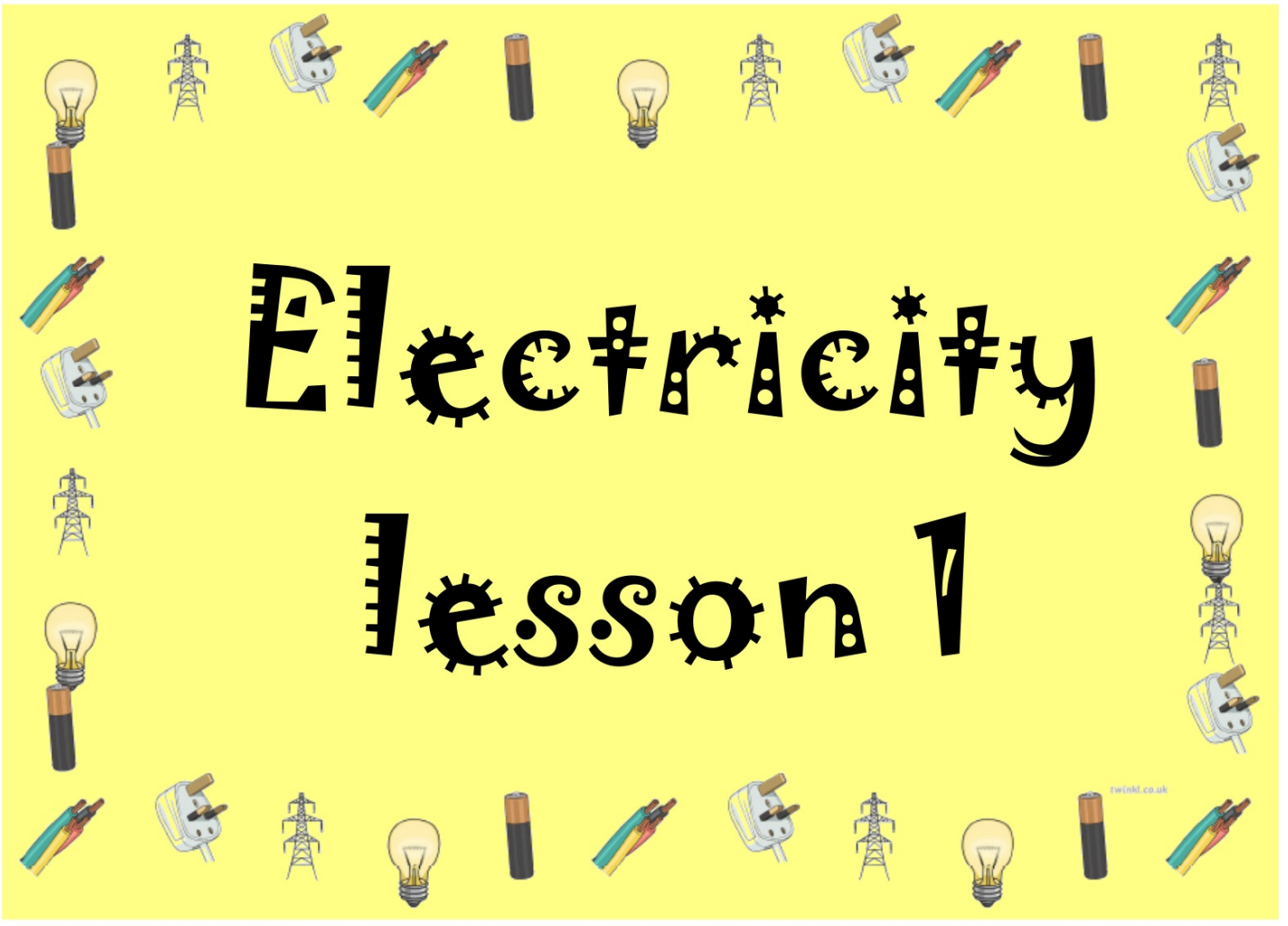


Electricity

Lesson 1



Glue in your
cover page

Electricity

Working scientifically

- asking relevant questions and using different types of scientific enquires to answer them
- setting up simple practical enquiries, comparative and fair tests
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- using straightforward evidence to answer questions or to support their findings

Knowledge and understanding

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors

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Tuesday 2nd November



watch first

Pre topic assessment

Produce a mindmap showing what you know about electricity already. You can draw pictures, write facts or sentences.

Here are some words to help you get started:

plug

battery

socket

LO: To explore the electricity kit and construct a simple circuit.

Explore	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	<u>LO: To explore the electricity kit and construct a simple circuit.</u>				Teacher
	K&U I can identify and name the components of a basic electrical circuit				
	WS I can record my findings using drawings and labelled diagrams				

Use the equipment to:
a) light a bulb



Plan

How can you answer your question?
What **type of enquiry** should you use?
Why?

1. Exploring
2. Research
3. Observing over time
4. Fair test/pattern seeking
5. Sorting and classifying
6. Designing and developing
7. Using a model

Plan 1
strategy

Draw your circuit.

Challenge: can you make your circuit noisy?



Now can you label each electrical component?



Label your drawing.



What have we learnt today?

Explore	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	<u>LO: To explore the electricity kit and construct a simple circuit.</u>				Teacher
	K&U I can identify and name the components of a basic electrical circuit				
	WS I can record my findings using drawings and labelled diagrams				

Year 4 Living things and their habitats	child	teacher
recognise that living things can be grouped in a variety of ways		
explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment		
recognise that environments can change and that this can sometimes pose dangers to living things		
Year 4 Animals, including humans	child	teacher
describe the simple functions of the basic parts of the digestive system in humans		
identify the different types of teeth in humans and their simple functions		
construct and interpret a variety of food chains, identifying producers, predators and prey		
Year 4 States of Matter	child	teacher
compare and group materials together, according to whether they are solids, liquids or gases		
observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)		
identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature		
Year 4 Sound	child	teacher
identify how sounds are made, associating some of them with something vibrating		
recognise that vibrations from sounds travel through a medium to the ear		
find patterns between the pitch of a sound and features of the object that produced it		
find patterns between the volume of a sound and the strength of the vibrations that produced it		
recognise that sounds get fainter as the distance from the sound source increases		
Year 4 Electricity	child	teacher
identify common appliances that run on electricity		
construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers		
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recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit		
recognise some common conductors and insulators, and associate metals with being good conductors		

Did you understand this objective? Draw a happy, sad or straight face to show how you feel about it.



Tuesday 9th November

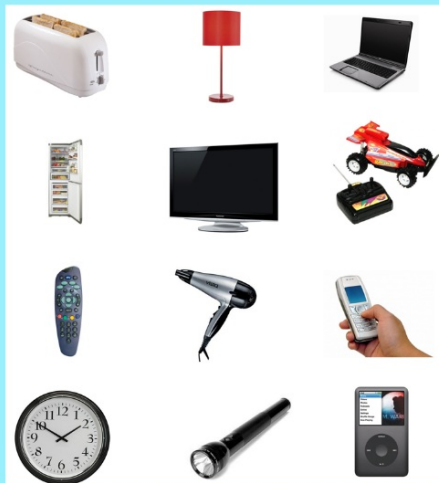


LO: To classify electrical appliances.



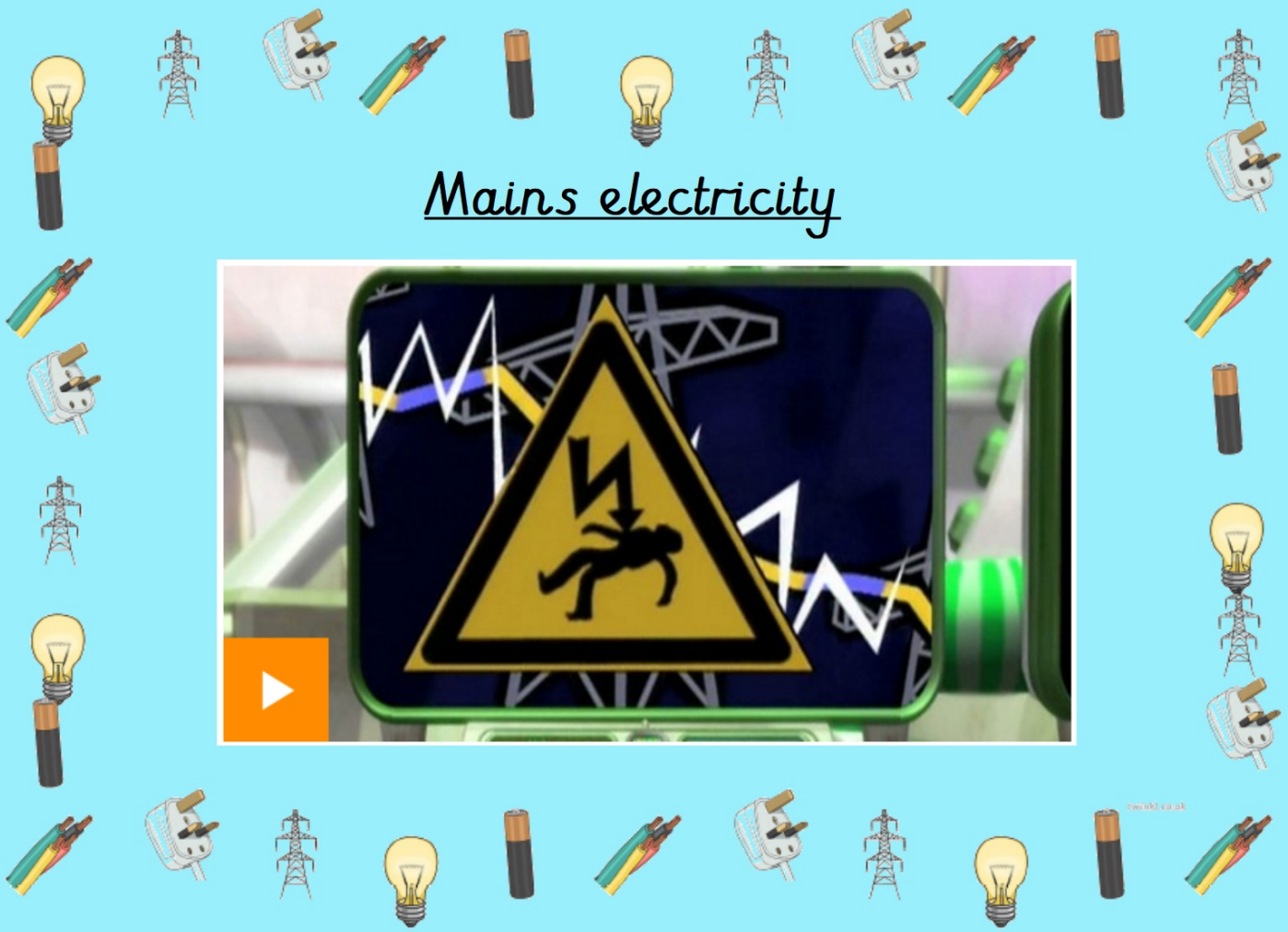
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Have a look at the pictures on your table.
How could you sort them? No sticking yet!



