

Name: \_\_\_\_\_

Block: \_\_\_\_\_

Date: \_\_\_\_\_

Chemistry 11

**Mixtures Worksheet**

Assignment

1. Identify each of the following substances as pure substances, heterogeneous mixtures, or homogeneous mixtures.

<u>Heterogeneous mixture</u>	alphabet soup
<u>Pure Substance</u>	salt
<u>Heterogeneous mixture</u>	concrete
<u>Homogeneous Mixture</u>	vegetable oil
<u>Homogeneous Mixture</u>	air
<u>Homogeneous Mixture</u>	paint
<u>Heterogeneous mixture</u>	granite
<u>Pure Substance</u>	sugar

2. True/False Questions

- |  |                   |
|--|-------------------|
| a. Drinking water can only be obtained from seawater by distillation.                                  | True <b>False</b> |
| b. The distillation of miscible liquids is only possible if the liquids have different boiling points. | <b>True</b> False |
| c. Paper chromatography is a physical method for separating mixtures.                                  | <b>True</b> False |
| d. Mixtures have fixed melting and boiling points.   | True <b>False</b> |

3. Fill in the Blanks: Complete the following sentences by Choosing the best separation technique for each situation listed below. Each word can be used once, more than once, or not at all.

filtration	crystallization
chromatography	electrolysis
distillation	

- a. Heterogeneous mixtures are often separated by filtration.
- b. Separating sand from water is done by filtration.
- c. The sugar in sugar water can be removed by crystallization.
- d. The separation technique that takes advantage of different boiling points is called distillation.
- e. Removing chlorophyll pigment from leaves might be done by chromatography.
- f. The best way to decompose water into oxygen and hydrogen is by electrolysis.
- g. Crude oil is broken down by heat, vaporized, and allowed to condense into various liquids such as gasoline. This process is called distillation.

4. Name the techniques which are suitable for separating the following mixture:

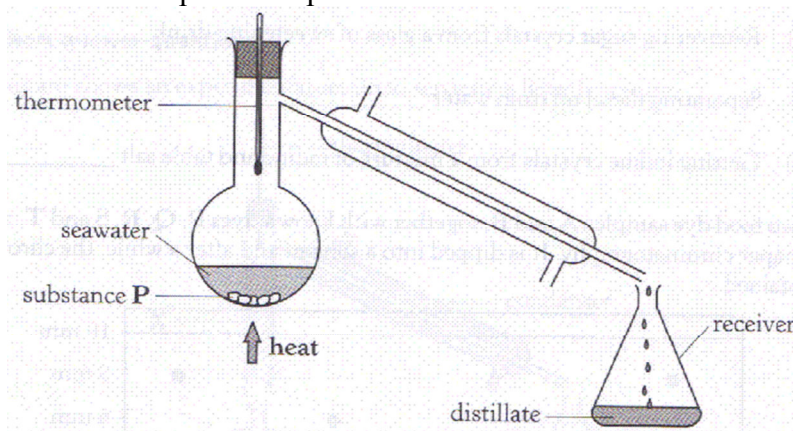
	Situation	Separation Technique(s)
a.	To obtain drinking water from muddy water	Distillation, Evaporation, Filtration
b.	To separate petrol from crude oil	Distillation
c.	To remove leaves from a swimming pool	Filtration, Mechanical Separation
d.	To obtain pure sugar from a solution	Evaporation, Crystallization
e.	To determine whether the colouring in a fruit juice is a single substance or a mixture of coloured substances	Chromatography

5. How would you separate a mixture of iron filings and aluminum filings? mechanical separation using magnets to remove the iron filings and leave the aluminum behind

6. You are asked to separate sand and sodium chloride. Name the methods needed to carry out the procedure. Explain how you would carry out the procedure to obtain pure sand and sodium chloride back.  
Filtration/Extraction and Crystallization. Dissolve the sample with water so the sodium chloride dissolves, filter the mixture so the sand stays in the filter paper (as the residue) and the salt water goes through (as the filtrate). Evaporate the water from the filtrate to leave just the sodium chloride in the container.

7. Could distillation be used to separate air into oxygen, nitrogen, carbon dioxide, argon and so forth? Explain.  
No, distillation separates liquids based on boiling point. All of the substances listed in the question are gases so they have already boiled. However, if cooled below all their boiling points then it could work.

8. The following diagram shows a set-up of a simple distillation.



a) Identify the distillate collected in the receiver. How would you determine that the distillate collected is a pure substance?

As you boil the seawater, water would be turned into gas and then condensed as the distillate on the other side of the apparatus. You should know it is a pure substance if it has a constant boiling temperature (noted on the thermometer in the distillation apparatus).