Electricity: Appliances

Aim **Lesson Duration** 60 mins Identify common appliances that run on electricity. It is estimated that this lesson will take Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. approximately 60 To classify and present data, identifying common appliances that run on electricity. minutes. **Success Criteria Key Vocabulary** I can identify electrical and non-electrical appliances. Appliance, mains, battery, electricity, powered, device, classify. I can group appliances based on whether they are mains- or batterypowered. I can use a Venn diagram to present my findings. **Standard School Equipment** Preparation Knowledge Organiser – per child (this will be used in each lesson) Sticky notes Flipchart/whiteboard Differentiated Sorting Appliances Activity Sheet - per child Obscure Appliances Activity Sheet - as required

Prior Learning and Progression: 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 mainsor battery-powered.

Reasoning Cards: Appliances - as required

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).	10 mins
	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?	5 _{mins}
	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.	5 _{mins}
	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?	5 mins



Sorting Activity: Using the Venn diagram and appliance cards provided in the **Sorting Appliances Activity Sheet**, children stick the appliances onto 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 Activity Sheet. Then, children can discuss and add the appliances from the Obscure Appliances Activity Sheet to their Venn diagram and complete the reasoning questions given.





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?

Exploreit

Imagineit: Children imagine a world without electricity and write a list of things that they think people would miss the most.

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

they can see.

Reasonit

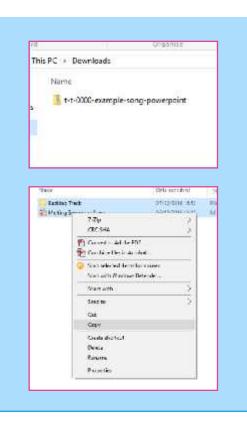
Children discuss Reasoning Card 1: Appliances. Children decide whether the given appliances are mains- or battery-powered and then justify why these appliances need to be powered in that way.

Assessment

Scientific Knowledge	
Working Towards the Expected Level	Children:
Children can define what an electrical appliance is and are starting to identify those that are mains- or battery-powered.	
Working At the Expected Level	Children:
Children can define what an electrical appliance is and identify those that are mains- or battery-powered.	
Working At Greater Depth	Children:
Children can define what an electrical appliance is and identify a variety of appliances that are mains- or battery-powered, including more unusual appliances.	
Working Scientifically	
Working Towards the Expected Level	Children:
Working Towards the Expected Level With support, children can group and classify things (appliances) and record their findings using labelled diagrams.	Children:
With support, children can group and classify things (appliances) and record their findings using labelled	Children: Children:
With support, children can group and classify things (appliances) and record their findings using labelled diagrams.	
With support, children can group and classify things (appliances) and record their findings using labelled diagrams. Working At the Expected Level Children can group and classify things (appliances)	

Guidance for Video/Audio in PowerPoints

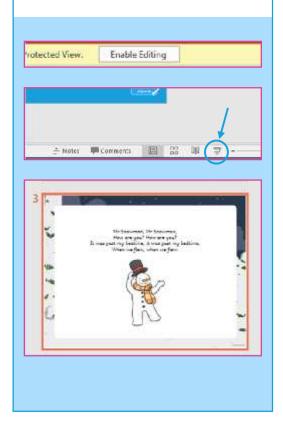
Open the downloaded folder and copy all the files.



Paste the copied files into a new folder.



To use the PowerPoint, enable editing and put into slide show mode.



Please note the embedded audio may not be compatible with earlier versions of PowerPoint.

Disclaimer/s

We hope you find the information on our website and resources useful.

Animations

This resource has been designed with animations to make it as fun and engaging as possible. To view the content in the correct formatting, please view the PowerPoint in 'slide show mode'. This takes you from desktop to presentation mode. If you view the slides out of 'slide show mode', you may find that some of the text and images overlap each other and/or are difficult to read.

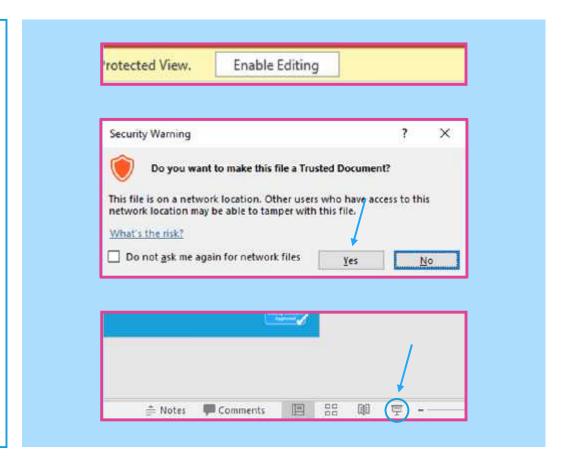
To enter slide show mode, go to the **slide show menu tab** and select either **from beginning or from current slide**.

Guidance for Macros in PowerPoints

We use macros within PowerPoints to increase the interactivity of our presentations. Follow this simple process to get the most out of this resource.

What to do:

- Open the PowerPoint file and enable editing.
- A security warning box will appear. Click yes.
- Enter presentation mode (start the slide show).



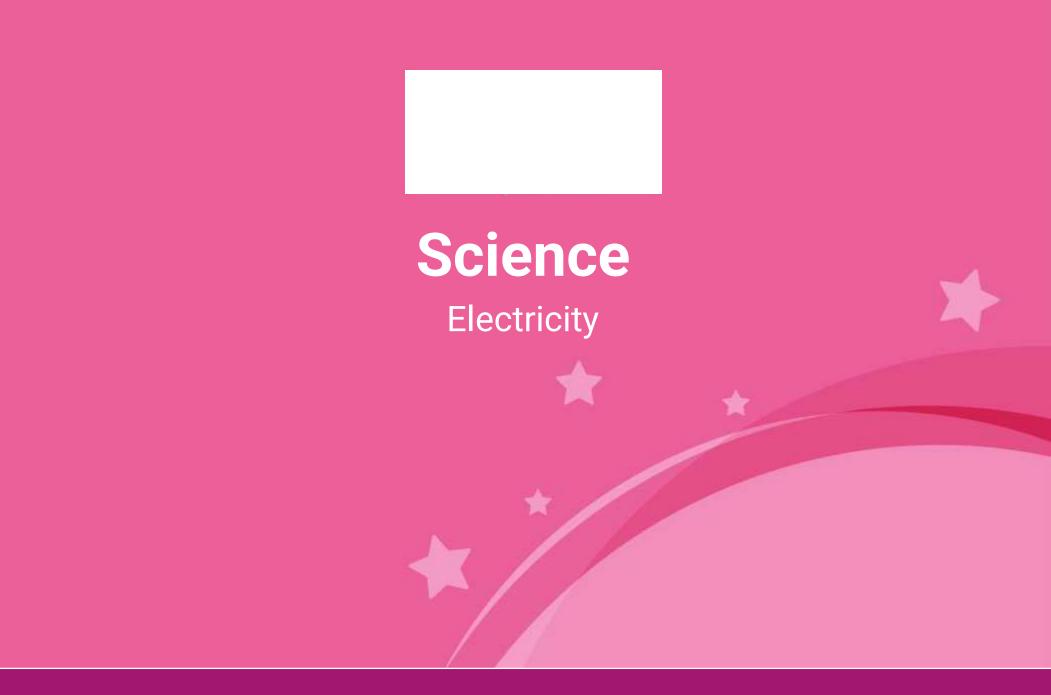
Question Marks

You will spot question marks at certain points in this **Lesson Presentation**.

Clicking the question marks will bring up key questions.



The assessment questions that appear will enable you to check your understanding against the lesson aim and success criteria.





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Aim

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

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.

