

Developing Models of Matter

About 450 BC

- Greek Philosopher Empedocles
- Earth, Air, Wind, Fire

About 400 BC

- Democritus
- matter made of tiny particles
- called them *atoms*



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About 350 BC

- Aristotle
- very influential because he was educated
- Empedocles model accepted for nearly 2000 years

AD 500-1600

- Alchemists-part philosopher, mystic, magician and chemist
- developed many of our current procedures and tools but still accepted the 4 element model



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About 1650

- Robert Boyle
- developed a new definition for "element"
- " a pure substance that cannot be broken down into simpler substances"

About late 1700's

- Priestly, Lavoisier and Cavendish
- isolated oxygen and later hydrogen and recognised them as elements



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1808

- John Dalton
 - All matter is made of tiny particles
 - Each element has its own kind
 - Compounds are created when elements combine
 - atoms cannot be created or destroyed



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1800's

- 1831-Michael Faraday
 - matter must contain positive and negative charges
 - opposite charges attract, like charges repel
 - atoms combine to form compounds because of electrical attractions



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1904

- JJ Thomson
- "raisin bun" model
 - atoms contain particles called electrons
 - electrons are very small and negative
 - remainder is a sphere with a positive charge
 - electrons are "embedded" in this sphere, resulting in an uncharged atom



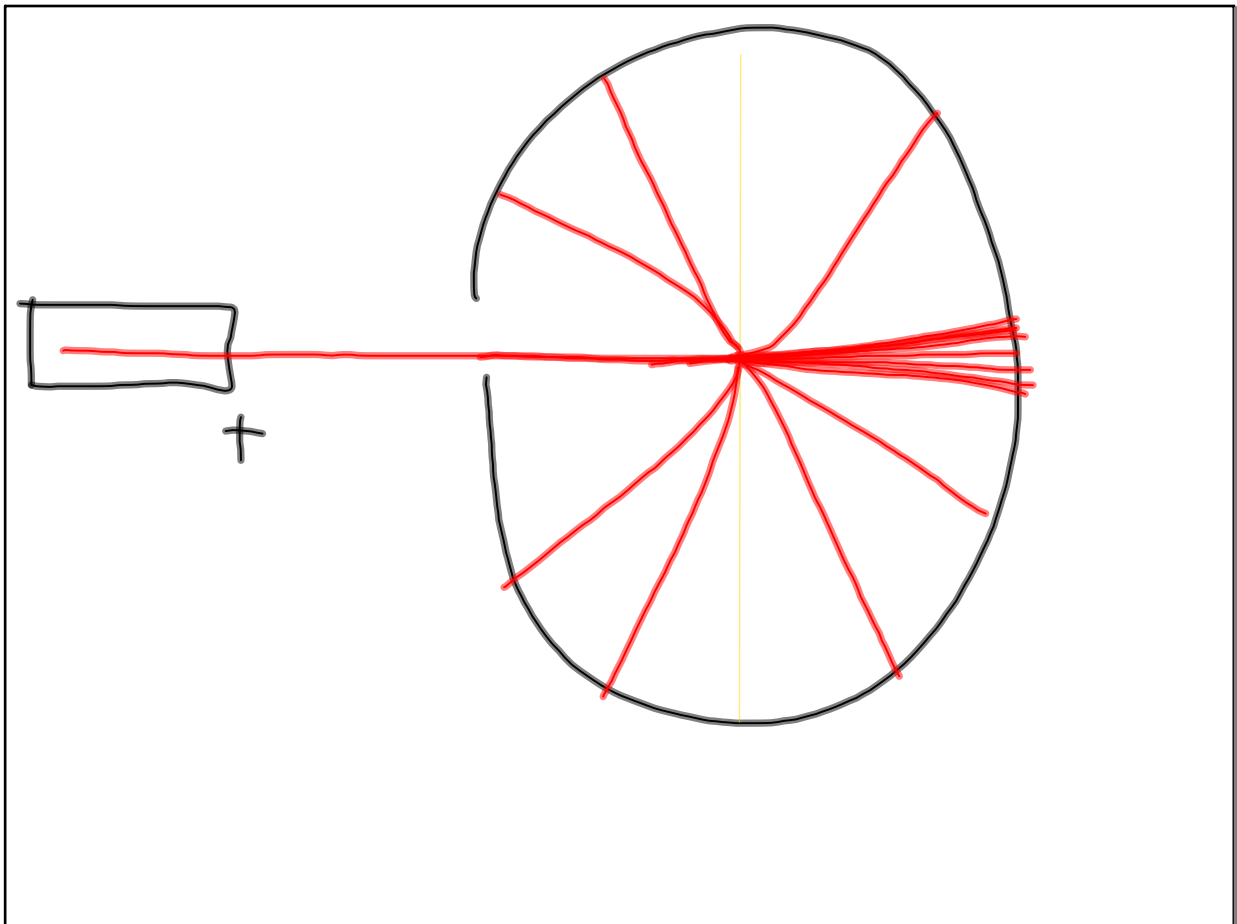
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1911

- Ernest Rutherford
- gold foil experiment
 - a tiny dense positive core called the nucleus
 - surrounded by mostly empty space containing the rapidly moving negative electrons



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Inside the Atom

-atoms consist of sub-atomic particles

protons-positively charged

electrons-negatively charged

neutrons-neutral

-the number of protons is significant since it is this that determines what the element actually is

atomic number = number of protons

number of protons = number of electrons

number of neutrons = mass number - number of protons

-a charged atom is called an ion

-electrons are very small and can be stripped off easily

-since each proton balances each electron, the ion has a charge equal to the number of electrons it has lost

Example: Na^{+1} has lost one electron



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Homework

Rd p. 82-85, terms

Q. # 1-6, p. 85

Rd p. 87-89, terms

Q. # 1-4, p. 89

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