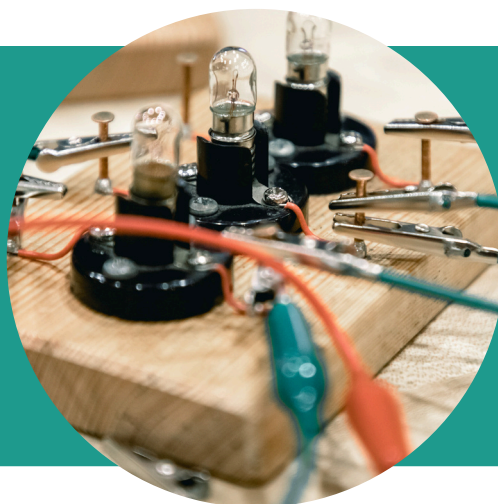


Virtual Circuits

Electricity All Around Us

Grades 5 - 8

Activity



Main Objective

This activity is designed in a way that allows learners to visualize series and parallel circuits. The online component allows learners to choose different power sources and batteries configured in different ways. They will be able to see how the power source and the configuration affect the motor, voltage and the life of the batteries.

Learning Outcomes

By the end of this activity, learners will:

- Explore various methods for choosing battery combinations to operate an electrical device and the effects of battery combinations on the life of the battery and the operation of the electrical device.
- Describe the most effective battery combination for powering an electrical device.
- Discover the advantages and disadvantages to connecting batteries in series or in parallel in circuits.

Length of Activity: 1.5 hours

Materials Required

- Internet-enabled device
- Virtual Circuits Learner Activity Instructions
- Virtual Circuits Learner Worksheet

Activity

Step 1:

Begin by accessing the Virtual Circuits online component of these activities:

https://learningcircuits.co.uk/circuit_builder

<https://phet.colorado.edu/en/simulations/circuit-construction-kit-dc>

Allow learners time to interact with the graphics.

Step 2: Direct your learners to begin answering questions on the worksheet.

Step 3: After the worksheet is complete, review the answers with your learners.

Tips and Extensions

- An educator demonstration could be constructed to illustrate two of the options from the Internet online activity. This would reinforce the concept that the method for connecting batteries affects battery life and the operation of the electrical device.
- Collect a number of battery-operated devices (learners could be asked to bring some from home). Have learners describe how the batteries are connected to provide a power supply. Have them compare the devices to determine if the batteries are all connected using the same method.

Discussion Questions

You may wish to test learners' comprehension of the basics of circuits using the following questions:

- Can you think of any applications for connecting batteries so you are not increasing the voltage but maintaining the life of the batteries? Ask the learners to explain the application.
- Ask learners to explain the best method for connecting batteries to increase voltage.
- What are the advantages of connecting a number of batteries in series?