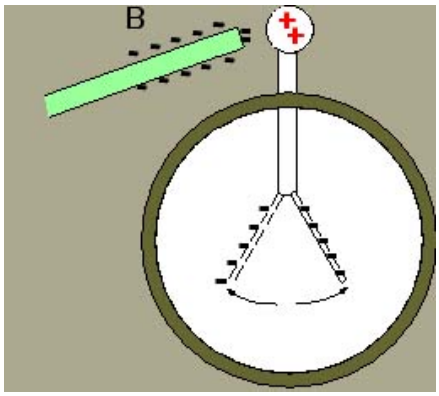
ST Pretest 2.2

1. When clothes tumble-dry they become statically charged?

   a. Why?
   b. If the clothes are *not* allowed to dry completely, will they still be charged?

2. In the diagram below,
   a. explain why the leaves of the electroscope are moving apart.
   b. explain how the leaves both became negative, and why the metal sphere is positive.
   c. explain what would happen if the rod actually touched or was placed extremely close to the sphere.



3. For each set, choose the one which offers the ***more*** resistance

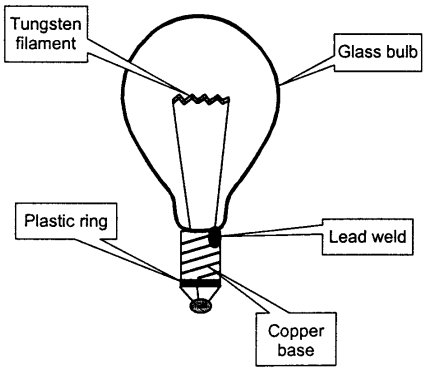
a. a wire 40 cm in length and 3 cm wide___
   a wire 40 cm in length and 8 cm wide___

b. a 20 cm wire(length) made of Cu ____
   a 30 cm wire made of Cu____

c. a circuit operating at -3 ^{o}C___
   one operating at 2 ^{o}C__

4.

The diagram on the right shows the main parts of an incandescent light bulb.



Which of the above substances used to make this light bulb are ***insulators***?

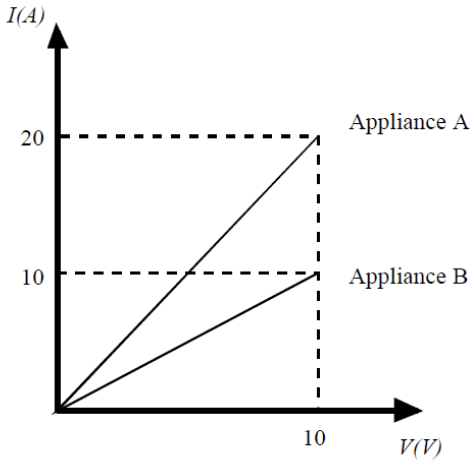
5. Two spheres are in contact with one another. The first sphere has twice the charge of the smaller sphere. The larger sphere has an area = 9 cm^2, and it loses 2 units of charge to the smaller sphere, which in spite of its size, is less crowded because it has so little charge.

   How many units of charge did the larger sphere begin with if the smaller sphere's area = 6.75 cm^2?

6. Define grounding.

7. What is the conductance of a wire if its resistance is 30 Ω?

8. Which appliance in the graph has the greatest electrical resistance? Why?



9. If a circuit's current is 200 mA and its resistance is 10 W, what is the voltage at the source?

1. When clothes tumble-dry they become statically charged?

   a. Why?
   b.

As they tumble, they rub against the metal, which transfers electrons to the bed sheets.

   b. If the clothes are *not* allowed to dry completely, will they still be charged?

No. Water is great at removing static.

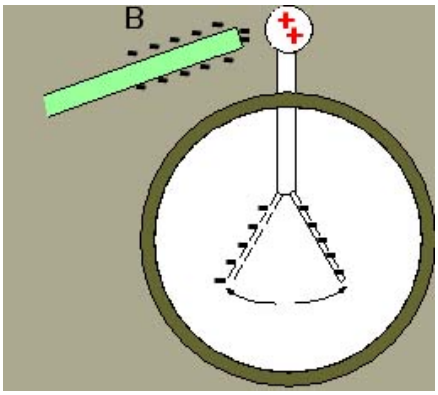
2. In the diagram below,
   a. explain why the leaves of the electroscope are moving apart.

