WHAT IS A PARALLEL CIRCUIT?

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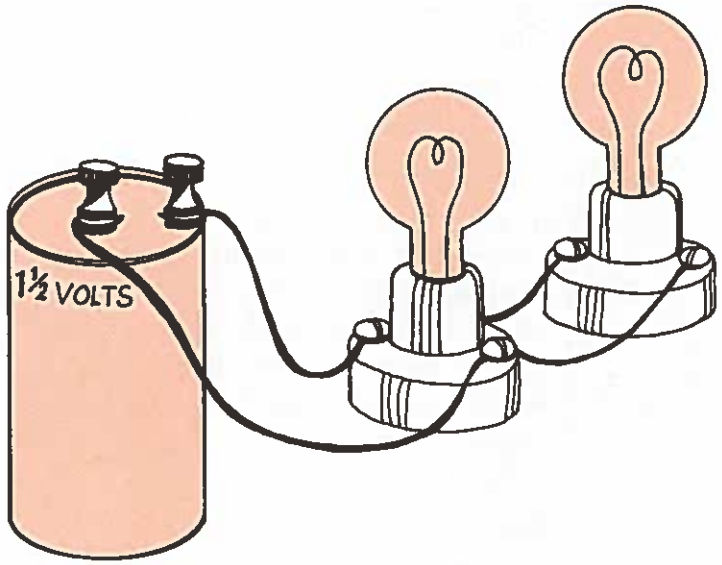
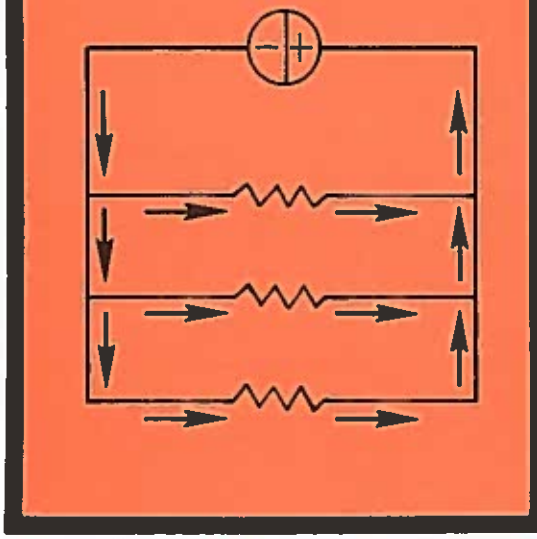




parallel circuit: an electrical hook-up in which the current has *more* than one path

AIM 4 | What is a parallel circuit?

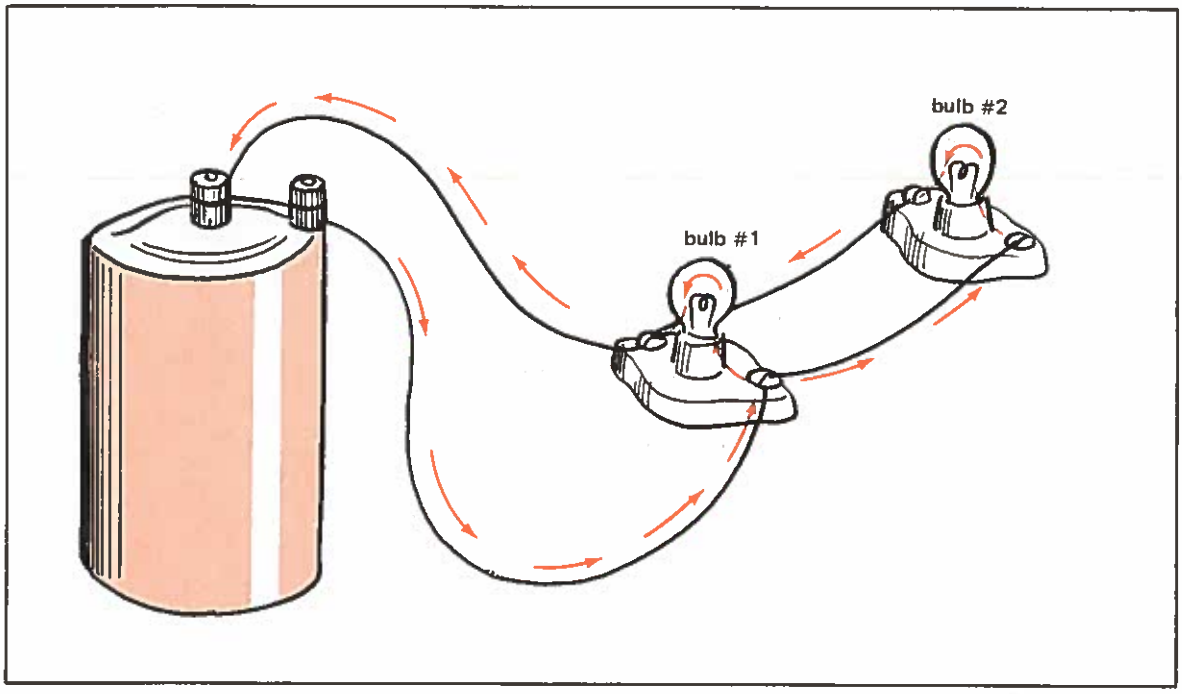
You walk into your home and switch on the TV. You switch on *only* the TV. You don't have to switch on the toaster and broiler, the hair dryer and radio—You don't have to because your home is *not* wired in series. Your home is wired in *parallel*.

