# Who Am I?

Three light bulbs having a different resistance are wired with different arrangements to create two circuits. One is a series circuit and the other is a parallel circuit. For the statement made below, identify whether it is true of the series circuit, the parallel circuit, both types of circuits, or neither type of circuit.

#### Apprentice Difficulty Level Question Group 1 Question 1

There is a single pathway by which charge can flow through the circuit from the + terminal to the - terminal of my batteries.

## **Question 2**

There are multiple pathways by which charge can flow through the circuit from rom the + terminal to the - terminal of my batteries.

#### Question Group 2 Question 3

Any charge flowing through one of my light bulbs will flow through all of my light bulbs.

## **Question 4**

Any charge flowing through one of my light bulbs will not flow through any of my other light bulbs.

Question Group 3 Question 5 When one of my light bulbs goes out, all the light bulbs will go out.

### **Question 6**

When one of my light bulbs go out, the other light bulbs will remain lit.

### Question Group 4 Question 7 The arrangement of bulbs in my circuit looks like this ...

The arrangement of bulbs in my circuit looks like this ...



# Question Group 5 Question 9

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, the current in the battery would decrease.

# **Question 10**

**Question 8** 

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, the current in the battery would increase.

### Question Group 6 Question 11

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, the overall resistance would increase.

# **Question 12**

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, the overall resistance would decrease.

# Master Difficulty Level Question Group 7 Question 13

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, then the current in each of the three other light bulbs would decrease.

### **Question 14**

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, then the current in each of the three other light bulbs would not change.

#### Question Group 8 Question 15

The current in one of my light bulbs is always the same as the current in my other light bulbs.

### **Question 16**

The current in one of my light bulbs is different than the current in my other light bulbs.

### Question Group 9 Question 17

The bulbs with the greater resistance have the same current in them as the bulbs with the smaller resistance.

### **Question 18**

The bulbs with the greater resistance have a lower current in them than the bulbs with the smaller resistance.

### Question Group 10 Question 19

If one of the wires connected directly to the battery is disconnected, then all of my light bulbs will go out.

## **Question 20**

When the circuit is turned on, all of my light bulbs will seem to light at the same time.

# Question Group 11 Question 21

When ammeters are used to measure the current in each of my bulbs, the readings look like this ...



# **Question 22**

When ammeters are used to measure the current in each of my bulbs, the readings look like this ...

(Diagram showing different ammeter readings)



## Question Group 12 Question 23

When voltmeters are used to measure the voltage drops across each of my bulbs, the readings look like this ...

(Diagram showing different voltmenter readings)



# **Question 24**

When voltmeters are used to measure the voltage drops across each of my bulbs, the readings look like this ...

(Diagram showing identical voltmenter readings)



# Wizard Difficulty Level Question Group 13 Question 25

My light bulbs have different voltage drops across them.

### **Question 26**

The voltage drop across each of my light bulbs is the same value.

### Question Group 14 Question 27

The bulbs with the greater resistance have a greater voltage drop across them than the bulbs with smaller resistance.

### **Question 28**

The bulbs with the greater resistance have the same voltage drop across them as the bulbs with smaller resistance.

## Question Group 15 Question 29

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, then the voltage drop across each of the three other light bulbs would decrease.

## **Question 30**

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, the voltage drop across each of the three other light bulbs would not change.

#### Question Group 16 Question 31

The overall resistance of my circuit is equal to the sum of the resistance values of the individual bulbs.

## **Question 32**

The overall resistance of my circuit is smaller than the resistance any one of the bulbs...

### Question Group 17 Question 33

The bulbs with the greater resistance have a smaller voltage drop across them than the bulbs with smaller resistance.

### **Question 34**

The bulbs with the greater resistance have a larger current in them than the bulbs with the smaller resistance.

### Question Group 18 Question 35

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, the overall resistance would not be affected.

### **Question 36**

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, the current in the battery would not be affected.

### Not Used in the Concept Builder

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, then the resistance value of each individual light bulb would decrease.

If a fourth light bulb were added to my circuit with the same arrangement as the other bulbs, then the resistance value of each individual light bulb would increase.

The charge that flows through my light bulbs is created by the battery.

The amount of charge that enters my light bulbs is always greater than the amount of charge that exits my light bulbs.

The light bulbs that are closer to the positive terminal of my battery are always brighter than the light bulbs that are further than the positive terminal of my battery.

When my light bulbs no longer light, it could be a sign that my battery has run out of charge.