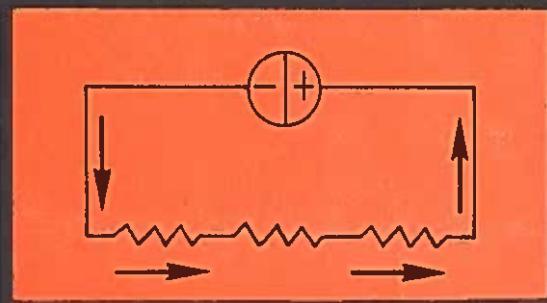
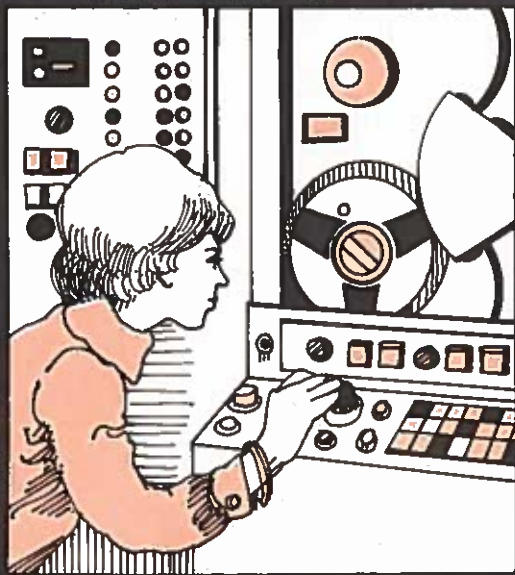
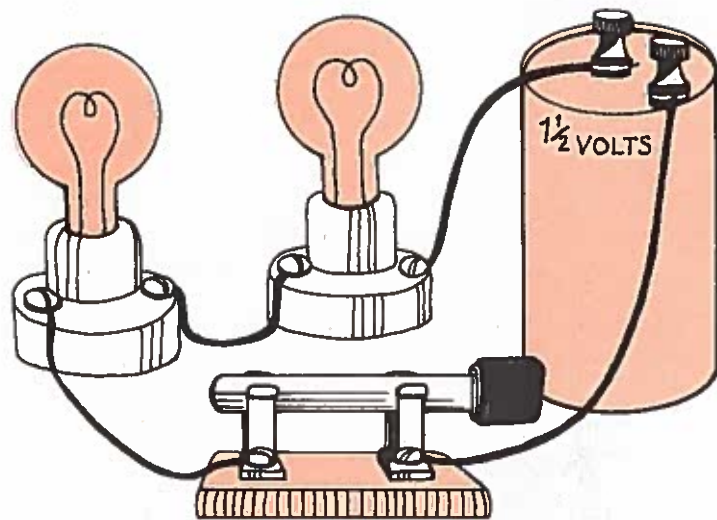


# WHAT IS A SERIES CIRCUIT?

3



**series circuit:** an electrical hook-up in which the current has only one path

# AIM | What is a series circuit?

## 3

How many light bulbs are there in your home? How many other electrical devices do you have?

Must they *all* be working if you want to use just one?

Do they *all* stop working if you shut off just one?

Of course not! Homes are not wired that way. But there are electrical hook-ups that work so that all electrical devices on the circuit are either on or off. This kind of electrical hook-up is called a *series circuit*.

There are two important things to remember about a series circuit:

