- So far: matter at the "gross" (macroscopic) level *(Chapter 1)*
  - Physical properties, physical changes
  - Chemical properties, chemical changes
- Now: matter at the <u>atomic</u> level *(Chapter 4)*
  - Particle model of matter (Bohr model)

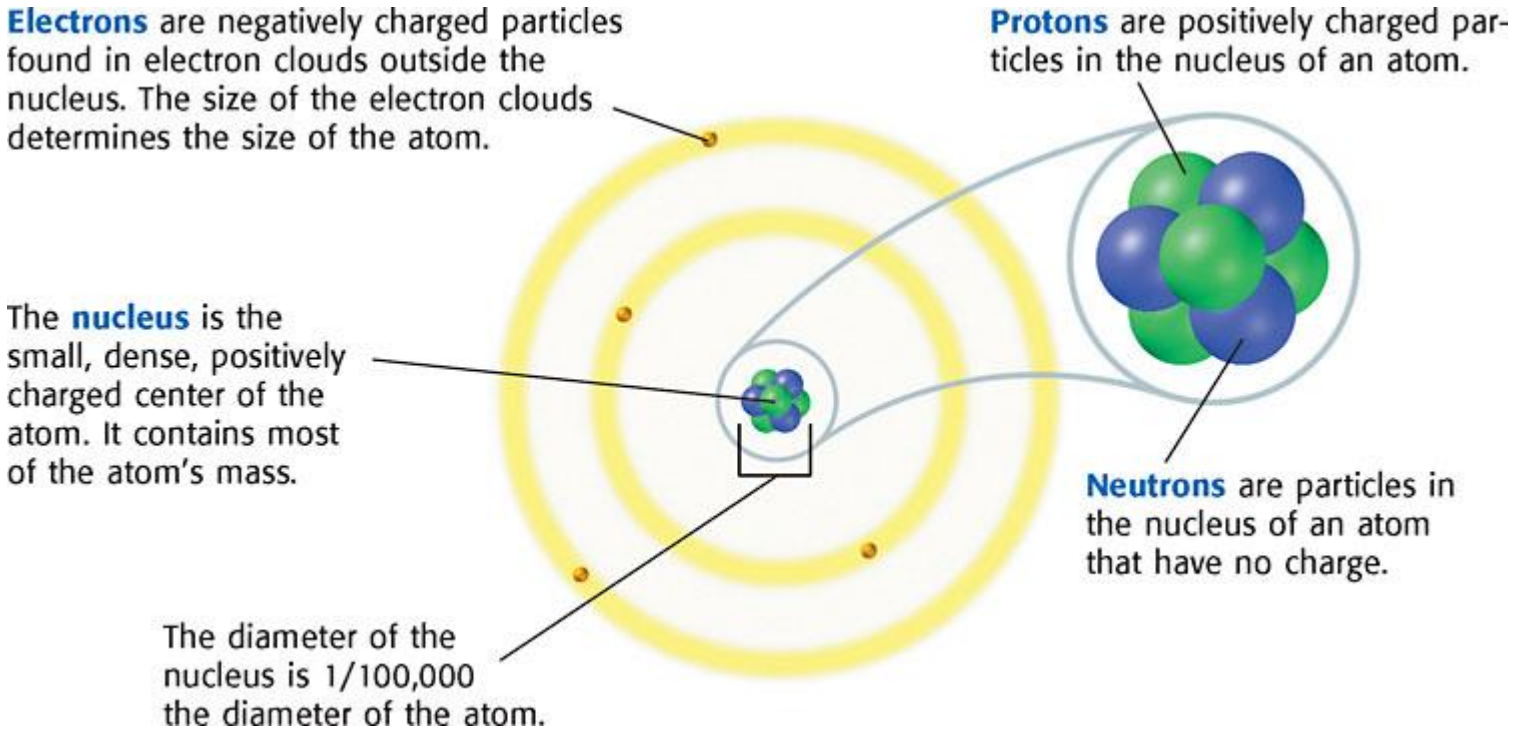


Figure from page 89 of your textbook (*Introduction to Matter*)

