

Are the lights on your holiday tree in series or parallel? How do you know?

Dear Teachers,

This week we're going to look at the topic of electrical circuits. Initially, this may seem simple, but a closer look reveals complexities. There are two different types of circuits. Circuits can be parallel or series. Which of these kinds of circuits are your holiday lights?

The Elementary Science Core Curriculum for K-4 states:

- *Standard 4 Major Understanding 4.1e Electricity travels in a closed circuit.*

Intermediate Science Core Curriculum for grades 5 -8 states:

- *Standard 4 Physical Setting Major Understanding 4.4e Electrical circuits provide a means of transferring electrical energy.*

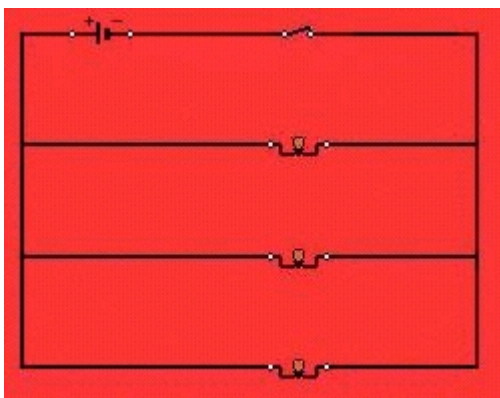
Series circuits are the simplest type of electric circuit. In a series circuit, the current flows through only one path.

Parallel circuits are more complicated. In a parallel circuit, the electrons can flow on more than one path.

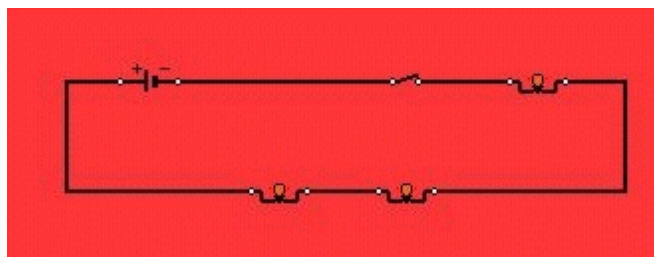
Suppose a battery, wires and a series of lights are connected in a series circuit. What happens if one of those lights goes out?

No electrons will flow. When the flow of electrons in a series circuit is stopped at any point, the whole circuit becomes open. None of the lights are lit.

In a parallel circuit, the electrons follow more than one path. The lights are on different branches. If one light goes out, the electrons will still reach the other lights.



Parallel Circuit



Series Circuit

The electric circuits in your home are parallel circuits. When appliances are plugged into wall outlets, they are connected to parallel circuits. If one appliance stops working, the electrons still flow in the circuit. The other appliances still work. Most schools and office buildings also use parallel electric circuits.

Student Activity

Have your students go home and check the holiday lights they have at home to determine if they are on a series or parallel circuit.