

Lesson Plan: Electrical Circuits (age 11 – 14) – Current & Voltage in Series Circuits.

Objectives:

The aim of this experiment is to investigate the current and voltage in series circuits.

Lesson introduction (15 min):

Recap on previous learning on electric current and simple circuits. Explain experiment and learning objectives. Can link to student revision information and quiz on www.twothirtyvolts.org

Lesson activity (30 min):

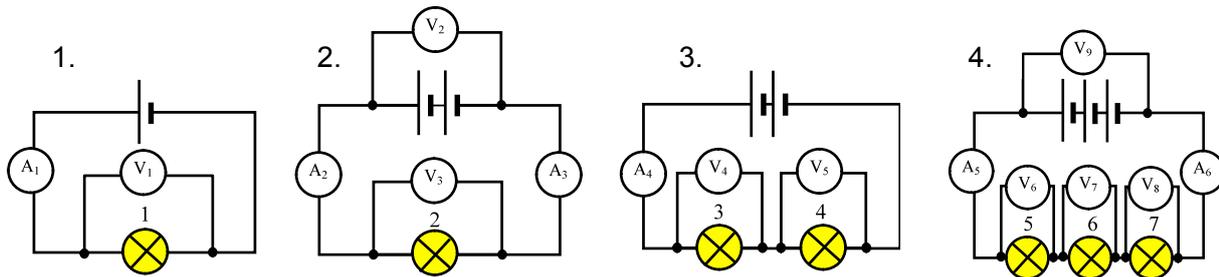
Group students in pairs and task them to:

- Set up the circuit shown in the diagram 1 and record meter readings.
- Set up the circuit shown in the diagram 2 and record meter readings.
- Set up the circuit shown in the diagram 3 and record meter readings.

As an extension:

- Set up the circuit shown in the diagram 4 and record meter readings.

The students are to record the results in a table.



Students record explanation of results and answer worksheet questions.

Lesson demonstration (10 min):

Select some of the students to inform the rest of the class about their findings. The remainder of the answers to the questions posed could be displayed for others to see and read.

Lesson review (5 min):

Recap on learning from experiment and establish levels of understanding.

Resources required:

The following resources are required per pair of students: Circuit board; Bulbs (3); Batteries (3); Multimeters (2) & Leads. The meters can be moved round within any of the circuits.

Expected Outcomes:

By the end of the session students will understand the basic principles of series circuits and the relationship between current and voltage.

Student sheet: Electrical Circuits – Current & Voltage in Series Circuits.

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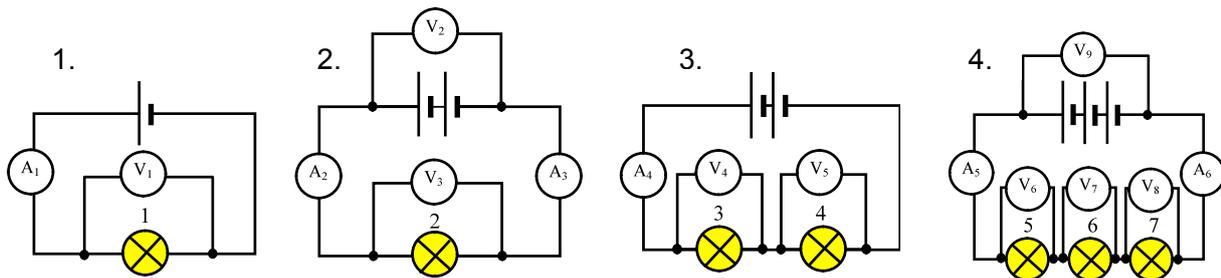
Resources required:

Circuit board; Bulbs (3); Batteries (3); Multimeters (2) & Leads. The meters can be moved round within any of the circuits.

Activity:

Working in pairs undertake the following tasks:

- Set up the circuit shown in the diagram 1 and record meter readings.
- Set up the circuit shown in the diagram 2 and record meter readings.
- Set up the circuit shown in the diagram 3 and record meter readings.



Record the current (A) and voltage (V) results on the table in the Worksheet.

Explain the readings that you have got.

Answer questions in the Worksheet.

Further work:

- Set up the circuit shown in the diagram 4 and record meter readings.
- Review notes and quiz on electrical circuits at www.Twothirtyvolts.org:

Linked Resources

www.twothirtyvolts.org:

Electrical Circuits 11-14 Student Revision Notes
Electrical Circuits 11-14 Revision Quiz

Worksheet: Electrical Circuits – Current & Voltage in Series Circuits.

Measurements:

Ammeter	Reading (A)	Voltmeter	Reading (V)
A₁		V₁	
A₂		V₂	
A₃		V₃	
A₄		V₄	
A₅		V₅	
A₆		V₆	
		V₇	
		V₈	
		V₉	

Explanation of Readings:

Questions:

1. What will be the reading on voltmeter 5 if bulb 4 blows?
2. What will be the reading on voltmeter 8 if bulb 5 blows?
3. What will be the reading on ammeter 3 if bulb 2 blows?
4. What will be the reading on ammeter 4 if bulb 4 blows?
5. What will be the reading on ammeter 5 if bulb 7 blows?