Remember It

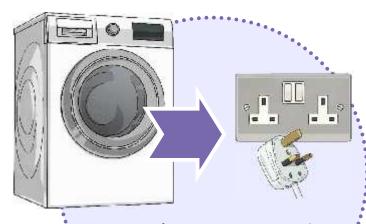
This is the first time you will have studied electricity at school. However, we all use electricity in our everyday lives.

- Think about all the items at home that would not work without electricity.
- If you had to order your top five electrical items (that you would struggle to live without), what would they be?
- > You have five minutes to jot down your top five items on sticky notes.

Remember It

We can power electrical items in different ways:

Mains-Powered



Items that run on **mains electricity** are plugged
into a socket.

Battery-Powered



To make **battery**-powered items run, you need to insert a **battery** into them.

Can you add your sticky notes into the correct column of the table for mains-powered or battery-powered?

What do you think we mean by 'appliance'?

Definition: An appliance is a piece of equipment or a device designed to perform a particular job.

Examples:

fan

A fan can be a **battery- or mains-powered appliance** that performs the task of cooling the user.

hairdryer



A hairdryer is a mains-powered appliance that dries a user's hair.

iron

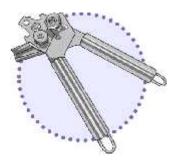


An iron is a **mains**-**powered appliance** that
presses clothes to
remove creases.

- **Definition:** An **appliance** is a piece of equipment or a device designed to perform a particular job.
- Look at the definition above of an **appliance**.

Do these household items perform a specific job?

can opener



Yes. A can opener performs the task of opening cans.

vacuum cleaner



Yes. A vacuum cleaner performs the task of collecting dust and small particles from floors.

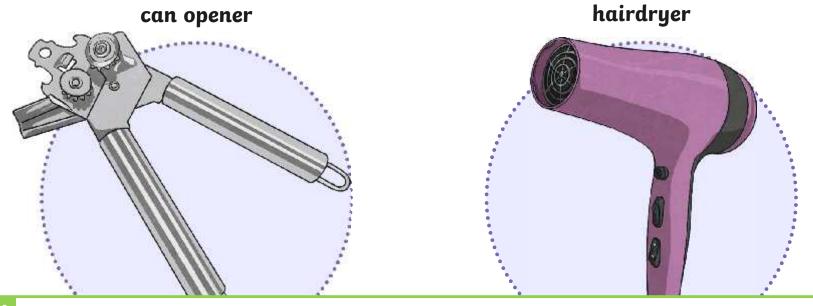
fridge



Yes. A fridge keeps food and drink cool so that they stay fresh.

Appliances that run on electricity are called 'electrical appliances'.

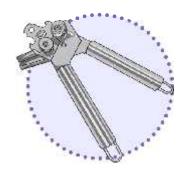
Which of the two appliances below is an electrical appliance?



Can you identify common **appliances** and identify whether they run on **electricity**?



can opener



- This can opener is **not** an electrical appliance.
- It is a household appliance that does not run on electricity.

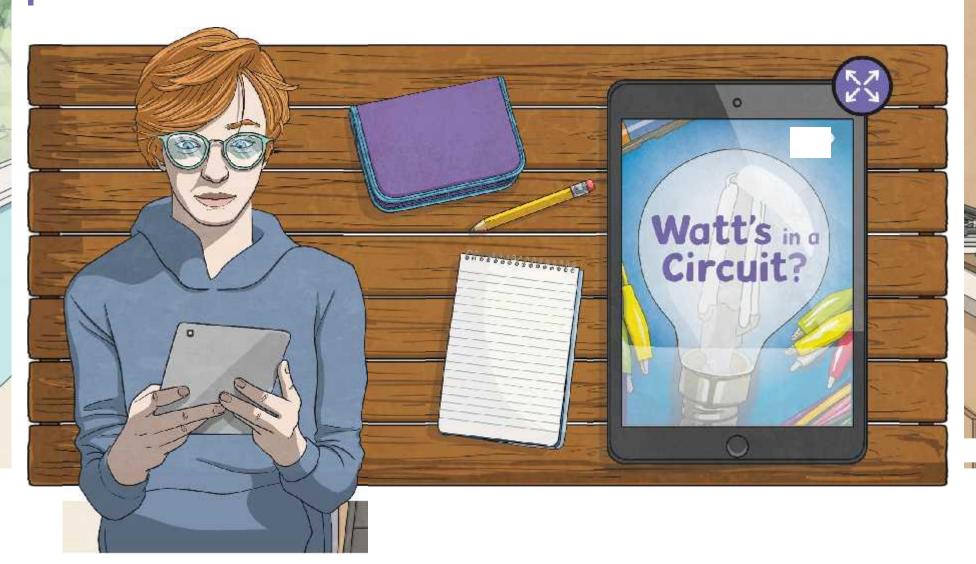
Are there such things as electrical can openers?

hairdryer



- ➤ A hairdryer **is** an electrical appliance.
- ➤ It is a household appliance that runs on electricity.

You can read more about appliances in the eBook.



Appliances

An appliance is a piece of equipment or a device designed to perform a particular job.

Appliances can be sorted into electrical appliances and non-electrical appliances. Electrical appliances can be further sorted into those that are battery powered and those that are mains powered; some appliances can even be either!

You might not be used to calling the items in the photographs 'appliances' but let's think about them with the definition. Each is designed to perform a particular job:



Non-electrical Appliances

- The hosepipe is designed to carry water to a particular place, such as flower beds when watering the garden.
 - A grater is designed to grate food, such as cheese or carrots.
 - A rake is designed to help bring items together, such as leaves or grass clippings or for jobs such as levelling soil off.

Appliances







Battery-Powered Appliances

These use a battery as their

power supply. Being able to power an appliance using a battery is useful as it makes the appliance portable.

Mains-Powered Appliances
These use mains electricity
as their power supply.
Appliances are normally
plugged into a socket to
access this.







Some appliances can come in mains-powered or batterypowered versions (or can use either within the one appliance!).

We often use **mains electricity** to recharge some types of batteries - think about plugging a mobile phone in to charge.

This alarm clock can be mains-or battery-powered



A mainspowered fan

12:01

A batterypowered fan

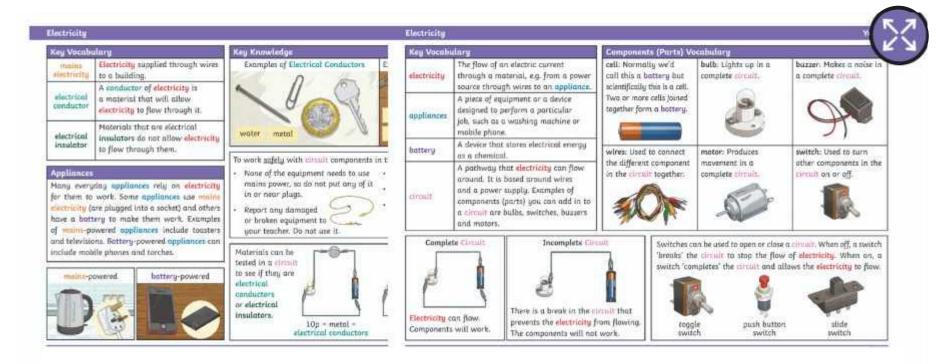


10

Knowledge Organiser

Here is the **Knowledge Organiser** for this unit.

Can you find the key vocabulary we have already looked at today?



Electricity

Key Vocabi	
electricity	The flow of an electric current through a material, e.g. from a power source through wires to an appliance
appliances	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 stores electrical energy as a chemical.
circuit	A pathway that electricity can flow around. It is based around wires and a power supply. Examples of components (parts) you can add in to a circuit are bulbs, switches, buzzers and motors.

Components (Parts) Vocabulary

cell: Normally we'd call this a battery but scientifically this is a cell. Two or more cells joined together form a battery.



wires: Used to connect

the different component

in the circuit together.

motor: Produces movement in a complete circuit.

bulb: Lights up in a

complete circuit.



buzzer: Makes a noise in a complete circuit.



switch: Used to turn other components in the circuit on or off.



