



Pure Substances & Mixtures

INTRO:

Matter is any substance that has mass and takes up space and volume. All matter is either a pure substance or mixture. Pure substances are made up of elements and compounds. These substances CANNOT be physically separated into smaller parts.

Pure Substances	
Elements	Compounds
Carbon (C), Oxygen (O), Nitrogen (N)	Water (H ₂ O), Carbon Dioxide (CO ₂)

Mixtures, on the other hand, CAN be physically separated into smaller parts. They exist in two forms. Homogeneous mixtures appear uniform (same) throughout, like when a substance is dissolved in another. Heterogeneous mixtures do not appear uniform throughout, like when substances form distinct separate layers when mixed.

Mixtures	
Homogeneous	Heterogeneous
Kool-Aid, Lemonade, Saltwater	Salad, Pepperoni Pizza, Cereal & Milk

In this lab, you will create mixtures from different elements and compounds. Then, you will attempt to separate those mixtures back into their pure substance states of matter. Some separations may be very easy, some may be quite difficult. Let's find out!

PURPOSE: Creating mixtures from pure substances. Separating pure substances from mixtures.

PROCEDURE:

- Put 50mL sand, 1 tbsp salt, & 1 tbsp iron filings into a 200mL beaker. Label it beaker "A".
- Put 50mL of warm water into another 200mL beaker. Label it beaker "B".
- Sketch beaker A and B below. Identify which is a mixture & which is a pure substance.
- Use the magnet to collect the iron filings from beaker A & place them on the white copy paper.
- Pour the warm water from beaker B into beaker A. Stir the contents with a stirring rod.
- Wait for the sand to sink to the bottom.
- Pour the salt water back into beaker B. Do this slowly to separate the sand from the salt.

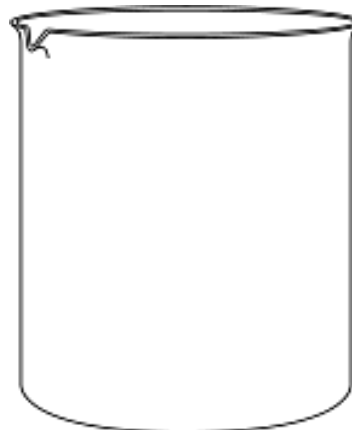
MATERIALS RECEIPT	
PRICES ARE APPROXIMATE	
Sand	\$6.00
Iron Filings	\$7.00
Salt	\$0.59
Magnet	\$3.00
Glasses/Beakers (2)	N/A
Stirring Rod/Spoon	N/A
Warm Water	N/A
Copy Paper/Napkin	N/A
TOTAL	\$16.59

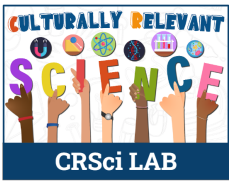
DATA:

Sketch of Beaker A - Label Its Components
Is this a pure substance or mixture? _____



Sketch of Beaker B - Label Its Components
Is this a pure substance or mixture? _____





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ANALYSIS QUESTIONS:

1. Were you able to separate all components of the mixture in beaker A? **Explain** why or why not.

2. Which component of the mixture in beaker A was the EASIEST to separate? **Justify** your answer by describing how it was separated.

3. Look at your sketch of beaker B at the beginning of the experiment. Why is this considered a pure substance and NOT a mixture?

4. Imagine if paper clips were added to the mixture in beaker A. **Develop** a way to remove the paper clips from the beaker, WITHOUT using your fingers.

