



SPARKY

and the
**ELECTRICAL
PILLAR**

**Teachers
Guidebook**

Sparky and the Electrical Pillar Teachers Guide

We hope you enjoy reading the picture book, Sparky and the Electrical Pillar in your early childhood classrooms. This book has been published to assist you with educating students about electricity in the neighbourhood and safety around electricity. Physical copies were distributed to all primary schools on our network. To order another copy or to download the e-book visit www.westernpower.com/sparky. You will also find videos and appendix items referenced in this guide through this page.

About this guide

This guide provides suggestions and resources for Safety and STEM activities that you can carry out in the classroom, using the story as a springboard. The activities are mapped by year group and curriculum, and are accompanied by an appendix full of useful worksheets to print or for use on whiteboards. All are available for individual download. We hope you find the story and this guide handy in the classroom.

Your feedback is important to us

We value your feedback. Please email energyeducation@westernpower.com.au with any comments, suggestions or questions. Your feedback will help us to improve future educational materials we produce.

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Activity overview

Activity overview

■ Maths ■ Science ■ D&T ■ Other subjects

Pre-Primary	
Curriculum descriptor:	Additional descriptors and cross curriculum:
Using units of measurement: Compare and order duration of events using everyday language of time (ACMMG007).	Reading and viewing: Respond to text which reflect personal and family experiences (ACELT1575b). Writing: Select an image and illustration to represent a familiar literary text or recent event (ACELT1580b). Reading and viewing: Attend to imaginative and informative texts including visual schedules in everyday experiences (ACELY1648b).
Have your students describe the sequence of events in the Sparky and the Electrical Pillar story. Storyboards are provided in the appendix. Students can cut up the storyboard and arrange the panels in the correct order.	
Shape: Sort, describe and name familiar 2D shapes and 3D objects in the environment (ACMMG009).	Questioning and predicting: Pose and respond to questions about familiar objects and events (AC SIS014). Can also extend through D&T and HASS detailed later.
With your class look at shapes in the street environment. Take a walk around the school 'collecting' shapes e.g. post boxes, street lights, sign posts, shapes on road signs, electrical domes and poles etc (the things Sparky the dog might have used to follow and track his route). The appendix has streets to help. You can also take photos of what you find and categorise them by shape in the classroom. Talk about what power poles and streetlights are for, and how and why they are arranged the way they are.	
Location and transformation: Describe position and movement (ACMMG010).	
Ask your students to describe how the dog escapes from the backyard in the story. Storyboards for Sparky's backyard escape are in the appendix. To extend them, ask them to invent a different escape plan for Sparky or how Sparky would escape their backyard.	

Chemical sciences:

Objects are made of materials that have observable properties (ACSSU003).

Knowledge and understanding – technologies contexts:

Materials and technologies specialisations – Characteristics of materials can be explored using senses (ACTDEK004).

Look at protective clothing with your class as a way of observing properties of different materials. Together, collect different types of gloves. Look at each glove closely and touch it. Then describe the properties of each glove and what it is used for.

Look at the gloves worn by the Network Response Officer in the [video](#), which shows him putting on full PPE (Personal Protective Equipment). Discuss how PPE helps protect the officer from electricity (property as electrical insulator or making it difficult for the electricity to flow through them.) A picture of Network Response Officer safety wear is available in the appendix.

Planning and conducting:

Participate in guided investigations and make observations using the senses (ACIS011).

Investigate how good your class' "doggy" senses of hearing and smelling are. Undertake a smelling investigation using essential oils and cooking extracts such as peppermint, vanilla, eucalyptus, jasmine. Put a different number of drops on absorbent paper and get the students to match up the same smells and rank them by strength. You can also lay a 'smell trail' to see if students can follow someone's (a particular fragrance) pathway using their nose (like a dog.)

You can also carry out a hearing investigation. Using different sounds, see how far away students can hear each sound and ask them to identify what it is. Chart the results. Investigate if you can ever see, hear or smell electricity (**while reinforcing never to touch it**).

Processing and analysing data and information:

Engage in discussions about observations and represent ideas (ACIS233).

Reading and viewing:

Respond to text which reflect personal and family experiences (ACELT1575b).

Writing:

Select an image and illustration to represent a familiar literary text or recent event (ACELT1580b).

Reading and viewing:

Attend to imaginative and informative texts including visual schedules in everyday experiences (ACELY1648b).

Discuss elements of the story such as how the electrical mini pillar/green dome broke, how Sparky the dog escapes from the yard, whether Sparky is clever (STEM smart)? How do dogs use their senses, do we use ours in the same way? Talk about dogs and how they behave.

Knowledge and understanding – technologies contexts:

Engineering principles and systems – ways in which objects move: push, pull, bounce, slide, fall, spin, float (ACTDEK002).

Some objects move because they are powered by electricity. Electricity provides the energy for things to move. Discuss how electricity is connected to movement? E.g. with an electric food mixer – the electricity runs the motor which spins and rotates the beater (pushes.) Get students to find examples of things that move with electricity and create a display.

Processes and production skills – creating solutions by:

Investigating and defining – Explore needs for design (WATPPS01).

Designing – Generate and record design ideas through describing, drawing, modelling and/or a sequence of written and spoken steps (WATPPS02).

Knowledge and understanding – technologies and society:

People produce familiar products and services to meet personal and community needs (ACTDEK001).

Consider designs for protecting people from electricity such as mini pillar/covers, power poles holding powerlines up out of the way and personal protective equipment (PPE or protective clothing) for workers.

Watch the [Day in the Life of a Network Response Officer video](#) to see what is under a mini pillar and to appreciate the job of the mini pillar (and the Network Response Officer.) Another video shows the protective clothing the officer might need to use.

Producing and implementing – Use given components and equipment to safely make simple solutions (WATPPS03).

Evaluating – Use personal preferences to evaluate the success of simple solutions (WATPPS04).

Collaborating and managing – Works independently, or with others when required, for solutions (WATPPS05).

Knowledge and understanding – technologies and society:

People produce familiar products and services to meet personal and community needs (ACTDEK001).

Talk about mini pillars/green domes as a protective casing for a point of electricity connection and how Western Power crew need safe access to it. They also need to blend in with their surroundings. Are they good at that job?

Model alternate mini pillar shapes using modelling clay or household waste such as plastic bottles and boxes (link to maths shape activity).

How does shape effect the stability, strength and internal capacity of a mini pillar?

Knowledge and understanding – geography:

People live in places – the representation of familiar places, such as schools, parks and lakes on a pictorial map (ACHASSK014).

The places people live in and belong to (e.g. neighbourhood, suburb, town, rural locality), the familiar features in the local area and why places are important to people (e.g. provides basic needs) (ACHASSK015).

Humanities and social sciences skills – questioning and researching:

Identify prior knowledge about a topic (e.g. shared discussion, think-pair-share) (WAHASS01).

Pose and respond to questions about the familiar (WAHASS02).

Explore a range of sources (WAHASS03).

Sort and record information and/or data into simple categories (e.g. use graphic organisers, drawings) (WAHASS04).

ANALYSING: Process information and/or data collected (e.g. sequence familiar events, answer questions, discuss observations) (WAHASS05).

Explore points of view (WAHASS06).

Represent information gathered in different formats (e.g. drawings, diagrams, story maps, role-plays) (WAHASS07).

Evaluating: (WAHASS08 & WAHASS09).

Communicating and reflecting: (WAHASS10, WAHASS11, WAHASS12).