Complete Circuit



Electricity can flow.

Components will work.

Incomplete Circuit



There is a break in the circuit that prevents the electricity from flowing. The components will not work.

Switches can be used to open or close a circuit. When off, a switch 'breaks' the circuit to stop the flow of electricity. When on, a switch 'completes' the circuit and allows the electricity to flow.



toggle switch



push button switch



slide switch

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.





Examples of Electrical Conductors Examples of Electrical Insulators wood plastic paper rubber glass fabric

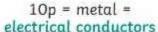
To work safely with circuit components in the classroom:

- 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.

Materials can be tested in a circuit to see if they are electrical conductors or electrical insulators.







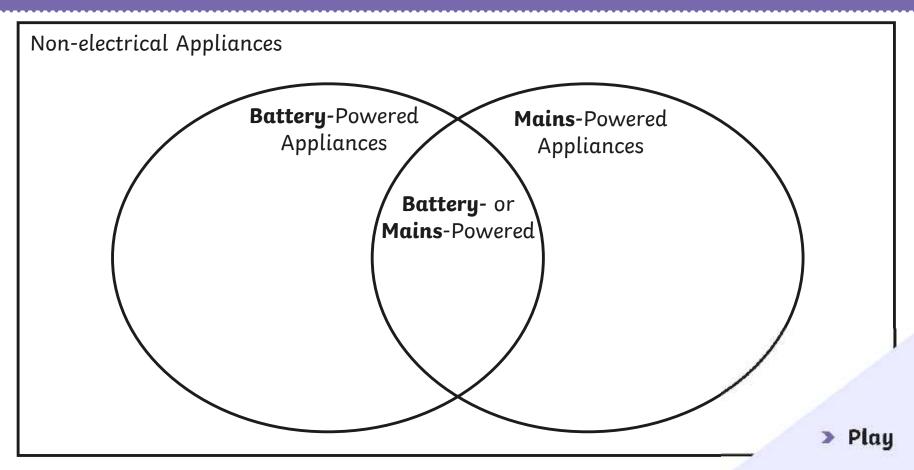
test circuit



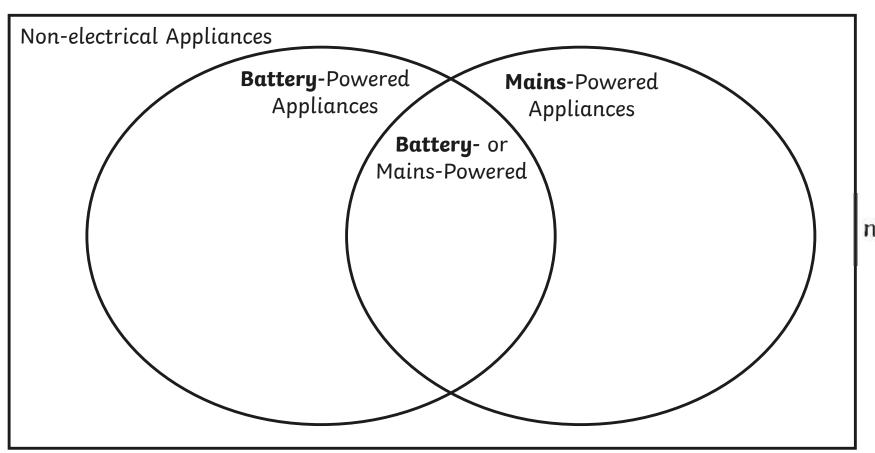
ruler = plastic = electrical insulators

Classifying Appliances

How do you use a Venn diagram?





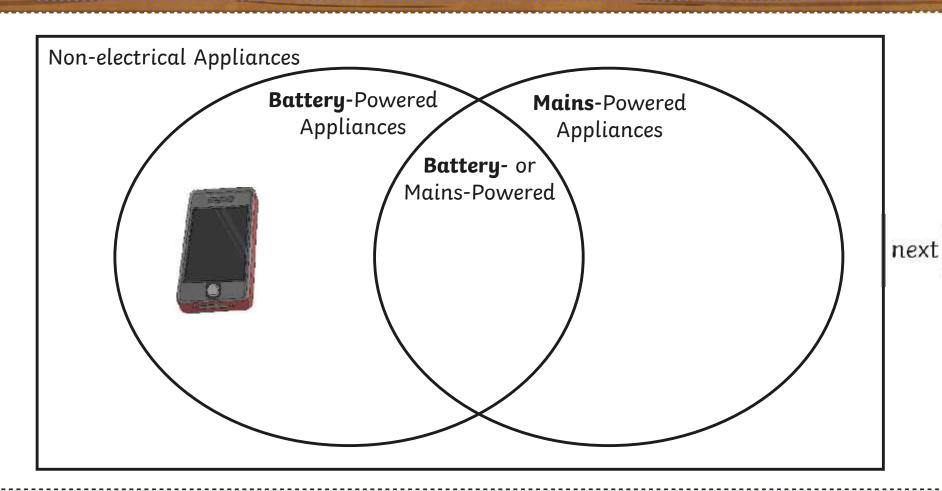


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Non-electrical Appliances Battery-Powered Appliances

