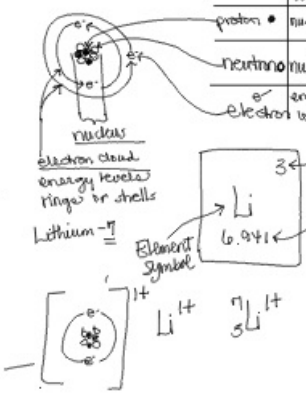
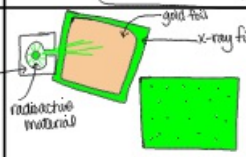
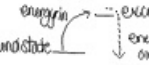
10/20/15 **The Atom**

	where found	mass (a.m.u.)	Charge	Determining quantity (How)
proton ●	nucleus	1	1+	Atomic #
neutron	nucleus	1	neutral	mass # − atomic #
e⁻ electron	energy levels	∅	1−	if neutral #p = #e if Charged #p − #e = Charge



Scientist	What they did	Model	How are we going to remember
Democritus	everything is made of very small particles - Atoms	X	Demo of the atom Demo of the theory
Dalton	Father of The Atomic Theory of Matter 1. Each element is composed of extremely small particles called Atoms — wrong → an atom has sub atomic particles 2. atoms of an element are identical but different than atoms of another element: — wrong → Protons must remain the same but e⁻ + neutron can vary. 3. atoms can not be created or destroyed — wrong → nuclear reactions - half-lives 4. Law of Constant Composition Atoms in a compound exist in a set proportion or relative quantity		Daddy Dalton
JJ Thompson	 cathode ray tubes proved the particles had a negative charge + he named them electrons.	 plum pudding model	JJ is a negative person (neg. particle) JJ - 2 tubes
Millikan	 charged oil drops calculated the size of an electron 1 proton = 1836 e⁻ mass e⁻ = 1/2000 of a proton	X	oil not milk oil Kan
Rutherford	 gold foil, x-ray film, lead box, radioactive material atom is mostly empty space with a very small centered nucleus.	 planetary model	Radioactive Rutherford "You can't a Ford gold"
Bohr	light waves — white light He every element has a unique spectral pattern different levels of excitement for the e⁻ Discovered energy levels  energy in, excited state, energy (light) out, ground state	 Solar system model	Behr Paint Bohr-ring - NOT

Average Atomic Mass

$^{7}_{3}Li = 88\%$ $^{6}_{3}Li = 12\%$

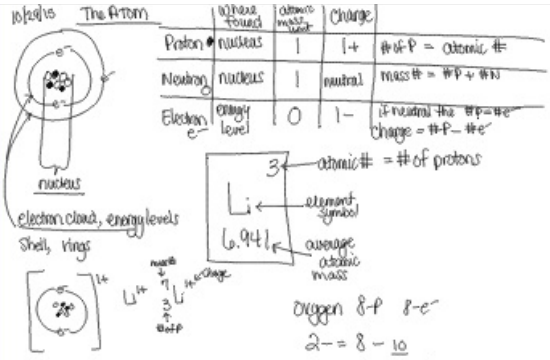
$$\text{ave. at. mass} = \frac{(\text{mass}_1 \times \%) + (\text{mass}_2 \times \%) + (\text{mass}_3 \times \%) \ldots}{100}$$

$$\frac{(7 \times 88\%) + (6 \times 12\%)}{100} = 6.88 \text{ ave. at. mass for Lithium}$$

10/28/15 The Atom

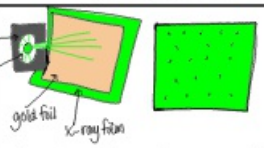
	Where found	atomic mass unit	Charge	
Proton	nucleus	1	1+	# of P = atomic #
Neutron	nucleus	1	neutral	mass # = #P + #N

Electron e^-	energy level	0	1−	if neutral the #P=#e
				Charge = #P − #e



Oxygen 8-P 8-e⁻

2− = 8 − 10

Scientist	What they did	model	How are we going to remember
Democritus	all matter is composed of particles he called ATOMOS	✕	Demo the Atomos
Dalton	Father of the Atomic Theory of Matter 1. The atom is the smallest part of an element (wrong → there are subatomic particles) 2. Atoms of an element are identical, but different from atoms of other elements. (wrong → only the # of protons must be the same) 3. Atoms cannot be created or destroyed. 4. Law of constant Composition (wrong → nuclear decay) Compounds have a constant ratio of kinds Elements (reliable, number)		Daddy Dalton
JJ Thompson	 named electrons, and found they had a negative charge.	 plum pudding model	Thompson Eats Cookies JJ likes pudding
Millikan (milk)	 oil droplets-charged Found the mass of an electron $1e^- = \frac{1}{1834}$ protons or $1e^- = 1/2000$ of a proton	✕	Oil not milk.
Rutherford lead box radio active material gold foil X-ray film	 Atom is mostly empty space with a small centered nucleus.	 planetary model	RAN- Rutherford Atom Nucleus You can't a FORD gold
Bohr	white light H gas He gas every element has a unique Spectrum. e^- move through different levels of energy. absorb energy excited state excited state ground state release energy in the form of light	 added energy levels Solar System model	Bohr's not Balming Bohr: Bohr Paint

Average atomic mass: the average of all naturally occurring isotopes

$^7_3Li = 91\%$ $^6_3Li = 9\%$

$$\text{ave. at. mass} = \frac{(\text{mass\#} \times \%) + (\text{mass\#} \times \%) + (\text{mass\#} \times \%)}{100}$$

$$\frac{(7 \times 91\%) + (6 \times 9\%)}{100} = 6.91 \text{ ave. at. mass}$$