There are two important facts you should know about parallel circuits:

1. In a parallel circuit, *the electrons have more than one path to follow. Each appliance has its own path.* This lets you use or shut off only one appliance at a time.
2. In a parallel circuit, *the appliances do not share the electrical pressure.* Each appliance gets the full voltage it needs. Adding more loads does *not* weaken the force. Each load still works with full power. For example, adding more bulbs to a parallel circuit does not make each bulb give off less light.

Parallel circuits make sense for use in homes, schools, and factories.

A TYPICAL PARALLEL CONNECTION



Look at this diagram. Then answer the questions.

1. How many bulbs are in this parallel circuit? _____

2. How many paths does the electricity have to follow? _____ Follow the paths that are shown with your pencil.

3. Is this circuit complete or incomplete? _____

4. Do the bulbs light up? _____

5. Does the electricity have to pass through bulb #1 for bulb #2 to light up? _____

6. If bulb #2 were to blow out, bulb #1 would _____.
   (stay lit, go out)

7. If bulb #1 were to blow out, bulb #2 would _____.
   (stay lit, go out)

8. If a *third* bulb were added, bulbs #1 and #2 would
   _____.
   (give off less light, give off the same amount of light)

9. The bulbs in this circuit _____ share the electrical pressure.
   (do, do not)

10. Your home is wired _____.
    (in parallel, in series)

CHOOSE ONE

Choose the correct word or term for each statement. Write your choice in the space.

1. Homes, schools and factories, _____ wired in series.
   (are, are not)

2. This school is wired in _____.
   (parallel, series)

3. In a *series* circuit, electricity has _____ path to follow.
   (one, more than one)

4. In a *parallel* circuit, electricity has _____ path to follow.
   (one, more than one)

5. In a *series* circuit, when one bulb goes out, the other bulbs _____.
   (stay lit, go off)

6. In a *parallel* circuit, when one bulb shuts off, the other bulbs _____.
   (stay lit, go off)

7. An extra bulb is added to a series circuit. The other bulbs now give off

   _____.
   (less light, the same amount of light)

8. An extra bulb is added to a parallel circuit. The other bulbs now give off

   _____.
   (less light, the same amount of light)

9. In a *parallel* circuit, you _____ use or shut off one appliance at a time.
   (can, cannot)

10. In a *series* circuit, you _____ use or shut off one appliance at a time.
    (can, cannot)

MATCHING

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

1. _____ parallel circuit
2. _____ series circuit
3. _____ another bulb added to a parallel circuit
4. _____ another bulb added to a series circuit

