or furniture legs or near hot appliances.	<input type="checkbox"/>	<input type="checkbox"/>
Electric appliances are used away from water.	<input type="checkbox"/>	<input type="checkbox"/>
People carry appliances by the handle, not the cord.	<input type="checkbox"/>	<input type="checkbox"/>
A multipurpose fire extinguisher is kept in the house.	<input type="checkbox"/>	<input type="checkbox"/>
All danger and warning signs are read and carefully followed.	<input type="checkbox"/>	<input type="checkbox"/>
Electric appliances that can get hot—such as heaters, toasters, and lightbulbs—are kept away from things that can burn.	<input type="checkbox"/>	<input type="checkbox"/>
Safety caps are inserted in power points when small children are around.	<input type="checkbox"/>	<input type="checkbox"/>
Small appliances are turned off and/or unplugged when people leave home.	<input type="checkbox"/>	<input type="checkbox"/>
All extension cords, lights, and appliances used outdoors are labeled for outdoor use.	<input type="checkbox"/>	<input type="checkbox"/>



Section 7: Going Further

Here are some assignment ideas to help your students take their electrical savvy to the next level:

- Prepare a one-minute presentation or play for your class on the basics of how electricity travels from the power station to appliances in people's homes.
- Prepare a poster showing electricity going through a person on its way to the ground. The source of the electricity could be a power line or an appliance cord.
- Think of three ways you can convince your friends to be safe around electricity. Share them with the class.
- Create a radio commercial about outdoor or indoor electrical safety.
- Write an essay describing electrical hazards found in an extremely dangerous imaginary house.

Section 8: More resources from Vector

School presentation

A school presentation is a great way to begin your class's journey on electricity learning. Each interactive, one hour presentation includes videos, website demonstrations and safety displays to educate your students about safety around electricity.

The presentation covers how electricity gets to their school and home, and introduces children to the concepts of conductors and insulators. Vector's Children's Safety Programme Coordinator ensures that students have the opportunity to get involved in a number of exercises and engage in discussion about electricity and safety at home and in the community.

A *Stay Safe Around Electricity* classroom workbook and ruler is provided for each student, and other prizes are given away during the presentation.

School presentations are available **free of charge** for schools in the Vector and UnitedNetworks regions of Auckland City, Manukau City, parts of Papakura District, North Shore City, Rodney District, Waitakere City, Wellington City, Hutt City, Porirua City and Upper Hutt City.

To book an electricity safety school presentation contact our Children's Safety Programme Coordinator on (09) 978 7736 or email tracey.rayner@vector.co.nz

Workbooks for the classroom

This colourful 16 page *Stay Safe Around Electricity* workbook is a perfect follow up to the schools presentation and companion to the www.vectorsafety.co.nz website. It uses the same messages to help students learn how electricity works and how to stay safe around it in a wide range of situations, from inside to outside the house, and out into the community where power lines and transformers can be a safety hazard for children.



The workbook uses puzzles, games and simple tasks to engage children in learning about:

- Where electricity is used
- Where electricity comes from
- How electricity can hurt you
- How electricity flows through conductors, including humans

- How to recognise the dangers of electricity
- What to do in an emergency
- Plus there's an electricity safety checklist for children to take home.

A **teacher's discussion and activity guide** is also provided with the workbooks.

Copies of the *Vector Stay Safe Around Electricity* workbooks are available **free of charge** for every child in the class for schools in the Vector and UnitedNetworks regions of Auckland City, Manukau City, parts of Papakura, North Shore City, Rodney District, Waitakere City, Wellington City, Lower Hutt, Upper Hutt and Porirua. Schools in other areas are welcome to order copies at cost: 80 cents each.

With their delightful illustrations promoting the key messages of safety and how electricity works, these booklets will be a winner in your classroom and they'll not only help your class learn, they'll also help keep your children safe.

To order workbooks for your classroom simply call Liz Person on (09) 978 7783, or email workbooks@vector.co.nz or post your name, classroom, school name, number of copies required, and your postal address to: Liz Pearson, Vector Limited, PO Box 99882, Newmarket

Payment: No charge for schools in Vector or UnitedNetworks areas. Schools in other areas please post your order and enclose cheque made out to Vector Limited for 80 cents for each copy, which includes GST and postage.