Australian Curriculum

This lesson plan could be used to support the teaching and learning of the following content description from the Australian Curriculum.

Year 6: Science: Science Understanding, Physical Sciences

Investigate the transfer and transformation of energy in electrical circuits, including the role of circuit components, insulators and conductors (AC9S6U03)

Aim: To classify and present data, identifying common appliances that run on electricity.	Key/New Wor Appliance, bat electricity, ma	r ds: tery, classify, device, ins, powered.	Resources: Lesson Pack			
Success Criteria: I can identify electrical and non-electrical appliance	es.	Preparation: Knowledge Organiser - one per child (this will be used in eac				
I can group appliances based on whether they are n battery-powered. I can use a Venn diagram to present my findings.	nains- or	Sorting Appliances Activ Obscure Appliances Activ Appliances Reasoning Ca	ity Sheet - one per child vity Sheet – as required ards - as required			

Prior Learning: This is the first time that children will have studied an electricity unit. Children will have awareness of electrical appliances and may be able to distinguish the difference between appliances that are mains- or battery-powered.

Learning Sequence

	Remember It: Using the questions and timer on the Lesson Presentation, children discuss the items they have at home that are powered by electricity and which of these they would struggle to live without. Children write the names of their chosen items on sticky notes. On a flipchart or whiteboard, prepare a table with two headings: 'Mains-Powered' and 'Battery-Powered'. After using the Lesson Presentation to define mains-powered and battery-powered, children can then add their sticky notes to the correct column. Discuss whether any of the items listed could be both mains- and battery-powered. You may wish to discuss how we use mains electricity to charge batteries in battery-powered appliances (e.g. mobile phones).	
	Household Appliances: Introduce the term 'appliance' using the Lesson Presentation. Share the examples with the children and then children can apply their understanding of the term by discussing why further examples are classed as appliances. Introduce the term 'electrical appliance' using the comparison of a non-electrical appliance (a can opener) and an electrical appliance (a hairdryer). A link to the appliance pages from the eBook is provided as an option from the Lesson Presentation should you wish to look at appliances in more detail. Can the children identify common appliances and identify whether they run on electricity?	
Winole Class	Knowledge Organiser: Introduce the Knowledge Organiser via the Lesson Presentation to be used across the unit. Children identify the key vocabulary and information that have been covered already in the lesson today.	
$\overline{}$	Classifying Appliances: Ask children how to use a Venn diagram. Then, with their talk partner, children discuss sorting the appliances given into the battery-powered/mains-powered Venn diagram shown on the Lesson Presentation . Invite the children to click the correct label for each appliance and discuss how appliances that could come in mains- or battery-powered versions can go in the middle and appliances that are not electrical can be placed outside the Venn diagram circles.	
	Can children identify electrical and non-electrical appliances?	

U	Sorting Activity: Using the Venn diagram and appliance cards provided in the Sorting Appliances Activity Sheet, children stick the appliances on the correct place on the Venn diagram. Children should base their sorting on the picture of the appliance given (for example, the picture of the toothbrush provided is a manual one but you can also, of course, get electric toothbrushes. This makes a good discussion point with children). Can children classify appliances as electrical/non-electrical and battery/mains powered? Can children use a Venn diagram to present their findings?	
	 Children are provided with a Venn diagram with headings to sort the appliances into. Reminders are given of the definitions of 'mains-powered' and 'battery-powered' for support. Children decide on appropriate headings for their Venn diagram and then sort the appliances into the correct section. Non-Electrical Appliances heading has been given as an example. Children initially complete the two star sorting Appliances and add the appliances from the Obscure Appliances Activity Sheet. Then, children can discuss and add the appliances heading has been given as an example. 	
	Reflection: Use the Lesson Presentation to reveal the answers. Discuss why some appliances listed are better off being battery-powered or powered using mains electricity. Can children think of an appliance that is more suited to being battery powered than powered by electricity? Can children give a fact about electricity to their partner?	
Explore it Imagi	ne it: Children imagine a world without electricity and write a list of things that they think people would miss the m	ost.

Observeit: Children look around the classroom or, with appropriate supervision, the school and write down all the electrical appliances that they can see.

Reasonit: Children discuss . Children decide whether the given appliances are mains- or batterypowered and then justify why these appliances need to be powered in that way.

NSW Curriculum

This lesson plan could be used to support the teaching and learning of the following outcomes from the NSW Curriculum.