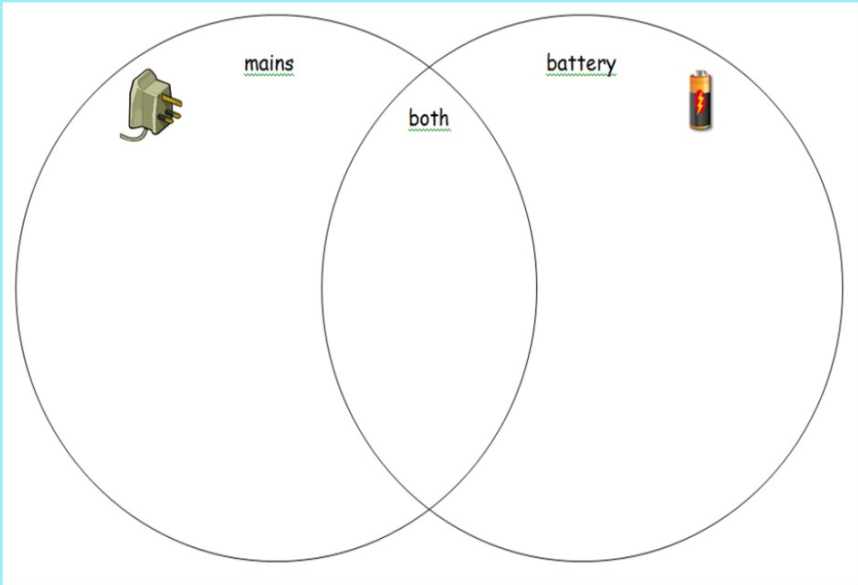
Classify	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	<u>LO: To classify electrical appliances.</u>				Teacher
	WS I can group appliances based on similarities and differences				
	K&U I know that some appliances use mains electricity and others use batteries				

Mains electricity





label each section



reduce and copy or photograph for books
write your names on the sheet

Individually, sort the birthday list into mains and battery powered appliances.



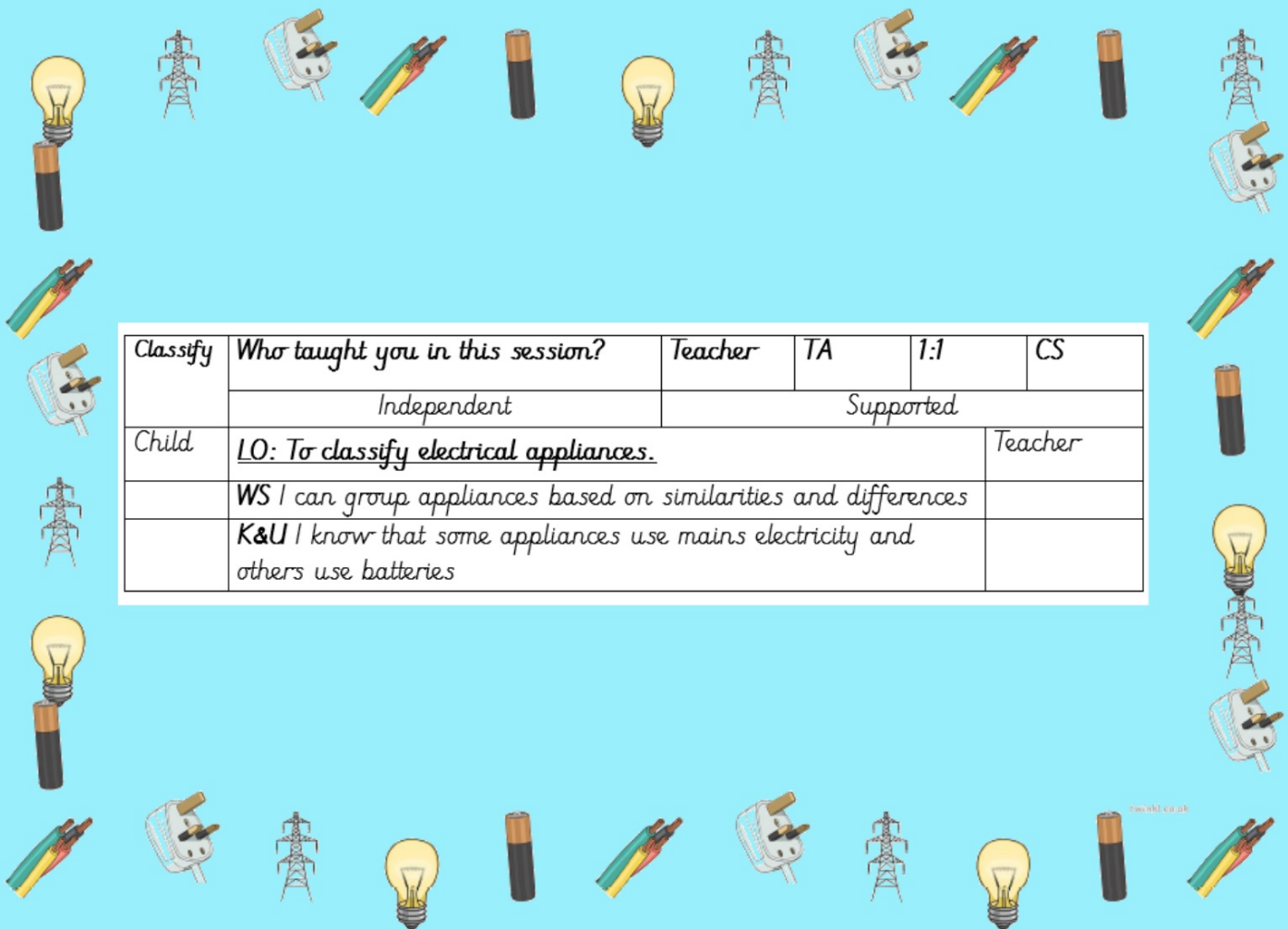
batteries	mains



Why do you think some items run on mains power and others on batteries?



Classify	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	<u>LO: To classify electrical appliances.</u>				Teacher
	WS I can group appliances based on similarities and differences				
	K&U I know that some appliances use mains electricity and others use batteries				



Year 4 Living things and their habitats	child	teacher
recognise that living things can be grouped in a variety of ways		
explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment		
recognise that environments can change and that this can sometimes pose dangers to living things		

Year 4 Animals, including humans	child	teacher
describe the simple functions of the basic parts of the digestive system in humans		
identify the different types of teeth in humans and their simple functions		
construct and interpret a variety of food chains, identifying producers, predators and prey		

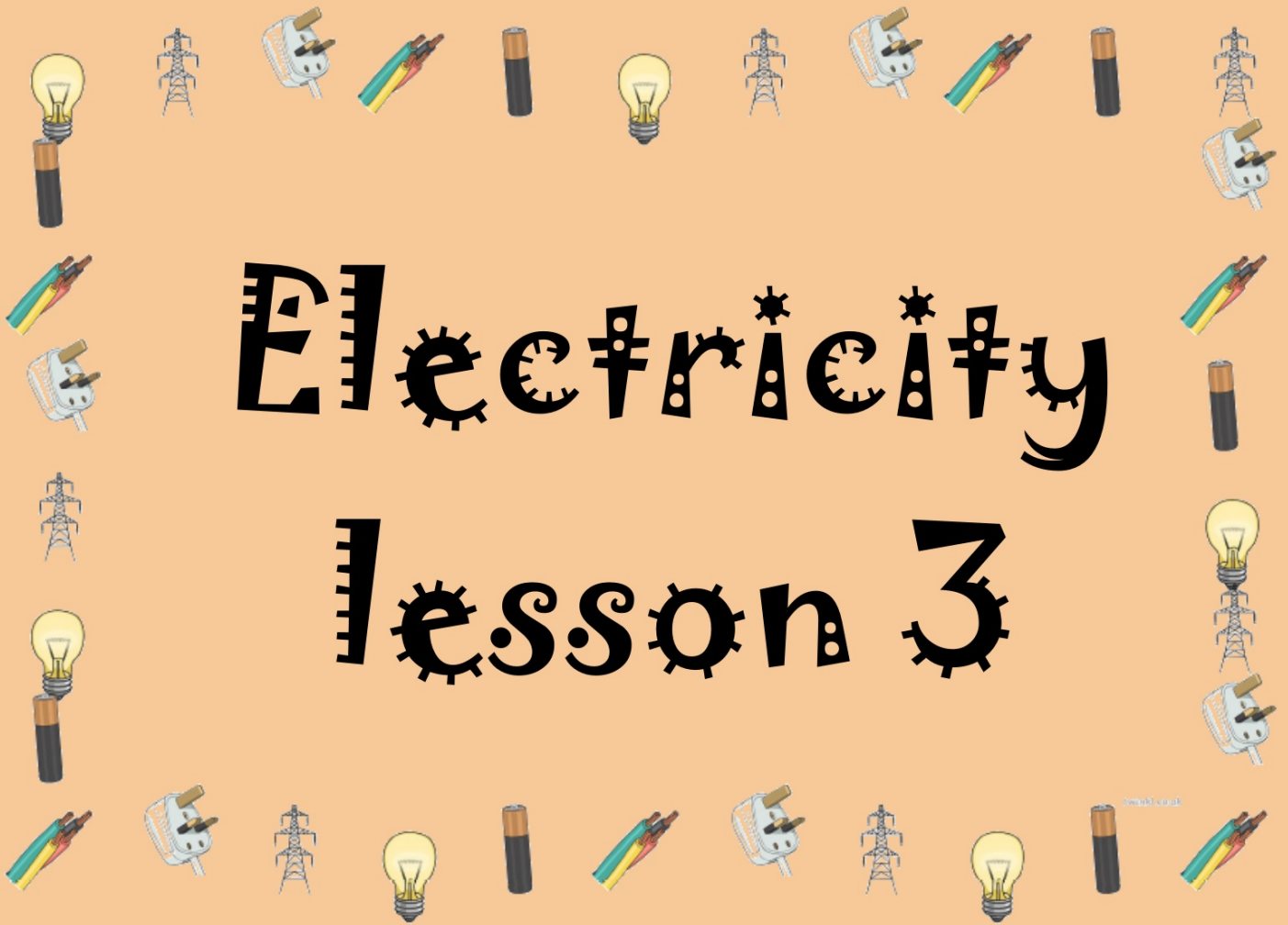
Year 4 States of Matter	child	teacher
compare and group materials together, according to whether they are solids, liquids or gases		
observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)		
identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature		

Year 4 Sound	child	teacher
identify how sounds are made, associating some of them with something vibrating		
recognise that vibrations from sounds travel through a medium to the ear		
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find patterns between the volume of a sound and the strength of the vibrations that produced it		
recognise that sounds get fainter as the distance from the sound source increases		

Year 4 Electricity	child	teacher
identify common appliances that run on electricity		
construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers		
identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery		
recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit		
recognise some common conductors and insulators, and associate metals with being good conductors		