Battery- or Mains-Powered



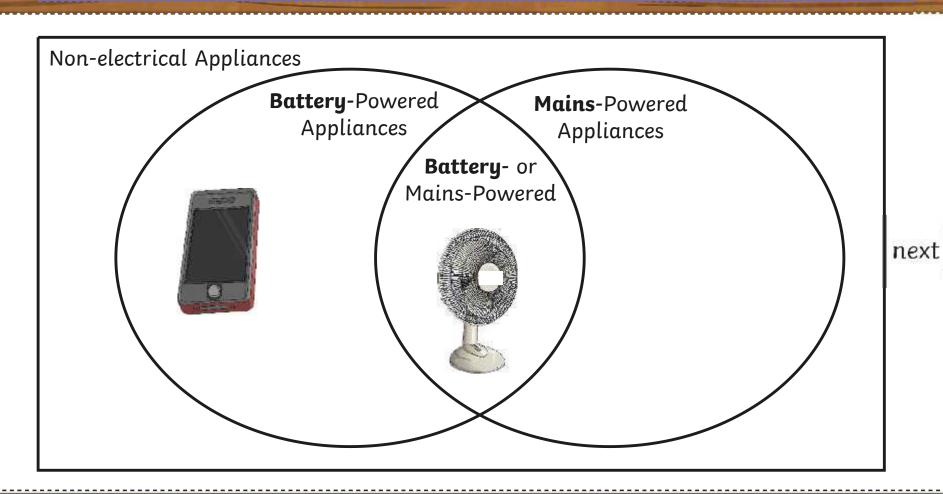




Non-electrical Appliances Battery-Powered Appliances

Battery- or Mains-Powered



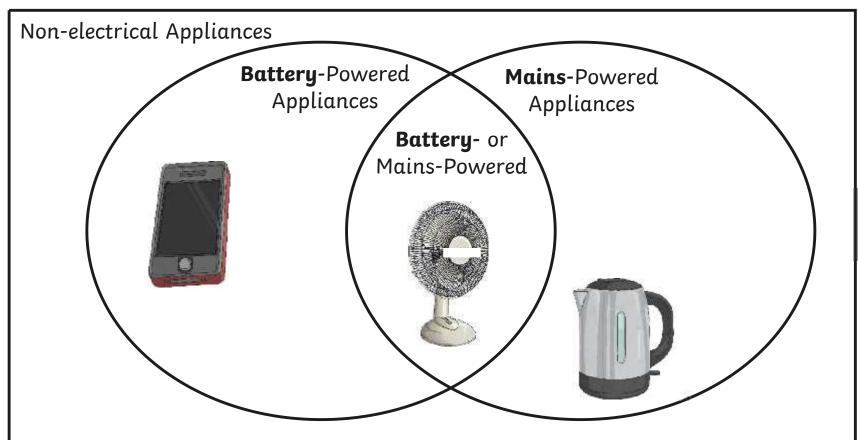




Non-electrical Appliances Battery-Powered Appliances

Battery- or Mains-Powered





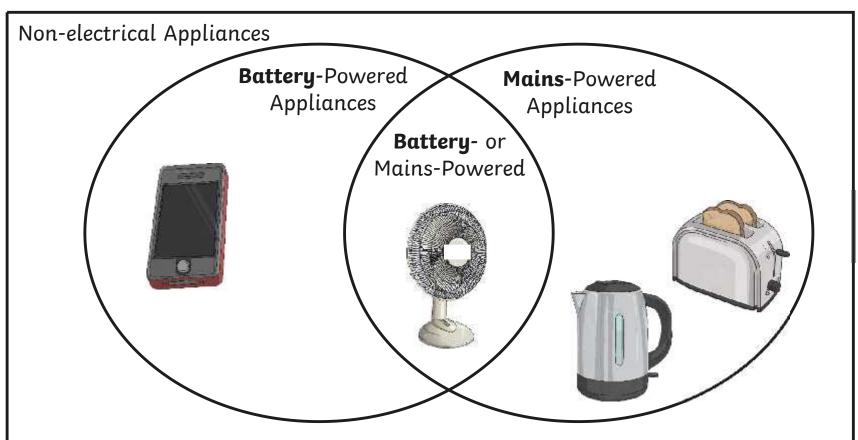
next



Non-electrical Appliances Battery-Powered Appliances

Battery- or Mains-Powered





next



Non-electrical Appliances Battery-Powered Appliances

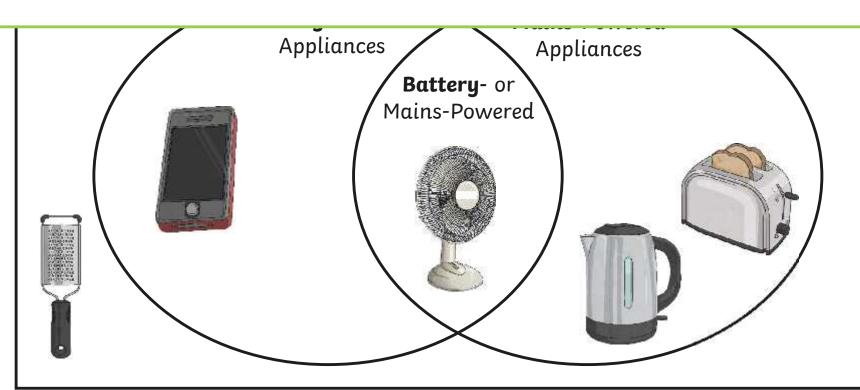
Battery- or Mains-Powered



X

Can you identify electrical and non-electrical appliances?





end

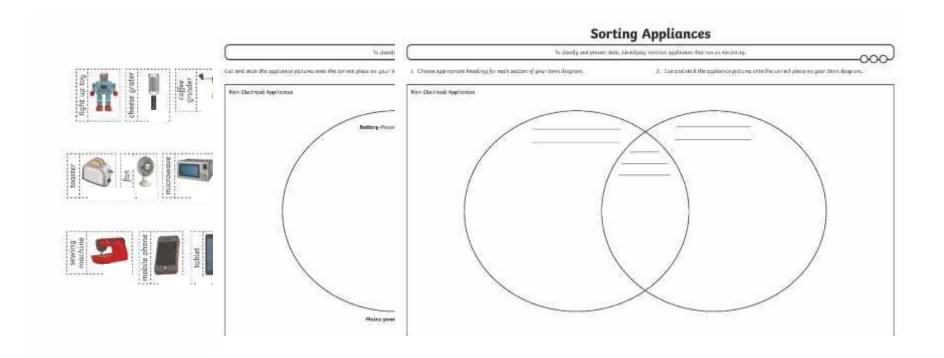


Non-electrical Appliances Battery-Powered Appliances

Battery- or Mains-Powered

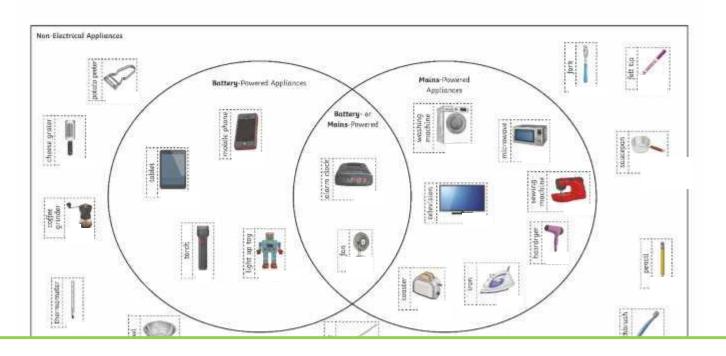
Sorting Activity

Cut and stick the given appliances into the correct section of your Venn diagram on the **Sorting Appliances Activity Sheet**.



Reflection

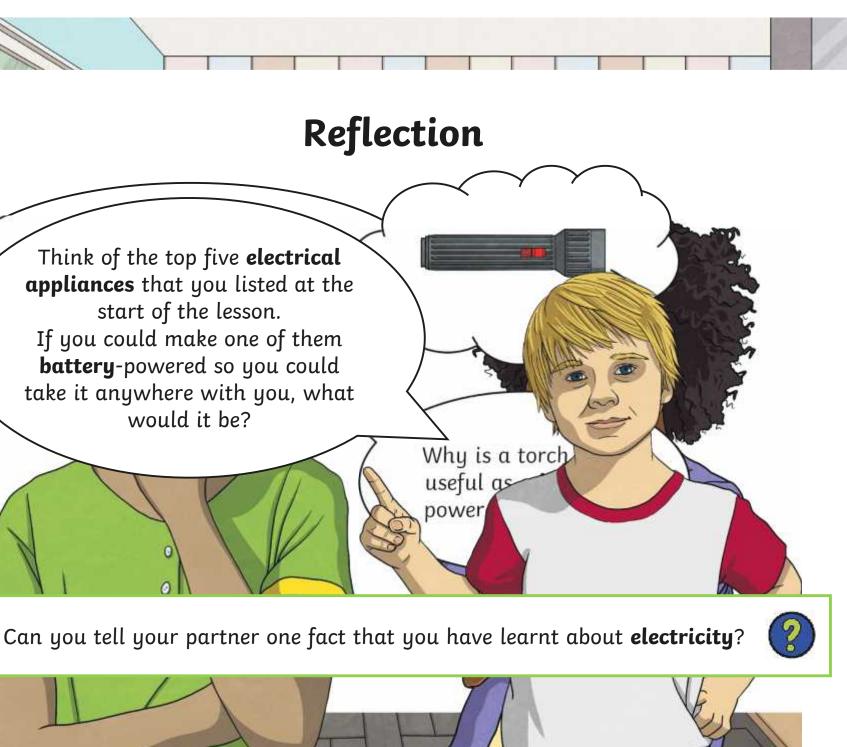
Sorting Appliances - Answers





Are any of the non-electrical items available as an electrical version?



