

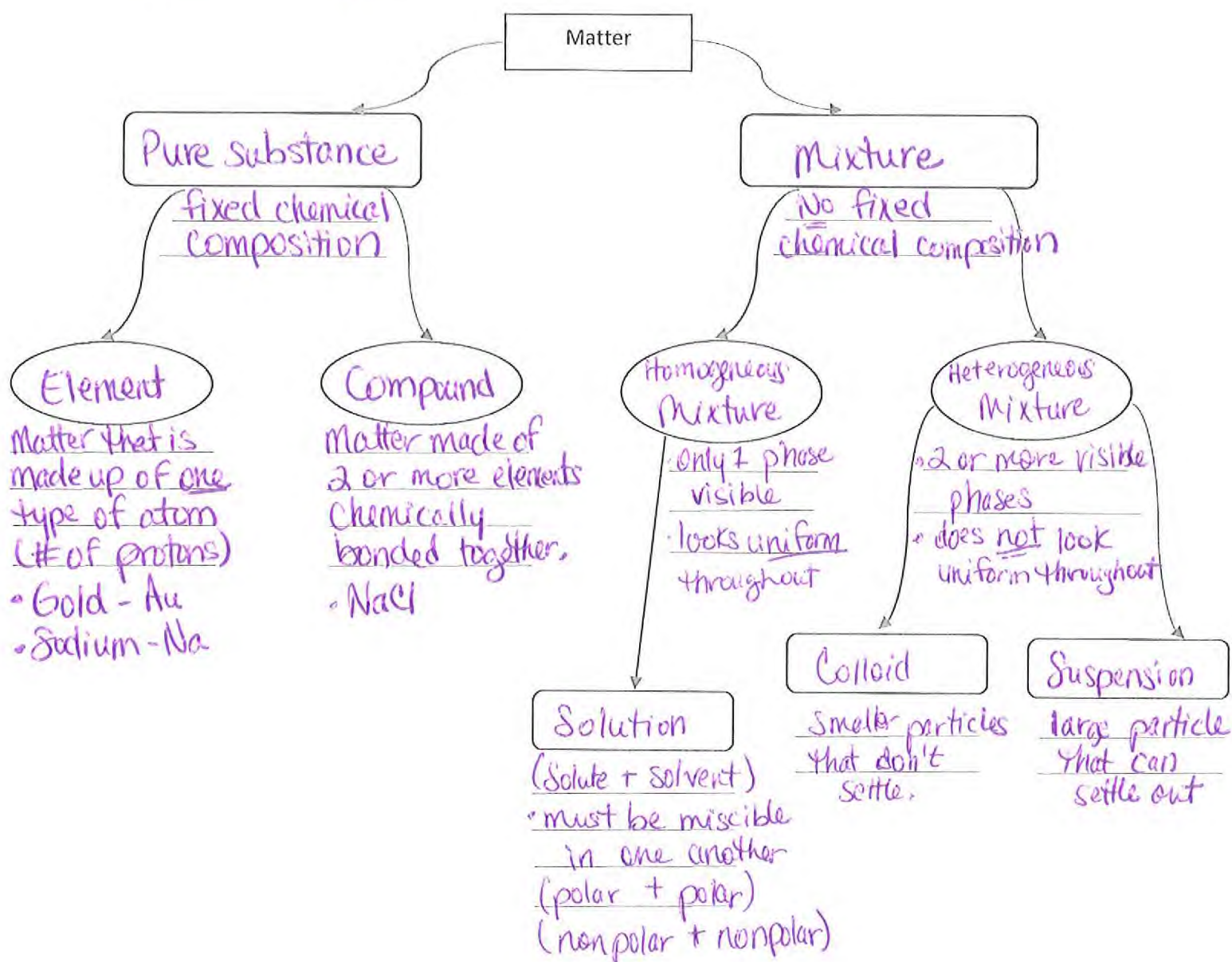
Notes: What is Matter?

Matter is all the material around us that we are able to sense.

Matter has 4 general properties:

- Mass: amount of material in a substance
- Volume: amount of space in a substance
- Density: mass per volume (g/mL) (kg/L)
- Inertia: the tendency of matter to continue doing what it's doing, resistance to change in position

Matter is a broad category for things around us that exist in Solid, liquid, gas or plasma state.



Notes: Changes and Properties of Matter

A. Changes in Matter

Physical Changes in Matter

- Changes to appearance only
- not a change in chemical composition
- State changes (solid \rightarrow liquid \rightarrow gas)
- temporary color changes (dilution of a solution)
- Physical changes take place in physical reactions

Boiling, melting, condensing

Chemical Changes to Matter

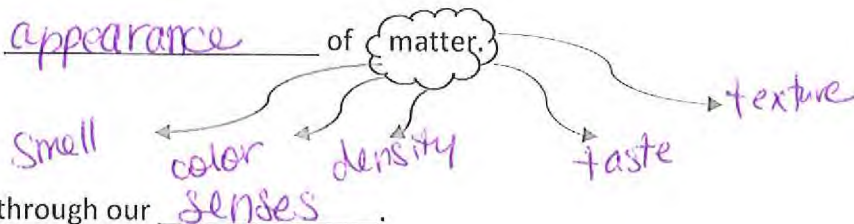
- permanent change to matter
- change in chemical composition by breaking "old bonds" & forming "new" bonds
- Indications of chemical changes
 - permanent color change
 - evolution of a gas from a reaction
 - heat production/given off or absorbed
 - electricity discharge
 - formation of a precipitate
- Chemical reactions cause chemical changes
- chemical changes can be expressed through a chemical equation
 - Example $2H_2O(l) \xrightarrow{\text{electrolysis}} 2H_2(g) \uparrow + O_2(g) \uparrow$



B. Properties of Matter

Physical Properties

- These are characteristics about the appearance of matter.



- We experience physical properties through our senses.

Chemical Properties

- These are characteristics about how the matter behaves



C. Types of Properties

Intrinsic (Intensive)

vs.

Extrinsic (Extensive)

Properties that do not depend on amount of matter present	Properties do depend on how much of your sample is present
Properties are normally in your appendix or reference tables	
Examples: color, odor, luster, conductivity, ductility, melting point, boiling point, freezing point, hardness, density	Examples: mass, volume, weight, length