

## Models of the Atom Homework - Answers

Select the best answer from the options below:

1. How are electrons arranged in an atom?
  - a. In groups of five
  - b. By shape
  - c. In energy levels
  - d. By color
  
2. Name the scientist who used an alpha-particle scattering experiment to investigate the structure of the nucleus in the atom.
  - a. John Dalton
  - b. James Chadwick
  - c. Ernest Rutherford
  - d. Lord Kelvin
  
3. Where does the majority of the atoms mass exist?
  - a. In the electron cloud
  - b. In the nucleus
  - c. In the neutrons
  - d. In the space between the electron cloud and the nucleus
  
4. Which of the following have a positive charge?
  - a. Quarks
  - b. Electrons
  - c. Protons
  - d. Neutrons
  
5. Which of the following have a neutral charge?
  - a. Quarks
  - b. Electrons
  - c. Protons
  - d. Neutrons
  
6. Which of the following statements is/are correct regarding the Bohr Model?
  - a. Move at a very high velocity around the nucleus
  - b. Electrons can move between energy levels when they gain or lose energy
  - c. Electrons can exist in different energy levels in orbit around the nucleus
  - d. All of the above

Name the scientist who proposed the following:

7. Atoms are not indivisible.
  
8. Electrons can change energy levels and behave as both waves and particles.

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Due Date: \_\_\_\_\_

## **Models of the Atom** Homework - Answers

9. The nucleus requires more than just positive particles.

**For each of the statements below, give the evidence which supports it.**

10. Most of an atoms mass is concentrated in its nucleus

11. Neutrons were also present in the nucleus

12. Electrons can move energy levels.

**For each of the statements below, give the evidence which disproves it.**

13. The atom contains electrons floating throughout it.

14. Atoms are indivisible.

15. All atoms are identical.

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Name the scientist who proposed the following:

- Atoms are not indivisible.  
**Thomson**
- Electrons can change energy levels and behave as both waves and particles.  
**Erwin Schrödinger**

## Models of the Atom Homework - Answers

9. The nucleus requires more than just positive particles.

Rutherford proposed this idea, which was proved by Chadwick

**For each of the statements below, give the evidence which supports it.**

10. Most of an atoms mass is concentrated in its nucleus

Some alpha particles were able to pass through the atom (empty space), while others were deflected (i.e. they hit a central mass).

11. Neutrons were also present in the nucleus

If there were only positively charged protons in the nucleus, it would in theory break apart due to the repulsive forces between the like-charged protons, however this does not occur.

12. Electrons can move energy levels.

Photons are emitted when electrons return to their "ground" energy level.

**For each of the statements below, give the evidence which disproves it.**

13. The atom contains electrons floating throughout it.

Alpha particles were able to pass through the atom in many cases without colliding with any other subatomic particles.

14. Atoms are indivisible

The existence of subatomic particles – electrons, protons and neutrons

15. All atoms are identical.

The discovery of isotopes – i.e. a variation in the number of neutrons.