a) does not change amount of light each bulb gives

b) loads work together

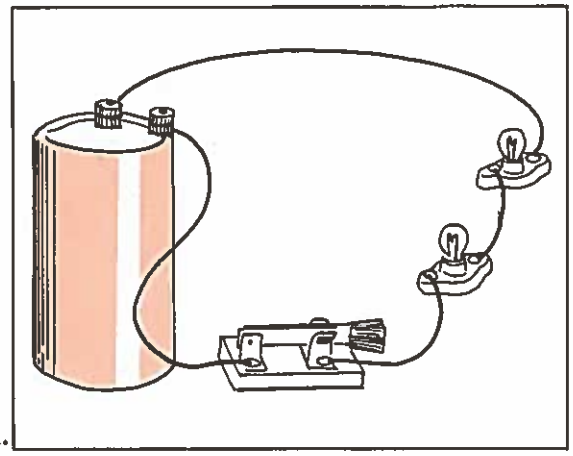
c) loads work one at a time

d) does change amount of light each bulb gives

WORKING WITH CIRCUITS

Look at each circuit. Then answer the questions next to it.

A.



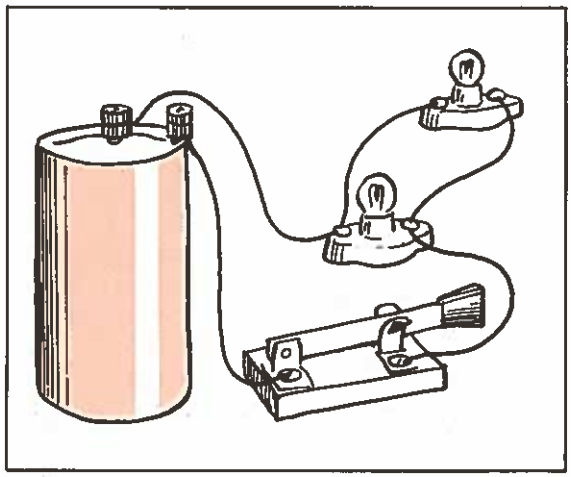
(Note: Do not count a switch as a load.)

1. What kind of circuit is this? _____
2. How many paths do the electrons have to follow? _____
3. How many loads does this circuit have? _____
4. Is the circuit complete or incomplete? _____
5. Are the loads working? _____

6. If one bulb were to blow out, the other bulb would _____ (stay lit, shut off)
7. Adding another bulb would make the other two give off _____ (less light, the same amount of light).
8. This _____ (is, is not) a good way to wire a home.

B.

1. What kind of circuit is this? _____
2. How many loads does this circuit have? _____
3. How many paths do the electrons have to follow? _____
4. Is the circuit complete or incomplete? _____



5. Are the loads working? _____

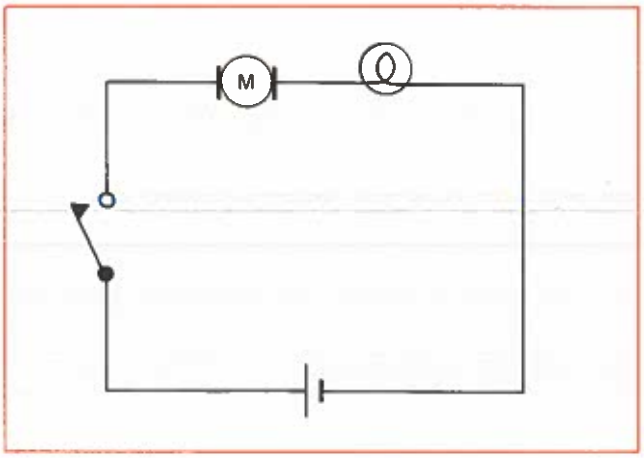
6. If one bulb were to go off, the other bulb would give off

_____.
more light, the same amount of light

7. Adding another bulb, would make each bulb give off _____.
less light, the same amount of light

8. Is this a good way to wire a home? _____

C.



