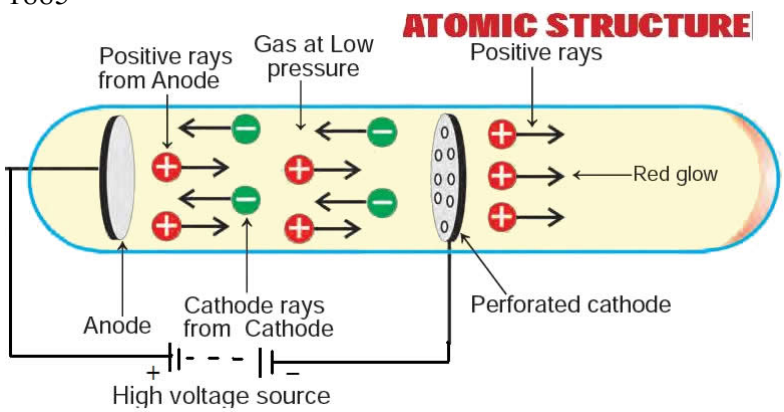
WKS - Honors **Name** _____

Unraveling the Structure of the Atom Part 2 **Period** _____ **Date** _____

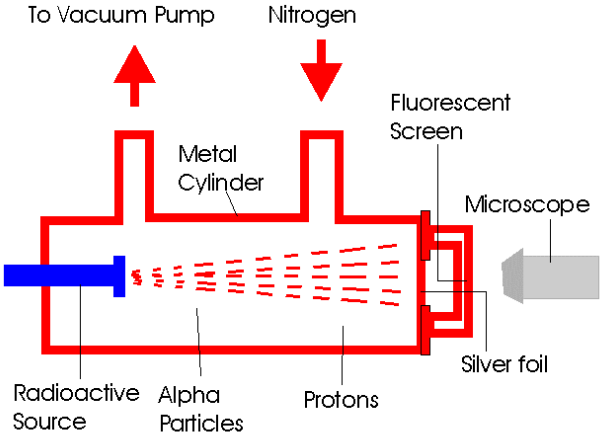
4) Proton Discovery

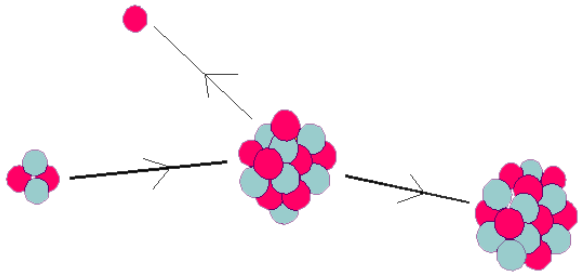
a. **Eugene Goldstein** 1885



- Used a cathode ray tube filled with _____ gases to observe positive "anode rays," which he called _____ but since they had different _____, which depended on the enclosed gas, they couldn't be identified as a single particle

b. Rutherford 1917

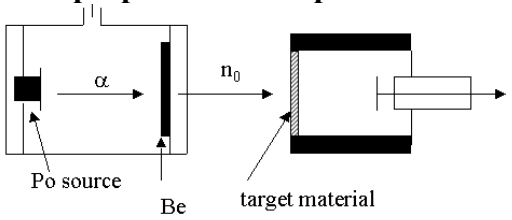




- Showed that hydrogen nucleus present in other atoms by bombarding N in air with a particle: $^{14}N + \alpha \rightarrow {}^{17}O + {}^{1}H$ so ^{1}H must be _____
- Charge of proton = _____
- Mass of proton = _____. This is _____ times the mass of an electron.

5) ***James Chadwick :*** English scientist; 1932

- Atom had more mass than + charge (about 2×) — must be something else in nucleus
- Found evidence for the existence of a third particle within the atom called the _____
- **His experiment**: Beryllium was bombarded with alpha particles (positively charged particles) --a yet undiscovered particle was given off. **Show reaction and list the properties of this particle**:



- The discovery of the _____ led to the understanding of what makes up the total mass of an atom.
- The total mass of an atom = mass of _____ + mass of _____ + mass of _____
- However, one of these particles is so light that its **mass is negligible**. Which particle is this?_____
- Thus the mass of an atom (or mass number) is equal to _____ + _____