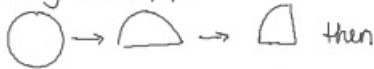
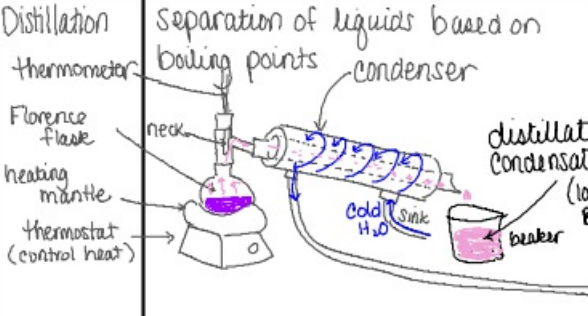
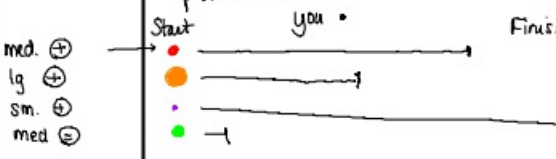
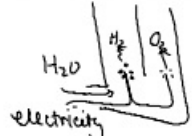


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Separation Techniques:

Methods of separation vary based on the type of mixtures present.

Technique	Method	Type of mixture
By Hand	Visual separation + removal of different pieces by hand.	heterogeneous mixture (lg pieces) Example: Legos trail mix sandwiches
Filtration	Separation of particles by size based on the opening size of a type of equipment. • strainer • air filter • sieve Folding filter paper  then "wet" and place in funnel	heterogeneous mix - Small pieces example: pasta/water Sand/shell air/dust
Crystallization/ Evaporation	evaporation of liquid portion, leaving behind crystals of material that had been dissolved or suspended.	liquid mixtures (homogeneous & heterogeneous) Example: Salt water Rock Candy
Distillation 	Separation of liquids based on boiling points	homogeneous liquid mixtures examples: alcohol/H ₂ O petroleum products
Chromatography 	Separation based on attraction + particle size.	both homogeneous & heterogeneous mixtures - must be in a liquid solvent Examples: ink particles enzymes DNA
Electrolysis 	Separation by electricity - often used to separate compounds into elements.	homogeneous mix & compounds. Example: $2\text{H}_2\text{O}_{\text{liquid}} \xrightarrow{\text{electricity}} 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$
Magnetism	Separation by magnetic properties	homogeneous/heterogeneous Example Fe vs. Al.

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matter: Hmuck

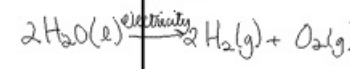
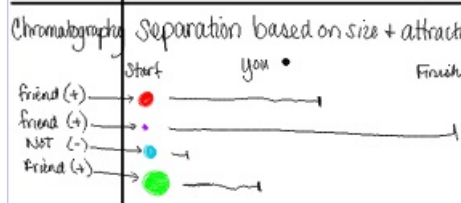
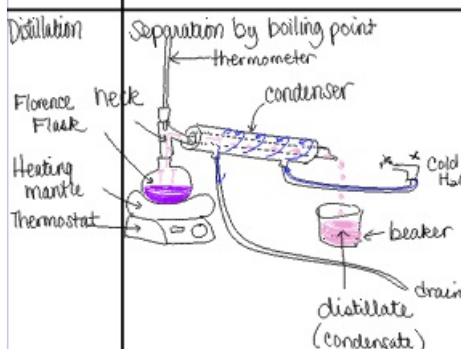
- | | | | |
|------|-------|-------|-------|
| 1 cp | 6 ip | 1 c | 6. c |
| 2 ep | 7 ep | 2 P | 7. c |
| 3 ip | 8 ip | 3 p+c | 8. P |
| 4 ip | 9 cp | 4 P | 9. P |
| 5 cp | 10 ip | 5 P | 10. c |



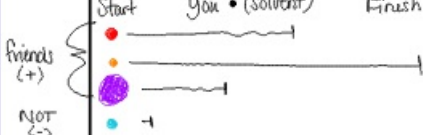
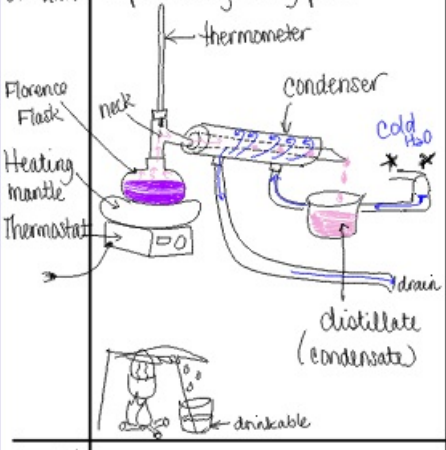

PC: tore, ink colored, crumpled, melted, scraped, dissolved

CC: let the candle, burn, make coffee

- | | |
|-----------|------------|
| 1 soln. | 6 depends |
| 2 element | 7 compound |
| 3 hetero. | 8 compound |
| 4 hetero. | 9 element |
| 5 hetero. | 10 hetero. |

Separation Technique	How it works	(examples) Where it works
Separate by hand	Visually identify the pieces and remove selected ones by hand.	Heterogeneous Mix (med to large pieces) Examples: peas - n. Carrots Fruit salad
Filtration	Separation by size - size of item retained is dependent on opening size. • strainer • sieve • filter	heterogeneous mix. Examples: pasta / H ₂ O Cheese curd / H ₂ O Sand / shells
Magnetism	Separation by magnetic quality	hetero/homogeneous example: Recycling Fe / Al
Crystallization/ Evaporation	Separation by the removal of the liquid portion (evaporation) leaving only the crystals behind.	homogeneous liquid mixture (some hetero. mix) Examples: Salt / H ₂ O Sugar / H ₂ O (Rock Candy)
Distillation	Separation by boiling point	homogeneous liquids Examples: distilled H ₂ O alcohol / H ₂ O petroleum products
Chromatography	Separation based on size + attraction	homogeneous mix. Examples: ink enzymes DNA analysis
Electrolysis	Separation by electricity - can be used to separate compounds into elements.	Compounds + homogeneous mix Example



Separation technique	How the method works	Where the technique works
Separate by hand	visually identify pieces and separate by hand.	heterogeneous mix. examples: Chex mix Lucky charms
Filtration	Separation based on size - the size of the opening controls what goes through. • sieve • strainer • filter  "wet" with the liquid to be separated.	heterogeneous mix examples: pasta/H ₂ O shells/sand dust/air
magnetism 	Separation by magnetic property	Heterogeneous mix (some homog.) examples: metal/cereal recycling: magnetic/non-magnetic
Crystallization/evaporation	Separated by liquid portion evaporating and other portion crystallizing.	homogeneous mix (liquid) example: salt/H ₂ O Rock Candy
Chromatography 	Separation based on size and attraction Start You • (solvent) Finish Friends (+) NOT (-)	homogeneous mix (needs a liquid solvent) examples: ink separation enzymes DNA
Distillation 	Separation by boiling point	homogeneous liquid mix. examples: alcohol/H ₂ O fresh H ₂ O → drinkable H ₂ O petroleum → oil → gasoline
electrolysis 	Separation by electricity - generally used to break apart compounds into their pure elements. $2\text{H}_2\text{O}(l) \xrightarrow{\text{electricity}} 2\text{H}_2(g) + \text{O}_2(g)$	Compounds + homogeneous mix.