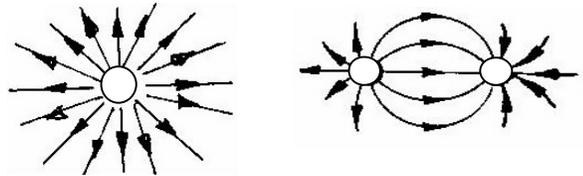


FILL IN THE BLANKS:

1. A material through which electrons move freely is classified as a(n) _____, and a material through which electrons **do not** move freely is classified as a(n) _____.
2. The instrument used to detect an electric charge is _____.
3. An _____ exists in a region of space around a charged object.
4. Lines of _____ are drawn from _____ to _____ in an electric field.
5. Static electricity is often produced by _____ between two objects. Use the attraction for electrons chart in your notes to predict the charge on each object:
 nylon rubbed with hair _____
 glass rod rubbed with polyester fabric _____
6. All static charge lies on the _____ of an isolated conductor.
7. When a positive charge, q^+ , is moved toward a positive plate, work is done _____ the charge, and the potential energy of the charge _____.
8. When a positive charge, q^+ , is moved toward a negative plate, work is done _____ the charge, and the potential energy of the charge _____.
9. The amount of work involved when a charge moves between two points is the _____ between the points. Another term for this energy (or work) per charge is _____.
10. _____, abbreviated _____, is the unit for electric charge.
11. _____, abbreviated _____, is the unit for potential difference. In fundamental units, it is the _____/_____.
12. The earth is considered an inexhaustible _____ of electrons or a limitless _____ for dumping electrons. The earth remains _____. Its voltage is _____. When an object is connected to the earth, it has been _____ and its voltage is _____.
13. When the air around a charged object becomes _____, an electric discharge can occur. This discharge can be a rapid _____ or a slow _____. Give examples of each.
 _____;
14. When the negatively charged bottom of a storm cloud is close to the earth, the ground becomes _____ charged by _____. A discharge can occur involving millions of volts. This is _____.
15. When an object is charged by _____, it acquires a charge opposite in sign to the charging rod. This charge is usually (temporary, permanent).
16. When an object is charged by _____, it acquires the same charge as the charging rod. This charge is (temporary, permanent).

17. _____ Law states that the force between two charged objects is directly proportional to the product of the objects' _____ and inversely proportional to the square of the _____ between them. The force also depends on the _____ separating the objects (represented by _____ in the equation). When F_{el} is _____, the force is attraction.
18. Which is stronger, gravitational or electrical forces? _____
19. To give a conductor a static charge, the conductor must be _____ from the ground, but for an insulator this is not necessary. Why?

20. Fill in the charges on the spheres:



For questions 21-25, choose the correct charge on the electroscope:

a.	b.	c.	d.	e.

21. _____ A positively charged rod is held near an uncharged electroscope.
22. _____ The rod in #21 is removed.
23. _____ A positively charged rod touches an electroscope and then is removed.
24. _____ A negative rod is brought close to an uncharged electroscope.
25. _____ The electroscope is charged by conduction with a negative rod.

PROBLEMS: Watch your units!!

1. The potential difference between a thunder cloud and the ground is 7.0×10^6 v. Find the energy dissipated when a charge of 52 C is transferred to the ground by a lightning bolt.
2. What is the force on a charge of $+4.0 \mu\text{C}$ which is 150 cm away from a charge of $+5.0 \mu\text{C}$?