

1. What does the term electrostatics mean?
2. Compare the strength of electric forces to the strength of gravitational forces?
3. If electric forces are so strong, why do they not crush us?
4. List three particles that are found in an atom. Give their charges and their locations within the atom.
5. What is the fundamental rule of charges?
6. What is meant by the statement “charge is conserved”?
7. Write Newton’s formula for determining the force of gravitational attraction between two objects.

Write Coulomb’s formula for determining the force of electrical attraction or repulsion between two charged particles.

The constant in Newton’s equation is $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$. The constant in Coulomb’s equation is $9 \times 10^9 \text{ Nm/C}^2$. Explain the significance of the relative sizes of these two constants.

8. An electron is attracted to another charge particle that is some distance away from it
 - a) What happens to the force of attraction when the distance between the two charged particles is halved?
 - b) Is the other particle positively or negatively charged? Explain your answer.
9. What is a Coulomb?

10. What determines whether a material will be a good conductor or a good insulator?

11. A negatively charged rod is brought near a neutral metallic sphere. Show how the charges will be distributed in the sphere when the charged rod is near it.

12. If the sphere in #11 is grounded while the negatively charged rod is still nearby.
 - a) what type of charge (+ or -) will move to or from the ground? Draw a diagram to show what happens.

 - b) What type of charge will be left on the sphere? Draw a diagram to show this.

13. What does it mean to say that an object is electrically polarized?

14. A neutral sphere hangs from a string. When a negatively charged rod is brought near the sphere, the sphere is attracted to the charged rod. Draw a diagram showing how the charge is distributed, and explain why the sphere is attracted to the rod.

15. What is electric current? What is the SI unit for electrical charge?

16. When is an atom positively charged?

17. What is electrostatics?

18. Why are metals good conductors?
19. What are semiconductors?
20. What are transistors used for?
21. What is a superconductor?
22. What is “charging by contact”?
23. What is “charging by induction”?
24. What is electrical polarization?
25. What are three ways objects become electrically charged?