Electricity

Lesson 3



Tuesday 16th November

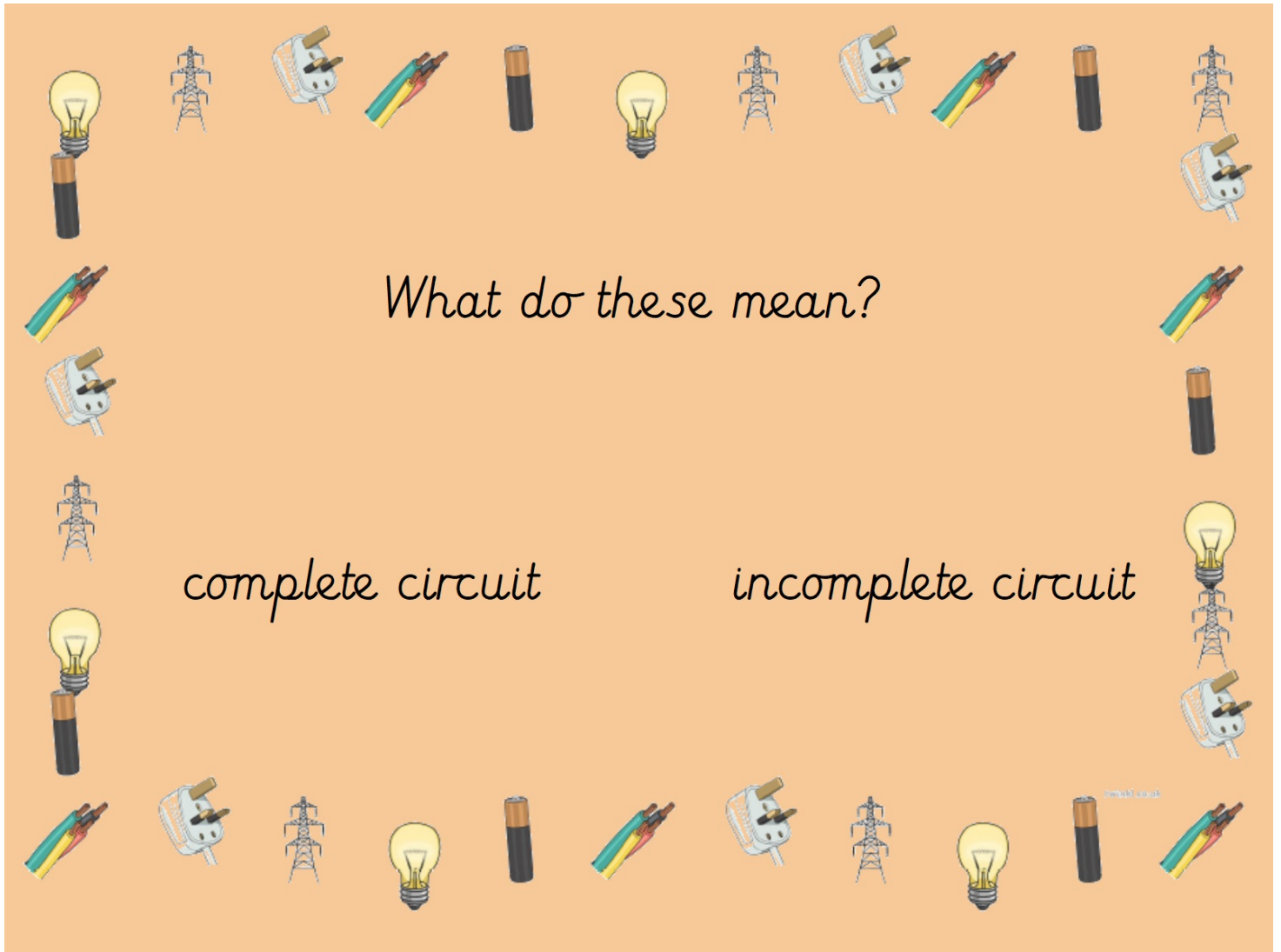
LO: To understand simple circuits.

	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	<u>LO: To understand simple circuits.</u>				Teacher
	WS I can prove whether my prediction is correct				
	K&U I understand that in order to light, a lamp must be part of a complete loop with a battery				

What do these mean?

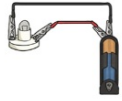
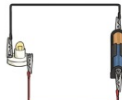
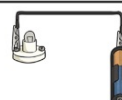
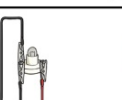
complete circuit

incomplete circuit

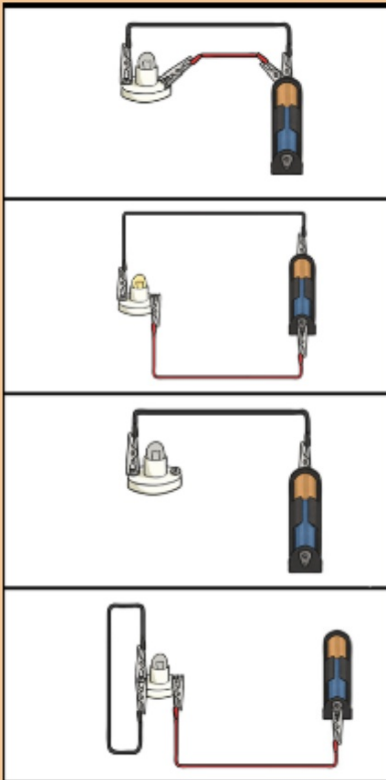


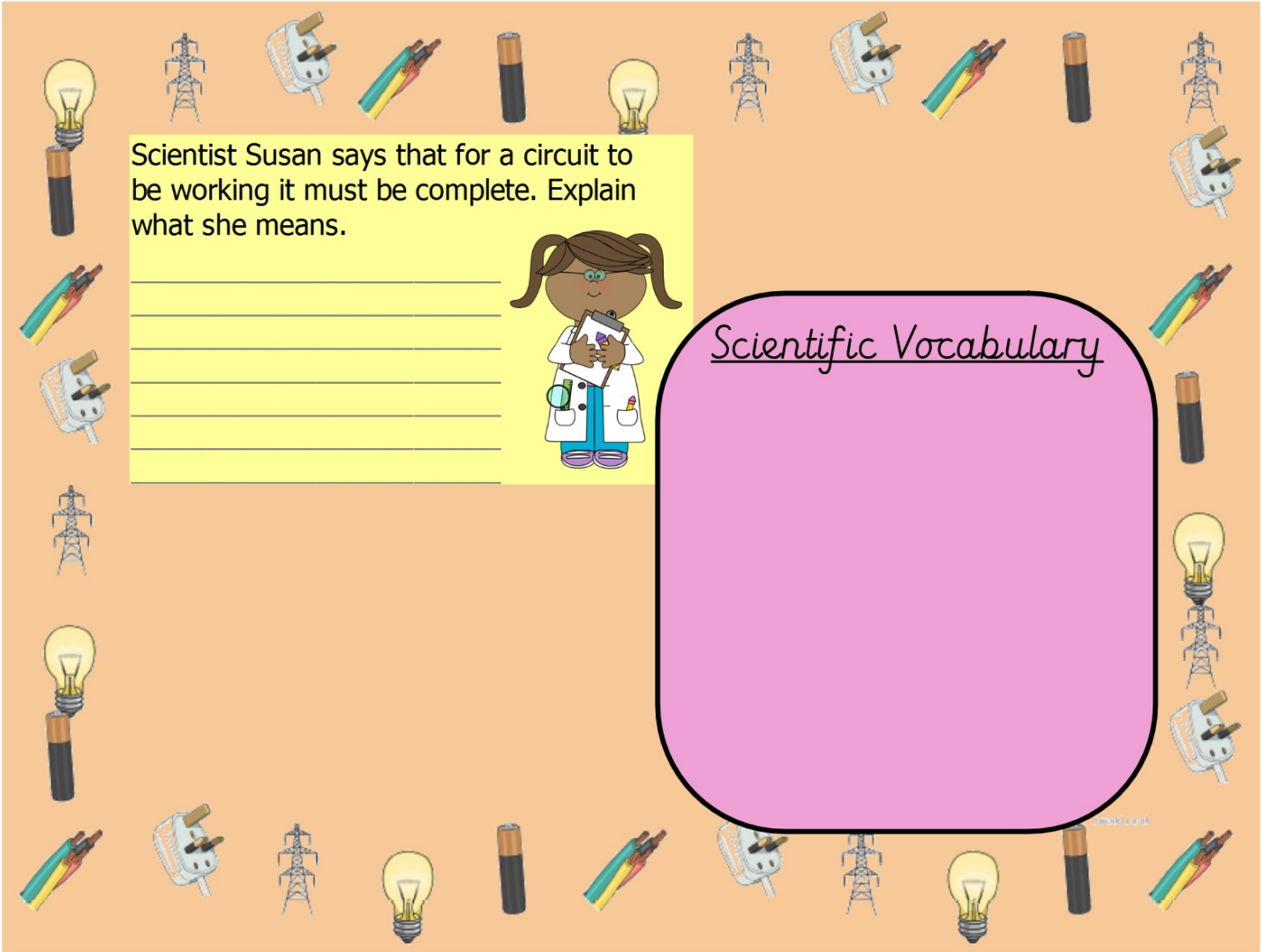
Predict and test these circuits.

Look at the following circuits carefully. Predict if they are complete (bulb will light) or incomplete (bulb will not light). After you have done this, create the circuits to test if your predictions are correct.

Circuit	Prediction (Complete or incomplete?)	Test (Was your prediction correct?)
		
		
		
		

What is the difference between the complete and incomplete circuits?





Scientist Susan says that for a circuit to be working it must be complete. Explain what she means.



Scientific Vocabulary

A large, empty, rounded rectangular box with a pink-to-purple gradient background, intended for writing scientific vocabulary words.