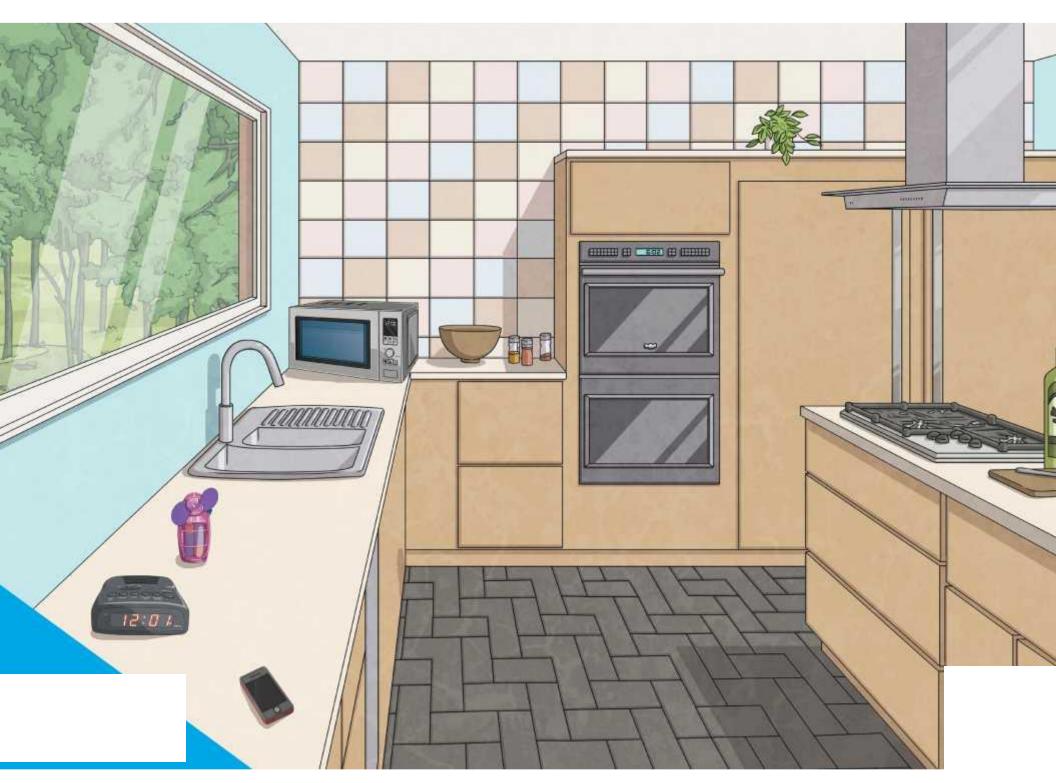


Aim

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

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.



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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	PPA	s	I	AL	GP	
I can identify electrical and non-electrical appliances.				Note	s/Eviden	ce				
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										
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Т	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

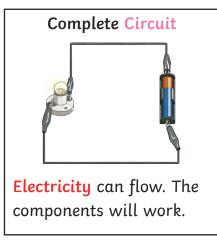
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Electricity Year 4

Key Vocabulary					
electricity	The flow of an electric current through a material, e.g. from a power source through wires to an appliance.				
appliances	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 stores electrical energy as a chemical.				
circuit	A pathway that electricity can flow around. It is based around wires and a power supply. Examples of components (parts) you can add in to a circuit are bulbs, switches, buzzers and motors.				

Components (Parts) Vocabulary cell: Normally, we would bulb: Lights up in a buzzer: Makes a noise in call this a battery but complete circuit. a complete circuit. scientifically, this is a cell. Two or more cells joined together form a battery. wires: Used to connect switch: Used to turn motor: Produces the different components movement in a other components in the in the circuit together. complete circuit. circuit on or off.





There is a break in the circuit that prevents the electricity from flowing. The components will not work.

Switches can be used to open or close a circuit. When off, a switch 'breaks' the circuit to stop the flow of electricity. When on, a switch 'completes' the circuit and allows the electricity to flow.







push button switch



slide switch

Electricity Year 4

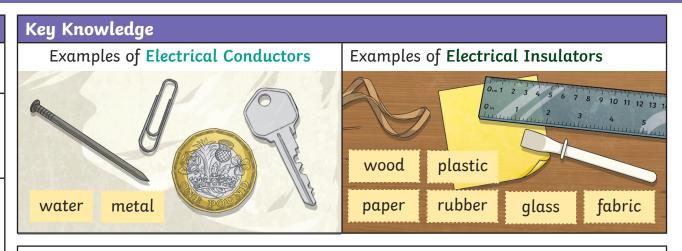
Key Vocabulary					
mains electricity	Electricity supplied through wires to a building.				
electrical conductor	A conductor of electricity is a material that will allow electricity to flow through it.				
electrical insulator	Materials that are electrical insulators do not allow electricity to flow 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 <u>safely</u> with <u>circuit</u> 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.

Materials can be tested in a circuit to see if they are electrical conductors or electrical insulators.



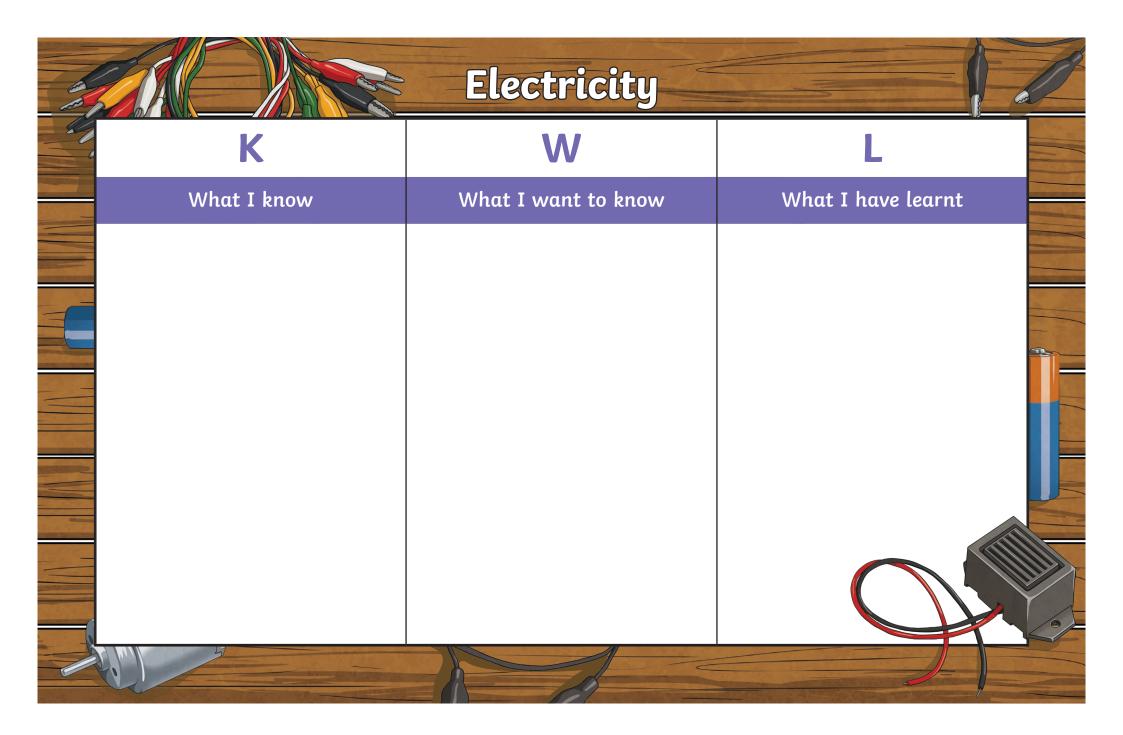




test circuit



ruler = plastic = electrical insulators



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.

What are the advantages and disadvantages of owning a mains-powered doorbell?
Why do you think it might be useful to have smoke alarms available in mains-powered or battery-powered versions?
How do you think a solar-powered garden light actually works?



Obscure Appliances - Answes

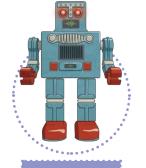
doorbell	battery- or mains-powered
solar-powered garden light	battery-powered (see answer to question
	below)
candle	non-electrical
hosepipe	non-electrical
toilet	non-electrical
smoke alarm	battery- or mains-powered
electric car	battery-powered
garden sprinkler	non-electrical – these usually just plug into a
	hosepipe 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.











robot toy

torch

mobile phone





electric car

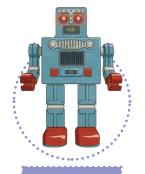
washing machine

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









robot toy

torch

mobile phone





electric car

washing machine

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.

