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## Separation Lab

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### Objective

How can you use physical and chemical properties of substances to separate a mixture and reclaim valuable materials for other uses?

Your goal is to separate the slag pile from the Raymond sawmill log yard into useful materials. The slag pile is equal parts (by mass) of salt, sand, poppy seeds (i.e. sawdust), and iron filings. As a mixture, the slag pile is worthless and will cost money to dispose of. The separated substances have the following values:

- salt = \$10/gram
- iron = \$15/gram
- sand = \$2/gram
- poppy seeds = \$5/gram

To succeed, you must have at least \$50 of reclaimed substances.

You have 1 class period to plan and 2 class periods to accomplish this. You must be finished by end of class on Friday. Any unseparated materials will be thrown away.

### Procedure

#### Day 1: Planning

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- With your partner, create an experiment plan for the lab.
  - Create a list of steps you will follow to separate each substance. Do your best to put the steps in the order you will follow. Clearly state when each substance is separated.
  - Create an equipment list with the necessary equipment for your procedure. Use correct equipment terminology. You may request other equipment than what is on the list.  
(NOTE: you may not request the Bunsen burner for this lab.)
- Get your experiment plan stamped.










#### Day 2 & 3: Separating

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- Obtain your approved equipment and a sample container with your heterogeneous mixture.
- Mass your original sample and record the data in your journal.
- Separate each substance. Record notes and observations about your procedures in your journal.
- Mass your final amounts of each substance and record the data in your journal.
- Make a small packet for each separated substance. Label the packet with the substance and final mass.

### Deliverables

- **Poster**  
Working together, the partner team will create a colorful, engaging poster that describes the separation process for each substance.  
Each substance should have a paragraph that provides a detailed description of the procedure, along with an analysis of the procedure and recommendations for improvement. Your stamped experiment plan is not written in the correct format for your poster.
- **4 substance packets**  
The 4 substance packets should be taped in appropriate sections of your poster.  
You will not lose points if you lose a substance in the separation process. You will evaluate what went wrong and recommend improvements.
- **Data**  
On your poster, list the starting mass of your mixture, along with the final mass for each substance. Include your final value of the reclaimed substances.  
If you're able to salvage more than \$40 of materials, make a big deal of it!

|   |   |   |   |   |   |
|---|---|---|---|---|---|
|    |     |     |    |    |    |
| beaker  | Bunsen burner   | burette   | clay triangle   | crucible tongs  | Erlenmeyer flask  |
|    |    |    |    |    |    |
| evaporating dish  | filter paper  | forceps   | funnel  | goggles   | graduated cylinder  |
|    |    |   |    |    |    |
| hot plate   | mortar & pestle   | pipette   | ringstand & ring  | scales  | scoopula  |
|   |  |  |   |  |   |
| squirt bottle   | stir rod  | striker   | test tube   | test tube brush   | test tube rack  |
|  |  |  |  |  |  |
| test tube tongs   | thermometer   | volumetric flask  | weigh boat  | well plate  | watch glass   |

# Separation Lab Experiment Plan

Partner names:

Period:

## Required Equipment

| Item | Purpose |
|------|---------|
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## Procedure Steps

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