Study the streetscapes represented in the book, especially the overhead view of Sparky's escapade route. See if your students can interpret the picture/map and relate it to the environment around their home and or school, and what surrounds them. Have students seen any of the electrical assets in the pictures; mini-pillars, transformer cabinets, sub stations, powerpoles etc. Do they know what they are for and why they are in every suburb?

Personal, social and community health – being healthy, safe and active:
Protective behaviours to keep safe and healthy: saying ‘no’, moving away, telling an adult, asking for help (ACPPS003).
Trusted people in the community who can help individuals feel safe (ACPPS003).

Watch our **Make the Safe Call adverts** and talk about staying 8m away from damaged electrical infrastructure. Measure out 8m and find a comparison (like the length of a bus) to judge it by. Talk about telling an adult to call **13 13 51** if you spot a split green dome. Watch the **Day in the Life of a Network Response Officer video**. What do students recall from it – what was dangerous? How does the officer behave to keep himself safe?

Contributing to healthy and active communities: Actions that promote health, safety and wellbeing, such as: identifying household substances that can be dangerous, following safety symbols and procedures (ACPPS006).
Safe active play in outdoor settings and the natural environment (ACPPS007) (WATPPS05).

Use the drawing of a Network Response Officer in the appendix and label the personal protective equipment (PPE.) Use the drawing of a Network Response Officer’s vehicle in the appendix and label the tools they use to keep them safe.

Year One	
Curriculum descriptor:	Additional descriptors and cross curriculum:
Shape: Recognise and classify familiar 2D shapes and 3D objects using obvious features (ACMMG022).	
<p>With your class, look at shapes in the street environment. Take a walk around the school ‘collecting’ shapes e.g. post boxes, street lights, sign posts, shapes on road signs, electrical domes and poles etc – the things the dog might have used to follow and track his route.</p> <p>The appendix has streets to help. You can also take photos of what you find and categorise them by shape in the classroom. Talk about what power poles and streetlights are for and how they are arranged.</p>	
Location and transformation: Give and follow directions to familiar locations (ACMMG023).	
<p>Ask students to describe a familiar route (from classroom to the library or from home to school). Think of landmarks you would find along the way to help remember where you are and what turns to make. Sparky uses smelling power poles and streetlights to mark his way.</p>	
Data representation and interpretation: Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays (ACMSP263).	Processing and analysing data and information: Use a range of methods to sort information, including drawings and provided tables through discussion, compare observations with predictions (AC SIS027).
<p>Survey the class – who has an overhead power supply or underground power supply? Tally sheet in appendix. Create a graph/display of the results.</p> <p>Look for and record electrical infrastructure around the school. Separate power poles into types. Create a graph/display of the results.</p> <p>If considering a familiar route – students could also count the number of mini-pillars, power poles or streetlights etc on that route.</p>	
Questioning and predicting: Pose and respond to questions about familiar objects and events (AC SIS014) (WATPPS05).	Knowledge and understanding – technologies and society: People produce familiar products and services to meet personal and community needs (ACTDEK001).
<p>Talk about what power poles are for, why they are up high (to keep us safe), why they all connect up (so everyone gets electricity and because electricity flows in a giant circuit).</p> <p>Talk about mini pillars/green domes as a protective casing for a point of electricity connection and how Western Power crew need safe access to it. They also need to blend in with their surroundings. Are they good at that job?</p> <p>View the Network Response Officer video. Talk about green domes and how the officer responds to reports of damaged domes, to make them safe as fast as possible.</p>	

Planning and conducting:

Participate in guided investigations to explore and answer questions (AC SIS025).

Investigate how good your class' "doggy" senses of hearing and smelling are. Undertake a smelling investigation using essential oils and cooking extracts such as peppermint, vanilla, eucalyptus, jasmine. Put a different number of drops on absorbent paper and get students to match up the same smells and rank them by strength. You can also lay a smell trail to see if the children can follow someone's (a particular fragrance) pathway using their nose.

You can also carry out a hearing investigation. Using different sounds, see how far away the students can hear each sound and ask them to identify what it is. Chart the results.

Investigate if you can ever see, hear or smell electricity (while reinforcing never to touch it).

Technologies contexts:

Materials and technologies specialisations – Characteristics and behaviours of individual materials used in products (ACTDEK004).

With your class, gather and look at protective clothing such as masks and gloves. Look at the materials used and discuss why that type of material is used. What is it protecting them from? What does it need to allow us to do (move our hands? Breathe?) What material is used for protective mini pillars? What are the characteristics of the material that make it suitable for this product (strong, shape-able, waterproof, coloured to not stand out)?

Technologies contexts:

Engineering principles and systems – Ways objects can be moved using technology (ACTDEK002).

Some objects move because they are powered by electricity. Electricity provides the energy for things to move. How is electricity connected to movement? (E.g. with an electric food mixer, the electricity runs the motor which spins and rotates the beater). Get students to find examples of things that move with electricity and create a display.

Processes and production skills creating solutions by:

Investigating and defining – Explore opportunities for design (WATPPS06).

Designing – Develop and communicate design ideas through describing, drawing, modelling and/or a sequence of written and spoken steps (WATPPS07).

Producing and implementing – Use given components and equipment to safely make solutions (WATPPS08).

Evaluating – Use personal preferences to evaluate the success of design processes (WATPPS09).

Collaborating and managing – Works independently, or with others when required, to safely create and share sequenced step for solutions (WATPPS10).

View the [Network Response Officer video](#) talking about green domes and how the officer responds to reports of damaged domes, to make them safe as fast as possible.

Mini pillars or green domes are often damaged by vehicles. Task students with designing a sticker or covering for a green dome, so that it is more noticeable and less likely to get hit. You can look at things we use to make objects stand out and also warning signs and symbols. Analyse the elements that make them effective. Their designs may also want to demonstrate that the electricity inside a dome is dangerous. It is important that students do not try to attach their design to an actual green dome.

Knowledge and understanding – geography:

Places had distinctive features – The activities (e.g. retailing, recreational, farming, manufacturing, medical, policing, educational, religious) that take place in the local community which create its distinctive features (ACHASSK033).

Humanities and Social Sciences skills:

Questioning and researching/Analysing/Evaluating/Communicating and reflecting (WAHASS 13-25).

Locate the substation for your local area. Note its features (reinforcing the stay out message) and discuss its role. Electricity travels large distances at very high voltages using large towers. At substations the voltage (force of electricity) gets changed (transformed) to a lower voltage for local distribution to homes, shops and schools etc. (Pole top transformers further reduce the voltage on the way.) See appendix for electricity transmission and distribution diagram.

If you have power generation in the vicinity – locate it and find out how it makes electricity. How does electricity get from the generator to people's homes?

