

• **Atomic Structure**

1. Fill out the following table about subatomic particles in an atom

Subatomic particle	Location	Charge	Relative mass
Proton	nucleus	+ positive	1
Neutron	nucleus	0 neutral	1
Electron	electron cloud surrounding nucleus	- negative	0

2. What is an isotope?

Atoms of the same element that have different mass numbers due to different number of neutrons

• **Density**

3. What is density?

Mass of an object divided by the volume.

4. Describe a situation where being able to determine density would be useful.

Could be used to identify objects.

5. Complete the table below.

Mass(g)	Volume(mL)	Density (g/mL)
100	5	20
10	0.16	63
57	10	5.7
9	0.39	23
784	14	56

• **Mixtures, Compounds, and Solutions**

6. Distinguish between a pure and impure substance. Give examples of each

Pure is one type of matter. Example being gold. Impure is more than one type of matter. Example being air, tap water, brass

7. What is the difference between an element and a compound? Give examples of each.

Element is one type of atom. Cannot be broken down. Compounds are made of two or more different elements and can be broken down chemically.

8. What is a mixture? Distinguish between a compound and mixture.

Two or more types of matter that can be separated by a physical process. Compounds can only be separated by chemical processes.

9. Differentiate between homogenous and heterogeneous mixtures. Give examples of each.

Homogeneous is uniform and heterogeneous is not uniform. You can identify the parts to a heterogeneous mixture. Two samples of a homogeneous would be identical. Sodas, air, tap water are all homogeneous. Salad, concrete, trail mix are heterogeneous.

• **Separation Techniques**

10. Describe at least 4 separations techniques discussed in class. Give examples of when these techniques would be used to separate mixtures.

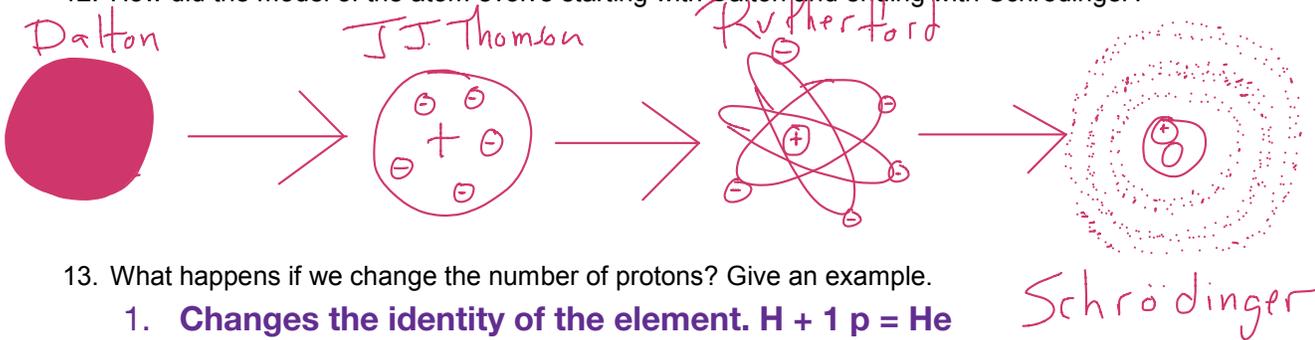
1. **Distillation**
2. **Filtration**
3. **Separating funnel**
4. **Centrifuge**
5. **Decanting**
6. **Evaporation**

11. What techniques would be used to separate the following:

- A. Sand and water: decanting or filtering
- B. Sugar and water: distillation
- C. Oil and water: separating funnel
- D. A mixture of heptane (bp = 98°C) and heptanol (bp = 176°C): distillation
- E. Mixture of salt and iron filings: magnet

• **Atomic Structure**

12. How did the model of the atom evolve starting with Dalton and ending with Schrödinger?



13. What happens if we change the number of protons? Give an example.

1. **Changes the identity of the element. $H + 1 p = He$**

14. What happens if we change the number of neutrons? Give an example.

Make isotopes.

15. What happens if we change the number of electrons? Give an example.

Creates charges making ions.

16. How can we find the number of protons in an atom? atomic #

17. How do we find the mass number of an atom?

$$p^+ + n^0 = \text{mass \#}$$

$$n^0 = \text{mass \#} - p^+$$

18.

Atom/Ion	Atomic Mass	Mass Number	Number of protons	Number of electrons	Number of Neutrons
N^{3-}		14	7	10	7
Au		197	79	79	118
Cl^{-1}		35	17	18	18
Ca^{+2}		40	20	18	20
O^{-2}		16	8	10	8
Ne		20	10	10	10
Cu^{+1}		64	29	28	35