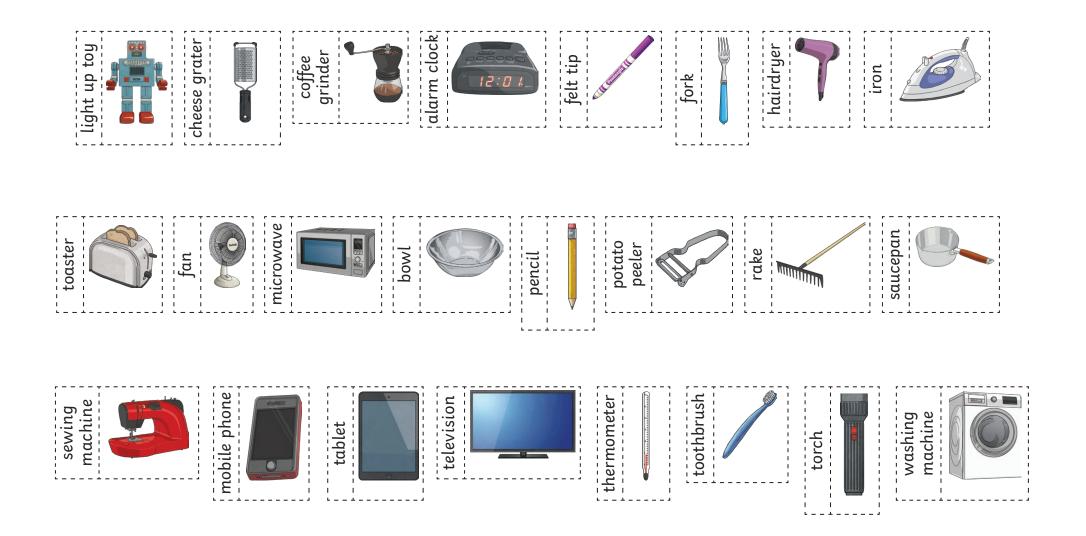
If the torch was mains-powered you wouldn't be able to go very far with it and you may trip over any cables. It would not be much use in a power cut if it was mains-powered.

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.

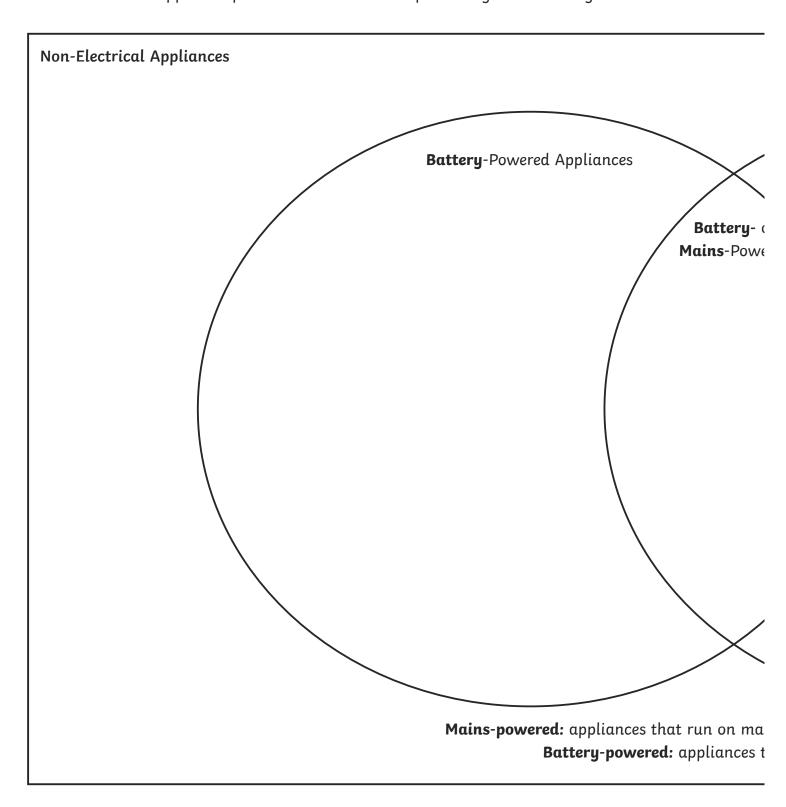
Sorting Appliances - Appliance Cards



Sorting Ap

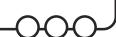
To classify and present data, identifying com

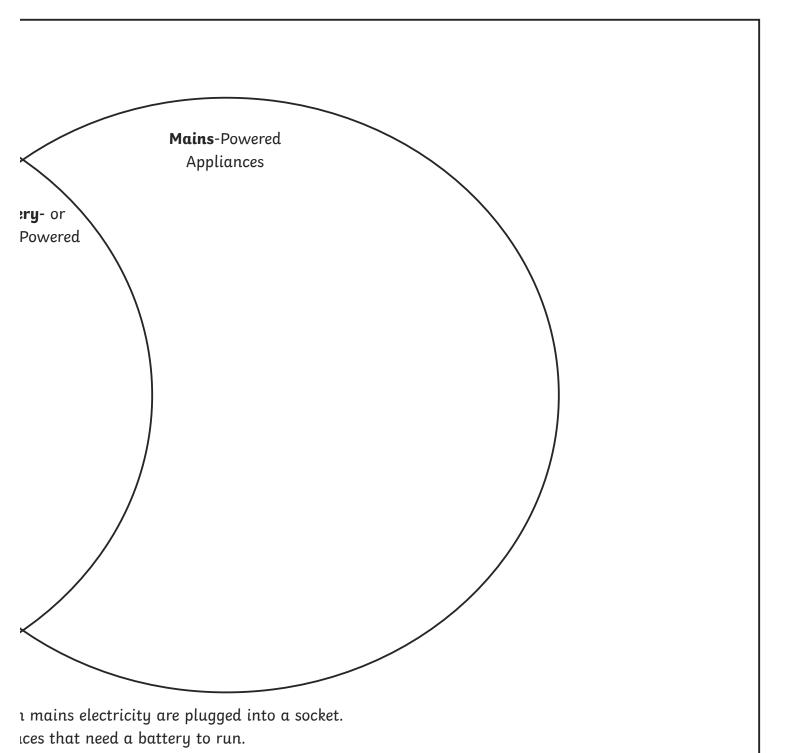
Cut and stick the appliance pictures onto the correct place on your Venn diagram.



Appliances

3 common appliances that run on electricity.