Year Two	
Curriculum descriptor:	Additional descriptors and cross curriculum:
Location and transformation: Interpret simple maps of familiar locations and identify the relative positions of key features (ACMMG044).	
Use a map of a familiar location such as your school (preferably where you can walk around). Get students to add in electrical features such as power poles, mini pillars, streetlights, electrical cabinets. Consider the spacing and number of electrical features. Measure, count and collect data in a chart.	
Data representation and interpretation: Identify a question of interest based on one categorical variable. Gather data relevant to the question (ACMSP048).	Data representation and interpretation: Create displays of data using lists, table and picture graphs and interpret them (ACMSP050).
Survey the class – who has overhead power supply or underground power supply? Tally sheet in appendix. Create a graph/display of the results. Look for and record electrical infrastructure around the school. Separate power poles into types. Create a graph/display of the results. If considering a familiar route – students could also count the number of mini-pillars, power poles or streetlights etc. on that route.	
Earth and space sciences: Earth's resources are used in a variety of ways (ACSSU032).	Processes and production skills: creating solutions by: Investigating and defining – Explore design to meet needs or opportunities (WATPPS11). Designing – Develop, communicate and discuss design ideas through describing, drawing, modelling and/or a sequence of steps (WATPPS12). Producing and implementing – Use components and given equipment to safely make solutions (WATPPS13). Evaluating – Use simple criteria to evaluate the success of design processes (WATPPS14). Collaborating and managing – Works independently, or collaboratively when required, to organise information and ideas to safely create and share sequenced step for solutions (WATPPS15). Technologies contexts: Materials and technologies specialisations – Characteristics and properties of materials and individual components that are used to produce design solutions (ACTDEK004). Knowledge and understanding – technologies and society: People produce familiar products, services and environments to meet personal and community needs (ACTDEK001).
As a class, look into the different ways electricity is made (burning coal or gas to turn turbines, wind turbines, photo-voltaic (PV) cells or solar power, hydro or water turning turbines, tidal and waves). Create a chart which shows the types of generation and the resource and how we get that resource (dig up coal, from the sunlight etc). Make a list of things in the classroom or at home that use electricity. Create a flow chart of energy that shows how coal, sun or wind becomes electricity to power things like a fridge. Consider how electricity is transported to homes and schools by transmission and distribution through a network (or grid). How does it travel? Is it through cables/wires/conductors overhead or underground? Make models of powerpoles and lines. Create poles or pylons that will hold up cables. See appendix for suggested useful sheets.	

Communicating:
Represent and communicate observations and ideas in a variety of ways (ACIS042).

Evaluating:
Compare observations with those of others (ACIS042).

Together, consider how Sparky escapes from his backyard. Discuss whether he really would have been able to do this. Get students to look at their own backyard or the school yard and think about how Sparky would escape (or alternatively they could work out how to stop him escaping from their yard.) They can describe it or draw it in a cartoon/storyboard. See appendix for Sparky escape storyboard.

Knowledge and understanding – History:
The past in the present: the impact of changing technology on people's live (e.g. at home, work, travel, communication, leisure, toys) and how the technology of the past differs from what is used today (ACHASSK046).

Humanities and Social Sciences skills:
Questioning and researching/Analysing/Evaluating/Communicating and reflecting (WAHASS13-25).

Perth by Power Route is a self-guiding tour map (which can be downloaded from our [website](#)) shows the route of the city's first electricity network. The map also explores a few ideas of past, present future.
Look at the map and discuss with students. Explore changes such as how cars have evolved and what they might be like in the future (electric, driverless), or how games have changed (become more electronic). Create a 'museum' that shows how something has changed over time (e.g. telephones, cameras). You may want to use images and real objects to demonstrate this.
Consider how we are more dependent on electricity and how we will continue to use it in the future.

Personal, social and community health – communicating and interacting for health and well being:
Ways health messages are communicated in the media and how they influence personal health choices, such as 'slip, slop, slap' (ACPPS021).
Contributing to healthy and active communities: Actions that keep people safe and healthy in and outside the classroom (ACPPS022).

Watch our **Make the Safe Call adverts** and talk about staying 8m away from damaged electrical infrastructure. Measure out 8m and find a comparison (like the length of a bus) to judge it by. Talk about telling an adult to call **13 13 51** if you spot a split green dome. Watch the **Day in the Life of a Network Response Officer video**. What do students recall from it? What was dangerous? How does the officer behave to keep himself safe?
Use the drawing of a Network Response Officer in the appendix and label the personal protective equipment (PPE.) Use the drawing of a Network Response Officer's vehicle in the appendix and label the tools they use to keep them safe.

Literature – creating literature:
Creating events and characters using different media that develop key events and characters from literary texts (ACELT1593).
Innovate on familiar texts by experimenting with character, setting or plot (ACELY1669).
Literacy: Interpreting, analysing, evaluating (ACELY1668).

Pose questions to your students about how they could further develop the Sparky and the Electrical Pillar story. For example, students can look at their own backyard and describe how Sparky would escape from it. How could Sparky get hurt if he went for a walk near their house? What jobs might Sparky do to protect their family?

Year Three	
Curriculum descriptor:	Additional descriptors:
<p>Shape: Make models of 3D objects and describe key features (ACMMG063). Location and transformation: Identify symmetry in the environment (ACMMG066).</p>	<p>Knowledge and understanding – technologies contexts: Materials and technologies specialisations – Suitability and safe practice when using materials, tools and equipment for a range of purposes (ACTDEK012). Processes and production skills – creating solutions by: Investigating and defining – Create a sequence of steps to solve a given task (WATPPS16). Designing – Develop and communicate ideas using labelled drawings and appropriate technical terms (WATPPS17). Producing and implementing – Select, and safely use, appropriate components with given equipment to make a solution (WATPPS18). Evaluating – Use criteria to evaluate design processes and solutions developed (WATPPS19). Collaborating and managing – Work independently, or collaboratively when required, to plan, safely create and communicate sequenced steps (WATPPS20).</p>
<p>Go for a walk with your class or ask students to do this activity at home. Look for and record shapes you find along a street (post boxes, street lights, sign posts, power poles etc). The things Sparky might have used to follow. Look for symmetry in the shapes or the arrangement (e.g. how powerlines are arranged). Have the class build a street for Sparky to explore, by modelling the shapes found along a street. Use 3D meshes or old household packaging. Identify electrical mini pillars in the streetscape. Discuss their 3D shape (and material) and how this contributes to their function:</p> <ul style="list-style-type: none"> • strong protection of an electrical connection to protect people from the electricity • allowing access to the connection when required • not taking up too much room in front yards or driveways • coloured green to blend in with the environment. <p>Discuss how the mini-pillar in the story gets damaged (hit by a car which is a common occurrence). Design and make models of mini pillars to protect underground power junction. Try different shapes for strength, stability and access by Western Power technicians. Get students to design an experiment to test for strength and stability of different shapes.</p>	
<p>Location And Transformation: Create and interpret simple grid maps to show position and pathways (ACMMG065).</p>	<p>Literacy – texts in context: Identify the point of view in a text and suggest alternative points of view (ACELY1675). Interpreting, analysing, evaluating: Identify the audience and purpose of imaginative, informative and persuasive texts (ACELY1678).</p>
<p>With your class, consider how Sparky finds his way around when he is out. Interpret the images in the book, particularly the map like images with a birds eye view. Take a trip around the school surrounds (you can also get students to complete this at home). Make a simple map of the roads and paths around school or home and indicate on the map the various electricity assets you see. This may include substations, electrical cabinets, power poles, streetlights and green domes.</p>	

Identify the point of view in the story. What does Sparky experience as he roams around?

Suggest alternative points of view (e.g. birds view, toddler in stroller) and recreate a section of the story from that point of view. You can also create a visual or map to represent that point of view. For example, what would a birds eye view of Sparky's backyard escape look like? Or when Sparky comes across the damaged green dome, gets a shock, staggers home and then races back to rescue his family.

Use and influence of science:

Science knowledge helps people to understand the effect of their actions (ACSHE051).

Discuss with your students what science Sparky seems to know. How does he use it, what didn't he know and how did it hurt him?

If Sparky had understood electricity, he would not have urinated on the damaged mini-pillar. But, he knew how to use other physics such as reducing friction, angle of elevation and angular momentum. He learned by experience to get out of his yard.

Talk and document with your students what kind of science they can observe and experience daily. Consider things that happen when riding scooters onto soft ground, spinning around and becoming unsteady, sliding down a slide with hands in different positions.

Sparky 'learns by experience' when he gets chased by bees, collects sticky seeds on his coat by brushing past a bush and slips on wet rocks around a pond. Why might that happen?

