

Lesson Planning Guide

Module: Magnetism and Electricity

Investigation/Lesson: Assessment Activities Based
Upon Investigation 3

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Time requirements: Two 50min classes

Content Vocabulary:

Schematic diagram
Parallel Circuit
Series Circuit
Complete Circuit

Concepts/Skills/Core Content:

What should a student know/be able to do as a result of this lesson?

- 1) Students will be able to draw schematic diagram after building a circuit and be able to build a circuit from a schematic.
- 2) Students will be able to identify series and parallel circuits.

Which core content bullet(s) is addressed in this lesson?

(1.3.3) Electricity in circuits can produce light, heat, sound, and magnetic effects. Electrical circuits require a complete conducting path through which an electrical current can pass

Materials:

What materials are needed for this lesson?

D-cells, light bulbs, motors, wires, circuit bases, switches, light bulb holder, graph paper in plastic buckets/tubs. Suggested supplies & prompts for 6 differing tubs are appended to the lesson.

What materials preparation is necessary for this lesson?

Each group will need a bucket of materials. The materials provided for each group should be varied. For example, provide one group with three light bulbs and another with a light bulb and a motor. If students will need direction, provide a prompt with the materials. Example: *Can you build a circuit with two light bulbs and one motor?*

Each group will need one piece of graph paper to draw the final schematic drawing. On day two the drawing and bucket of parts will be switched to another group. That second group is then challenged to build the circuit based on the first group's schematic.

Classroom/Materials Management:

How will students be grouped?

8 groups of 4 students.

*Note: Have an even number of groups to allow the groups to discuss building a circuit from a schematic.

Student Notes/Notebooks:

Where and how will students record important classroom information? How will students know what to record? Students will record EVERYTHING in their science notebooks. A check list will be provided for the students at the beginning of the class.

Students should be prompted to record the following information about their circuits:

1. Have you built a COMPLETE circuit?
2. Is your circuit a series circuit, or a parallel circuit? How do you know?
3. Draw a picture of your circuit.
4. Draw a schematic of your circuit.

How will students organize their notes/notebooks?

Students will organize their notebooks following the scientific format.

Date:

Title: Trading Circuits

Purpose: Can you draw a schematic from a circuit you build? Can you build a circuit from a schematic?

Data:

Answers and responses to the questions listed above.

Conclusions: Reflections on building circuits from schematics.

How will you provide feedback to your students about their notes/notebooks and their organization?

Feedback will be provided as teacher and fellow circle the room during the two day investigation.

Thinking Through the Lesson:

Introduction-How will you introduce the lesson and connect it to prior student learning?

Review the difference between parallel and series circuit. Also review the importance of schematic drawings.

Facilitation-How will you facilitate learning and move all students to higher order thinking?

Questions to ask:

1. Compare the two circuit designs series and parallel. How are they alike and how are they different?
2. Give an example when a series circuit would be the best design to use. Give an example when a parallel circuit would be the best design to use.
3. Which circuit can run more components from 1 D-cell? Why?

Closure-How will you know what each student has learned/is able to do?

Observe students while they work and note their responses to the questions and by student responses at the end of class when we share out our findings.

Suggested Prompts and Materials for Individual Groups:

A.

Build a circuit using:

1 D-cell

2 light bulbs

4 wires

B.

Build a circuit using:

1 D-cell

2 light bulbs

3 wires

C.

Build a circuit using:

1 D-cell

1 light bulb

1 switch

1 motor

2 wires

The switch **MUST** turn off both the light bulb and the motor.

D.

Build a circuit using:

1 D-cell

1 light bulb

1 motor

1 switch

3 wires

The switch must turn off the light bulb and the motor.

E.

Build a circuit using:

1 D-cell

1 light bulb

1 motor

2 wires

F.

Build a circuit using:

1 D-cell

1 light bulb

1 motor

1 wire