

Section 9.3 Explaining Static Electricity – Answer Key

1) What theory was accepted by scientists for over a hundred years?

The fluid theory was accepted by scientists for over a hundred years.

2) Give a brief explanation of this theory?

The theory described electricity as a fluid, separate from the atoms that make up objects.

3) Who discovered the electron? **J.J Thomson discovered the electron.**

4) What happened to the theory in question # 1 after the electron was discovered? **The fluid theory was no longer accepted.**

5) What does all matter consist of?

All matter is made of atoms with a positively charged nucleus containing protons and neutrons, and negatively charged particles that surround the nucleus.

6) Define conductor. **A conductor is a material that allows heat and electrons to move freely through it.**

7) Why is silver a better conductor than aluminum? **Silver is a better conductor because it allows electrons to move more freely through it.**

8) How do electrons travel through conductors? **Electrons travel through conductors by moving from one atom to the next.**

9) Define insulator. **An insulator is a material that does not allow electrons to move freely.**

10) Do all insulators hold onto their electrons the same amount? **No, all insulators do not hold onto their electrons the same amount.**

11) What happens when two oppositely charged objects approach each other, but do not touch? **If the charge is great enough, there will be an electrical discharge or a spark.**

12) What happens after the spark? **After the spark the objects are no longer charged.**

13) Is dry air a good conductor or insulator? **Dry air is a very poor conductor. It should normally not allow electrons to move through it.**

- 14) Do all atoms have the same characteristics? **No, different atoms have different characteristics.**
- 15) Can protons move from one material to another? **No, protons cannot move from one material to another.**
- 16) What is it called when materials gain electrons? **Materials that gain electrons can be called negatively charged.**
- 17) What is it called when materials lose electrons? **Materials that lose electrons can be called positively charged.**
- 18) Is the Earth a good conductor? Explain. **Earth is not an excellent conductor but because of its size, it can take or give up lots of electrons without any major change to its overall charge.**
- 19) What can grounding prevent? **Grounding can prevent serious accidents.**
- 20) What should always be grounded? **Electrical wiring in homes, businesses and industries should always be grounded.**
- 21) What could happen if a refrigerator was not grounded? Explain. **If the wiring in a refrigerator became loose and touched the casing of the fridge, then the case would have a large charge. If a person touched the door, then that person could receive a dangerous shock.**
- 22) What materials are sensitive to surges of electrical energy? **Electronic instruments such as computers are very sensitive to surges of electrical energy.**
- 23) What is a common way to ground wiring? **A common way to ground wiring is to connect a wire to copper water pipes that go deep into the Earth below the building.**
- 24) What does the third prong do on a plug? **The third prong on a plug connects to the ground wire.**