Nature and development of science:

Science involves making predictions and describing patterns and relationships (ACSHE050).

Electricity flows in closed circuits. If there is an electrical potential difference (which can be provided by the two ends of a battery,) and a circuit of conducting material – electricity will flow.

A switch breaks or makes an electrical circuit. Using simple snap together circuit kits, make simple electrical circuits that include a switch.

Get students to draw diagrams of their circuits and explain what happens when they use the switch.

Knowledge and understanding – technologies and society:

Role of people in design and technologies occupations (ACTDEK010).

Ways products, services and environments are designed to meet community needs (ACTDEK010).

Literacy – texts in context:

Identify the point of view in a text and suggest alternative points of view (ACELY1675).

Interpreting, analysing, evaluating:

Identify the audience and purpose of imaginative, informative and persuasive texts (ACELY1678).

Our **Day in the Life of a Network Response Officer video** on our **website** and **YouTube channel** show how our response officers attend to emergencies to make the area safe for the community. It also shows the personal protective equipment, vehicle modifications and tools they have to do their job and keep them safe.

Use these videos (and worksheets in the appendix) to discuss technologies in various occupations, while drawing attention to safety around electricity.

Get students to design an experiment to test for strength and stability of different shapes. Consider mini pillars and their use.

Knowledge and understanding – civics and citizenship:
Communities – who makes rules, why rules are important and the consequences of rules not being followed (ACHASSK071).

Sparky comes across various electrical equipment and infrastructure in the story, including a substation. See if your students have observed a substation in their local area. Have they seen and understood the signage on substations?

Discuss rules about keeping people safe from electricity such as keeping out of electricity substations. Refer to the high voltage, keep out sign in the appendix.

Draw up a list of rules that exist for keeping people safe (e.g. wearing seatbelts, wearing a helmet, not entering a swimming pool area without an adult).

Personal, social and community health – being healthy, safe and active:
Assertive behaviours and communication skills to respond to unsafe situations, such as: keeping calm, using appropriate non-verbal communication skills, seeking help (ACPPS035).

Watch one or more of the [Make the Safe Call videos](#) with your students. Help them to find the safety message.

Get your students to role play a situation where someone has to stop other people from going near an unsafe electrical asset. Role play seeking help during an electrical emergency (telling an adult, calling **000** or **13 13 51**).

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Appendix

Download teaching resources from
westernpower.com.au/sparky

Themes for discussion

Doing a job



What is a job?

What does Sparky think is his job?

What sort of things does he do to carry out the job normally?

What does he do on this particular day that he thinks is a good job?

Why are Sparky's family not impressed with him?

Protection and safety



What things around us do we have to be careful about for our safety?

What things help to protect us?

What can you see around us that is there to help keep us safe?

Observing the world through our senses



What are our senses?
When do we use them?

What senses does Sparky use?

Do dogs and people use senses in the same way?

Streetscape

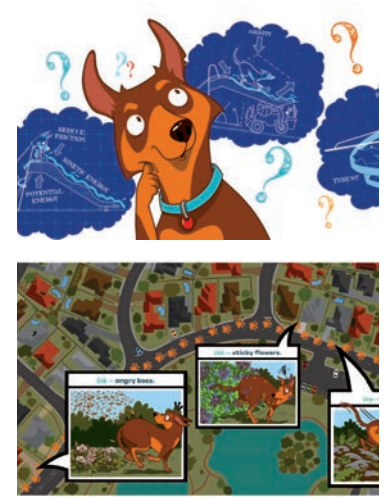


What do you notice on the streets around us?

What are they for?
What can you see everywhere and what can you only see in some places?

How do you find your way around the streets?

STEM behaviour



How does Sparky find out about things?

How does Sparky get out of the backyard?

What sort of thinking and behaviour does he show?

Electricity

Electricity is a form of **energy** that we can make (generate) and move around (transmit and distribute) to use in our homes and schools to **power** appliances. It is very **useful**, but it is powerful so it can be **dangerous**.

Electricity is measured by its pressure or force – voltage, and its rate of flow (speed) – current. It needs both to be at a certain level to hurt. When electricity is travelling long distances it is at a high voltage. When it is in your house it is a low voltage, however all electricity in overhead wires and underground cables and in your house has that potential to hurt.

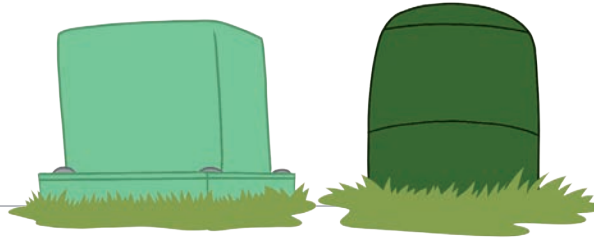


Power pole and power lines

Electricity travels on a path, known as a circuit, along wires made of good conductors such as aluminium. The power poles hold the wires up out of the way for safety. If you ever see a power line on the ground stay 8 metres away and call 000 or Western Power on **13 13 51**.

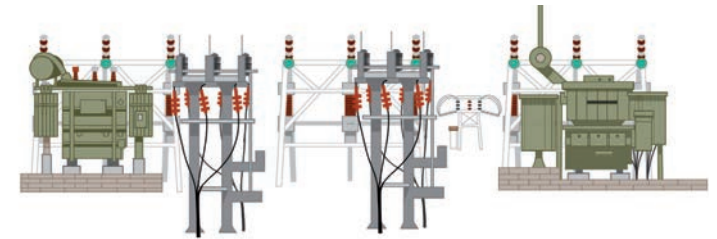
Green dome or mini pillar

Sometimes electricity goes underground instead of overhead. Green mini pillars are connection points for underground power that allow technicians to work on them. The pillars are strong to protect the wires and they are coloured green to blend in with their surroundings. Pillars are safe, but can become dangerous if damaged. If you see a damaged pillar report it to Western Power on **13 13 51**.



Substation

Electricity that has travelled a long way at a high voltage (transmission), needs to be converted to a lower voltage at a substation, so that it can continue safely to where it's needed (distribution). Only trained people can enter substation sites.



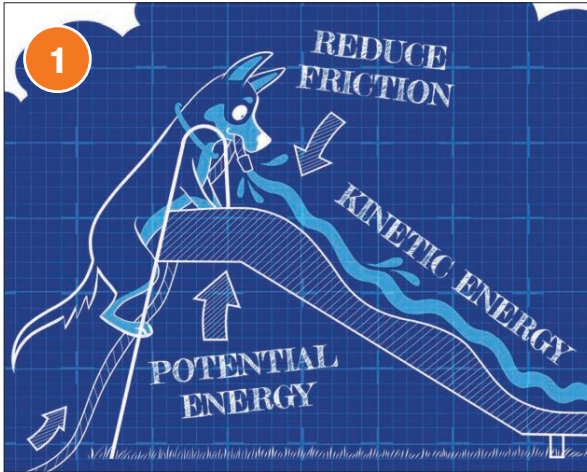
Electrical cabinet

An electrical cabinet houses a transformer for underground power and protects it. Transformers in your neighbourhood change high voltage, to a lower voltage. This, then allows electricity to move safely to your home or school to power your appliances. Voltage is the push of the electricity, similar to the force of water coming out of a tap.