Year 6: Science: Physical World

Explains how energy is transformed from one form to another (ST3-8PW-ST)

1 35		
Aim: Explains how energy is transformed from one form to another (ST3-8PW-ST)	Success Criteria: I can identify electrical and non-electrical appliances.	Resources: Lesson Pack
To classify and present data, identifying common appliances that run on electricity.	I can group appliances based on whether they are mains- or battery-powered. I can use a Venn diagram to present my findings.	
	Key/New Words: Appliance, mains, battery, electricity, powered, device, classify.	Preparation: Knowledge Organiser - one per child (this will be used in each lesson) Sorting Appliances Activity Sheet - one per child
		Obscure Appliances Activity Sheet – as required Appliances Reasoning Cards - as required

Prior Learning: This is the first time that children will have studied an electricity unit. Children will have awareness of electrical appliances and may be able to distinguish the difference between appliances that are mains- or battery-powered.

Learning Seq	uence	
	Remember It: Using the questions and timer on the Lesson Presentation, children discuss the items they have at home that are powered by electricity and which of these they would struggle to live without. Children write the names of their chosen items on sticky notes. On a flipchart or whiteboard, prepare a table with two headings: 'Mains-Powered' and 'Battery-Powered'. After using the Lesson Presentation to define mains-powered and battery-powered, children can then add their sticky notes to the correct column. Discuss whether any of the items listed could be both mains- and battery-powered. You may wish to discuss how we use mains electricity to charge batteries in battery-powered appliances (e.g. mobile phones).	
	Household Appliances: Introduce the term 'appliance' using the Lesson Presentation. Share the examples with the children and then children can apply their understanding of the term by discussing why further examples are classed as appliances. Introduce the term 'electrical appliance' using the comparison of a non-electrical appliance (a can opener) and an electrical appliance (a hairdryer). A link to the appliance pages from the eBook is provided as an option from the Lesson Presentation should you wish to look at appliances in more detail. Can the children identify common appliances and identify whether they run on electricity?	
Whole Class	Knowledge Organiser: Introduce the Knowledge Organiser via the Lesson Presentation to be used across the unit. Children identify the key vocabulary and information that have been covered already in the lesson today.	
$\overline{\mathbf{O}}$	Classifying Appliances: Ask children how to use a Venn diagram. Then, with their talk partner, children discuss sorting the appliances given into the battery-powered/mains-powered Venn diagram shown on the Lesson Presentation. Invite the children to click the correct label for each appliance and discuss how appliances that could come in mains- or battery-powered versions can go in the middle and appliances that are not electrical can be placed outside the Venn diagram circles.	
	Can children identify electrical and non-electrical appliances?	

C C C	Sorting Activity: Using the Venn diagram and appliance cards provided in the Sorting Appliances Activity Sheet, children stick the appliances on the correct place on the Venn diagram. Children should base their sorting on the picture of the appliance given (for example, the picture of the toothbrush provided is a manual one but you can also, of course, get electric toothbrushes. This makes a good discussion point with children). Can children classify appliances as electrical/non-electrical and battery/mains powered? Can children use a Venn diagram to present their findings?	
	 Children are provided with a Venn diagram with headings to sort the appliances into. Reminders are given of the definitions of 'mains-powered' and 'battery-powered' for support. Children decide on appropriate headings for their Venn diagram and then sort the appliances into the correct section. Non-Electrical Appliances heading has been given as an example. Children decide on appropriate headings for their Venn diagram and then sort the appliances and add the appliances and add the appliances heading has been given as an example. 	
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Exploreit Imagi	neit: Children imagine a world without electricity and write a list of things that they think people would miss the m	ost.

Observeit: Children look around the classroom or, with appropriate supervision, the school and write down all the electrical appliances that they can see.

Reasonit: Children discuss Children decide whether the given appliances are mains- or batterypowered and then justify why these appliances need to be powered in that way.

VIC Curriculum

This lesson plan could be used to support the teaching and learning of the following content description from the VIC Curriculum.

Year 6: Science: Science Understanding, Physical Sciences

Energy from a variety of sources can be used to generate electricity; electric circuits enable this energy to be transferred to another place and then to be transformed into another form of energy (VCSSU081)

Aim: Energy from a variety of sources can be used to generate electricity; electric circuits enable this energy to be transferred to another place and then to be transformed into another form of energy (VCSSU081)	Success Criteria: I can identify electrical and non-electrical appliances. I can group appliances based on whether they are mains- or battery-powered. I can use a Venn diagram to present my findings.	Resources: Lesson Pack
To classify and present data, identifying common appliances that run on electricity.	Key/New Words: Appliance, mains, battery, electricity, powered, device, classify.	Preparation: Knowledge Organiser - one per child (this will be used in each lesson)
		Sorting Appliances Activity Sheet - one per child
		Obscure Appliances Activity Sheet – as required
		Appliances Reasoning Cards - as required

Prior Learning: This is the first time that children will have studied an electricity unit. Children will have awareness of electrical appliances and may be able to distinguish the difference between appliances that are mains- or battery-powered.