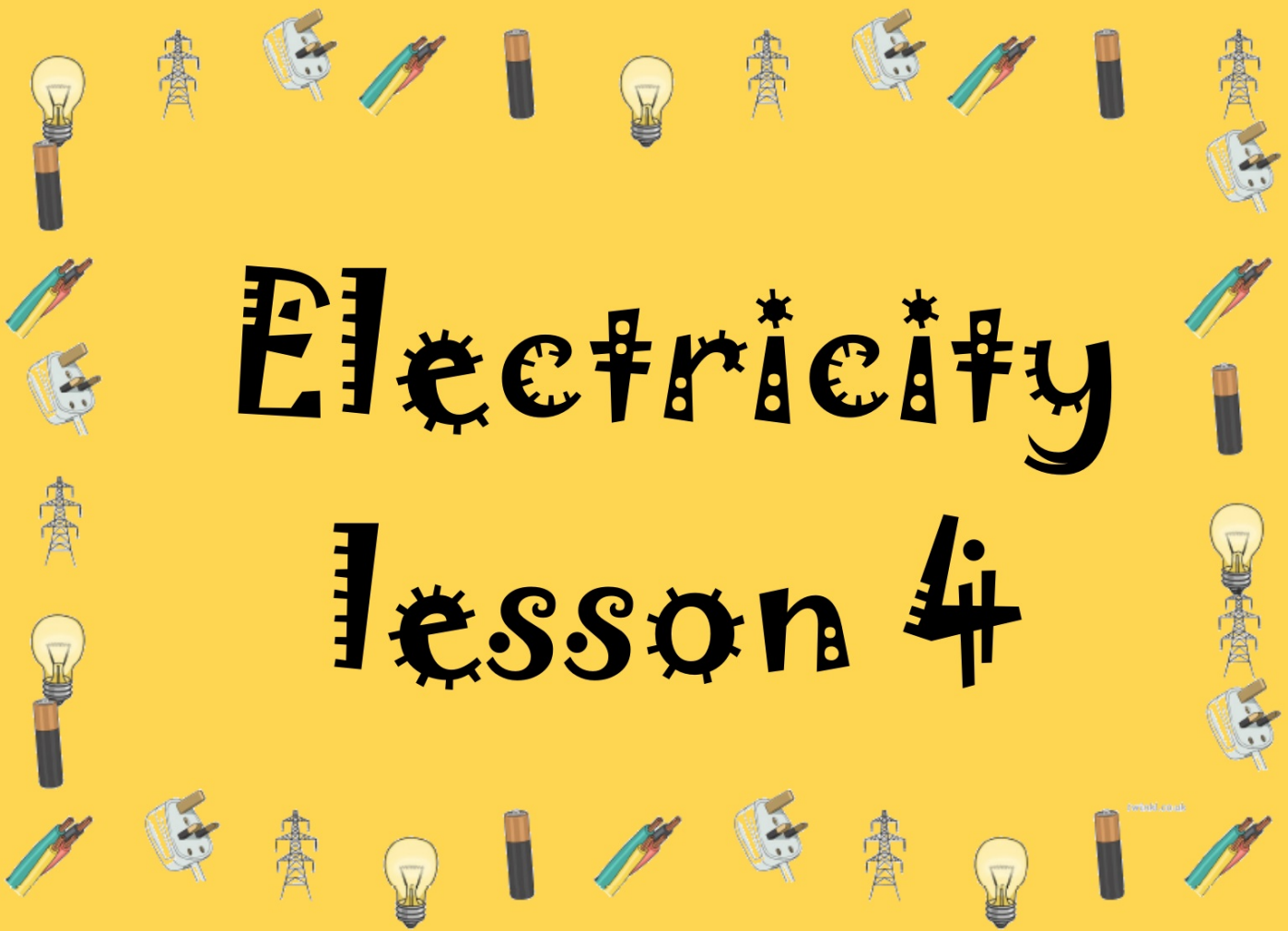
	<i>Who taught you in this session?</i>	<i>Teacher</i>	<i>TA</i>	<i>1:1</i>	<i>CS</i>
	<i>Independent</i>	<i>Supported</i>			
<i>Child</i>	<i>LO: To understand simple circuits.</i>				<i>Teacher</i>
	<i>WS I can prove whether my prediction is correct</i>				
	<i>K&U I understand that in order to light, a lamp must be part of a complete loop with a battery</i>				

Year 4 Living things and their habitats	child	teacher
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recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit		
recognise some common conductors and insulators, and associate metals with being good conductors		

Draw a face to describe how confident you are today

Electricity

Lesson 4



Tuesday 23rd November

LO: To work independently to follow a line of enquiry.

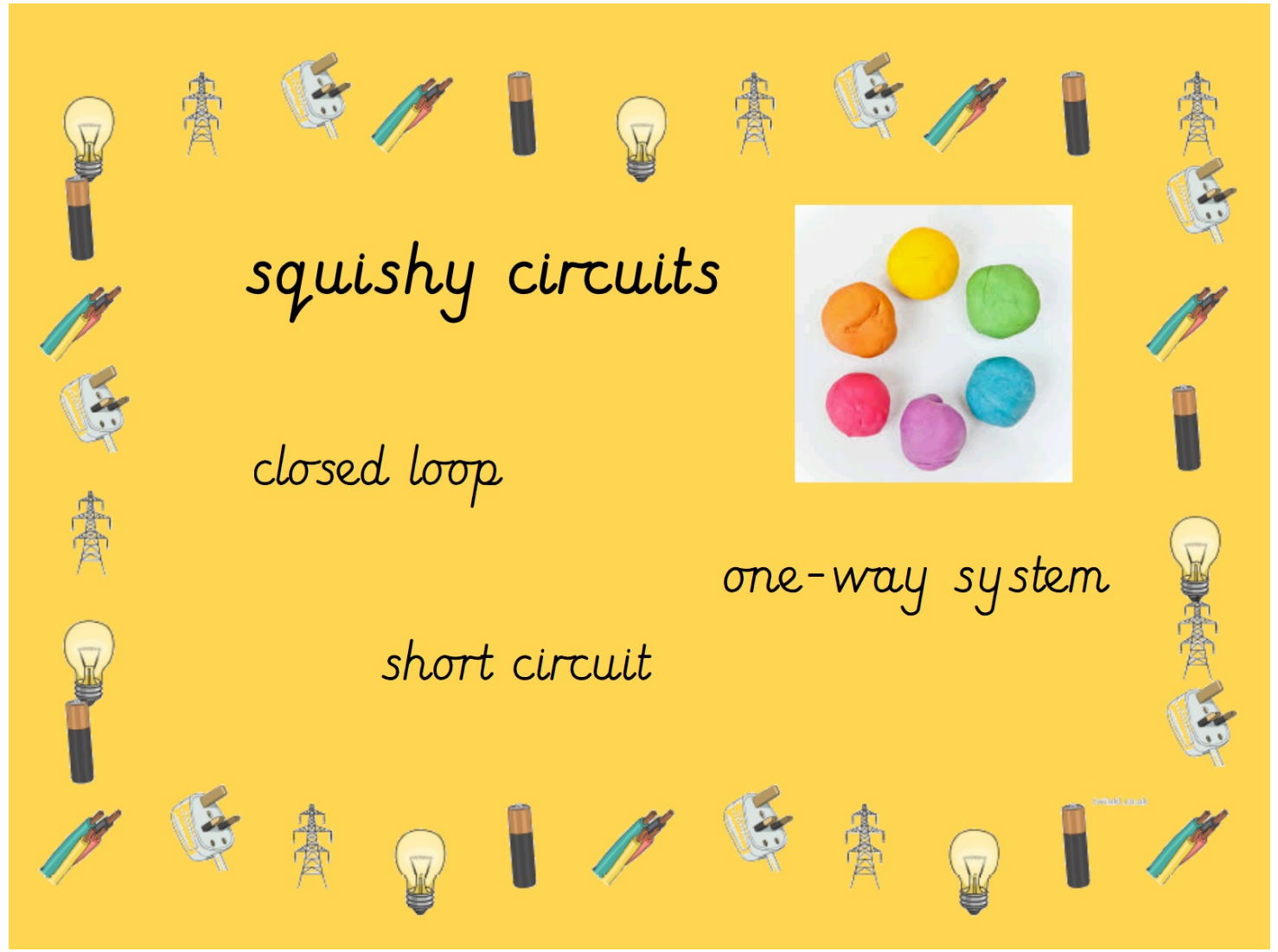
	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	LO: To work independently to follow a line of enquiry.			Teacher	
	WS I can ask and answer scientific questions.				
	K&U I understand that a short circuit occurs due to electricity taking the path of least resistance.				