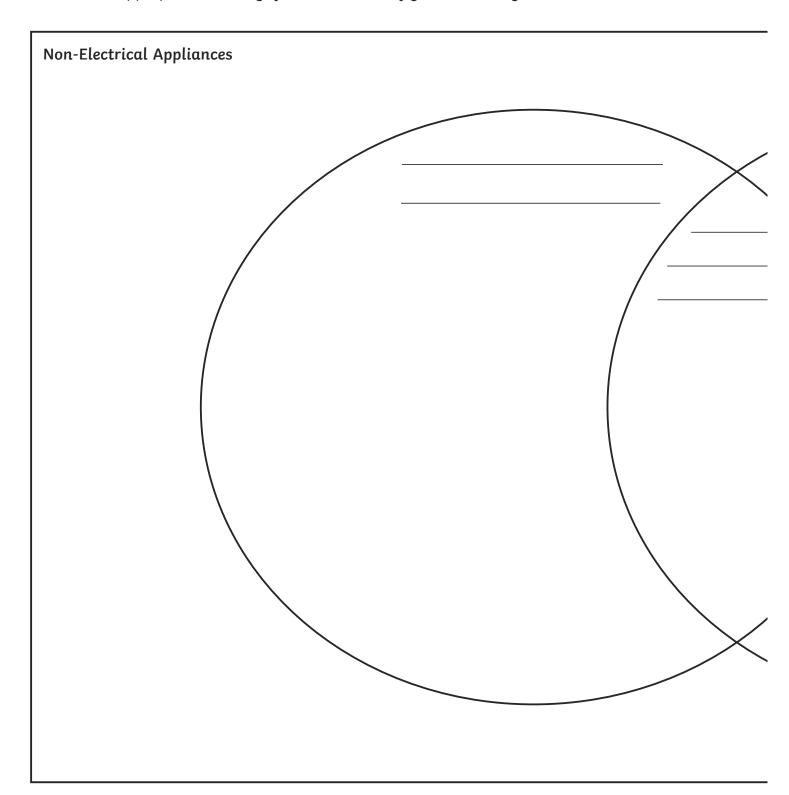




Sorting Ap

To classify and present data, identifying con

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

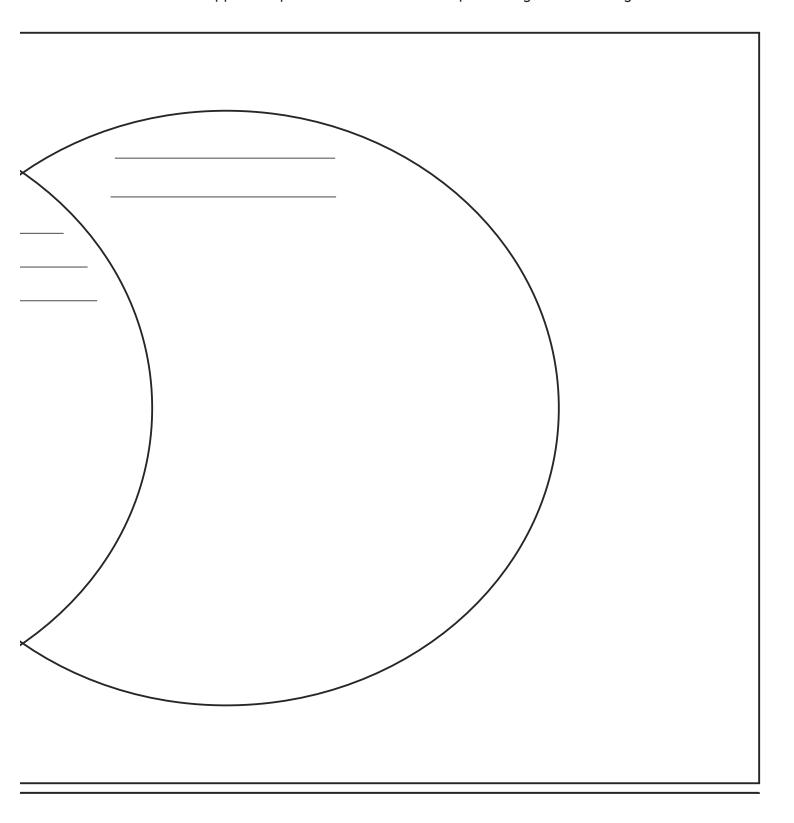


Appliances

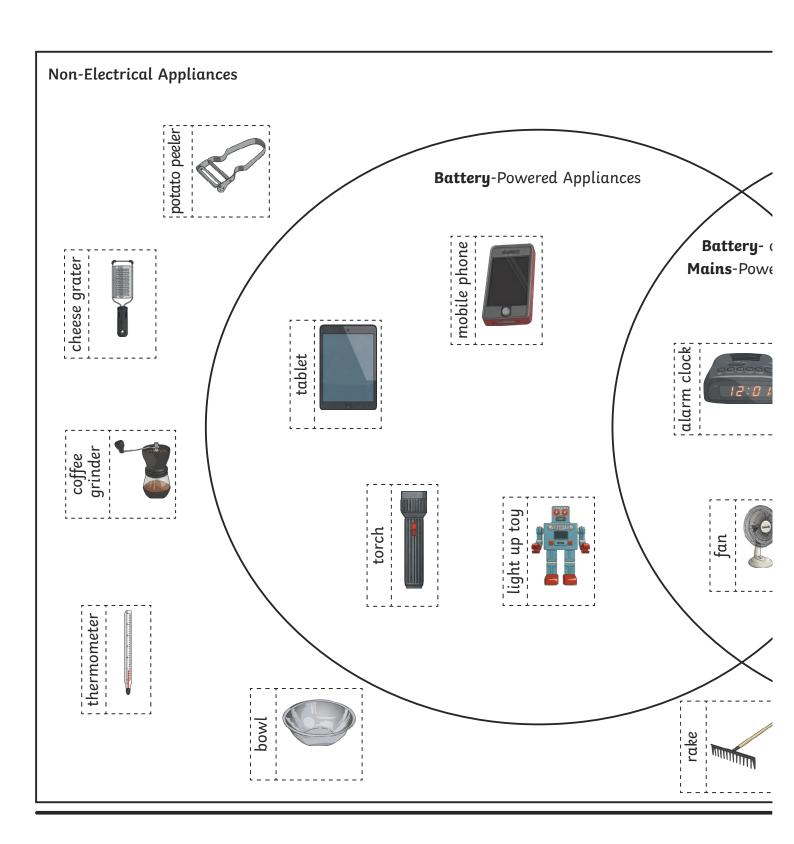
3 common appliances that run on electricity.



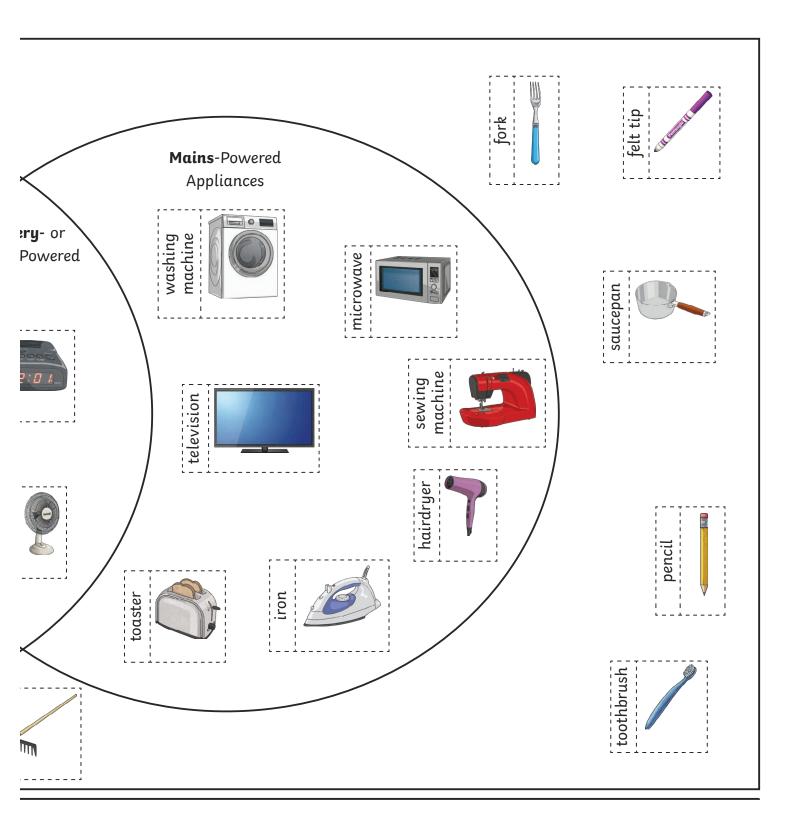
2. Cut and stick the appliance pictures onto the correct place on your Venn diagram.