8th grade Science, November 28th

- Historical models of the atom
    - Democritus (440 BC)
    - Aristotle (400 BC)
    - John Dalton (1803)
    - J.J. Thomson (1890)
    - Ernest Rutherford (1909)
    - Niels Bohr (1912)
    - Schrödinger & Heisenberg (1926-1930)

Greek philosophers' models of the atom

- Democritus (~440 BC) – 3 ideas

- Aristotle (~350 BC)

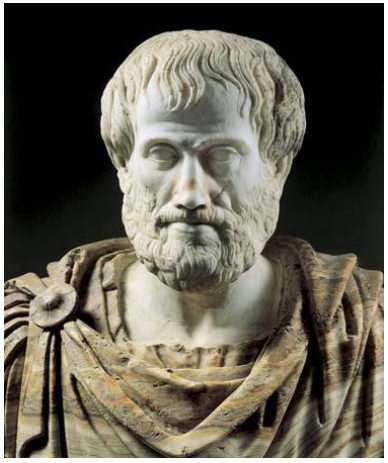


Image of Aristotle sculpture: https://www.britannica.com/biography/Aristotle

John Dalton (1803): atomic theory based on experiments

Dalton's 4 inferences:

Figure from page 83 of your textbook

J.J. Thomson (1890): cathode-ray tube experiment

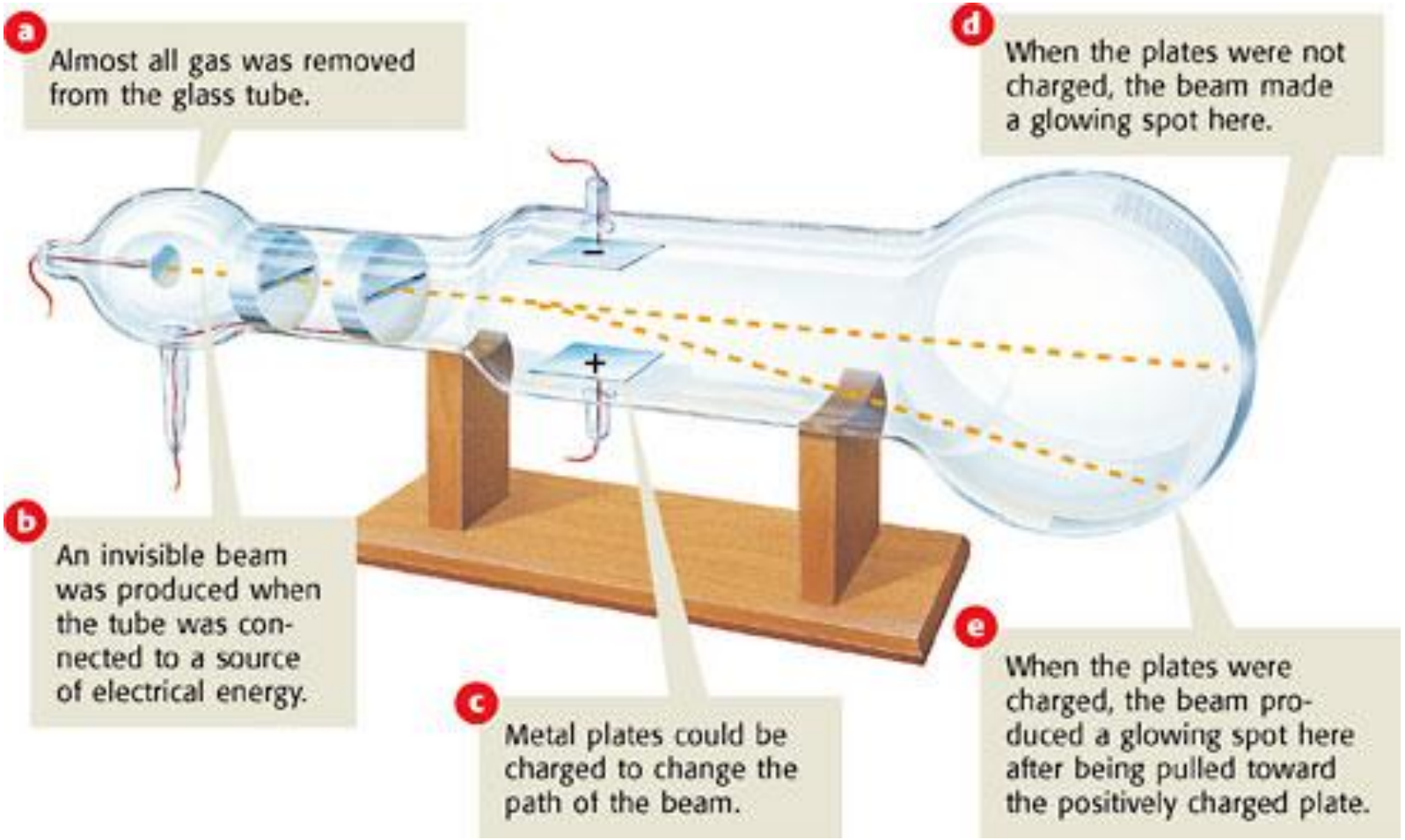


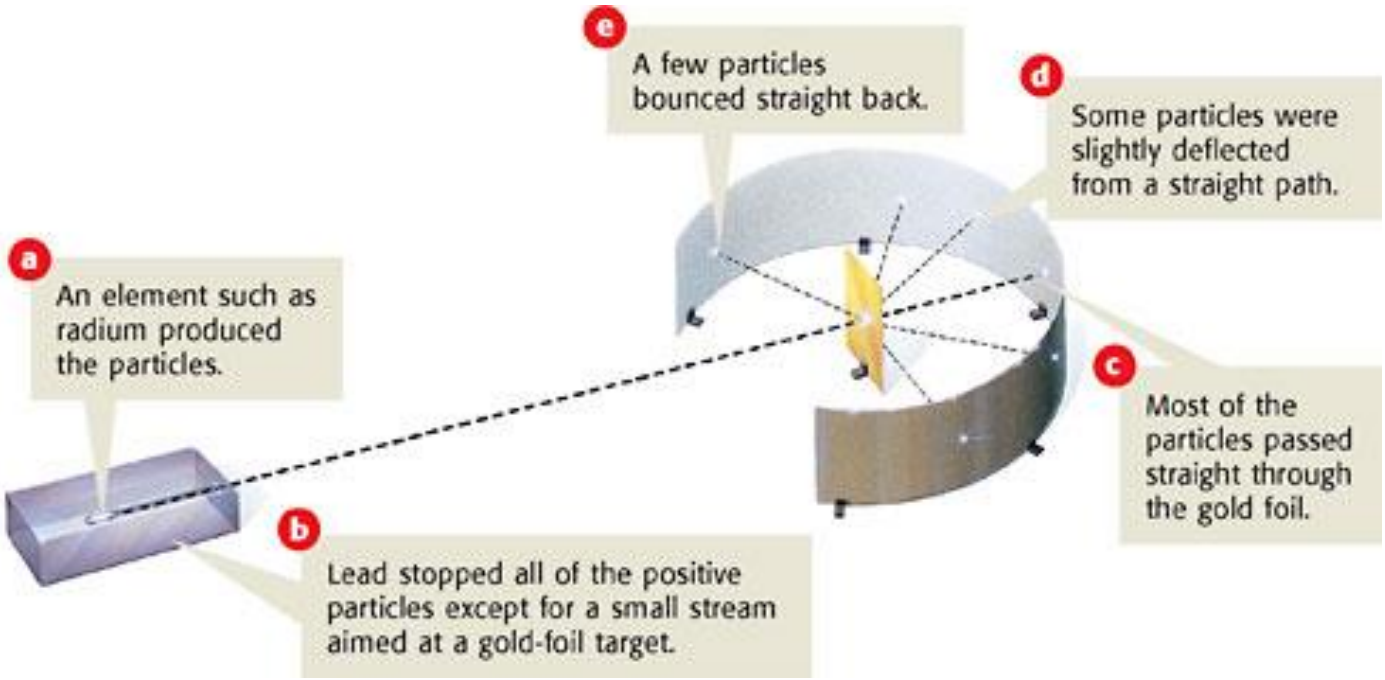
Figure from page 84 of your textbook

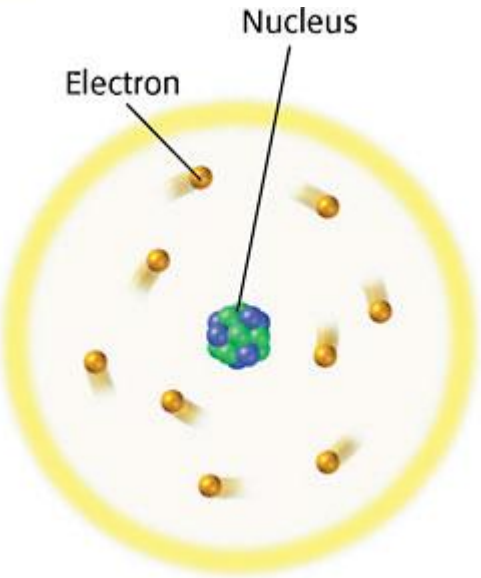
Thomson's "plum pudding" model of the atom

(Can you think of a <u>better</u> analogy?)

