

Physics

1. Draw a **circuit diagram** for the following circuits. Be sure to identify the **direction** that current is travelling for each scenario. Once you have drawn your diagram, build the circuit using the materials provided and use the voltmeter to measure voltage. Show your teacher once each question is complete

- a. A circuit with a battery that turns on one lightbulb

Voltage across the lightbulb: _____

Teacher Check: _____

- b. A circuit with a battery where an open switch has turned off two lights placed in series

Voltage across the battery: _____

Teacher Check: _____

- c. A circuit with an electrochemical cell, a closed master switch, and two light bulbs all in parallel with each other. Each light bulb has its own switch that turns it on and off.

Voltage across the battery: _____

Teacher Check: _____

2. Complete the following table:

	Symbol	Unit
Current		
Voltage		
Resistance		

3. What is the resistance of a toaster if a current of 12.5 A flows through it when it is connected to 120 V?

V=

I=

R=

4. A light bulb has a resistance of 90Ω . What current flows through the bulb when it is connected to 120 V?

V=

I=

R=

5. The current through a load in a circuit is 2.5 A. If the voltage is 75 V, what is the resistance of the load?

V=

I=

R=

6. How much electrical potential difference is necessary to generate 9.5 A in a circuit with 2.0Ω ?

V=

I=

R=

7. Complete the following table:

	Series Circuit	Parallel Circuit
The effect on current		
The effect on voltage		

8. Identify the type of energy associated with each of the following sources:

- a. The Sun
- b. River flow
- c. A battery
- d. Uranium
- e. Food

	ORIGINAL ENERGY FORM	FINAL ENERGY FORM
Wind turbine		
Riding a bike		
Firework		

9. Describe the process of generating electrical energy using:

- a. River flow

- b. Fossil fuels

- c. Nuclear reactions

10. What is the difference between a renewable and non-renewable energy source? Provide at least 2 examples for each.

11. What is electrical power and how is it measured?

12. If a light bulb is marked with 100 W. What does this mark tell a consumer about the lightbulb?
13. What information does a smart meter relay to the utility company?
14. If a family goes away on vacation, why might electrical energy still be consumed in their home?
15. Compare the information on an EnerGuide label with the information on an Energy Star® label.
16. Why is a parallel circuit that has too many electrical devices connect to it not safe?
17. Draw a circuit diagrams for the following circuits. Be sure to identify the direction that current is travelling for each scenario.
- A circuit with a cell that runs a buzzer.
 - A circuit with a battery where an open switch has turned off two lights placed in parallel to each other.

- c. A circuit with a battery, a closed switch, two light bulbs, and a clock all in series with each other.

 - d. A circuit with an electrochemical cell, a closed master switch, and three light bulbs all in parallel with each other. Each light bulb has its own switch that turns it on and off.
18. Two items of clothing are made of different materials. They were put into a clothes dryer and the items stick together when they are removed from the dryer.
- a. Name the process that has just taken place

 - b. Explain how this process could cause the clothing items to stick together.
19. Photovoltaic cells are commonly used to provide electrical energy for satellites. Suggest an advantage that photovoltaic cells might have in space, compared with similar cells on Earth.