Static Electricity

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1. Who was the first person to determine that there are exactly two kinds of electric charge?
2. What determines which becomes positive and which becomes negative when two materials are rubbed together?
3. When fur is rubbed on amber, the amber becomes negatively charged. How does this happen?
4. Explain why charged objects can attract neutral objects but not repel them.
5. Why do the leaves of an electroscope always repel each other no matter what kind of charge is placed on the electroscope?
6. What is the equation that defines Coulomb's Law?
7. Electrical forces are, in general, much larger than gravitational forces. Why is it then, that gravity seems to be the driving force in the universe?
8. What English word comes from the Greek word for amber?
9. What name is given to the quantity that describes the force that a positive test charge would experience if it were to be placed at a point?
10. What is the difference between electrical potential energy and electrical potential?
11. What is the unit for electrical potential?
12. In terms of conservative and non-conservative, what are electrical forces?
13. What defines the direction of an electric field?
14. There are two correct units for electric field. What are they?
15. What arbitrary definition made by a famous Philadelphian resulted in electrons being negatively charged?

## Capacitance and Capacitive Circuits

16. What is the structural definition of a capacitor?
17. What is the functional definition of a capacitor?
18. How does the voltage between one plate of a capacitor and a point midway between the plates compare to the voltage between the two plates?
19. If two conductors have a constant potential difference between them, what happens to the electric field between them if the distance between them is doubled?
20. What does "breakdown field strength" mean?
21. How is the energy stored on a capacitor at any point in time related to the current through it at that time?
22. When a capacitor is charged through a resistor by a constant voltage source, the current through the circuit decreases exponentially. Why?
23. When an uncharged capacitor is connected in series with a resistor in a circuit with a voltage source, the voltage across the capacitor will be zero initially and increase over time. What will the voltage across the capacitor be when it stops rising?
24. When an uncharged capacitor is connected in series with a resistor in a circuit with a voltage source, the voltage across the capacitor will be zero initially and increase over time. What will the current in the circuit be when the voltage across the capacitor is the same as the supply voltage?