Sorting Applian



inces - Answers



Sorting Appliances

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



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



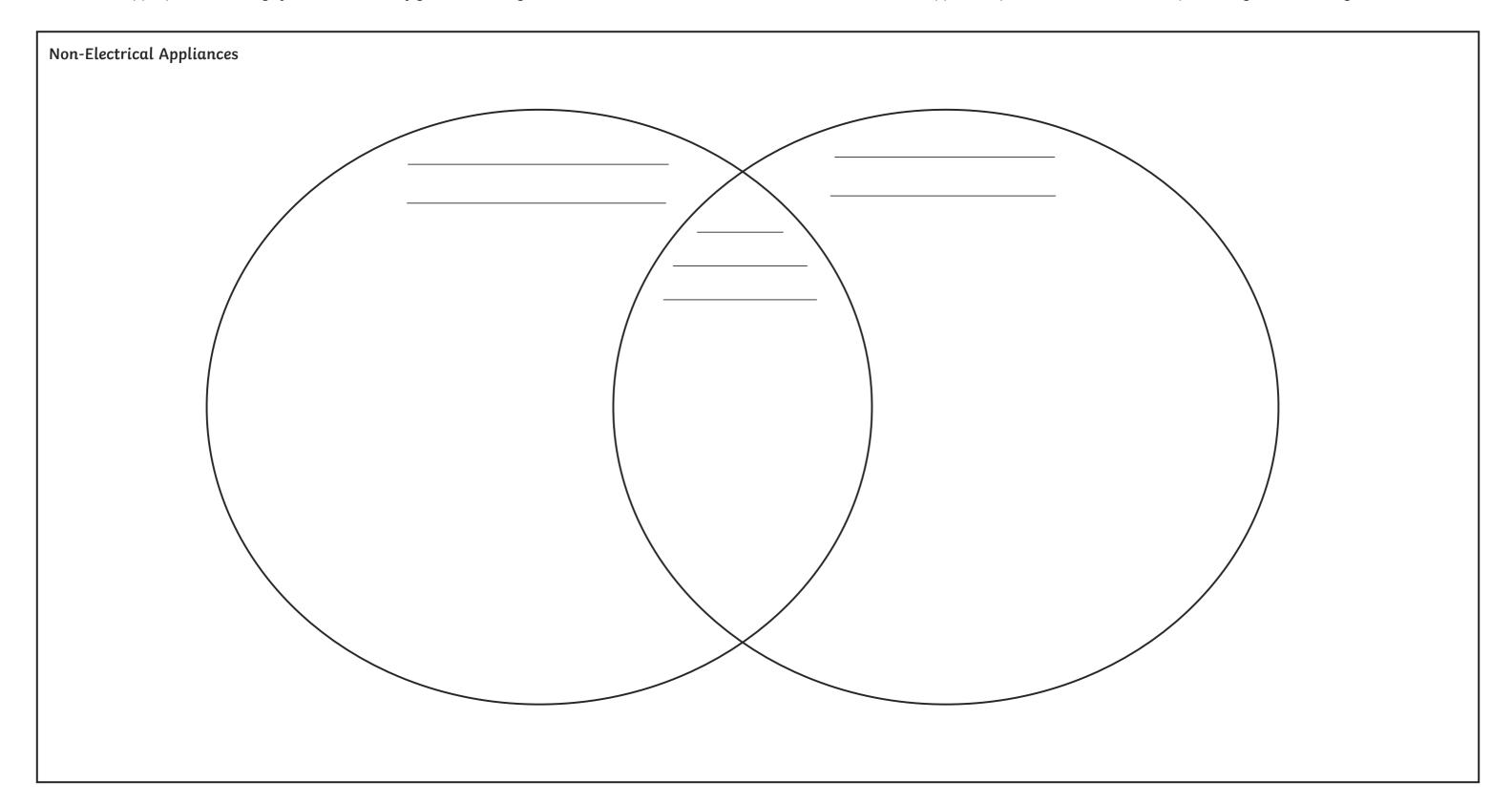
Sorting Appliances

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

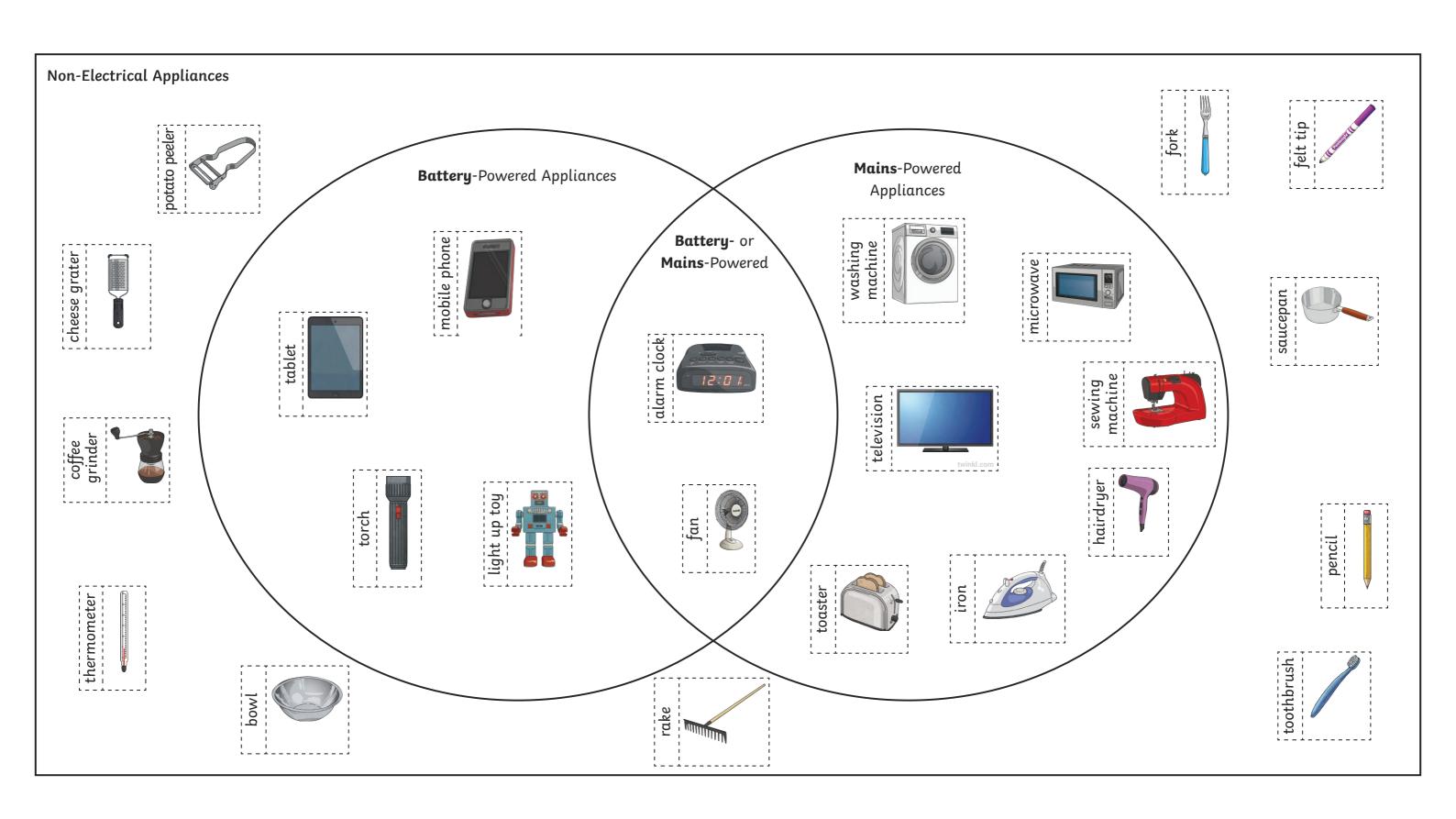
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1. Choose appropriate headings for each section of your Venn diagram.

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



Sorting Appliances - Answers



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

I can use a Venn diagram to present my findings.