Name Date

Comprehension
Section 9.1

Key

Use with textbook pages 306–313.

more volts → more current

Series or parallel?

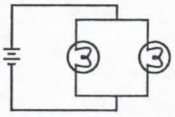
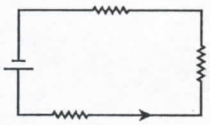
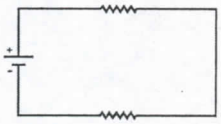
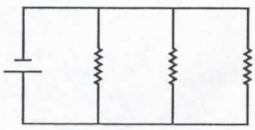
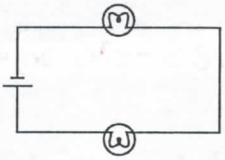
For each of the following statements, identify whether it applies to a series circuit or a parallel circuit.

1. The current is the same throughout the circuit.
   series
2. Adding a resistor will decrease the total resistance of the circuit.
   parallel
3. The voltage across each resistor in the circuit is the same.
   parallel
4. There is only one pathway for electrons to flow.
   series
5. Adding a resistor will increase the total resistance of the circuit.
   series
6. There is more than one pathway for current to flow.
   parallel
7. As more cells are added to the circuit, the brightness of the light bulb increases.
   parallel / series
8. There are junction points in the circuit.
   parallel
9. If the current through one load in the circuit goes to 0 A, the current through all other loads remains the same.
   parallel.
   ~ in series if one load goes to 0 – no current
   ~ all others will not work as before.
10. The sum of voltages across the loads equals the total voltage supplied by the battery.
    series
11. The total current entering a junction point equals the sum of the current leaving the junction point.
    parallel

Use with textbook pages 306–313.

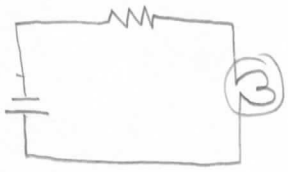
Is it in series or in parallel?

Match each description on the left with the correct circuit on the right.

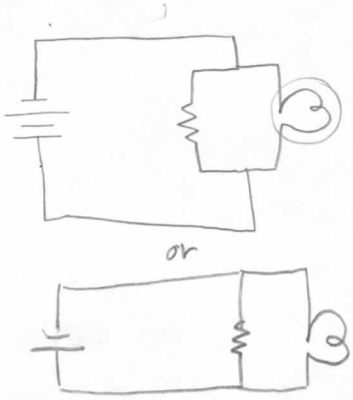
Description	Circuit
1. B 3 resistors in series **2.** D 3 resistors in parallel **3.** E 2 light bulbs in series **4.** A 2 light bulbs in parallel	**A.**  **B.**  **C.**  **D.**  **E.** 

Draw circuit diagrams as directed below.

5. Draw a circuit diagram showing one resistor and one light bulb in series.



6. Draw a circuit diagram showing one resistor and one light bulb in parallel.



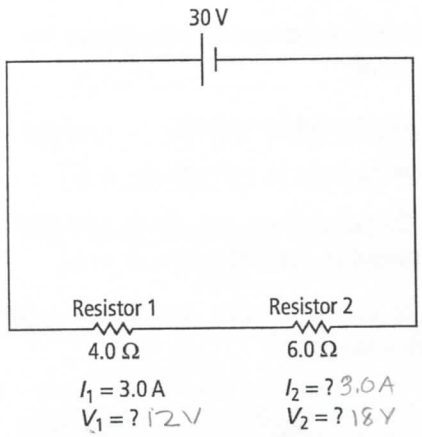
Name Date

Applying Knowledge
Section 9.1

Use with textbook pages 306–313.

Calculations with series circuits

Use the diagrams to answer the questions below.



1. (a) What is the total resistance in the circuit?

10 Ω

(b) What is the amount of current flowing through Resistor 2?

3.0 A

(c) Using Ohm's Law ($V = IR$), determine the voltage drop across Resistor 2.

$V = 3(6)$

$V = 18$ V

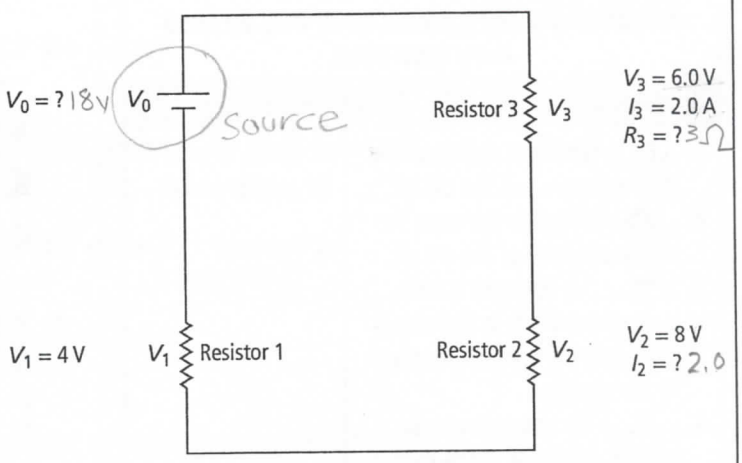
(d) What is the voltage drop across Resistor 1? $V = 3(4)$

$V = 12$ V

or

$30 - 18 = 12$

$V_T - V_2 = V_1$



2. (a) What is the total voltage in the circuit?

18 V

(b) What is the amount of current flowing through Resistor 2?

2.0 A

(c) Ohm's law is $R = \frac{V}{I}$. Use Ohm's law to determine the resistance of Resistor 3. 3Ω

$R = \frac{6}{2}$

$R = 3\Omega$

Use with textbook pages 306–313.

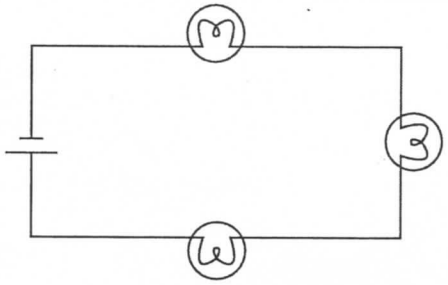
Series and parallel circuits

Match each Description on the left with the Circuit on the right. Each Circuit may be used more than once.

Description	Circuit
1. B Resistors decrease the total resistance of the circuit.	**A.** series circuit
2. A Resistors increase the total resistance of the circuit.	**B.** parallel circuit
3. A The voltages across each of the loads in the circuit add up to the voltage supplied by the source.	more pathways
4. B The voltages across each of the loads in the circuit are equal to each other and to the voltage supplied by the source.	
5. A The current through the whole circuit is the same throughout and is equal to the total current supplied by the source.	
6. B The current through each pathway of the circuit adds up to the total current supplied by the source.	

Circle the letter of the best answer.

Use the following diagram to answer questions 7 and 8.



7. The light bulbs are connected in parallel.

A. The statement is correct.

B. The statement is incorrect.

C. The diagram does not show whether the statement is correct or incorrect.

8. The current is the same throughout the entire circuit.

A. The statement is correct.

B. The statement is incorrect.

C. The diagram does not show whether the statement is correct or incorrect.

9. Which of the following statements applies to a series circuit?

I.	There are junction points in the circuit.
II.	There is only one path for electrons to flow.
III.	The total resistance is equal to the sum of the individual resistances.

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

10. Which of the following applies to a parallel circuit?

A. There is only one path for electrons to flow.

B. Adding a resistor to the circuit increases the total resistance.

C. The sum of the voltages lost on the resistors equals the total voltage supplied by the battery.

D. The total current entering a junction point must equal the sum of the current leaving the junction point.