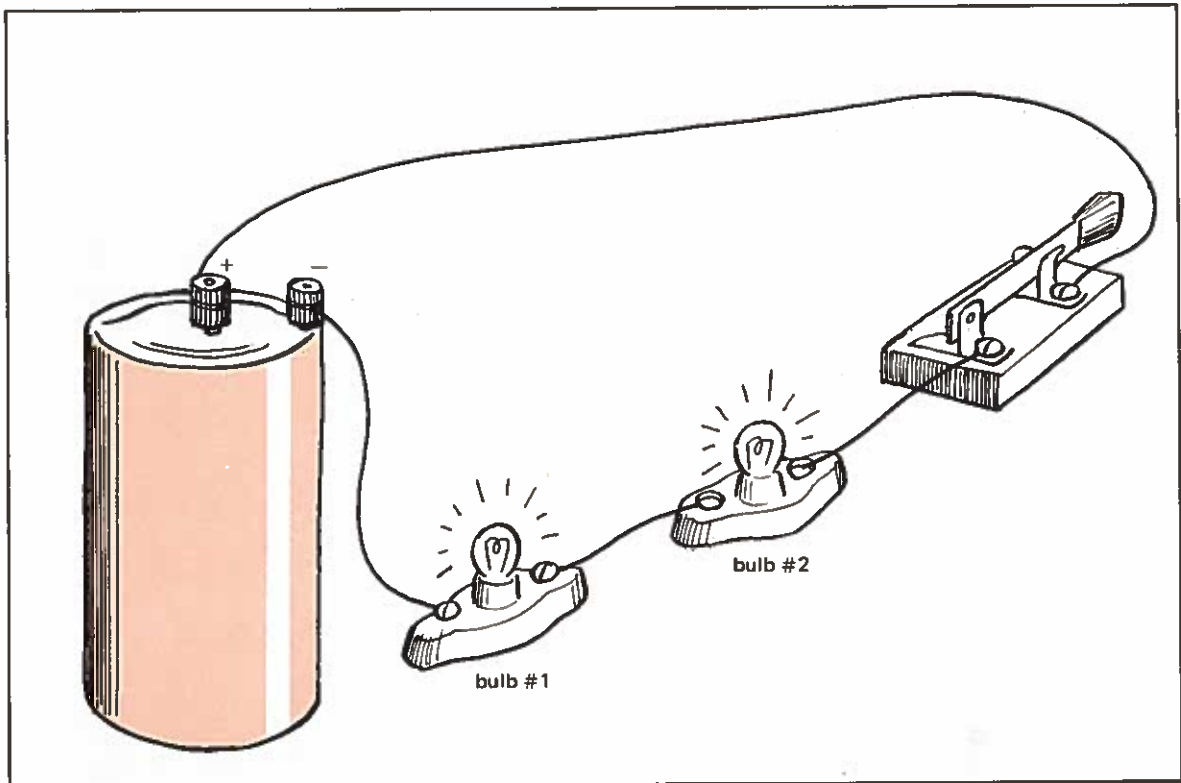
1. *Electrons have only one path to follow* in a series circuit. Each electrical device is connected along this one path. Because of that, the electricity cannot go to just one device. It must move through *all*.

If you turn off any electrical device, you will turn them all off. If you turn that device back on, you will turn on all the devices.

2. The electrical devices, or appliances, share the electrical pressure in a series circuit. If you add electrical appliances, each one gets less electrical pressure. For example, suppose you have light bulbs along a series circuit. Then you add more bulbs. What would happen? Each bulb would give off less light.

Why bother with series circuits? They don't make sense for homes, schools, or factories! But there are special uses for series circuits. Parts of computers, radios, and television sets are wired in series. Parts of space rockets are too!

## A TYPICAL SERIES CONNECTION



1. Trace the path of the electrons in this series circuit. (Draw in arrows along the circuit.)
2. In this circuit, the electricity has \_\_\_\_\_ paths to follow.  
one, two
3. This circuit is \_\_\_\_\_.  
complete, incomplete
4. Where does the electricity have to go before it reaches bulb #2? \_\_\_\_\_
5. If bulb #1 were to go out, bulb #2 would \_\_\_\_\_.  
stay lit, go out
6. If bulb #2 were to go out, bulb #1 would \_\_\_\_\_.  
stay lit, go out
7. In this circuit, each bulb \_\_\_\_\_ getting the full electrical pressure.  
is, is not
8. If more bulbs were added to this circuit, each bulb would give off \_\_\_\_\_ light.  
more, less
9. If this circuit had only one bulb, it would give off \_\_\_\_\_ light.  
more, less

**COMPLETING SENTENCES** Complete the sentences with the choices below.

---

go off  
less  
one

moving electrons  
series  
share

switched on  
are not

1. The circuit you are learning about in this Aim is the \_\_\_\_\_ circuit.
2. In a series circuit, electrons have only \_\_\_\_\_ path to follow.
3. In a series circuit, when one appliance is shut off, all other appliances \_\_\_\_\_.
4. In a series circuit, when one appliance is switched on, *all* other appliances must be \_\_\_\_\_.
5. In a series circuit, the appliances \_\_\_\_\_ the electrical pressure.
6. In a series circuit, when you add more appliances, each appliance gets \_\_\_\_\_ power.
7. Homes, factories, and schools \_\_\_\_\_ wired in series.
8. Current electricity comes from \_\_\_\_\_.

