

Involves contact	Involves rubbing
Can involve any two objects with a difference in electric charge	Involves two neutral objects
Results in balanced charges	Results in imbalanced charges

5. a) When they touched, 6 electrons were transferred. b) The particles moved from Y to X because in charge by conduction, electrons always move from the more negatively charged object to the less negatively charged object, in order to distribute the charge evenly between the two objects).

6. Electrons will travel up from the ground until the positively charged object becomes neutral (when the amount of electrons is equal to the amount of protons).

7. Electrostatic precipitators are very expensive and are only effective on dry particles (not mist).

8. When I slid down a slide, the static electricity (charge imbalance) gave me a shock. There is static cling on my laundry clothes, with can be aggravating.

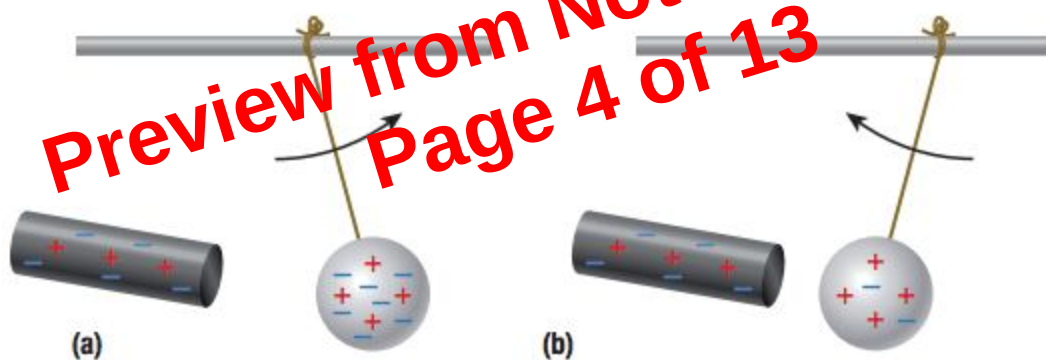


Figure 7 (a) Both objects are negatively charged and repel each other. This causes the pith ball to move away from the metal rod. (b) When the pith ball and the metal rod are oppositely charged, they are attracted to each other and the pith ball moves toward the rod.

- Conductor: a material that lets electrons move easily through it
- Insulator: a material that does not easily allow the movement of electrons through it

-Positively charged objects and neutral objects attract each other; and negatively charged objects and neutral objects attract each other.

-Copper wire is a conductor. Ceramic is an insulator.

-Some non metals such as graphite (a form of carbon) are also reasonably good conductors of electricity.

-Graphite and silicon are example of materials called semiconductors because they allow electrons to move through them.

-You can't charge a conductor if you were holding it in your hand because any charge would immediately pass through the conductor into your hand, which is grounded.

-You should never use an electrical appliance near water because water is a conductor.

-Salt water is a fair conductor because ions pass through salt water easily.

-Pure water is non-conductive because it has no ions.

-Oil, plastic, wood and fur are good insulators.

-“Knob and tube” wiring is a type of wiring used in the 1930s that uses insulators

-Electricity distribution also uses insulators

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-A laser printer consists of a drum made of a positively charged photoconductor.

-A photoconductor is a special class of conductor that conducts electrons only when light shines on it.

-If no light shines on it, it remains an insulator.

-In this case, the light is a laser.

-The laser light quickly “draws” the image to be printed across a positively charged selenium drum, causing these areas to become negatively charged.

-The drum is rolled across positively charged toner particles that are attracted to the negatively charged areas on the drum and are repelled by the positive areas.

-The paper then passes through a fuser that melts the toner particles, which are made from plastic, onto the paper using temperature of over 200 degrees Celsius.

-The paper does not catch fire because of how quickly this process happens.

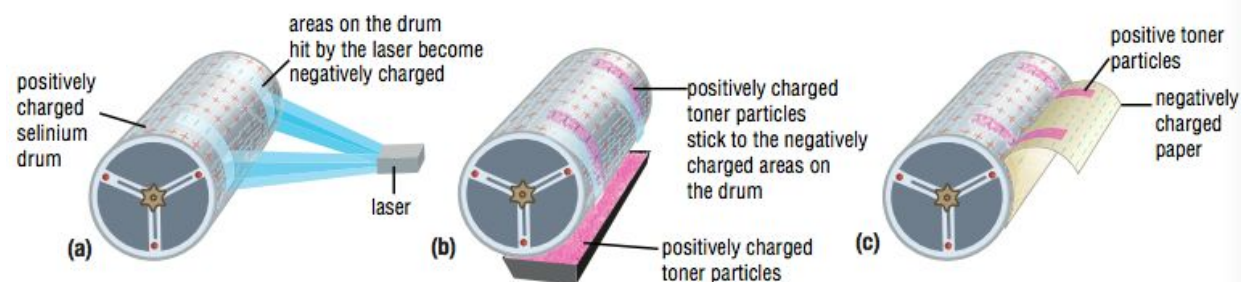


Figure 5 (a) The laser “draws” the image on the drum, making these areas negatively charged. (b) The drum rolls across the positively charged toner, which sticks to the negatively charged laser “drawing.” (c) The drum rolls across paper with a higher negative charge and the toner particles “stick” to the paper.

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