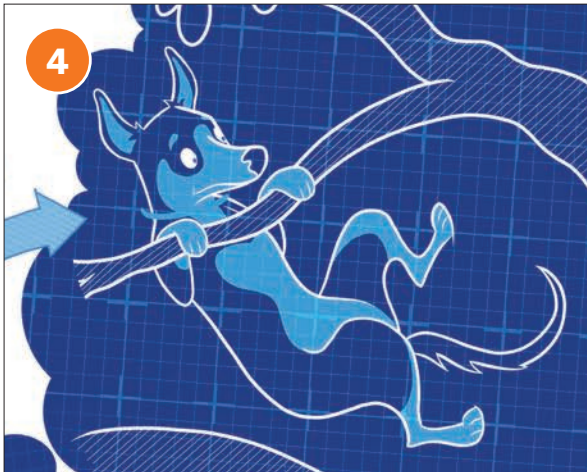
Sparky storyboards



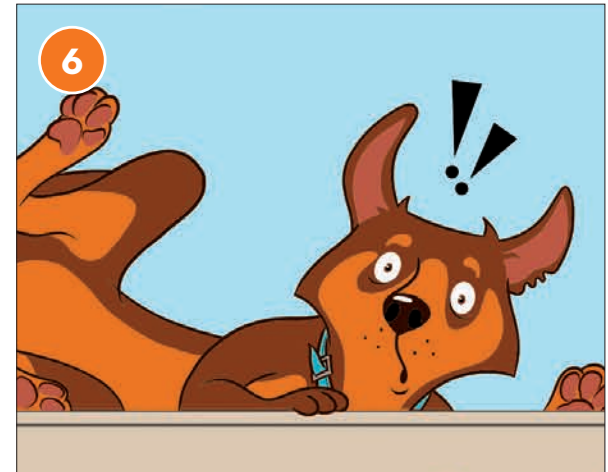




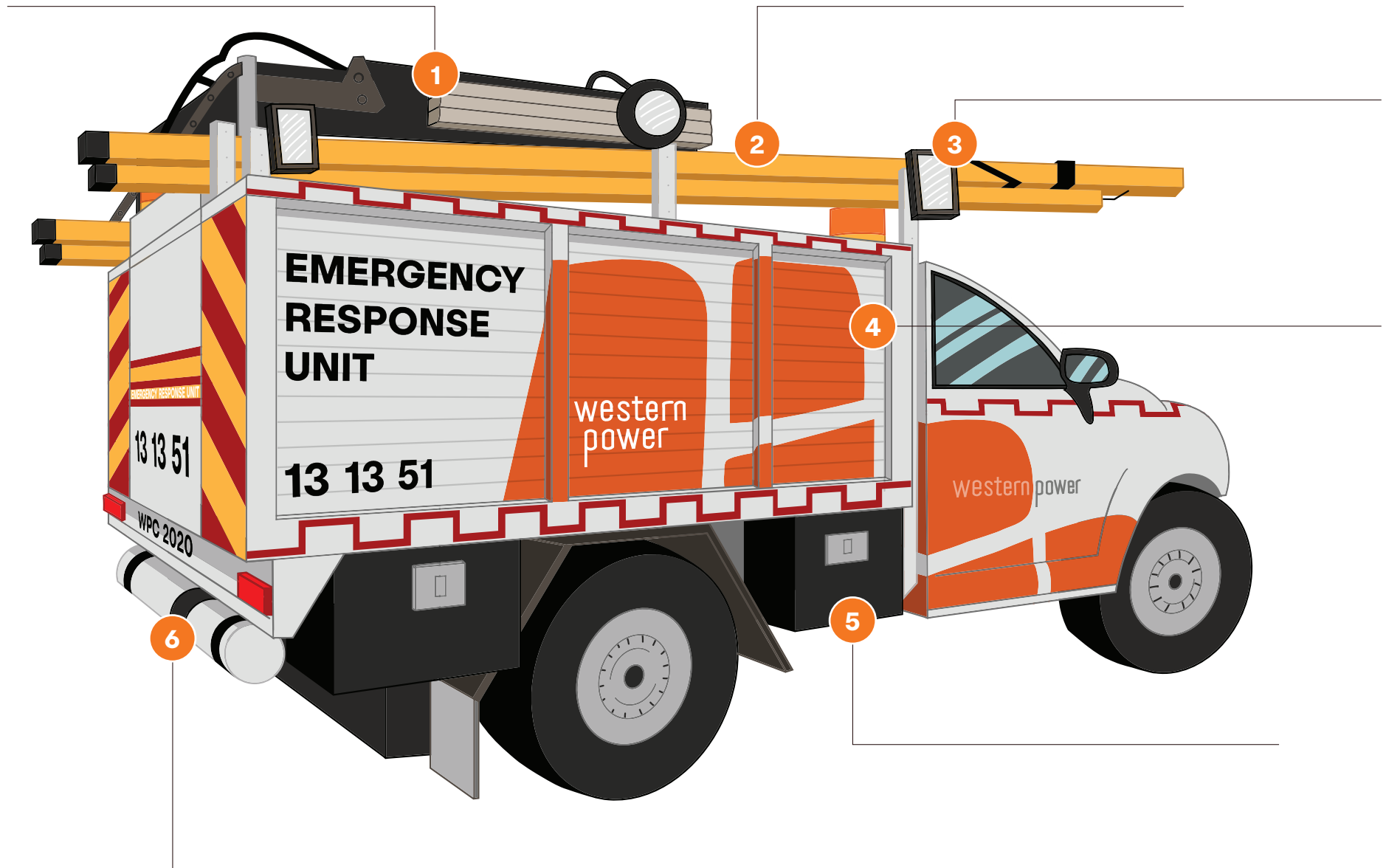








Emergency response unit vehicle

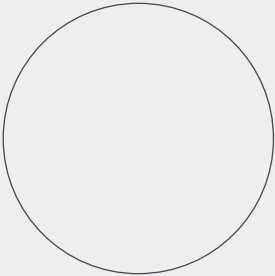
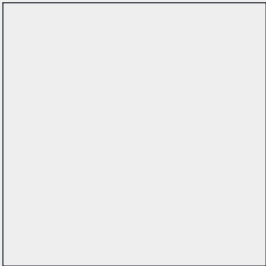
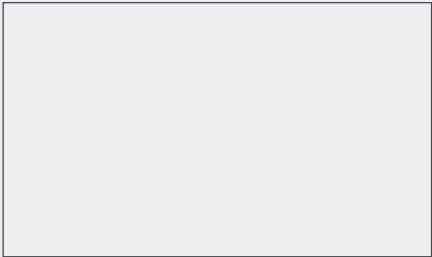


Emergency response protective wear

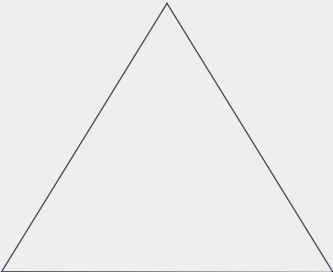
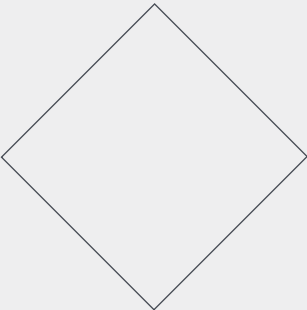
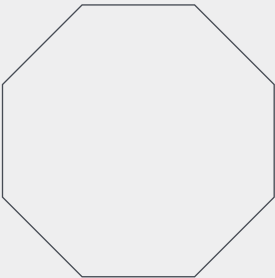
Western Power network response officers wear these items to protect them from electricity.