Image of plum pudding from https://archives.sfweekly.com/foodie/2010/12/10/sfoodie-advent-calendar-day-8-john-campbells-plum-pudding

Ernest Rutherford (1909): gold-foil experiment





Figures from pages 85 and 86 of your textbook

Niels Bohr (1912): electrons have discrete energy levels

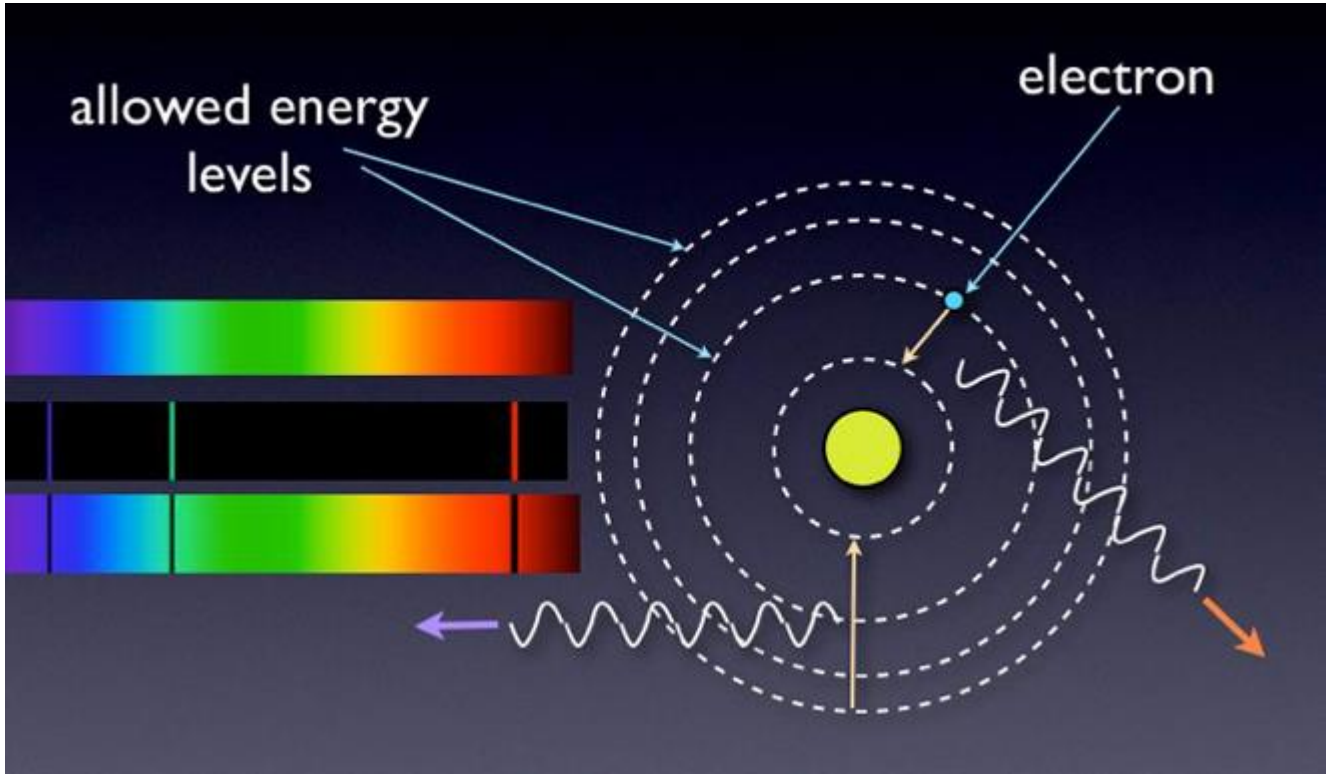


Image: https://www.wired.com/2011/08/the-rutherford-model-of-the-atom-100-years-old/