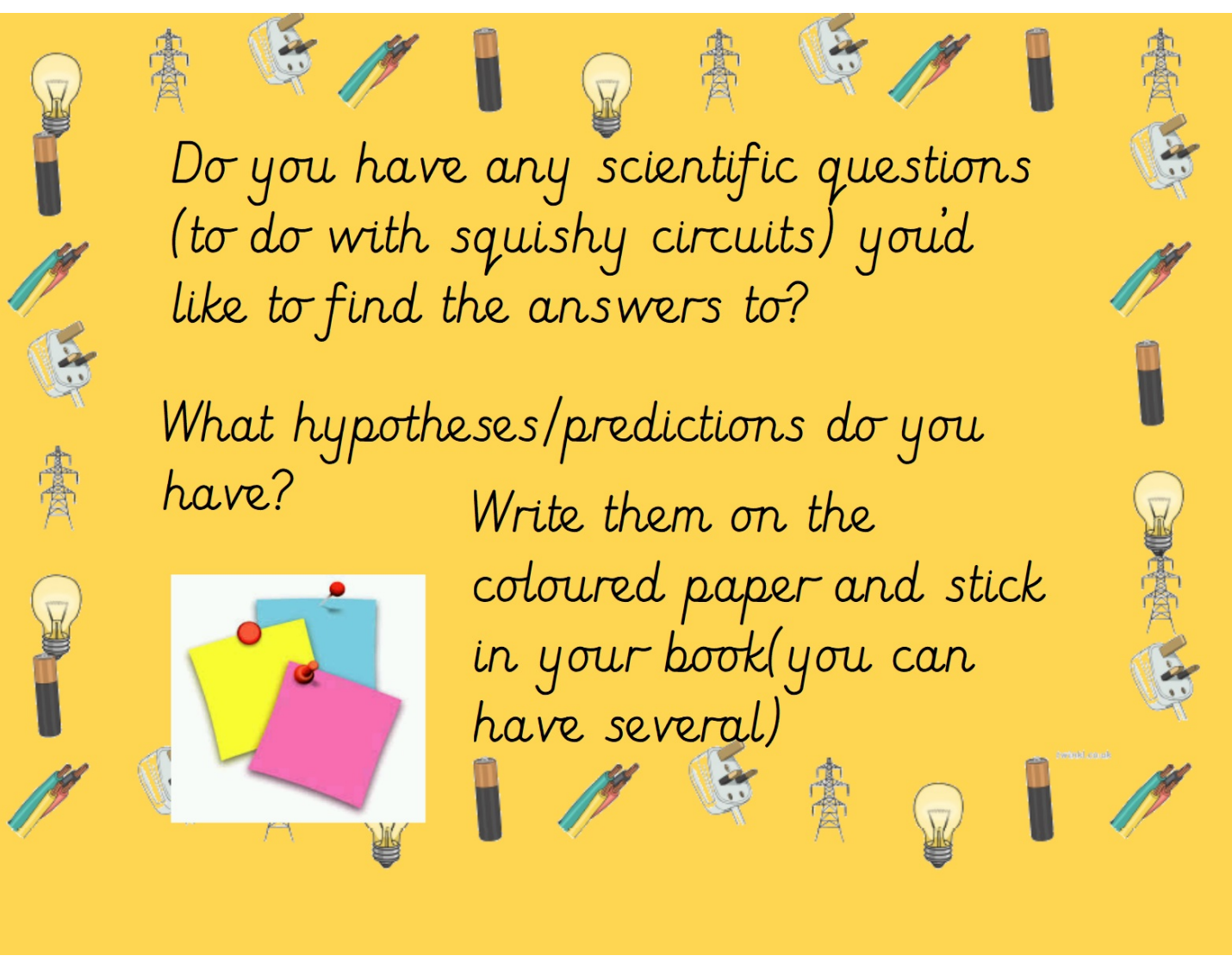
squishy circuits

closed loop

one-way system

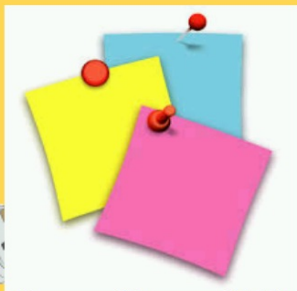
short circuit



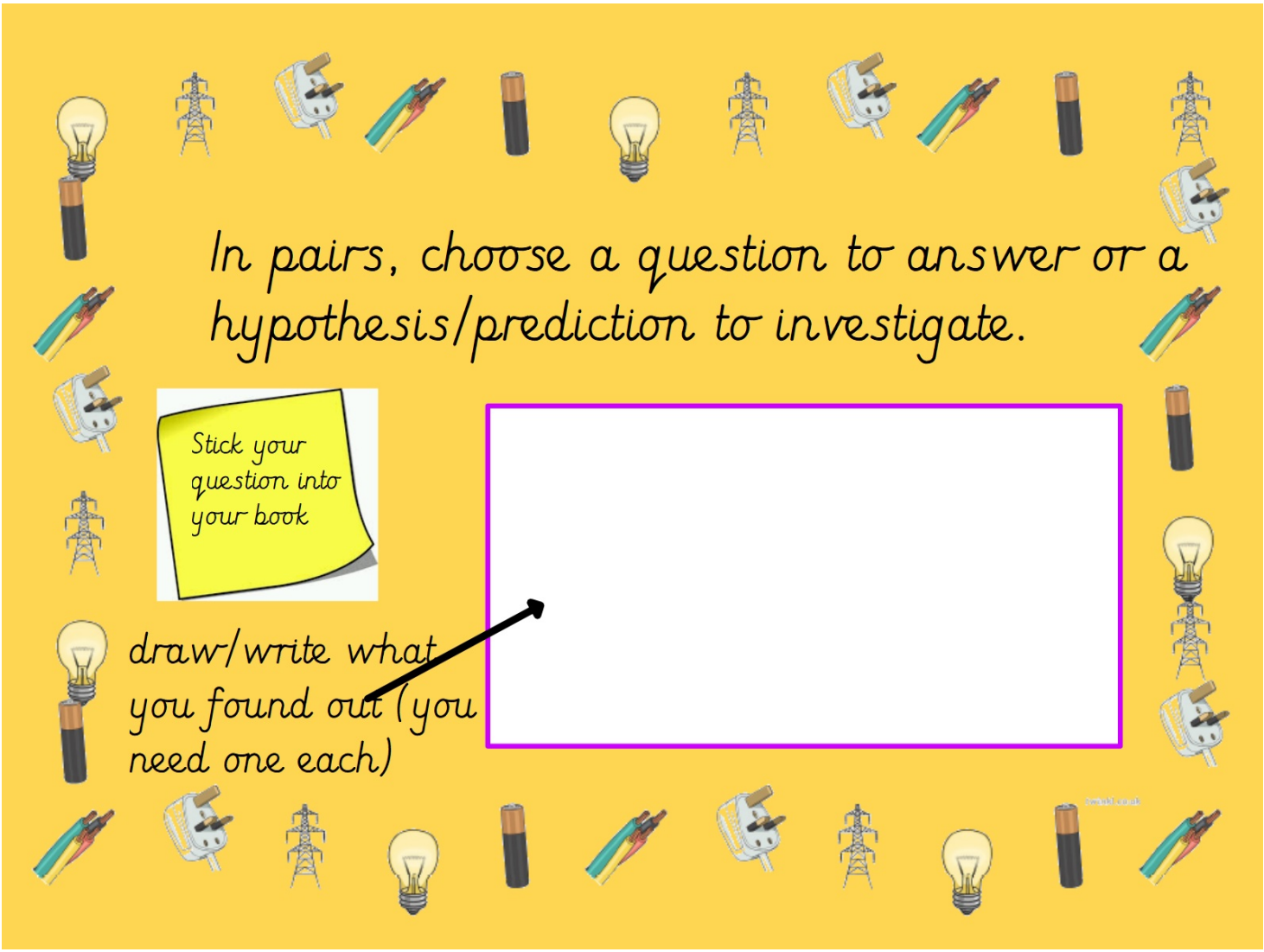


Do you have any scientific questions
(to do with squishy circuits) you'd
like to find the answers to?

What hypotheses/predictions do you
have?



Write them on the
coloured paper and stick
in your book (you can
have several)



In pairs, choose a question to answer or a hypothesis/prediction to investigate.

Stick your question into your book

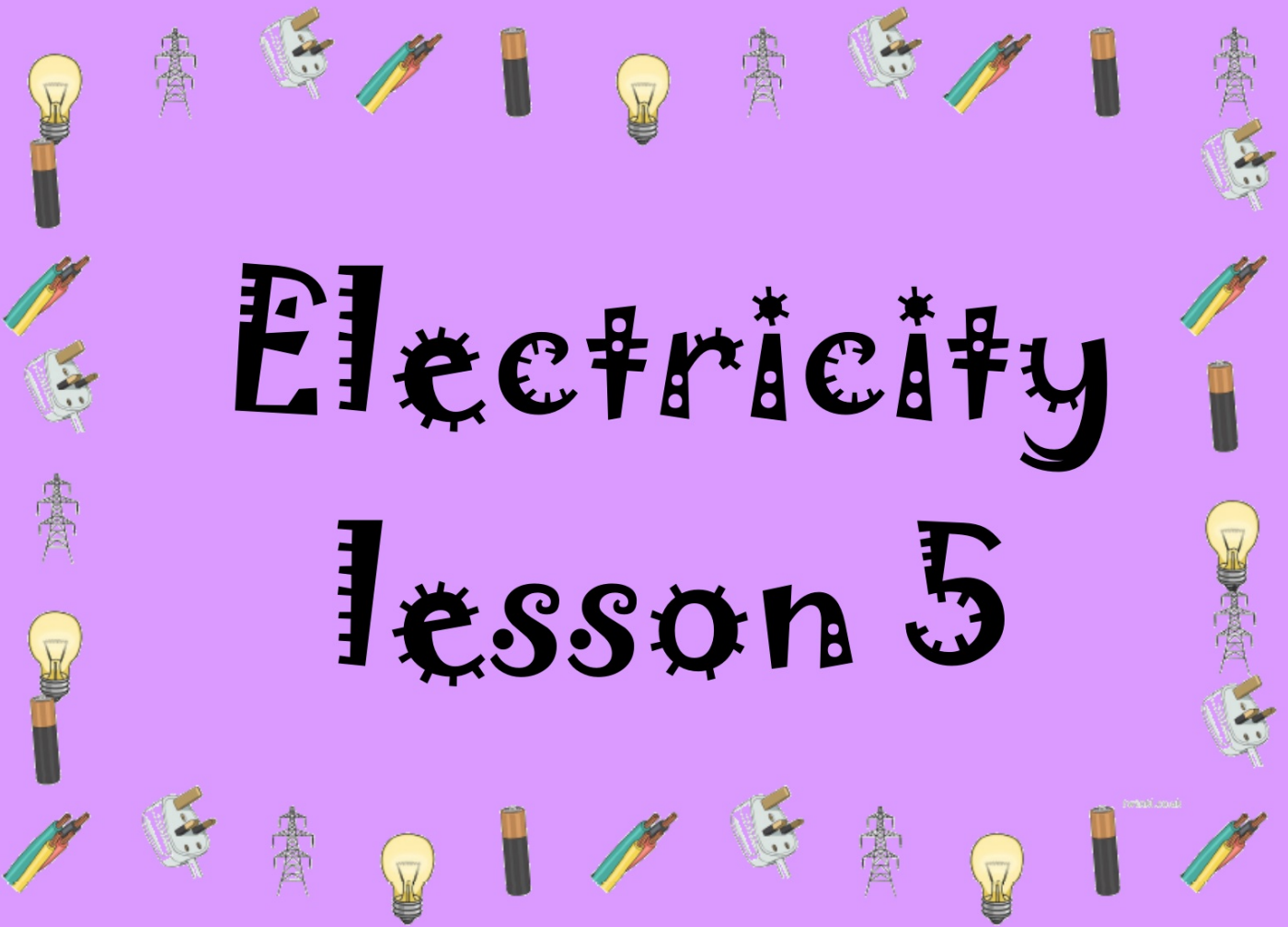
draw/write what you found out (you need one each)



	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	<u>LO: To work independently to follow a line of enquiry.</u>			Teacher	
	WS I can ask and answer scientific questions.				
	K&U I understand that a short circuit occurs due to electricity taking the path of least resistance.				

Electricity

Lesson 5



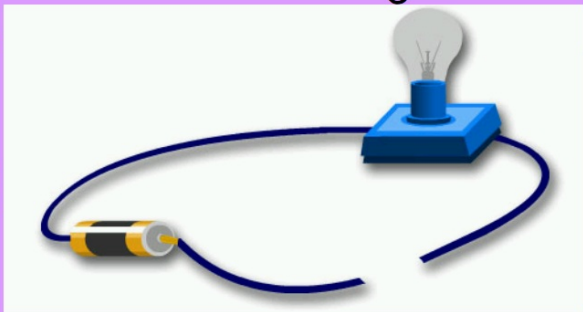
Tuesday 30th November

LO: To investigate conductors and insulators.

	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	LO: To investigate conductors and insulators.			Teacher	
	WS I understand how to set up a simple enquiry.				
	K&U I can recognise some common insulators, and associate metals with being good conductors.				

What would you do if you ran out of wire?

What could you use instead?



Prediction

Remember...
to write a
scientific
prediction,
use the word
because.

