

Electrical Circuits

Lesson Overview: Students will familiarize themselves with the differences between parallel and series circuits.

Lesson Tie to Textbook: Harcourt, 5th grade edition ©2000.

Learning Objectives/Outcomes: Students illustrate and explain the differences between series circuits and parallel circuits.

Ties to National Standards:

National Science 5-8.2: Physical Science

As a result of activities in grades 5-8, all students should develop an understanding of:

- Transfer of energy.

Ties to Texas State Standards:

(5.8) Science concepts. The student knows that energy occurs in many forms.

- (A) differentiate among forms of energy including light, heat, electrical, and solar energy;
- (C) demonstrate that electricity can flow in a circuit and can produce heat, light, sound, and magnetic effects.

Grade Level: 5

Subject Area: Science: Physical Science: Electricity

Software Used: Sketchy

Materials Needed: Any standards-based science textbook, handheld computers with correct software, illustrations of series and parallel circuits, strands of lights (both series and parallel), batteries, insulated wire, mini-light bulbs, and additional reference material (if necessary).

Ties to Overall Unit: In gaining a greater understanding of electricity, students will illustrate how to correctly construct a series circuit and a parallel circuit.

Helpful URL: <http://cipco.apogee.net/foe/fcspo.asp>

Vocabulary: series circuit, parallel circuit, electric charge

Teaching the Lesson

1. Introducing the Lesson:

- Using strands of lights, provide students with visual examples of both series and parallel circuits.
- Have students brainstorm about why one strand of lights will work without all light bulbs functioning and why the other strand will not.



2. Conducting the Lesson:

- a. Introduce students to the concepts of series and parallel circuits (Harcourt, pp. F 70-71) and their different functions.
- b. Provide students with illustrations of both types of circuits.
- c. Using Sketchy, have students illustrate and label both series and parallel circuits. Students should pay close attention to the symbols used to correctly illustrate circuits. They also must correctly depict the flow of electricity in their illustrations.
- d. Once students have created their illustrations, have students test them by building functioning models. Students should be encouraged to make necessary changes to their illustrations as they test their drawings.

3. Concluding the Lesson:

- a. Facilitate this lesson by checking students' drawings and models to make sure that they are on the right track.
- b. Once they have tested their illustrations and are assured that they work, and after they demonstrate both series and parallel circuits, allow students to share their findings with their classmates.
- c. Collect the illustrations.

Reflecting on the Lesson

1. **Teaching Through Student Misconceptions:** Students often misuse symbols when creating circuits. Provide students with information on the correct scientific symbols.
2. **Issues to Consider:** Encourage students to find creative and safe ways to create both parallel and series circuits.

Assessment: During the lesson, assess students by comparing their drawings to the hands-on models. See example rubric below.

	Super	Good	Needs Improvement
Illustrations	Illustrations correctly represent series and parallel circuits using correct symbols.	Illustrations include both series and parallel circuits and some correct symbols are used.	Illustrations make an attempt at illustrating both series and parallel circuits; correct symbols are not included.
Model	Illustrations and models correctly represent series and parallel circuits. Model is fully functional.	Illustration and model make a good attempt at representing series and parallel circuits. Model has a few issues with functionality.	Illustration and model do not match and there is little functionality to the model.

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