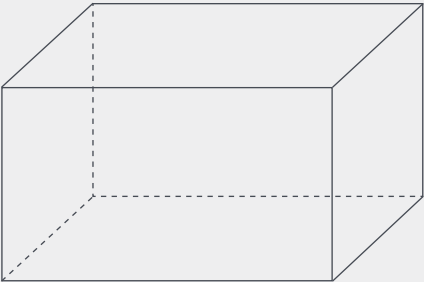
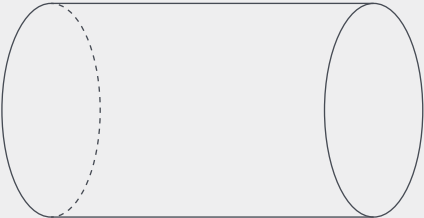
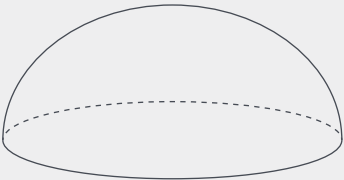
Find 2D shapes around you

2D shape to find:	What you've found:	What is the object for?
<div>Circle</div> 		
<div>Square</div> 		
<div>Rectangle</div> 		

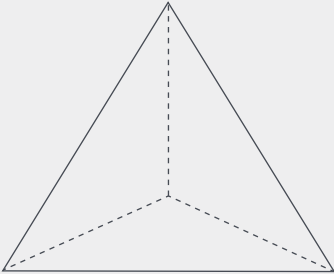
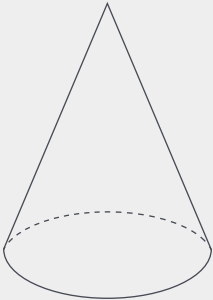
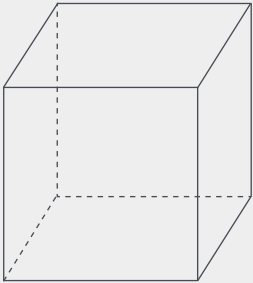
Find 2D shapes around you

2D shape to find:	What you've found:	What is the object for?
<div>Triangle</div> 		
<div>Rhombus</div> 		
<div>Hexagon</div> 		

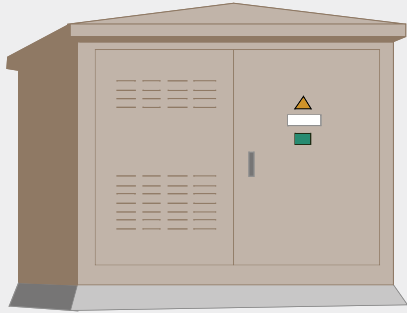

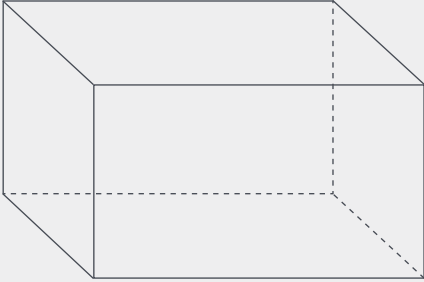
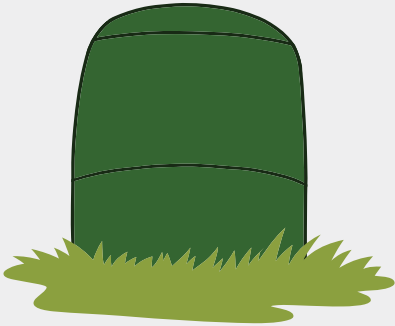
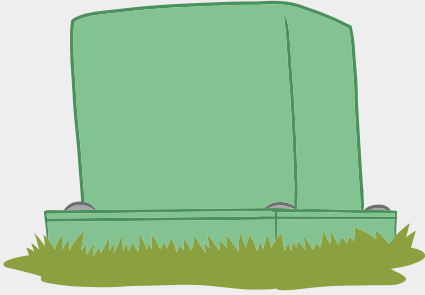
Find 3D shapes around you

3D shape to find:	What you've found:	What is the object for?
<div>Rectangular prism</div> 		
<div>Cylinder</div> 		
<div>Hemisphere</div> 		

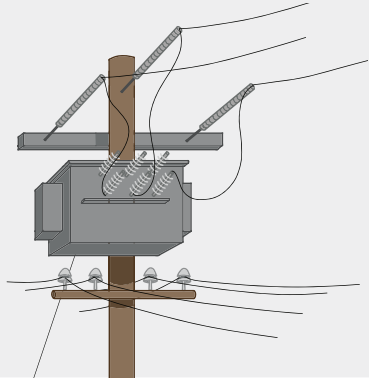
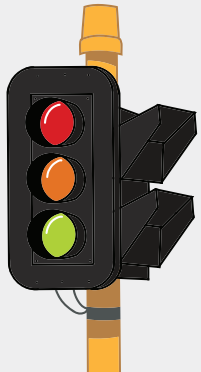
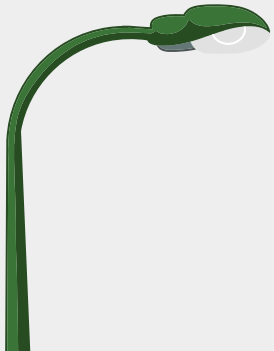
Find 3D shapes around you

3D shape to find:	What you've found:	What is the object for?
Triangular prism 		
Cone 		
Cube 		

Find shapes in electrical equipment

Electrical equipment:	What shapes can you see?
	 
	
	

Find shapes in electrical equipment

Electrical equipment:	What shapes can you see?
	
	
	