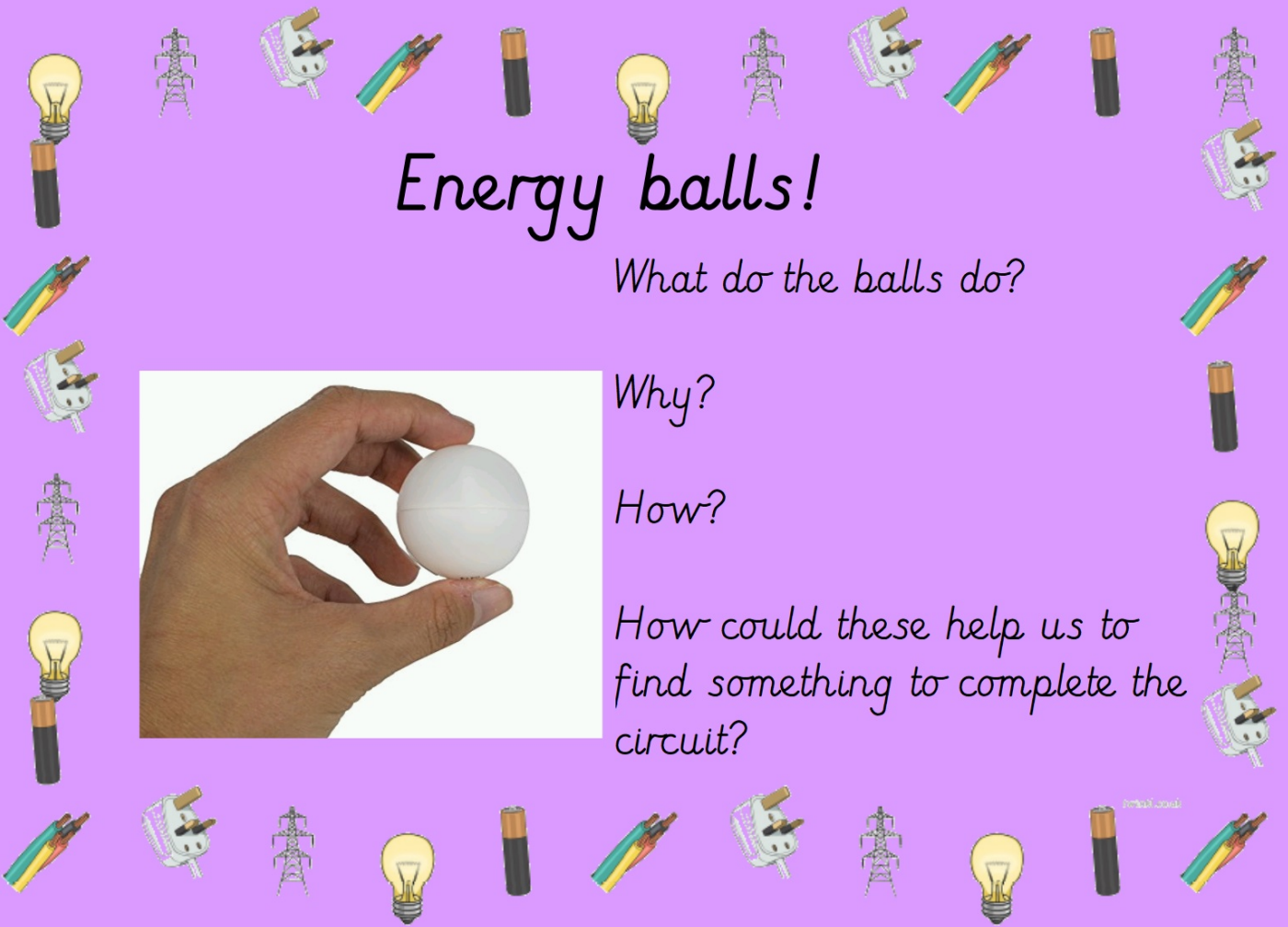
Energy balls!

What do the balls do?

Why?

How?

How could these help us to find something to complete the circuit?



Explore and think scientifically



What are you trying to find out?
What questions and ideas do you have?
Who uses this or where is it used in everyday life?

Ask key Questions

What do you want to find out?
What variables are you changing or measuring?
Does your question tell others this?



Plan

How can you answer your question?
What type of enquiry should you use?
Why?
1. Exploring
2. Research
3. Observing over time
4. Fair test/pattern seeking
5. Sorting and classifying
6. Designing and developing
7. Using a model

Evaluate and Refine

Do you trust your results? Why?
How could you change what you did to make your evidence more reliable or meaningful?
What new questions do you have now?

Analyse and Conclude

What is the answer to your question?
What does your evidence mean?
Are there any patterns?
What did you find out? How can you tell?
Why? Is there anything odd? What could have caused this?
Have you used secondary research to support or compare your results?



Present Information and Communicate

Do you need any more information?
Do you need to double check anything?
How will you show others what you've found out?

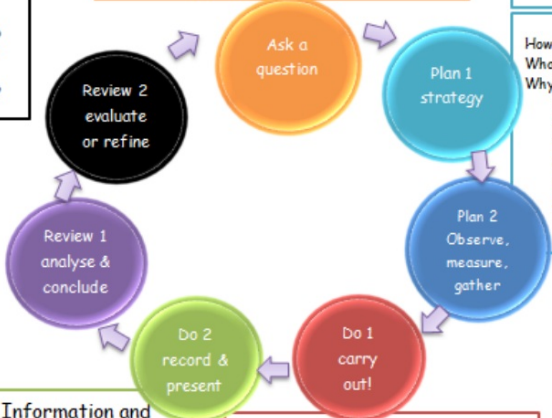
Carry out

Working on your own or in a team?
Does everyone have a role?
Will you have enough time?
Now you've started do you need to make any modifications to succeed?



Observe & Measure

What will you need?
How will you use it?
How often will you do it?
How will you record it; table, notes, drawings?
How will you make it safe?
How will you make it fair?
Make predictions.



What is our question?



conduct

conductor

What type of enquiry will help us to answer our question?



Plan

Plan 1
strategy

How can you answer your question?
What **type of enquiry** should you use?
Why?

1. Exploring
2. Research
3. Observing over time
4. Fair test/pattern seeking
5. Sorting and classifying
6. Designing and developing
7. Using a model

Quick plan...

Plan 2
Observe,
measure,
gather

Observe & Measure

What will you need?
How will you use it?
How often will you do it?
How will you record it: table, notes,
drawings?
How will you make it safe?
How will you make it fair?
Make predictions.



Do 2
record &
present

**Present Information and
Communicate**

Do you need any more information?
Do you need to double check anything?
How will you show others what you've
found out?

Have a look at another group's findings.

Can we explain our results using our scientific knowledge?

Analyse and Conclude

What is the answer to your question?
What does your evidence mean?
Are there any patterns?
What did you find out? How can you tell?
Why? Is there anything odd? What could have caused this?
Have you used secondary research to support or compare your results?

Review 1
analyse &
conclude



Evaluate and Refine

Do you trust your results? Why?
How could you change what you did to
make your evidence more reliable or
meaningful?
What new questions do you have now?

Review 2
evaluate
or refine

New questions:



Conclusion: What have we found out?

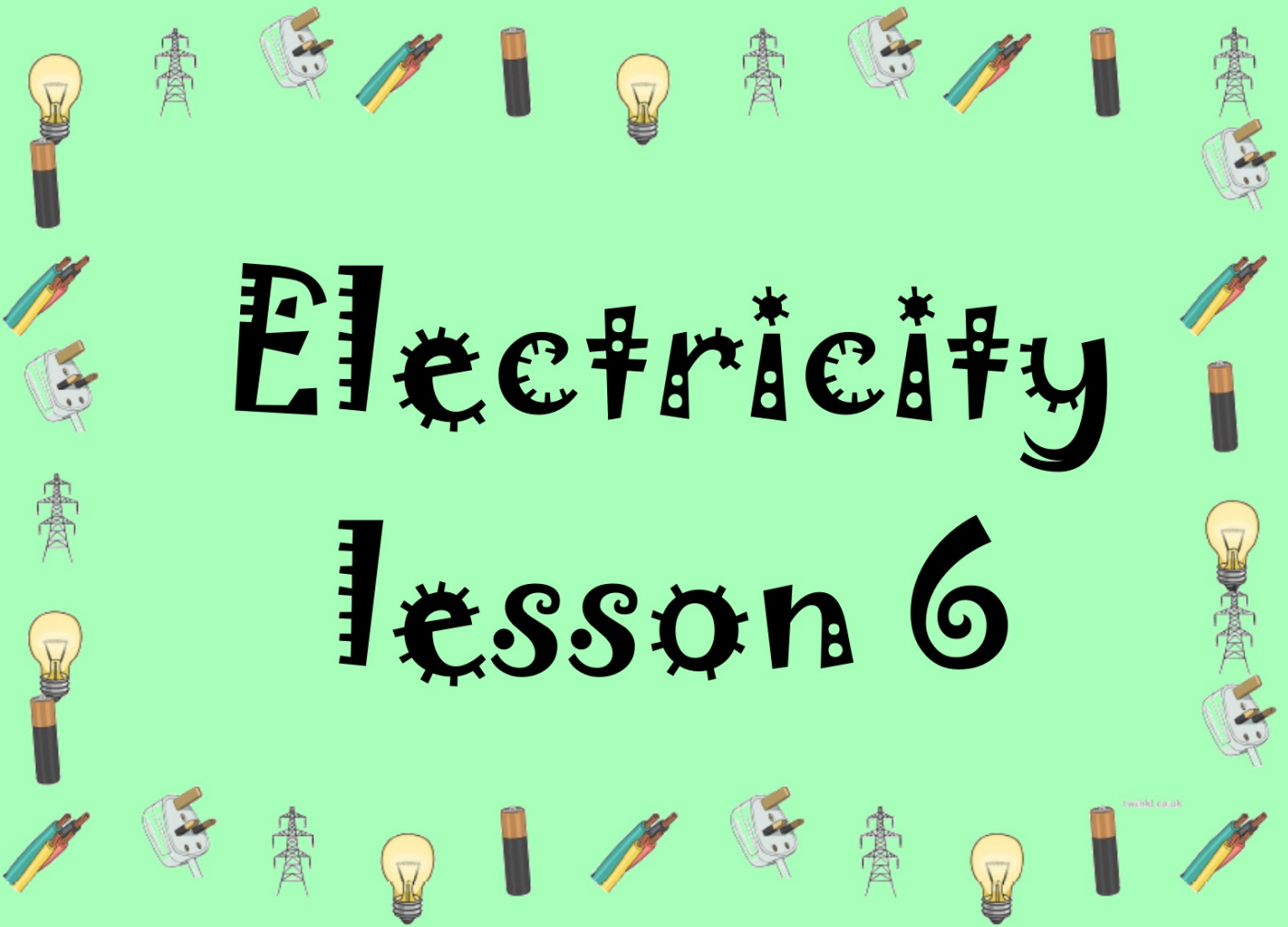
Common insulators include:

_____, are good conductors. We know this because...

	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	LO: To investigate conductors and insulators.			Teacher	
	WS I understand how to set up a simple enquiry.				
	K&U I can recognise some common insulators, and associate metals with being good conductors.				

Electricity

Lesson 6



Tuesday 7th December

LO: To make a working switch for an electrical circuit.

	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	LO: To make a working switch for an electrical circuit.			Teacher	
	WS I can record findings using simple scientific language and labelled diagrams.				
	K&U I understand that a switch opens and closes a circuit.				



What equipment do we need to make a simple circuit?



What if we wanted to add an extra component to our circuit?



