

## Atoms and particles

### Worksheet 3

#### TEACHER'S NOTES

**Atom Basics:** Go to: <http://www.chemtutor.com/struct.html> and read the "And you thought you were strange" section to answer the following questions (put answers in the table).

1. What are the three subatomic particles that all atoms are made of?
2. Where are each of the three particles located within the atom?
3. What is the electrical charge of each particle?

| The 3 subatomic particles | Location within the Atom        | Electrical Charge |
|---------------------------|---------------------------------|-------------------|
| Electrons                 | Shells/Orbital's around Nucleus | Negative          |
| Protons                   | Nucleus                         | Positive          |
| Neutrons                  | Nucleus                         | Neutral           |

4. When did Dalton form his Atomic Theory?

**Dalton publish is Atomic Theory in 1808.**

5. What are the four components of Dalton's Atomic Theory?

**1) All matter is made of atoms. Atoms are indivisible and indestructible. 2) All atoms of a given element are identical in mass and properties. 3) Compounds are formed by a combination of two or more different kinds of atoms. 4) A chemical reaction is a *rearrangement* of atoms.**

6. What is the year in which J.J. Thomson discovered the electron?

**In 1897 the British physicist Joseph John (J. J.) Thomson discovered the electron.**

7. What was the evidence for "bodies much smaller than atoms"?

**Thomson in a series of experiments designed to study the nature of electric discharge in a high-vacuum cathode-ray tube, an area being investigated by numerous scientists at the time. He interpreted the deflection of the rays by electrically charged plates and magnets as evidence of "bodies much smaller than atoms" that he calculated as having a very large value for the charge-to-mass ratio. Later he estimated the value of the charge itself.**

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8. What was the model of the atom he proposed in 1904?

**In 1904 Thomson suggested a model of the atom as a sphere of positive matter in which electrons are positioned by electrostatic forces. It is called the Plum Pudding Model.**

9. What makes up the atomic number?

**The Protons in the Nucleus.**

10. What makes up the atomic mass?

**The Neutron and Protons in the Nucleus.**

11. What observation led Chadwick (and Rutherford) to conclude there must be something besides just the proton in the nucleus of atoms?

**Using an experimental method for tracking particle radiation His experiments were successful. He was able to determine that the neutron did exist and that its mass was about 0.1 percent more than the proton's.**

12. What is the something-besides-just-the proton called?

**It was called a Neutron.**