Birds eye view of Sparky's route





Find the items that use electricity to work



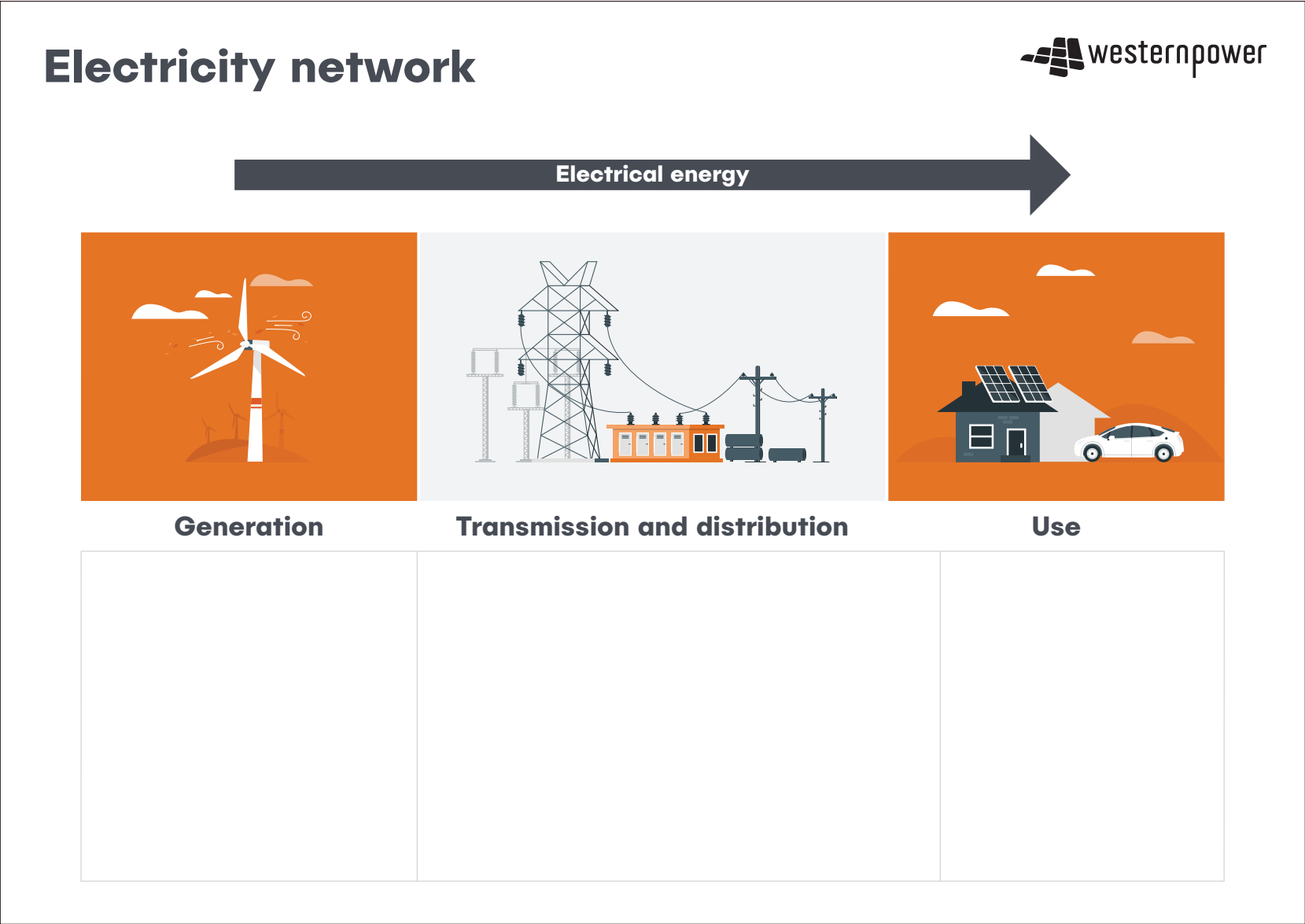
What can you find? _____

Follow the electrical cables



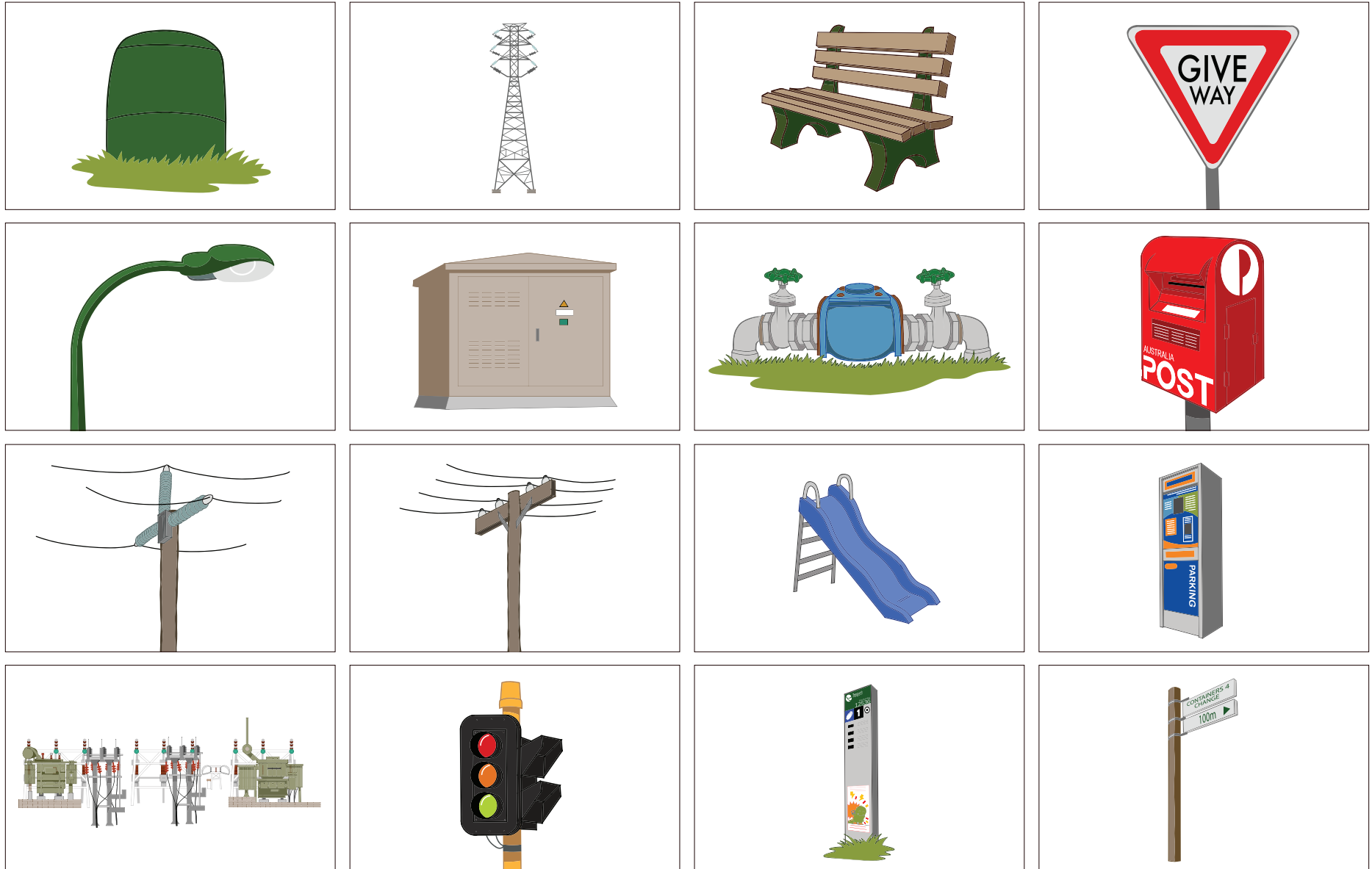
What can you see underground? _____

Electricity network diagram



Sparky's street equipment snap cards

Cards template can be downloaded from westernpower.com.au/sparky. Print, laminate and cut out cards to play snap.



Power supply survey

Underground power:



Overhead power:



