

KS3 Electricity Lesson 4: Series Circuits

Teaching Ideas

Learning Objective: To investigate current in series circuits.

Success Criteria:

- To recall the definition of current and the unit that is used to measure it.
- To draw and construct a series circuit from a description.
- To explain what happens to the current as the number of bulbs in a circuit is increased.

Context: This is lesson 4 in a series of lessons that covers the topic of KS3 electricity with a focus on series circuits. Students are currently completing their training to become a trainee electrician for Ideal Electricals. Students are asked to complete a practical investigation into series circuits and report their findings back to the head of the company. You can teach this lesson as a stand-alone lesson or use it to form the wider unit of work on the introduction of electricity. The choice is yours!

Resources

ammeters
bulbs
wires
crocodile clips
batteries

Starter

Identify the Symbol

The starter shows six symbols for students to try and identify. The names are revealed on a click and then on another click, the answers are shown.

Main Activities

What Is an Electrical Current?

You can use this section to introduce the topic of electricity to students and explain what current is.

Next, you can introduce the series circuits rules and activity. Go through the rules of drawing circuits with students and then provide the following activity sheet **Introduction to Series Circuits Activity Sheet**.

There is a lower ability version of the **Introduction to Series Circuits Activity Sheet** which provides some of the series circuits partially drawn. There is a timer on the slide for you to use. You may find that different groups need different lengths of time to complete the tasks. Allow students time to self-assess and correct any mistakes. You may choose to do this as a peer assessment activity instead.

Ideal Electricals Investigation

Provide students with the context of the lesson and the Ideal Electricals Investigation. Before you start, ask the class to think about the following: what happens to the brightness of the bulbs in a circuit as you increase the number of bulbs, and what happens to the current as you increase the number of bulbs in a circuit?

There is room for a class discussion and you can gather students' ideas. You may choose to create a mind map of student's ideas before commencing with the investigation. Once you have gathered the students' ideas, you may choose to discuss the possible variables in the investigation. You may also choose to present students with a selection of the equipment and ask students to suggest how they could build the three series circuits. There is a step-by-step method for those students who may need more support with this task.



Provide students with the **Ideal Electricals Investigation Activity Sheet**. There is a lower ability version of the **Ideal Electricals Investigation Activity Sheet** which provides tables for collecting data rather than asking students to formulate their own.

Conclusion

After students have been given time to complete the investigation, there is scope for a class discussion on the findings of the investigation. Depending on the ability of the class, you may choose to do this as a mind map. Allow students time to self-assess the findings from the investigation and correct any mistakes. You may choose to do this as a peer assessment activity instead.

Practice Exam Question

After the conclusion you may choose to assess students' knowledge of the type of materials that conduct electricity and those that do not in a short exam-style question.

Extension

After students have completed the conclusion, you could choose to provide students with an extension question. Allow students time to consider how the increase in temperature of the bulbs will impact on the flow of charge around the wire. This is called resistance.

Plenary

Light Bulb Moment

Today, our success criteria were:

- To recall the definition of current and the unit that is used to measure it.
- To draw and construct a series circuit from a description.
- To explain what happens to the current as the number of bulbs in a circuit is increased.

Complete the sentences with a learning outcome from today.

What Went Well?

I can ...

Even Better If

I need to be able to ...