1. What kind of circuit is this? _____
parallel, series

2. How many paths do the electrons have to follow? _____

3. How many loads does this circuit have? _____

Name them. _____ _____

4. Is the circuit complete or incomplete? _____

5. Are the loads working? _____

6. Is your home wired this way? _____

1. What kind of circuit is this?

_____
parallel, series

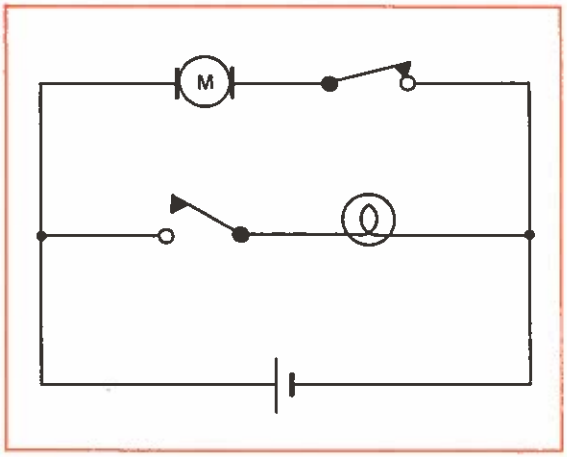
2. How many paths do the electrons have to follow? _____

3. How many loads does this circuit have? _____

Name them. _____

_____

D.



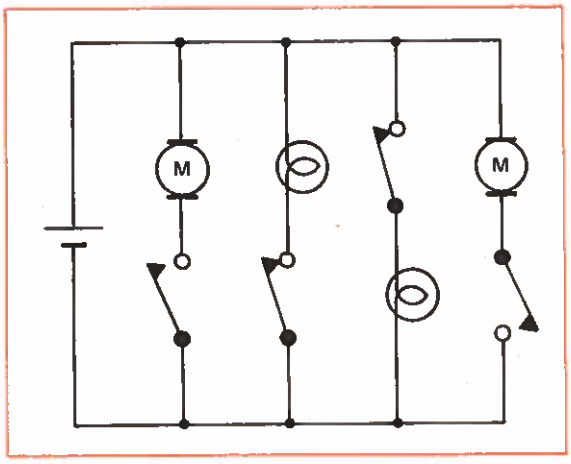
4. How many switches does this circuit have? _____

5. Which appliance is working? _____

6. Which appliance is not working? _____

7. Is your home wired this way? _____

E.



1. What kind of circuit is this?

_____

2. How many paths do the electrons have to follow? _____

3. How many loads does this circuit have? _____

Name them. _____

_____

4. How many switches does this circuit have? _____

5. Which loads are working? _____

_____

6. Which loads are not working? _____

_____

7. Is your school wired this way? _____

CHECK THE CIRCUIT

Each phrase below describes either a parallel circuit or a series circuit. Which one is it? Put a check (✓) in the proper box.

		Parallel Circuit	Series Circuit
1.	only one path for the electricity to follow		
2.	more than one path for the electricity to follow		
3.	loads work or shut off one at a time		
4.	all loads are on or all loads are off		
5.	appliances share the voltage		
6.	appliances do not share the voltage		
7.	good way to wire a home		
8.	not a good way to wire homes		
9.	an extra bulb makes the others less bright		
10.	an extra bulb does not change the brightness of the others		

THROW ONE OUT

In each of the following sets of terms, one of the terms does *not* belong. Circle that term.

1. parallel circuit loads must work together wiring in this school
2. series circuit loads must work together wiring in this school
3. electrical symbol   
4. switch open complete circuit switch closed
5. generator switch battery

REVIEWING ELECTRICAL SYMBOLS

Draw the following electrical symbols.

1.	open switch	
2.	closed switch	
3.	one dry cell	
4.	two dry cells	
5.	wire	
6.	motor	
7.	light bulb	

TRUE OR FALSE Write T on the line next to the number if the sentence is true. Write F if the sentence is false.

1. _____ A dry cell gives static electricity.
2. _____ Static electricity lights our homes.
3. _____ Static electricity causes lightning.
4. _____ A safe place to stay during a lightning storm is under a tree.
5. _____ Electricity is useful.
6. _____ Electricity can be dangerous.
7. _____ This school is wired in parallel.
8. _____ Your home is wired in series.
9. _____ A parallel circuit lets you use or shut off one appliance at a time.
10. _____ Appliances wired in parallel share the electrical pressure.

REACHING OUT

Draw these circuits. Use electrical *symbols*.

1. *complete series circuit* ■ one battery ■ one switch ■ three bulbs	
2. *complete parallel circuit* ■ one battery ■ one switch ■ three motors	
3. *incomplete parallel circuit* ■ two batteries ■ two switches ■ one bulb, one motor