Learning Sequ	Jence	
	Remember It: Using the questions and timer on the Lesson Presentation, children discuss the items they have at home that are powered by electricity and which of these they would struggle to live without. Children write the names of their chosen items on sticky notes. On a flipchart or whiteboard, prepare a table with two headings: 'Mains-Powered' and 'Battery-Powered'. After using the Lesson Presentation to define mains-powered and battery-powered, children can then add their sticky notes to the correct column. Discuss whether any of the items listed could be both mains- and battery-powered. You may wish to discuss how we use mains electricity to charge batteries in battery-powered appliances (e.g. mobile phones).	
	Household Appliances: Introduce the term 'appliance' using the Lesson Presentation. Share the examples with the children and then children can apply their understanding of the term by discussing why further examples are classed as appliances. Introduce the term 'electrical appliance' using the comparison of a non-electrical appliance (a can opener) and an electrical appliance (a hairdryer). A link to the appliance pages from the eBook is provided as an option from the Lesson Presentation should you wish to look at appliances in more detail. Can the children identify common appliances and identify whether they run on electricity?	
Vinole Class	Knowledge Organiser: Introduce the Knowledge Organiser via the Lesson Presentation to be used across the unit. Children identify the key vocabulary and information that have been covered already in the lesson today.	
	Classifying Appliances: Ask children how to use a Venn diagram. Then, with their talk partner, children discuss sorting the appliances given into the battery-powered/mains-powered Venn diagram shown on the Lesson Presentation . Invite the children to click the correct label for each appliance and discuss how appliances that could come in mains- or battery-powered versions can go in the middle and appliances that are not electrical can be placed outside the Venn diagram circles.	
	Can children identify electrical and non-electrical appliances?	

U	Sorting Activity: Using the Venn diagram and appliance cards provided in the Sorting Appliances Activity Sheet, children stick the appliances on the correct place on the Venn diagram. Children should base their sorting on the picture of the appliance given (for example, the picture of the toothbrush provided is a manual one but you can also, of course, get electric toothbrushes. This makes a good discussion point with children). Can children classify appliances as electrical/non-electrical and battery/mains powered? Can children use a Venn diagram to present their findings?	
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Aim: To classify and present data, identifying common appliances that run on				Date:						
electricity.				Delivered By: Support:						
Success Criteria	Me	Friend	Teacher	т	РРА	S	I	AL	GP	
I can identify electrical and non-electrical appliances.				Notes	Notes/Evidence					
I can group appliances based on whether they are mains- or battery-powered.										
I can use a Venn diagram to present my findings.					-					
Next Steps										
J										
J										

т	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

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Reasoning Card





Decide whether each of the given appliances is mainspowered or battery-powered.

For each appliance, write a sentence about why it is appropriate that the appliance is either mains-powered or battery-powered.

Reasoning Card





Decide whether each of the given appliances is mainspowered or battery-powered.

For each appliance, write a sentence about why it is appropriate that the appliance is either mains-powered or battery-powered.

Reasoning Card (1)

Decide whether each of the given appliances is mains-powered or battery-powered.

Example answer:

The robot toy, torch, mobile phone and electric car are battery-powered.

The washing machine is mains-powered.

For each appliance, write a sentence about why it is appropriate that the appliance is either mains-powered or battery-powered.

Example answer:

The robot toy would not be safe for children if it was mains-powered. Being battery-powered also allows it to move freely.

If the torch was mains-powered you wouldn't be able to go very far with it and you may trip over any cables. It would not be much use in a power cut if it was mains-powered.

Like the torch, a mobile phone would not be portable if it had to be mains-powered.

An electric car would also be very difficult to use if it were mains-powered - you would not be able to travel very far and the cables would get caught very easily.

Washing machines and other similar appliances are mains-powered because of their relatively high energy needs.

