PhyzSpringboard: Parallel Circuits

Felix

Electric Quantites

1. A simple circuit—such as a battery, bulb, and wire—can be characterized by the voltage, current, resistance, and power associated with it. What happens to these quantities when more and more resistors (bulbs or other electric devices) are connected to the circuit in **parallel**? Before answering, write definitions for each of the quantities.

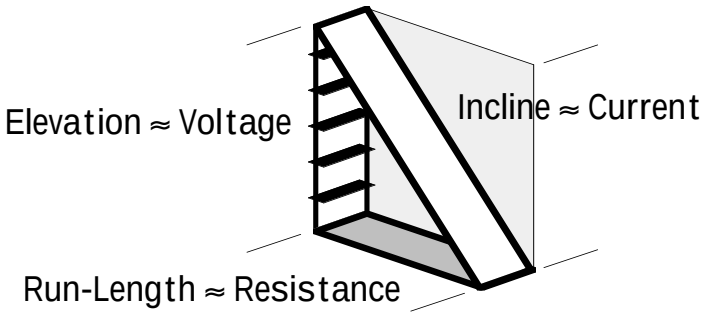
a. Voltage / Electromotive Force — the amount of energy stored in each unit of charge.

b. Current — the rate at which charge flows. (By convention, it is said to flow from the positive terminal of the battery to the negative terminal.)

c. Resistance — the extent to which an object obstructs the flow of electric charge.

d. Power — the rate at which energy is used or converted.

2. How is each of these quantities related to characteristics of the slide?



Bun-Burning ≈ Power

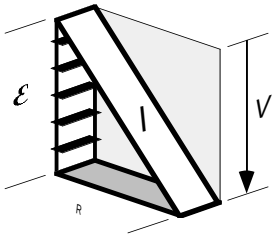
a. The Run-Length of the slide is like the **resistance** of a circuit.

b. The Bun-Burning of the slide is most like the **power** of a circuit.

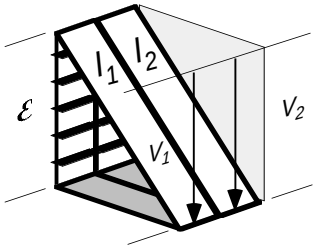
c. The Elevation of a slide is most like the **voltage** of a circuit.

d. The Incline of a slide is most like the **current** of a circuit.

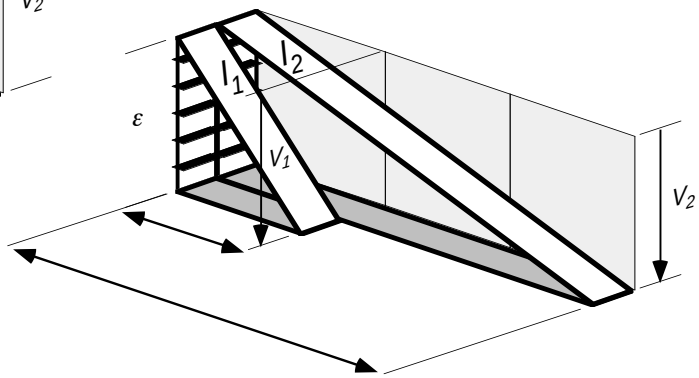
Comparative Slidology



THE SIMPLE SLIDE



TWO PARALLEL SLIDES



3. a. Compared to the simple slide, the elevation of a parallel slide is _____the same_____

b. Compared to the simple slide, the flow rate* (incline) of a parallel slide is _____greater_____

*The passenger capacity of the arrangement. For example, two identical slides can carry twice as many passangers as one.

c. Compared to the simple slide, the effective run length** of a parallel slide is _____lesser_____

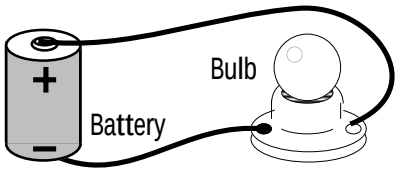
**The run length of a single, simple slide that would have the same flow rate as the parallel slide.

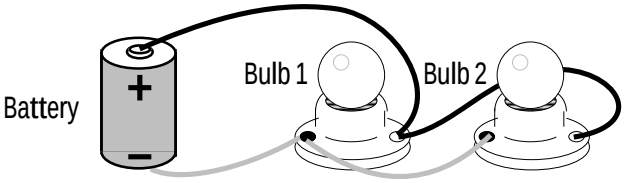
d. Compared to the simple slide, the bun-burning on a parallel slide is _____greater_____

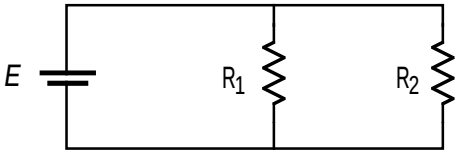
4. What characteristic—if any—do both sections of a parallel slide **always** have in common?

_√_Vertical drop __Incline __Run length __Bun-burning

Moving on to circuits







5. a. Compared to a simple circuit, the voltage of a parallel circuit is _____the same_____

b. Compared to a simple circuit, the current of a parallel circuit is _____greater_____

c. Compared to a simple circuit, the resistance of a parallel circuit is _____lesser_____

d. Compared to a simple circuit, the power of a parallel circuit is _____greater_____

6. What characteristic—if any—do both resistors in a parallel circuit **always** have in common?

_√_Voltage __Current __Resistance __Power