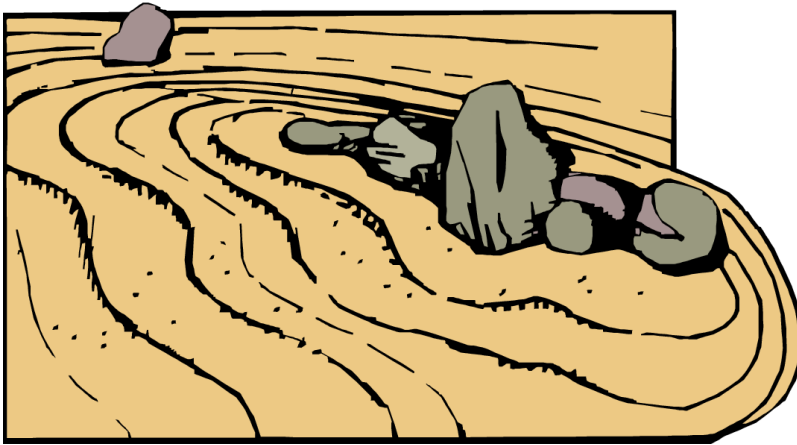


Inquiry Question

How can we separate those mixtures that would be hard to separate by hand?

Name: _____ Date: _____

Separation of Salt and Sand



Have you ever tried to separate a mixture of things that are really small and hard to separate by picking out the different pieces? Salt and sand would be one of those mixtures that would be hard to separate by hand in this way.

What do we know about the properties of salt and sand that could help us separate this mixture? Would there be an easier way?

In this project, salt and sand will be separated based on their difference in solubility.

General Instructions

The goal of this project is to separate a mixture of sand and salt using their differences in solubility.

Materials you'll need:

- Salt (regular household salt is great)
- Sand (from the beach or hardware store)
- A kitchen strainer or coffee filter. A coffee filter isn't a necessary part of the experiment, but it does help when it comes time to strain the saltwater from the sand. In most cases, however, a kitchen strainer is easier to use.
- A pan and heating element. Heat speeds up this experiment but treat it carefully and it would be good to have a parent nearby. In the kitchen, a stove is a good source of heat. If you're in a chemistry lab, a flask and bunsen burner are arguably even better. A second pan is also recommended to catch the strained saltwater.

Ideas and Hints:

- Carefully measure out 10 grams of sand and add to the pan.
- Carefully measure out 10 grams of salt and add to the pan.
- Mix the sand and salt together (carefully shake the pan or use a toothpick).
- Add approximately 100 mL of water.
- To dissolve the salt more quickly, you can carefully heat the mixture (at medium - do not boil). Heat until all salt is dissolved (should be done within 15 minutes or so).
- Once the salt is dissolved completely, it's time to separate the sand from the saltwater solution. This can be done by draining the mixture into a strainer. Make sure you strain it above a second pan in order to catch the saltwater. Straining into a pan is good to do as then it will be ready to boil. If you lack a strainer, you can scrape the sand aside with a spoon but this may take longer to accomplish.
- In order to fully separate the salt from the sand, without the additional water present, you need to return the salt to its original state. This can be done by boiling off the water. Put the pan on a stovetop and let the water boil. Wait until the water has evaporated completely and then turn off the heat. Now, you should be able to see the salt remaining in your pan.
- Explain why this worked and how it could prove useful.

Project submission:

You can either submit photos or a video of your project (along with an explanation and/or steps of construction) or, if you can drop-in to the school, you can present this project to your teacher in-person. Be sure to carefully organize any data collected so that any other student or teacher could reproduce your experiment and achieve the same results.