

Salt Water Race

Summary

Students will design and perform an experiment to dissolve salt in water in as short a time as possible. They will utilize the materials provided to discover which methods are most effective.

Time Frame

1 class periods of 45 minutes each

Group Size

Small Groups

Materials

- road or water softener salt
- heat source
- beakers of different size
- stirring utensils
- cloths
- pie tins
- crushing tools
- goggles
- very weak HCl
- [student worksheet](#)
(attached)

Background for Teachers

Salt dissolves at a rate of 35g/100 ml water at room temperatures. Salt does not dissolve significantly faster in warm water but crushing, stirring and having the largest possible amount of water to dissolve in do increase rate of dissolving.

Instructional Procedures

Teaching and Learning Strategies

To ensure inquiry, students should not be coached as to what the materials should be used for. This may be difficult in the crushing step because students need to know how to safely crush something. The salt should be covered with the paper towel during this step. Instruction could be given when individual groups decide to use this step. Make sure some students receive beakers that are too small for all the salt to dissolve (100-150 ml) The weak hydrochloric acid has little or no affect.

Hook:

You may want to begin this activity by asking students to describe the solutions they are familiar with. Cooking, cleaning, and painting all involve the use of solutions. If they are unclear about what a solution is, this would be a good time to define and describe one. Then pose the question: How can you get salt to dissolve in the shortest amount of time possible?

Procedures:

Hand out the worksheet (attached) and familiarize them with the materials available. Students should work in groups of 3-4 students.

Read the procedure with them, have them write their own procedures and write their hypothesis on the board. Make sure no two groups have the same hypothesis. Allow students to gather their materials and wait for the class to be ready. You may want to check their procedures before you start.

The first group that dissolves all their salt has won the "salt water race".

Safe operating procedures include proper use of heat sources such as alcohol burners, bunsen burners or hot plates. If students have not used these before, they should be instructed as to your expectations concerning their use and the location of fire extinguishing materials. Crushing the salt requires covering it and wearing safety goggles.

Assessment Plan

Scoring Guide

:

Students design procedures testing one variable and correctly write hypothesis

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Students follow procedures to safely perform experiment.....4

Students correctly answer analysis questions.....4

Answers:

answers will vary from class to class

the types of energy are difficult to compare or measure but salt seems to respond to some more than others. Stirring and having a lot of water are particularly effective.

dissolving is a physical change

Conclusion is thoughtfully written.....4

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

[Utah LessonPlans](#)