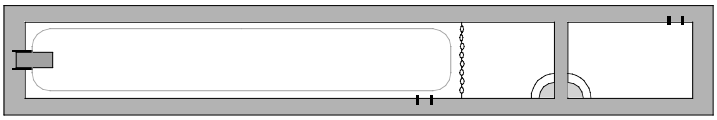
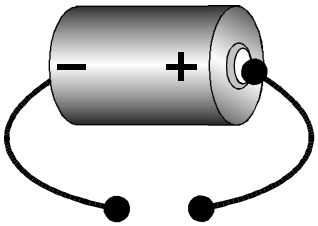
Phyz Springboard:
Resistance is not Futile



FAULTY CIRCUITS

Consider a battery and connecting wires arranged as shown.



1.a. How could the elements be arranged to create a circuit with the minimum electrical resistance?

b. What kind of circuit would this be?

2.a. How could the elements be arranged to create a circuit with the maximum electrical resistance?

b. What kind of circuit would this be?

RESISTANCE AND LENGTH

An object is placed into the circuit as shown.

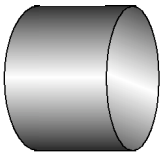
Long

Short

3.a. Which object should be selected to create a circuit with more resistance?

b. What is the relationship between the length of an object and its resistance?

RESISTANCE AND CROSS-SECTIONAL AREA



Wide

Narrow

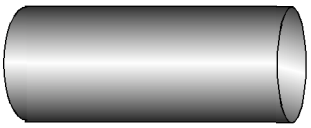
4.a. Which object should be selected to create a circuit with more resistance?

b. What is the relationship between the cross-sectional area of an object and its resistance?

SIZE AND SHAPE

5. Consider the four objects shown to the right. Based on the findings so far,

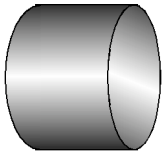
a. which object has the greatest resistance?



Long and wide

b. which object has the lowest resistance?

Long and narrow

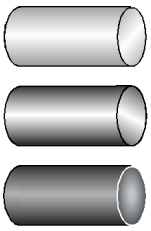


Short and wide

Short and narrow

RESISTANCE AND MATERIAL

6. a. The objects shown have the same size and shape. But they have different values of resistance. Rank them from highest to lowest resistance.



Gold

Rubber

Carbon

b. What is the factor that distinguishes them (in terms of their resistance)?

c. That symbol is used to denote this quantity?

The value of _____ is high for rubber and low for gold.

d. What is the relationship between the _____ of an object and its resistance?

7. a. Use all the factors to write the equation for the resistance of an

object in terms of its _____, cross-sectional area, and length.

b. What are the units of _____?