**MATCHING** Match the two lists. Write the correct letter on the line next to each number.

---

- |  |  |
|--|--|
| 1. _____ charged atoms that are not moving | a) only one path for electrons to move |
| 2. _____ moving electrons                  | b) ending point of a circuit           |
| 3. _____ series circuits                   | c) static electricity                  |
| 4. _____ minus terminal                    | d) starting point of a circuit         |
| 5. _____ plus terminal                     | e) current electricity                 |

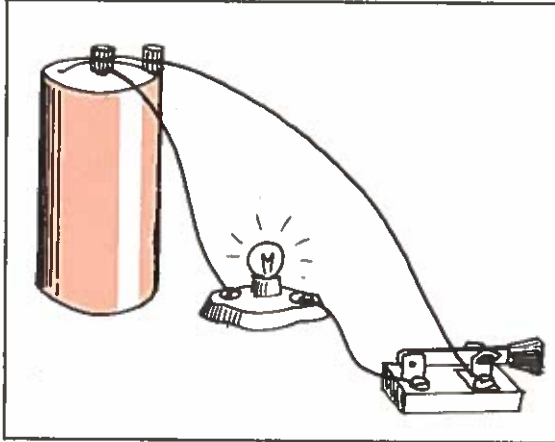
**WHAT DO THE PICTURES SHOW?** Look at each picture. Then answer the questions.

Quiet! Electrical Engineer at work!

Four series circuits are shown below. Use arrows to show the path of the electricity in each one.

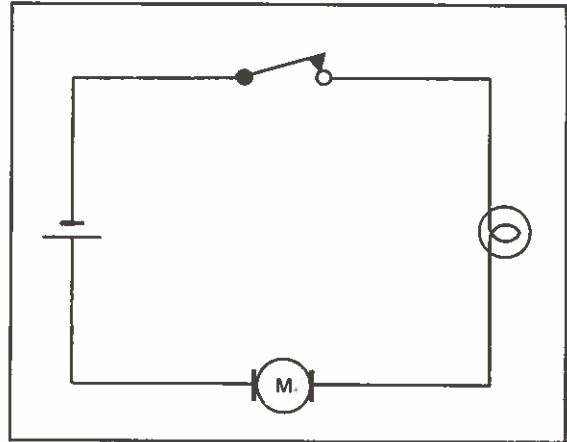
Remember: A series circuit has only one path for the electrons to follow.

A.



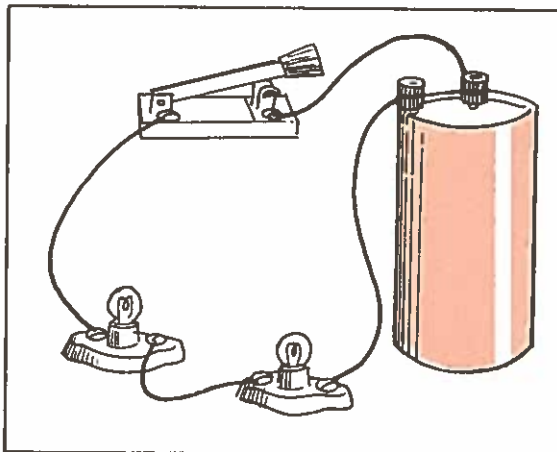
How many paths are there in this circuit? \_\_\_\_\_

B.



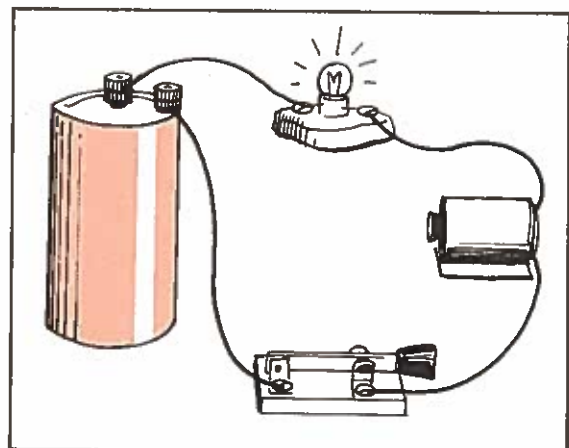
How many paths are there in this circuit? \_\_\_\_\_

C.



How many paths are there in this circuit? \_\_\_\_\_

D.



How many paths are there in this circuit? \_\_\_\_\_

**COMPLETE  
THE CHART**

Use electrical symbols to draw these series circuits.

- |   |  |
|---|--|
| 1. one dry cell<br>one open switch<br>two motors                    |  |
| 2. two dry cells<br>one closed switch<br>three light bulbs          |  |
| 3. one dry cell<br>no switch<br>three loads (your choices)          |  |
| 4. two dry cells<br>one open switch<br>one motor<br>two light bulbs |  |