FORK IN THE ROAD

4-H Electrical Science Lesson

IDENTIFY PARALLEL AND SERIES CIRCUITS

Project Skills:

Recognizing parallel and series circuits

Life Skills:

Decision making
WI Academic Standards:
Science C.4. Science Inquiry

Time:

30-35 minutes

Supplies:

- Wire strippers
- Each pair of youth needs the following materials
  - 5 pieces of 8-10 inch insulated, solid core, 20, 22 or 24 gauge wire
  - 2 D-cell batteries
  - 2 D-cell battery holders
  - 2 - 1.5 volt light bulbs
  - 2 light bulb holders
  - 2 Parallel or Series Circuit Worksheets
  - 2 pencils

Getting Ready:

1. Use the wire strippers to remove 1/2 inch of plastic covering from each end of each wire.
2. Make enough copies of the Parallel or Series Circuit Worksheet.

Adapted from 4-H CCS Electric Excitement project series Level 1, Magic of Electricity (BU-06848 Revised), pp. 18-19.

WHAT TO DO

Complete the Parallel or Series Circuit Worksheet.

1. Pair up youth. Give each youth a pencil and a Parallel or Series Circuit Worksheet.
2. Explain the following to the youth:
   - Diagrams on the worksheet show a battery connected to one or more light bulbs and then connected back to the battery. Each is a complete circuit.
   - There are two types of electric circuits: parallel and series. A parallel circuit branches. A series circuit does not branch.
3. Have youth follow a wire leading away from the battery until it connects back to the battery. Did they ever have to choose one line to follow over another (branch)? If yes, this is a parallel circuit. If not, it is a series circuit.
4. Ask them to examine each diagram closely, then write down:
   - The number of branches.
   - Whether the circuit is series or parallel.
   - Predict if the light bulb(s) will light.

Answers to Parallel or Series Circuit Worksheet

Diagram	No. of Paths	Series or Parallel	No. of Lights On
A	1	Series	1
B	1	Series	2
C	2	Parallel	2
D	1	Series	2

Build each of the circuits on the worksheet.

1. Distribute the electrical supplies listed above to each pair of youth.
2. Have youth build the circuit in Diagram A. Ask them to compare their actual results with what they predicted.
3. Have youth build the circuit in Diagram B through D and compare results with predictions as above.

ENHANCE

If you have more time, have youth build a circuit with two batteries and one light bulb (like Diagram B but with only one light bulb). Ask youth to predict what will happen. Discuss what happened with the youth. For more information on this topic, refer to Increasing Voltage on pg. 19 of the Electric Excitement project series Level 1, Magic of Electricity.

TALK IT OVER

Try to get each youth to express his or her feelings and experiences.

Reflect:

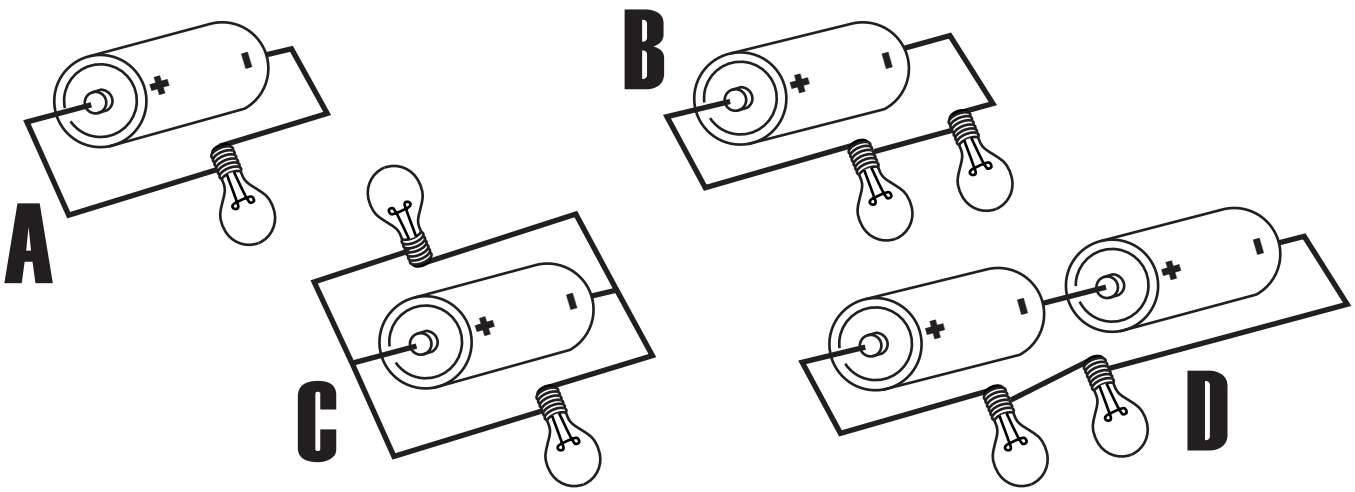
- How did you decide if a circuit was series or parallel?
- What did you discover about circuits?
- Why is it easier to look at a wiring diagram when building a circuit than it would be if someone tried to describe the circuit to you?

Apply:

- Do you think that electrical circuits in your home are series or parallel? Why?
- Describe a time when you didn't know something and then figured out the answer by testing it yourself?

PARALLEL OR SERIES CIRCUIT WORKSHEET

Diagram	No. of Paths	Series or Parallel	No. Lights On
A			
B			
C			
D			



PARALLEL OR SERIES CIRCUIT WORKSHEET

Diagram	No. of Paths	Series or Parallel	No. Lights On
A			
B			
C			
D