J. J. Thomson Life Story Worksheet (Includes Answers)

Resources:
https://www.youtube.com/watch?v=b2rIKHTliA0
www.somethingcalledscience.com/post/jj-thomson-life-story

J.J. Thomson: The Electron Discovery Worksheet

Name: _____ **Date:** _____

Part 1: Multiple Choice

Circle the correct answer for each question.

1. In what year did J.J. Thomson discover the electron?
   - a) 1856
   - b) 1891
   - c) 1897
   - d) 1906
2. How old was Thomson when he started college?
   - a) 14 years old
   - b) 18 years old
   - c) 21 years old
   - d) 27 years old
3. What did scientists create to study cathode rays?
   - a) A microscope
   - b) A glass tube with a vacuum
   - c) A magnetic field generator
   - d) A lightning rod
4. How much lighter is an electron compared to a hydrogen atom?
   - a) About 100 times lighter
   - b) About 500 times lighter

- c) About 2,000 times lighter
- d) About 10,000 times lighter

5. What was Thomson's atomic model called?

- a) The solar system model
- b) The plum pudding model
- c) The chocolate chip model
- d) The nuclear model

Part 2: True or False

Write T for True or F for False next to each statement.

6. _____ Before Thomson's discovery, people thought atoms could be broken down into smaller pieces.
7. _____ Thomson personally invented the word "electron."
8. _____ Cathode rays were attracted to positive electrical charges.
9. _____ Thomson won the Nobel Prize in 1906.
10. _____ Thomson's son also won a Nobel Prize.

Part 3: Short Answer

Answer each question in 1-2 complete sentences.

11. What were the three key observations Thomson made about cathode rays that proved they were particles with a negative charge?

12. Who proposed that electrons orbit the nucleus like planets orbit the sun, and in what year?

13. Why was Thomson's plum pudding model important even though it wasn't completely correct?

14. Name three modern technologies that depend on our understanding of electrons.

Part 4: Fill in the Blanks

Complete each sentence using words from the word bank.

Word Bank: Cavendish, Westminster Abbey, Ernest Rutherford, nucleus, 1908, electrons, George Johnstone Stoney

15. Thomson became head of the _____ Laboratory at age 27.

16. The term "electron" was first coined by _____.

17. Thomson's student _____ discovered that atoms have a dense, positively charged center.

18. A _____ is the small, dense, positively charged center of an atom.

19. Thomson was knighted in _____.

20. Thomson was buried in _____, near Isaac Newton's grave.

Part 5: Critical Thinking

21. Before Thomson's discovery, people thought atoms were the smallest possible pieces of matter. Explain in your own words why Thomson's discovery was so revolutionary and what it proved about atoms.

22. The text states that "science often works this way: someone makes the best guess they can with the evidence available, and then other scientists improve on it." Give an example from the text that illustrates this statement.

23. How does J.J. Thomson's work from over 100 years ago still affect your daily life today? Give specific examples.

Answer Key

Part 1: Multiple Choice

1. c) 1897
2. a) 14 years old
3. b) A glass tube with a vacuum
4. c) About 2,000 times lighter
5. b) The plum pudding model

Part 2: True or False

6. F (They thought atoms were solid and couldn't be broken down)
7. F (George Johnstone Stoney coined the term in 1891)
8. T
9. T
10. T

Part 3: Short Answer

11. Thomson observed that: (1) the rays were pulled toward positive electrical charges, (2) the rays were pushed away from negative charges, and (3) the rays could be bent by magnets.

12. Niels Bohr proposed that electrons orbit the nucleus in specific paths in 1913.

13. Thomson's plum pudding model was an important first step in understanding atomic structure. It showed scientists were thinking about atoms as having internal parts, even though the exact arrangement wasn't right yet.

14. Any three of: smartphones, computers, TVs, video games, LED lights, electric cars, medical equipment, battery charging devices, or any other reasonable electronic technology.

Part 4: Fill in the Blanks

15. Cavendish
16. George Johnstone Stoney
17. Ernest Rutherford
18. nucleus
19. 1908
20. Westminster Abbey

Part 5: Critical Thinking

21. **Sample answer:** Thomson's discovery was revolutionary because it proved that atoms were not solid, unbreakable spheres as everyone believed. He showed that atoms were made of even smaller parts (electrons), which meant atoms had structure and could be

studied further. This completely changed how scientists thought about matter and opened up new questions about how atoms were put together.

22. **Sample answer:** Thomson first proposed the plum pudding model based on the evidence he had. Then his student Ernest Rutherford discovered the nucleus and improved the model. Later, Niels Bohr made it even better by showing electrons orbit in specific paths. Each scientist built on the previous work to get closer to the truth.

23. **Sample answer:** Thomson's work affects my daily life every time I use electronic devices. When I charge my phone, electrons flow into the battery. When I use my computer or play video games, millions of transistors control electron flow. Without understanding electrons, we wouldn't have any of the technology I use every day, from lights to TVs to smartphones.