Atoms and Molecules

I. Focus Question: There are atoms in your body that originated in the Big Bang.

a. Students work in small groups to generate questions on the above statement under the following set of rules: 1. Come up with as many questions as possible.

2. Don’t stop to discuss, judge, or answer any questions.

3. Write down every question as it is stated.

4. Change any statement into a question.

b. Give students time to choose their favorite question, find its answer, and report back to the class.

II. Building blocks of matter – what does that mean?

1. Matter
   1. Definition
   2. States
2. Discovery – Have students watch TED-Ed video: “2,400 Year Search for the Atom” by Theresa Doud, and create timeline
   1. Democritus – apple parts, 460(490) – 370 B.C, Greece
   2. Bohr – planetary model 1885 – 1962, Denmark
   3. Rutherford – mostly empty space
      1. If a proton were as big as a pin head, its electrons would be in Georgetown
      2. If all the empty space were squished out of all of the 7,500,000 humans on the planet, we’d take up as much space as an apple.

III. Sub-atomic Particles

1. Protons, Neutrons, and Electrons
2. Bohr’s Planetary Model
3. How do the particles hold together?
4. Electro-magnetic force
5. Strong atomic force

IV. Periodic Table

1. Atomic symbol, number, mass, and number of protons, neutrons, and electrons
   1. Have students do Atoms chart
2. Periods – horizontal, same number of orbitals
3. Groups – vertical, same number of valence electrons