7 AZU TOM

It's time for... THE HISTORY OF THE ATOM



Democritus (400 B.C.)

- Despite having no evidence, proposed that matter is made of about 100 tiny particles called that collide and combine to make everything.
- What does the word "atom" mean in Greek?
- His theory was not widely believed, even though it turned out to be correct.









Denied the existence of atoms.
Said matter consisted of combinations of only four elements -- _____, _____, _____, _____, _____, _____, _____, _____, _____, and ______.
Was widely respected, and his ideas formed the basis of science for nearly 2000 years.
Lead to _______ and superstition.





John Dalton's Atomic Theory (1800)

- 1. All elements are composed of atoms, which are ______ and ______ particles. Atoms are the smallest particles of nature.
- 2. All atoms of the same element are exactly alike; in particular, they all have the same _____.
- 3. Atoms of different elements are different; in particular, they have different masses.
- 4. Compounds are formed by the ______ of atoms of two or more elements. They are joined in a definite whole-number ratio, such as 1 to 1, 2 to 1, 3 to 2, etc.
- 5. Chemical reactions involve the ______ of atoms to make new compounds.



1879 William Crookes







Proved that Crookes' negative "beam" was really a stream of particles he called "_____.

Realized that these electrons must be smaller than the atom

Developed the "_____ model of the atom





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Plum Pudding Model



Ernest Rutherford - 1911

Performed _____

• Won Nobel Prize for Chemistry



The Gold Foil Experiment

Bombard thin piece of gold foil with alpha particles Result: a few are deflected while most are unaffected What does it all mean?



Rutherford's Planetary Model of the Atom

 Compares electrons orbiting the nucleus of an atom to orbiting around the



BUT...

 If the nucleus is positive in the middle, and the electrons are negatively charged on the "edges" of the atom, what would YOU expect to happen to the atom?

Niels Bohr (1913)

- Supported Rutherford's model of the atom, but helped to explain its



- Electrons are in "_____" at specific distances from the nucleus.
- Each energy level has specific amounts of energy.
- Electrons are only "allowed" to have certain amounts of energy.

The Bohr Model of the Atom

- Still compares electrons orbiting the nucleus to planets orbiting around the sun, but adds this idea...
- Electrons occupy distinct
- Energy levels have specific energies and distances from the nucleus.





Erwin Schrodinger (1925)

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- Regions where electrons are most likely found are called "________."
- Different types of orbitals have different shapes and different levels of energy.
- This new model of the atom explained the physical properties of atom and the Periodic Table perfectly.



James Chadwick 1932

•Discovered the while doing experiments with radioactive elements

•Predicted by Rutherford in 1920, but very difficult to detect since it has no charge.

1980's



-The first atoms are seen with scanning timeling croscopes

+ Picture of

1995

Fermi lab scientists in Batavia, Illinois study and detect six types of _____ (up, down, charm, strange, top and bottom)

Quarks are particles believed to make up protons and neutrons