How to make a paper windmill



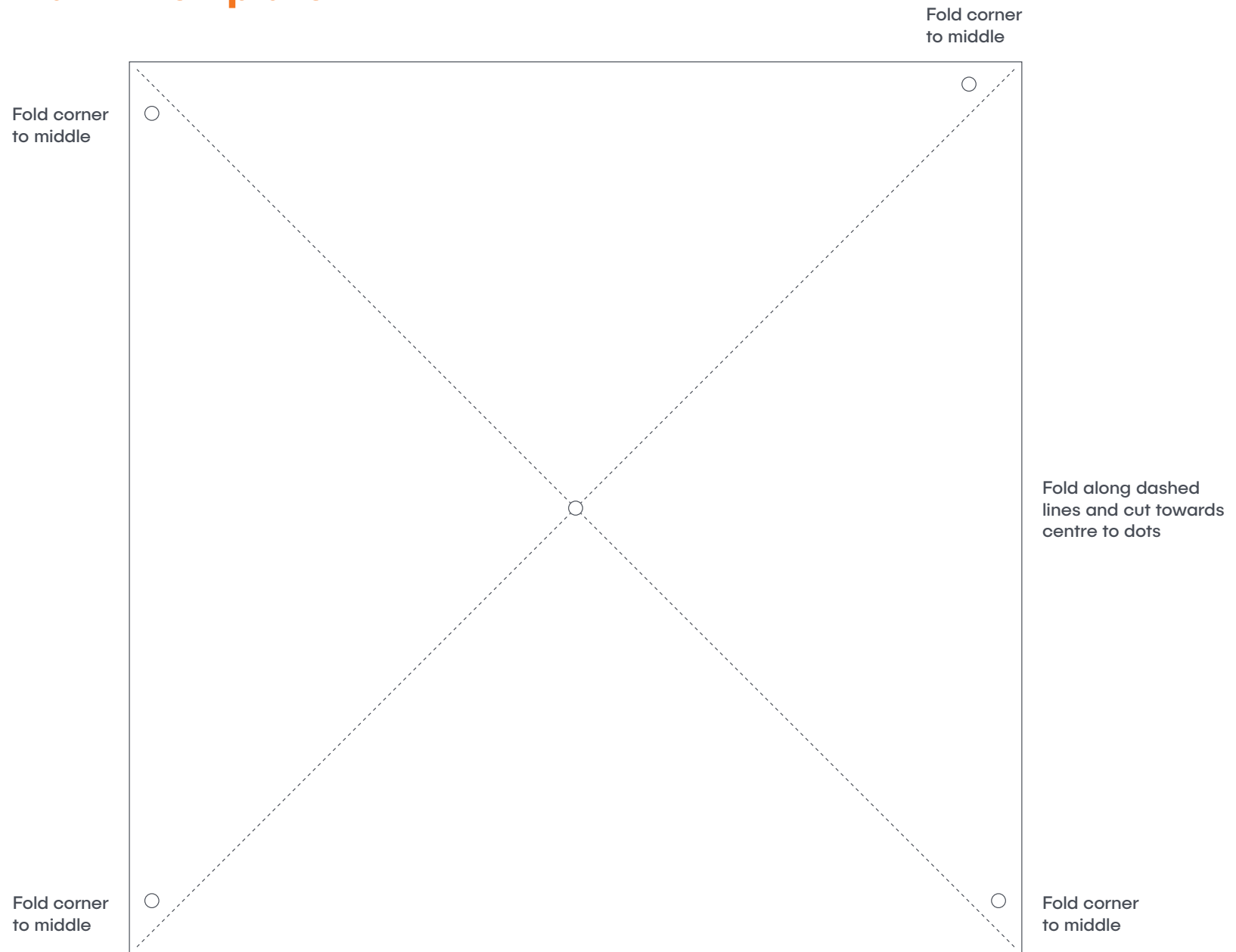
Here's what you'll need:

- Square piece of paper (see template on next page)
- Blu-tac
- Knitting needle or sharp pencil
- Paper fastener
- Bead (centre hole should be wide enough to slide onto paper fastener)
- Drinking straw

Instructions:

- 1** Cut around the outside edges of the square and decorate your piece of paper front and back (eg. use bright colours, glitter, patterns).
- 2** Fold the paper in half along one dashed line, and then unfold the paper again. Repeat for the second dashed line.
- 3** The point where the two folds meet is the centre of your paper. From the centre measure 4cm along each fold and mark a pencil dot. Cut along the folds from each outside corner into the dot.
- 4** Roll some blu-tac into a ball and place it under the centre spot of your paper. Use a knitting needle or sharp pencil to push a small hole through the centre. Do the same on one side of each corner as marked on the paper.
- 5** Fold each of the corner pieces in towards the centre so the holes line up with the hole in the middle. Push a paper fastener through all five holes.
- 6** Thread a bead onto the back of the paper fastener. This will stop the paper wings of your windmill rubbing against the straw and help it spin better.
- 7** Measure down 2cm from the top of your straw and using the same method above, make a small hole going through the front and back.
- 8** Push the paper fastener through the hole and fold the ends back to hold your windmill together.

Paper windmill template



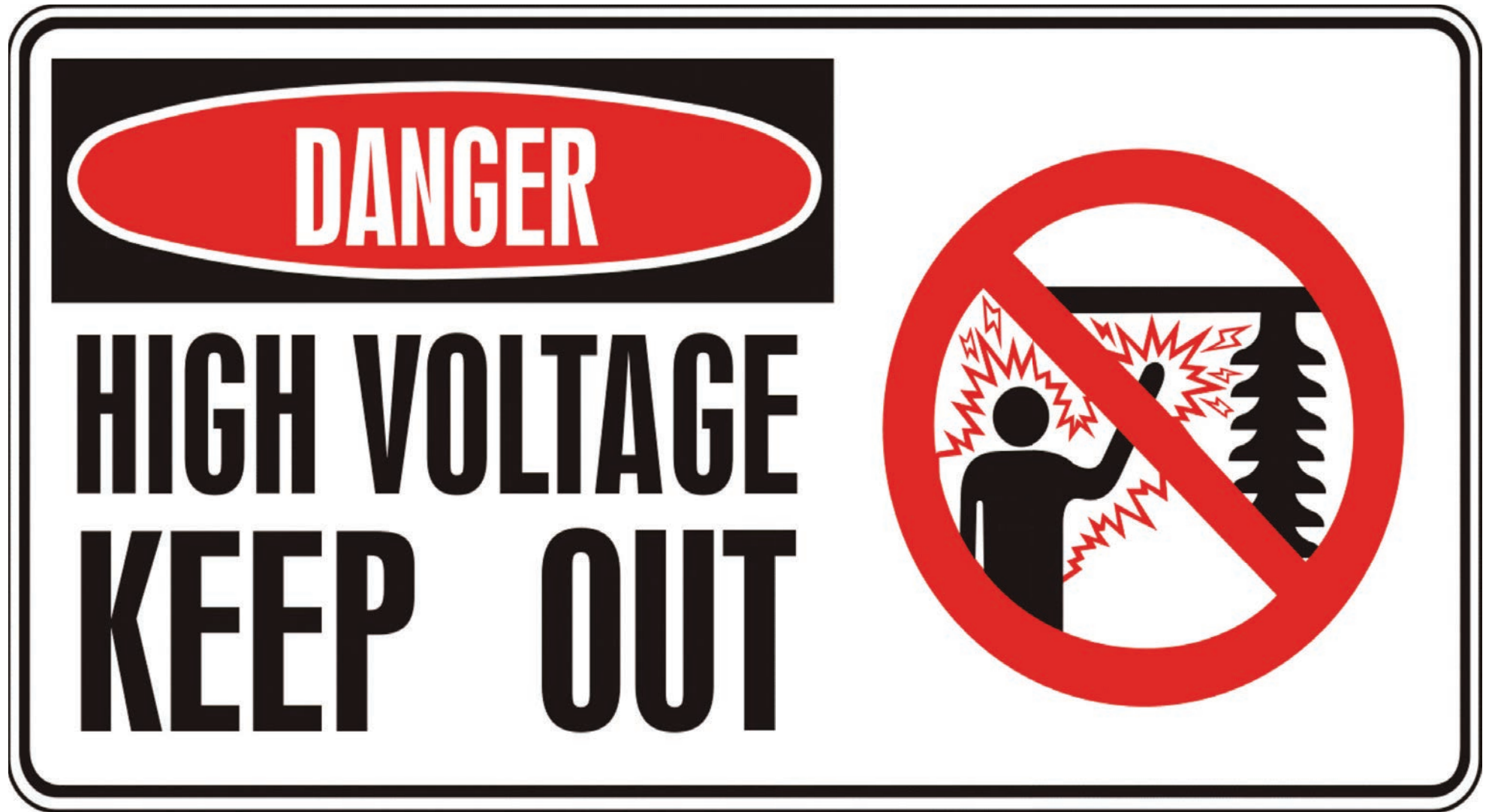
Experiment with making power poles that hold up lines



Some suggested materials:

- Pens, pencils and disposable cutlery
- Building bricks and other construction toys
- Old boxes and packaging
- Wire or string
- Modelling clay
- Craft supplies

Printable danger sign



Damaged power pole



SPARKY

and the
ELECTRICAL
PILLAR

