

Name: _____

Science and Technology 404
Static Electricity

1. Consider the following experimental results:

A. Two glass rods rubbed on silk **repel** each other.

B. An ebonite rod rubbed on fur **attracts** a glass rod rubbed on silk.

a) What can you conclude from statement A about the charges on the glass rods?

b) What can you conclude from statement B about the charges on the ebonite rod and the glass rod?

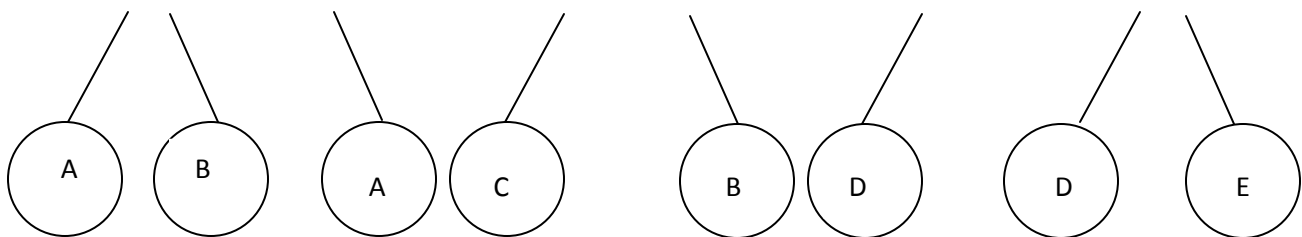
2. Will the following atoms be positively or negatively charged? Explain your answers.

a) An atom containing 14 protons and 11 electrons

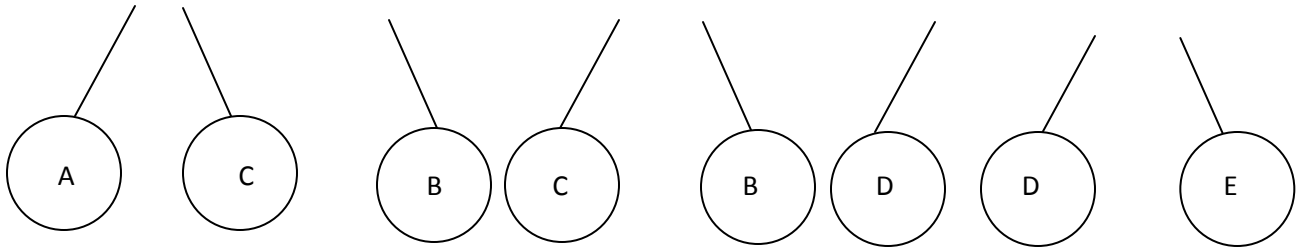
b) An atom containing 8 protons and 10 electrons.

3. Vanessa observes that an object is positively charged. Has it gained or lost electrons? Explain your answer.

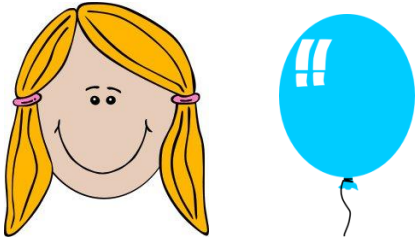
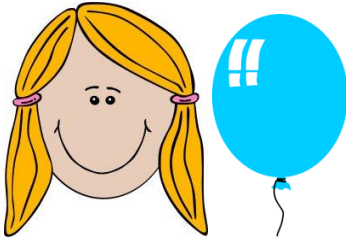
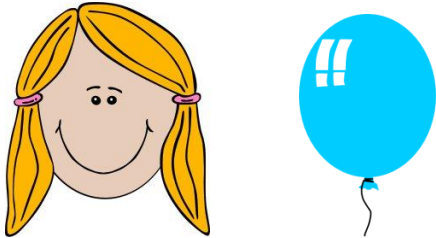
4. The five spheres identified A to E, carry an electrical charge. If sphere A carries a positive charge, what is the sign of the charges on each of the other spheres? Explain your answer.



5. Pith balls A, B, C, D and E are electrically charged. The following diagrams show the positions of some of these pith balls when they are suspended two by two, side by side. What electrical force, attraction or repulsion, would be present between pith balls A and E if they are placed near each other?



6. When a balloon is rubbed against human hair, the balloon becomes negatively-charged with static electricity. On the three diagrams, use (+) and (-) signs to show the electric charges and arrows to show any transfer of charges between the balloon and the hair. Explain each of the three steps.

Before the balloon is rubbed on the hair	While the balloon is rubbed on the hair	After the balloon is rubbed on the hair
 <p>Explanation:</p>	 <p>Explanation:</p>	 <p>Explanation:</p>

For the questions 8 and 9, use the table below.

Substances in triboelectric series

Tendency	Substance
High affinity for capturing electrons (tendency to acquire a negative charge)	Plastic Copper Ebonite (hard rubber) Wood Cotton Paper Silk Lead
Strong tendency to give up electrons (tendency to acquire a positive charge)	Wool Glass

7. To clean his copper trophy, Brad rubs it with a woolen cloth. What will be the charge on each of these objects? Explain your answer.

8.

- i) A glass rod is rubbed with a cotton cloth.
- ii) An ebonite rod is rubbed with a wool cloth
- iii) The charged glass rod is brought near the charged ebonite rod.

Is the electrical force between the glass rod and the ebonite rod an **attraction** or a **repulsion**?