Schrödinger & Heisenberg (1926-1930): electron clouds

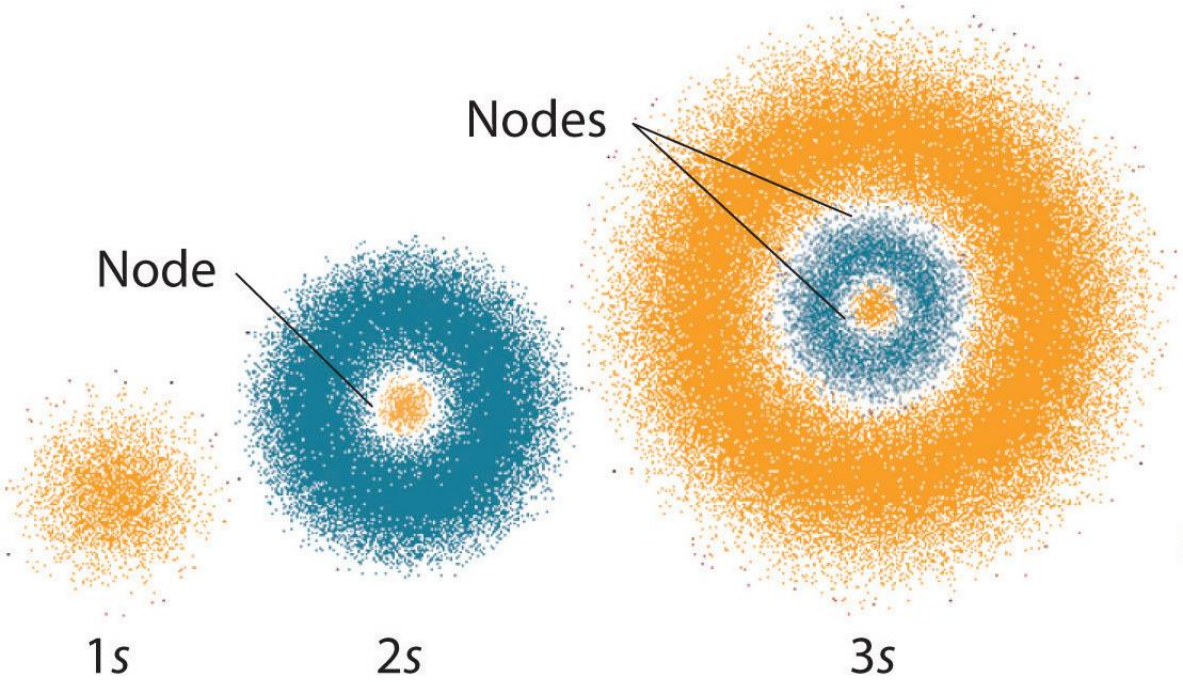


Image: https://www.khanacademy.org/science/physics/quantum-physics/quantum-numbers-and-orbitals/a/the-quantum-mechanical-model-of-the-atom

The Bohr model (below) will be especially helpful as we learn about the periodic table (Chapter 5).