Like charges repel. Both pieces are (-)

   b. explain how the leaves both became negative, and why the metal sphere is positive.

The negative charge from the rod repelled the electrons from the sphere into the pieces at the bottom.

   c. explain what would happen if the rod actually touched or was placed extremely close to the sphere. The entire electroscope (knob and leaves) would become negative.



3. For each set, choose the one which offers the ***more*** resistance

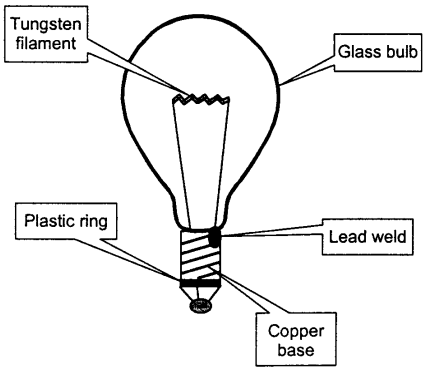
a. a wire 40 cm in length and 3 cm wide__X_
   a wire 40 cm in length and 8 cm wide___

b. a 20 cm wire made of Cu ____
   a 30 cm wire made of Cu__X__

c. a circuit operating at -3 ^{o}C___
   one operating at 2 ^{o}C__X

4. .

The diagram on the right shows the main parts of an incandescent light bulb.



Which of the above substances used to make this light bulb are ***insulators***?

Plastic, glass

5. Two spheres are in contact with one another. The first sphere has twice the charge of the smaller sphere. The larger sphere has an area = 9 cm^2, and it loses 2 units of charge to the smaller sphere, which in spite of its size, is less crowded because it has so little charge.

   How many units of charge did the larger sphere begin with if the smaller sphere's area = 6.75 cm^2?

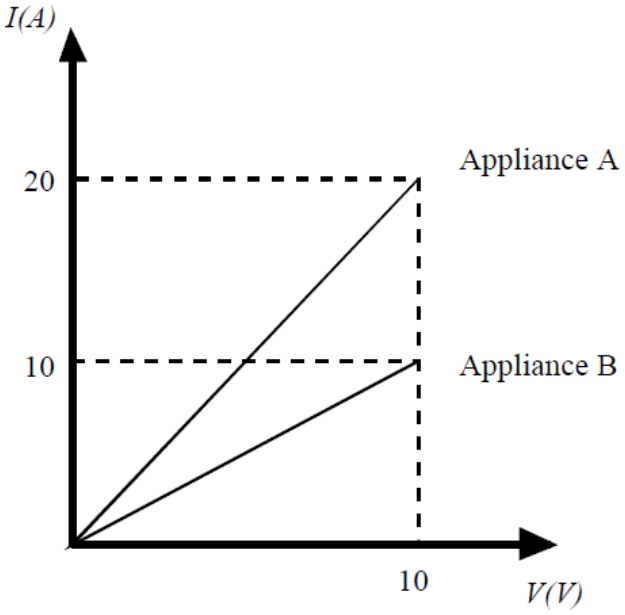
$$\frac{2x-2}{9} = \frac{x+2}{6.75}$$
$$6.75(2x-2) = 9(x+2)$$
$$x = 7$$
$$2x = 14 \; units \; of \; charge$$

6. Define grounding.
   Grounding is the process by which excess charge is removed from an object.

7. What is the conductance of a wire if its resistance is 30 Ω?

   G = 1/R = 1/30 = 0.033 S

8. Which appliance has the greater electrical resistance**? B has the lowest conductivity) lowest slope (I/V) and therefore the higher resistance.**



9. If a circuit's current is 200 mA and its resistance is 10 Ω, what is the voltage at the source?

V = IR
V= 0.200A(**10 Ω**)
= 2 V