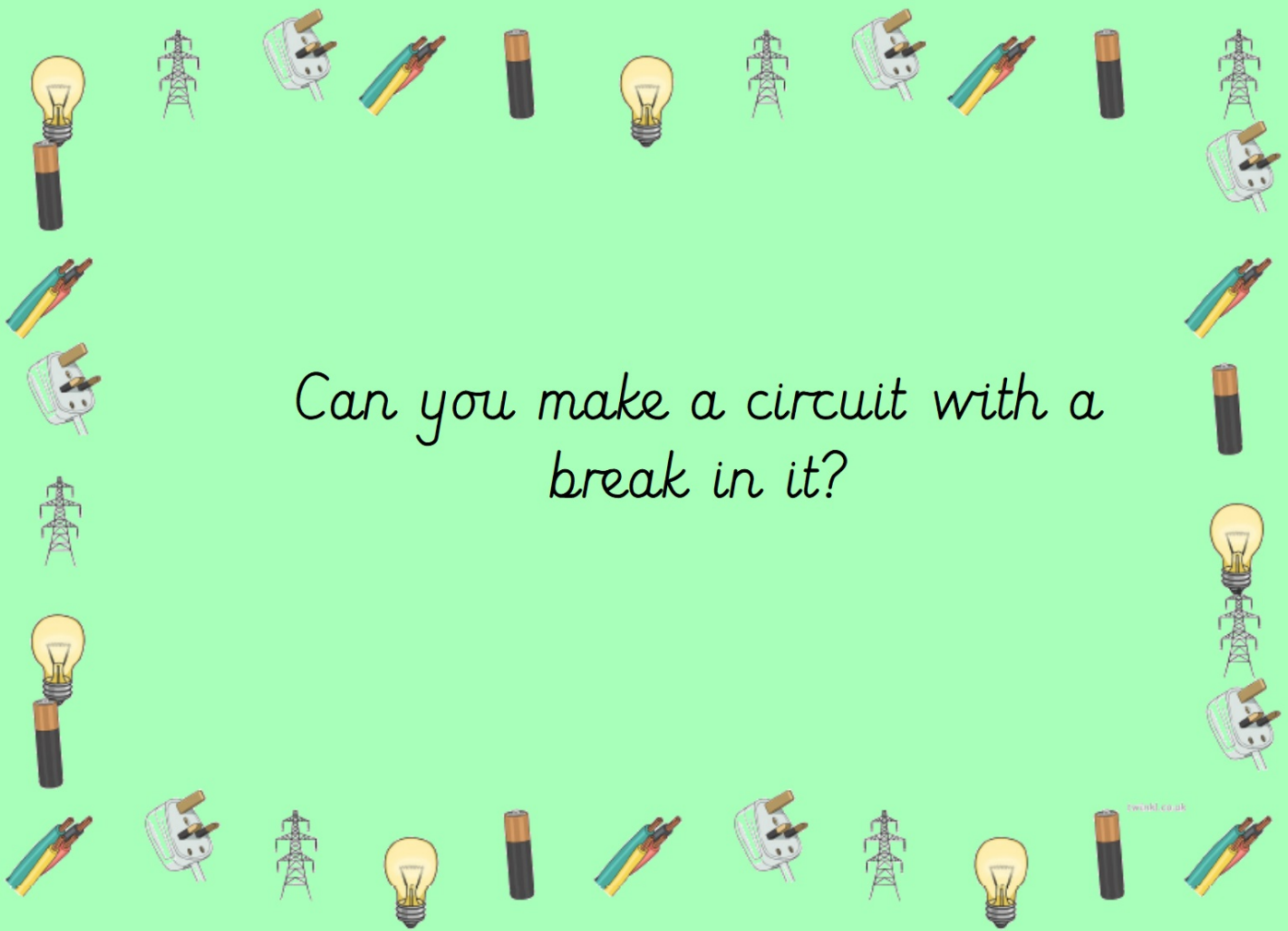
Why might we want to add an extra component?



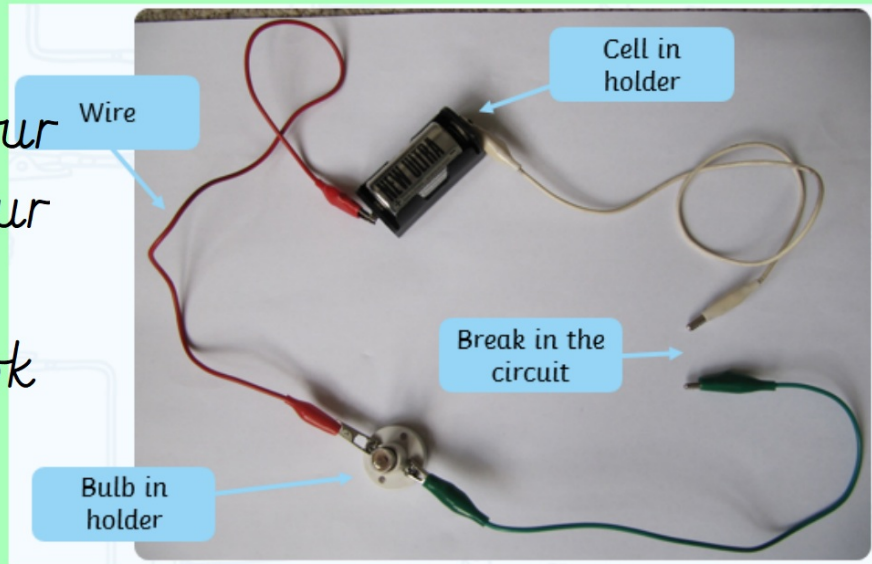
What switches can you recognise from home?

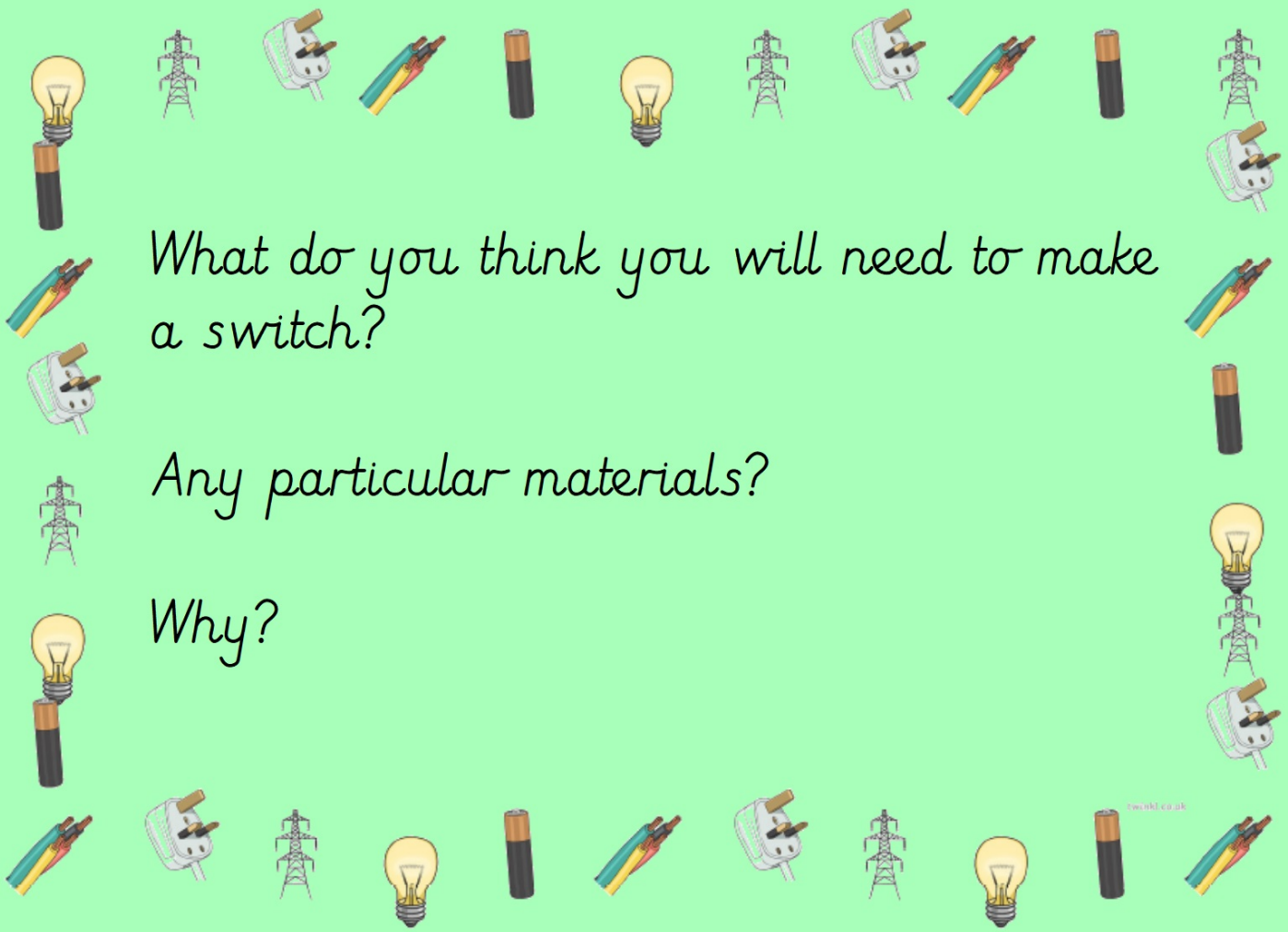


Can you make a circuit with a break in it?



Before adding your switch your circuit should look like this.



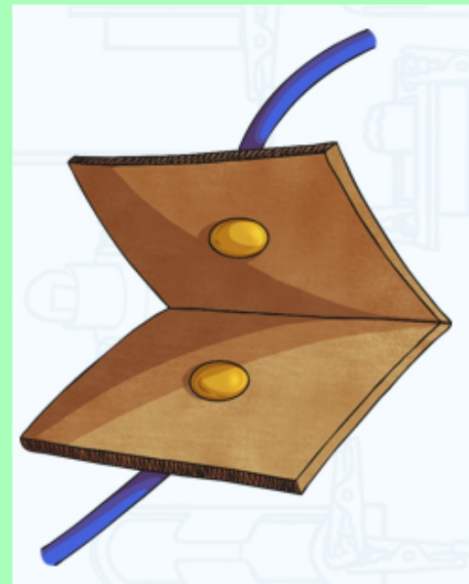
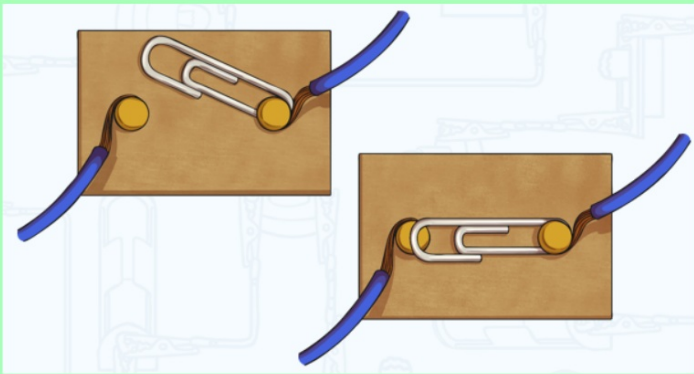


What do you think you will need to make a switch?

Any particular materials?

Why?

Here are some examples of home made switches.



