

# Understanding: Electricity

Name: \_\_\_\_\_

This worksheet goes with the movie *Understanding: Electricity*

1. Even the King has to obey the laws of \_\_\_\_\_ . 00:15
2. Current flows into the Earth where there are \_\_\_\_\_ and flows out where there are \_\_\_\_\_ 02:19
3. There is a 200 – 300 volt difference between our \_\_\_\_\_ and our \_\_\_\_\_ . 02:29
4. Ben \_\_\_\_\_ originated the terms positive charge and negative charge. 03:09

## Striking Discoveries

5. The rockets are used to direct lightning to hit simulated \_\_\_\_\_ and \_\_\_\_\_ lines. 03:43
6. If Ben's kit had indeed been hit by lightning, what would be the likely outcome? 04:07
7. The wire attached to the rocket provides a \_\_\_\_\_ for the lightning to follow. 04:21
8. The rocket wire is disintegrated into a green vapour by the \_\_\_\_\_ amps of current in the lightning bolt, as compared to the \_\_\_\_\_ amps of current in a wall electrical outlet. 05:12
9. The temperature of the lightning is about \_\_\_\_\_ or six times hotter than the surface of the \_\_\_\_\_. 05:20
10. It is the \_\_\_\_\_ that are torn from atoms to create electricity. 05:47
11. The \_\_\_\_\_ between the charge is measured in volts. 06:10
12. Electrons flow from \_\_\_\_\_ to \_\_\_\_\_. 06:17
13. Copper has a lot of \_\_\_\_\_ held electrons so it is a good \_\_\_\_\_. 06:50
14. Clay and rubber are good insulators because their electrons are \_\_\_\_\_ bound to their atoms. 06:56
15. Electromagnetism: Electricity can make \_\_\_\_\_ and magnetism can make \_\_\_\_\_. 07:17

## Electricity in Space

16. What was produced in space on Feb. 25, 1996? \_\_\_\_\_ 08:14 – 08:19
17. The experiment was based on the principle that if you move a \_\_\_\_\_ through a magnetic field, \_\_\_\_\_ start to flow. 08:37
18. The resulting electrical current can flow through a \_\_\_\_\_. 08:43
19. The wire (or cable,) was \_\_\_\_\_ long! 08:52
20. The motion of the wire was due to the space shuttle \_\_\_\_\_ the Earth. 09:12
21. The moving wire generated \_\_\_\_\_ volts! 09:18
22. The tether eventually broke because a \_\_\_\_\_ burned through the wire. 10:42
23. Utilities have to \_\_\_\_\_ their lines. 12:57

## A High-wire Act

24. The web of power lines is called a \_\_\_\_\_. 13:12
25. The power lines carry \_\_\_\_\_ volts! 13:24
26. Mixing aviation with \_\_\_\_\_ is dangerous! 13:50
27. Spider's suit is made of lightweight stainless-steel thread. This suit provides a \_\_\_\_\_ for electric current so that the electricity \_\_\_\_\_ though his body. 14:46
28. If the helicopter gets too close between a power line and a tree, the current may flow (arc) \_\_\_\_\_ the helicopter and the tree and \_\_\_\_\_ out the power line. 16:10

29. The metal wand provides a \_\_\_\_\_ path for electricity when the helicopter gets close to the wire. 17:53
30. What is of greater concern, a half million volts or the current flow? \_\_\_\_\_ 18:47
31. It only takes \_\_\_\_\_ of current to stop a human heart. 19:03
32. Water pressure is like \_\_\_\_\_ while the amount of water flowing is like \_\_\_\_\_. 19:30
33. Electrical measurements are based upon \_\_\_\_\_ of \_\_\_\_\_. 19:37
34. One amp of current has sixteen quintillion electrons moving through a wire in \_\_\_\_\_. 19:46

### **Generating the Juice**

35. The Hoover Dam converts the \_\_\_\_\_ of falling water into electrical \_\_\_\_\_. 20:58
36. Write the equation involving volts, amps, and watts: \_\_\_\_\_ 22:16
37. One \_\_\_\_\_ is equal to one thousand watts. 22:22
38. Each generator produces \_\_\_\_\_ volts. 22:50
39. "Volts of alternating current"? Is this correct? YES / NO 22:50
40. The falling water spins a \_\_\_\_\_. The turbine spins a \_\_\_\_\_ inside a coil of wire. This spinning magnet causes \_\_\_\_\_ to move in the wire. An electrical current is produced. 23:17
41. Direct current flows without any \_\_\_\_\_. 23:27
42. Alternating current: The electrons flows to the \_\_\_\_\_ and then back to the \_\_\_\_\_. 23:53
43. The 16,500 V of electricity are boosted to \_\_\_\_\_ volts for transmission over long distances. 24:14
44. When the electricity arrives at your home, it is "stepped down" to \_\_\_\_\_ volts. 24:21

### **Lighting the Night**

45. A light bulb lights because it's filament offers \_\_\_\_\_ to the flow of \_\_\_\_\_. 29:02
46. The resistance of the tungsten filament causes it to heat up to \_\_\_\_\_. This releases \_\_\_\_\_. 29:34
47. What is the greatest threat to the Fremont Street Experience? \_\_\_\_\_ 30:00
48. Neon and fluorescent lights use electricity to \_\_\_\_\_ atoms, thus producing \_\_\_\_\_. 30:39

### **Electric Eden**

49. What is "Electric Eden"? \_\_\_\_\_ 31:01
50. Who created this Electric Eden? \_\_\_\_\_ 31:12
51. \_\_\_\_\_ was introduced at \_\_\_\_\_. 31:42
52. The electric motor that drives the Cyclone roller coaster has been in service for \_\_\_\_\_ years! 32:35
53. An electric motor is simply a \_\_\_\_\_ in reverse. It turns \_\_\_\_\_ into \_\_\_\_\_. 32:51
54. Who saw the connection between lightning and muscle movement in frog's legs? \_\_\_\_\_ 34:36

### **The Beating Heart**

55. A heart beats because electrical \_\_\_\_\_ spread through the heart, triggering and co-ordinating movement. 35:28
56. Electricity in our bodies is created by \_\_\_\_\_ reactions between cells. 35:55