

Create a Pathway

Summary

Students build and experiment with electric circuits using easily available materials.

Time Frame

1 class periods of 45 minutes each

Group Size

Individual

Materials

For the Student: (Individual or Pairs)

- 1 battery (size D)
- 1 Christmas tree light with wires
- 2 strips of aluminum foil
- 2 paper clips

Background for Teachers

Electricity can be made to flow along materials that will conduct the flow. Wire is a good example of a material that will allow electricity to flow. A circuit includes a source for electrical energy, a conducting path, and something that will use the electrical energy. The devices that use the electrical energy are placed on separate paths or connecting paths. When two or more dry cells are connected, a battery is created.

Intended Learning Outcomes

- Observe simple objects, patterns, and events and report their observations.
- Compare things, processes, and events.
- Plan and conduct simple experiments.
- Predict results of investigations based on prior data.
- Use data to construct a reasonable conclusion.

Instructional Procedures

Lab Preparation:

Prepare an aluminum foil ribbon by doing the following.

Lay parallel strips of 1/2 inch strip of clear tape on the dull side of the aluminum foil.

Use scissors to cut beside and between the strips. You should end up with two 1/2 inch wide strips of tape coated aluminum ribbon.

This ribbon will act as the wire in these activities. Paper clips can be used to connect the wires.

To prepare the Christmas tree bulbs, cut the wire between each bulb and scrape off enough of the plastic covering to expose about one inch of the wires. (These lights are better than flashlight bulbs because they do not burn out.)

Lab:

Give each student (or pairs) the supplies you have prepared.

Challenge them to use the battery, light bulb, 2 strips of aluminum ribbon, and 2 paper clips and find three ways to make the bulb light.

Challenge them to also find three ways that will not work to make the bulb light.

After they have had sufficient time to experiment and "play," students should draw pictures of

each of the six ways in their science journals.

Have the students compare and contrast their findings.

Draw a picture of a circuit. Label the electrical source, the electrical path, and the user of the electrical energy.

Randomly select one component of the circuit and have students predict what will happen if that part is changed.

Test their hypothesis and discuss the results.

Select additional components to change and have students hypothesize how it will affect the circuit.

Continue this process until students understand the components of a complete electrical circuit.

Extensions

Once students understand how to make a complete electrical circuit, give them additional materials (insulators and conductors) and see how they affect their ability to make the bulb light.

Assessment Plan

Use the Science Lab Report Rubric to evaluate student science journal entries for their experiments.

Rubrics

[Science Lab Report Rubric](#)

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