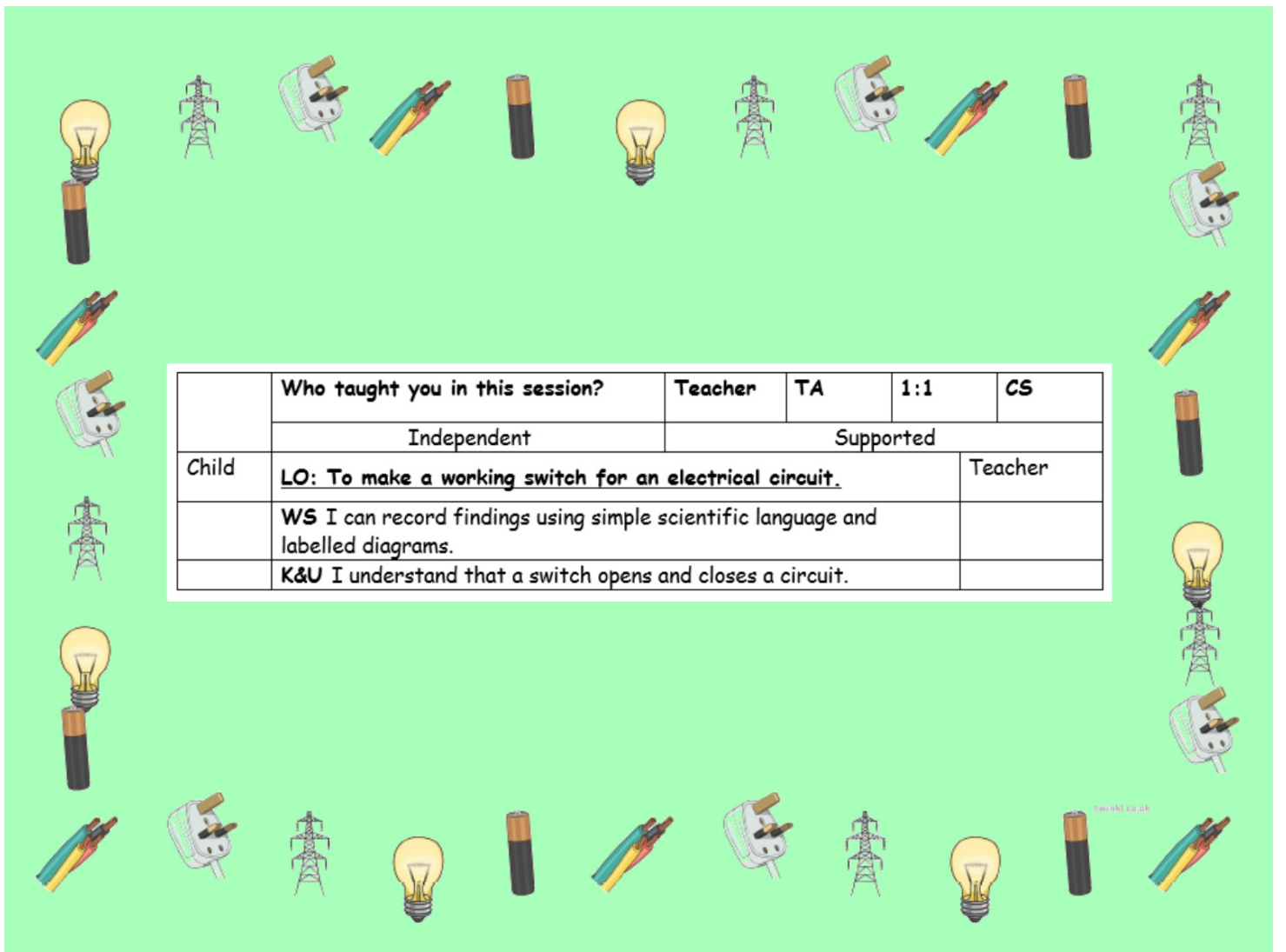
How do you think they work?

Next Friday, you will be making a torch. Which of these switches will you use?

Draw a labelled diagram of the switch, naming each part (object and material).

Describe how the switch works, using the words insulator, conductor and complete circuit.

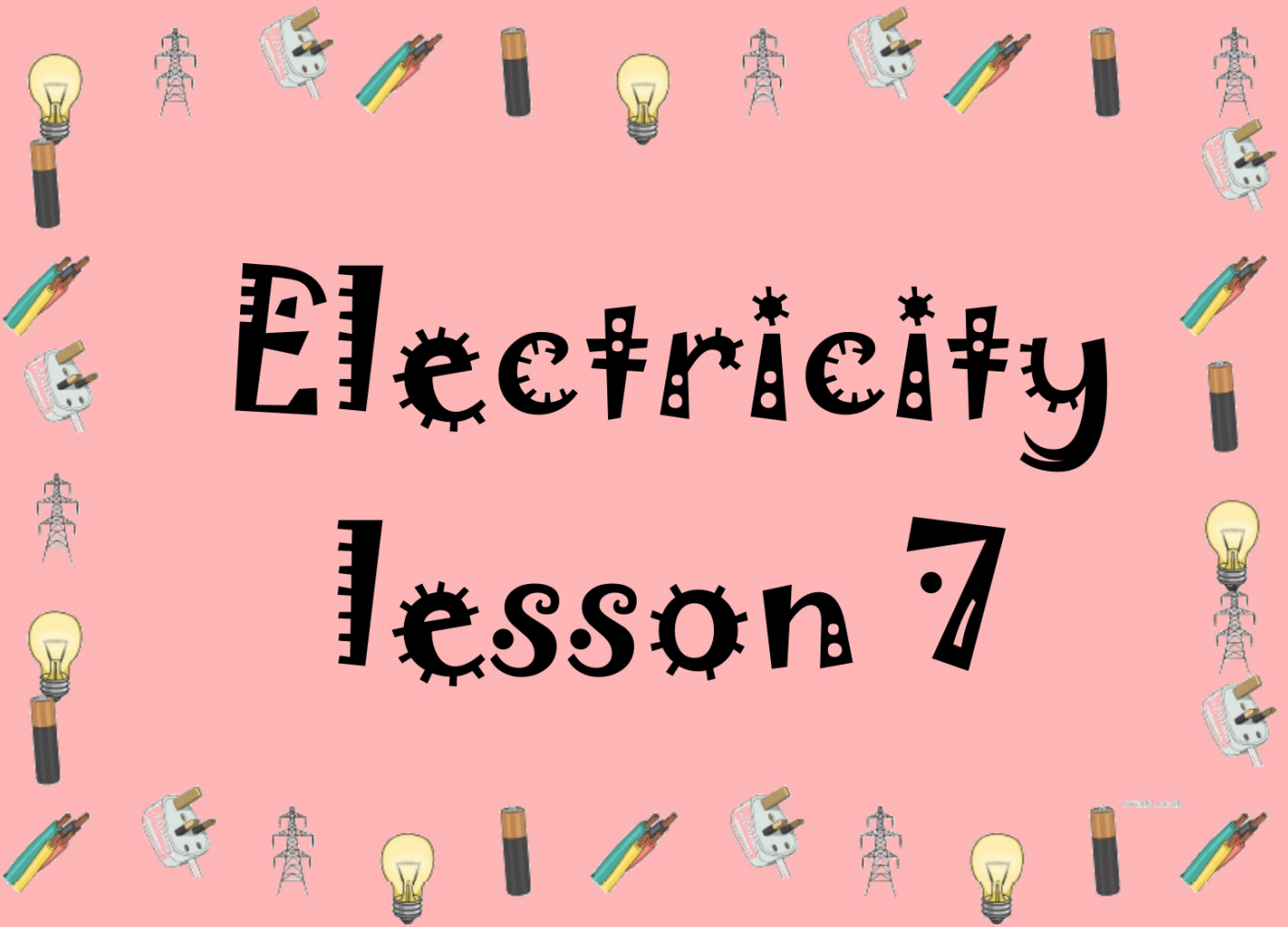
A large empty rectangular box for drawing a diagram, with five horizontal lines below it for writing labels.



	Who taught you in this session?	Teacher	TA	1:1	CS
	Independent	Supported			
Child	LO: To make a working switch for an electrical circuit.			Teacher	
	WS I can record findings using simple scientific language and labelled diagrams.				
	K&U I understand that a switch opens and closes a circuit.				

Electricity

Lesson 7



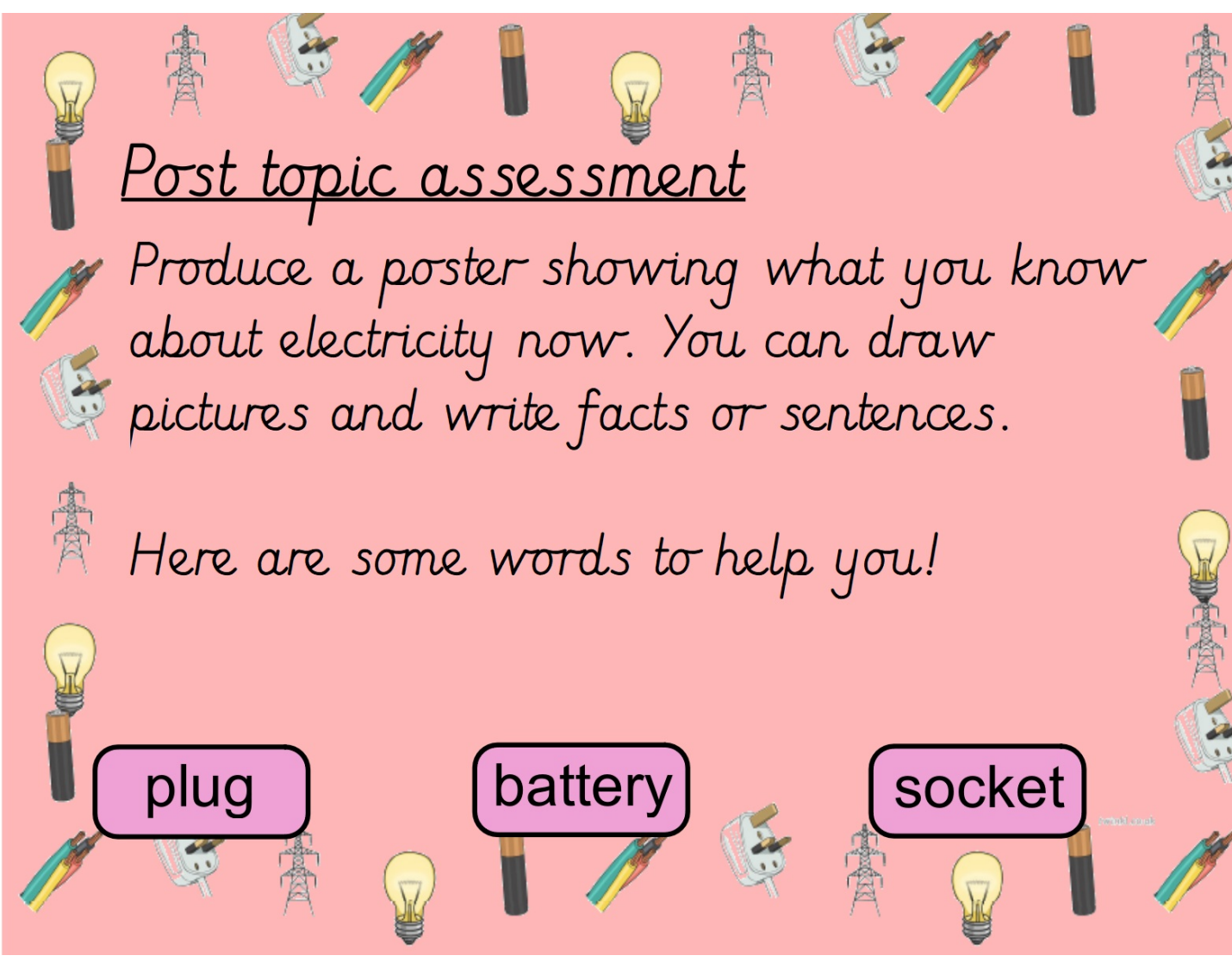
Tuesday 14th December
LO: To design a torch.



Torch design Circuit design

How will the outside of your torch look?
What will be inside?

example



Post topic assessment

Produce a poster showing what you know about electricity now. You can draw pictures and write facts or sentences.

Here are some words to help you!

plug

battery

socket