Homework: p. 87, questions 1 through 10

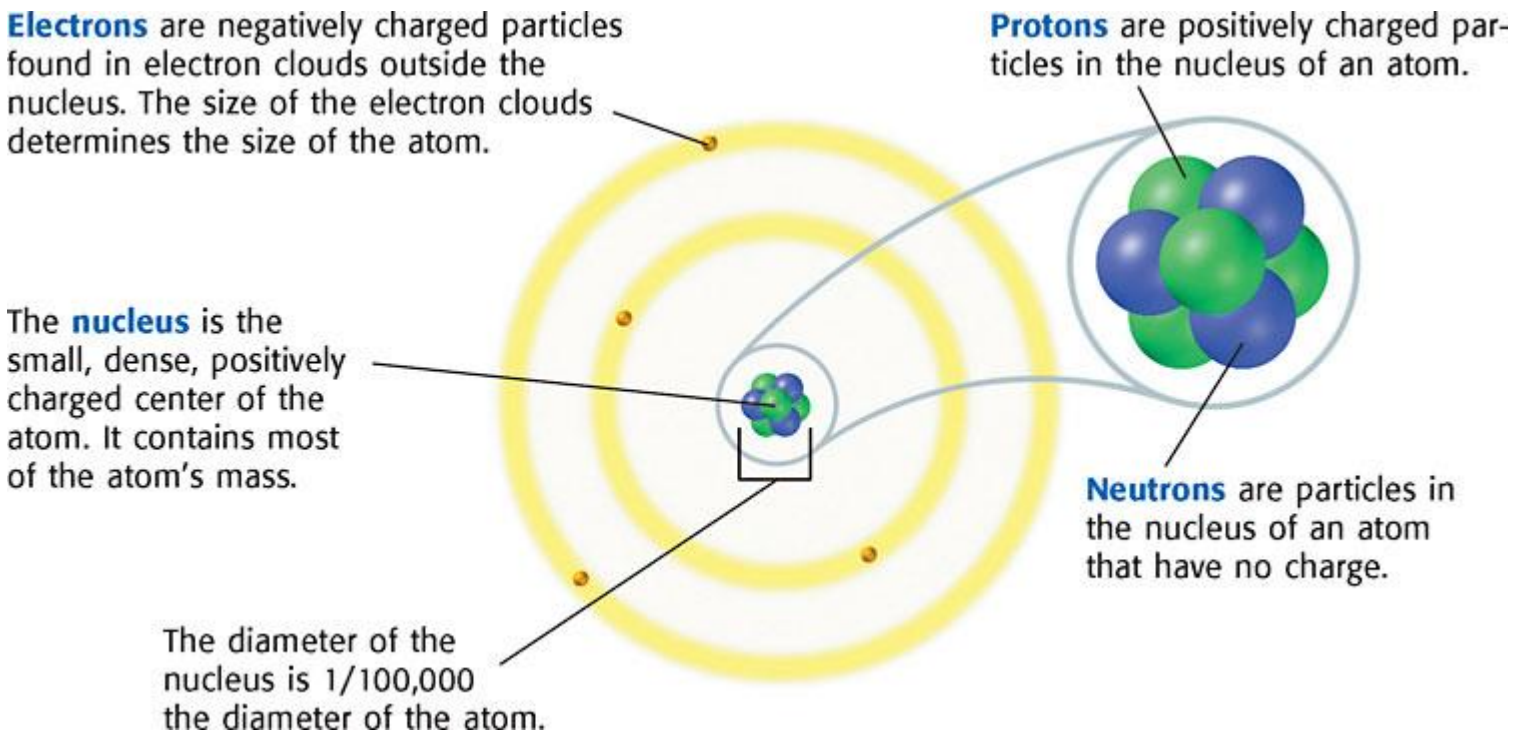


Figure from page 89 of your textbook (*Introduction to Matter*)

Wednesday, November 29

Assignment: draw model atoms!

LO: Illustrate historical models of the atom.

SLE: Convey ideas in a variety of formats.

- Draw model atoms on a piece of drawing paper.
  - Header on the back of the paper.
  - Show these models: Dalton, Thomson, Rutherford, Bohr.
  - Label the parts of each model (e.g., nucleus, electrons).
  - Below each model list 2 facts relevant to that model (e.g., an experiment on which it was based, or a verbal description of key features).
  - Please include some color.
  - Due Thursday, Nov. 30.

Review for Friday (Dec. 1) quiz on matter

- How does the mathematical definition of density relate to the definition of matter?
- Be able to classify a property as a physical property or a chemical property.
- Be able to classify a change as a physical change or a chemical change.
- Summarize the ways each person advanced our understanding of the atom: Dalton, Thomson, Rutherford, Bohr, and Schrödinger/Heisenberg.
- What did Thomson's cathode-ray tube experiment and Rutherford's gold-foil experiment show about atoms?