Glossary

conductor a material that allows electrons to move separately from their atomic orbits

conductor an object with properties that allow charges to move about freely within it

Coulomb force another term for the electrostatic force

Coulomb interaction the interaction between two charged particles generated by the Coulomb forces they exert on one another

Coulomb's law the mathematical equation calculating the electrostatic force vector between two charged particles

dipole a molecule's lack of symmetrical charge distribution, causing one side to be more positive and another to be more negative

electric charge a physical property of an object that causes it to be attracted toward or repelled from another charged object; each charged object generates and is influenced by a force called an electromagnetic force

electric field a three-dimensional map of the electric force extended out into space from a point charge

electric field lines a series of lines drawn from a point charge representing the magnitude and direction of force exerted by that charge

electromagnetic force one of the four fundamental forces of nature; the electromagnetic force consists of static electricity, moving electricity and magnetism

electron a particle orbiting the nucleus of an atom and carrying the smallest unit of negative charge

electrostatic equilibrium an electrostatically balanced state in which all free electrical charges have stopped moving about

electrostatic force the amount and direction of attraction or repulsion between two charged bodies

electrostatic precipitators filters that apply charges to particles in the air, then attract those charges to a filter, removing them from the airstream

electrostatic repulsion the phenomenon of two objects with like charges repelling each other

electrostatics the study of electric forces that are static or slow-moving

Faraday cage a metal shield which prevents electric charge from penetrating its surface

field a map of the amount and direction of a force acting on other objects, extending out into space

free charge an electrical charge (either positive or negative) which can move about separately from its base molecule

free electron an electron that is free to move away from its atomic orbit

grounded connected to the ground with a conductor, so that charge flows freely to and from the Earth to the grounded object

grounded when a conductor is connected to the Earth, allowing charge to freely flow to and from Earth's unlimited reservoir

induction the process by which an electrically charged object brought near a neutral object creates a charge in that object

ink-jet printer small ink droplets sprayed with an electric charge are controlled by electrostatic plates to create images on paper

insulator a material that holds electrons securely within their atomic orbits

ionosphere a layer of charged particles located around 100 km above the surface of Earth, which is responsible for a range of phenomena including the electric field surrounding Earth

laser printer uses a laser to create a photoconductive image on a drum, which attracts dry ink particles that are then rolled onto a sheet of paper to print a high-quality copy of the image

law of conservation of charge states that whenever a charge is created, an equal amount of charge with the opposite sign is created simultaneously

photoconductor a substance that is an insulator until it is exposed to light, when it becomes a conductor

point charge A charged particle, designated Q, generating an electric field

polar molecule a molecule with an asymmetrical distribution of positive and negative charge

polarization slight shifting of positive and negative charges to opposite sides of an atom or molecule

polarized a state in which the positive and negative charges within an object have collected in separate locations

proton a particle in the nucleus of an atom and carrying a positive charge equal in magnitude and opposite in sign to the amount of negative charge carried by an electron

screening the dilution or blocking of an electrostatic force on a charged object by the presence of other charges nearby

static electricity a buildup of electric charge on the surface of an object

test charge A particle (designated q) with either a positive or negative charge set down within an electric field generated by a point charge

Van de Graaff generator a machine that produces a large amount of excess charge, used for experiments with high voltage

vector a quantity with both magnitude and direction

vector addition mathematical combination of two or more vectors, including their magnitudes, directions, and positions

xerography a dry copying process based on electrostatics