Electricity

Key Vocabulary			Components (Pa	rts) Vocabul	lary		
electricity	The flow of an electric current through a material, e.g. from a power source through wires to an appliance .		cell: Normally, we would call this a battery but scientifically, this is a cell. Two or more cells joined together form a battery.		e: Lights up in α plete <mark>circuit</mark> .	buzzer: Makes a noise in a complete circuit.	
appliances	ppliances A piece of equipment or a device designed to perform a particular job, such as a washing machine or mobile phone.						
battery	A device that store as a chemical. Tw together form a be	es electrical energy o or more cells joined <mark>attery</mark> .	wires: Used to cor the different comp	nnect mot e ponents mov	or: Produces ement in a	, switch: Used to turn other components in the	
circuit	A pathway that e around. It is based power supply. Exa (parts) you can ac bulbs, switches, b	lectricity can flow d around wires and a imples of components dd in to a circuit are uzzers and motors.	in the circuit toge	ther. com	plete circuit.	circuit on or off.	
Series Circuit A circuit where the components are connected in a loop. Electricity flows through each component in a single pathway.		Incomplete There is a break circuit that prev electricity from components will	Incomplete Circuit There is a break in the circuit that prevents the electricity from flowing. The components will not work.		used to open or close a switch 'breaks' the circuit f electricity. When on, a the circuit and allows the n slide switch		

push button switch

The components

will work.

Electricity

Key Vocabulary				
mains electricity	Electricity supplied through wires to a building.			
electrical conductor	A conductor of electricity is a material that will allow electricity to flow through it.			
electrical insulator	Materials that are electrical insulators do not allow electricity to flow through them.			

Appliances

Many everyday appliances rely on electricity for them to work. Some appliances use mains electricity (are plugged into a socket) and others have a battery to make them work. Examples of mains-powered appliances include toasters and televisions. Battery-powered appliances can include mobile phones and torches.





To work safely with **circuit** components in the classroom:

- None of the equipment needs to use mains power so do not put any of it in or near plugs.
- Report any damaged or broken equipment to your teacher. Do not use it.

- Only use equipment as instructed.
- Connect equipment correctly.
- Disconnect equipment after use and put it away neatly.



Obscure Appliances

To classify and present data, identifying common appliances that run on electricity.

Look at the cards below of some more obscure (unusual) appliances. Where do you think they would go on your Venn diagram? Why? Cut and stick your answers onto your Venn diagram from earlier.

Use reasoning to answer the following questions about the appliances that you have just added to your Venn diagram.

1. What are the advantages and disadvantages of owning a mains-powered doorbell?

2. Why do you think it might be useful to have smoke alarms available in mains-powered or battery-powered versions?

3. How do you think a solar-powered garden light actually works?



Obscure Appliances - Answes

doorbell	battery- or mains-powered
solar-powered garden light	battery-powered (see answer to question below)
candle	non-electrical
hose	non-electrical
toilet	non-electrical
smoke alarm	battery- or mains-powered
electric car	battery-powered
	non-electrical - these usually just plug into a
garden sprinkler	hose but complex sprinkler systems can involve
	electrical systems to control them.

Answers may vary. Example answers are given below:

1. What are the advantages and disadvantages of owning a mains-powered doorbell?

Advantages include that a battery could stop working and your doorbell would no longer work whereas mains-powered would remain powered. Disadvantages include it might be complicated to install and you may have to find somewhere for the cables to run.

2. Why do you think it might be useful to have smoke alarms available in mains-powered or battery-powered versions?

Battery-powered versions can be easier to install and can be used where there might not be access to mains electricity. With mains-powered smoke alarms, you don't need to worry about the battery running out of charge. You can get smoke alarms that can be battery- and mains-powered (so the battery becomes a back up in the case of power cuts).

3. How do you think a solar-powered garden light actually works?

Solar-powered garden lights actually contain a battery. When sunlight is present, solar panels convert the sunlight into electricity which charges the battery. This battery then powers the lights at night.







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Sorting A_f

To classify and present data, identifying corr

Cut and stick the appliance pictures onto the correct place on your Venn diagram.



Appliances

3 common appliances that run on electricity.



Sorting A_f

To classify and present data, identifying cor

1. Choose appropriate headings for each section of your Venn diagram.



Appliances

3 common appliances that run on electricity.

2. Cut and stick the appliance pictures onto the correct place on your Venn diagram.



Sorting Applian



inces - Answers



Sorting Appliances



Sorting Appliances

To classify and present data, identifying common appliances that run on electricity.

1. Choose appropriate headings for each section of your Venn diagram.

2. Cut and stick the appliance pictures onto the correct place on your Venn diagram.





Sorting Appliances - Answers



Electricity | Appliances

To classify and present data, identifying common appliances that run on electricity.	
I can identify electrical and non-electrical appliances.	
I can group appliances based on whether they are mains- or battery-powered.	
I can use a Venn diagram to present my findings.	

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