

Making Water Soft

Purpose: To demonstrate how soft water is transformed into hard water.

Materials:

- Baby food jars with lids (2 jars per child)
- Distilled water
- Epsom salts
- Spoons
- Eyedroppers
- Liquid dishwashing detergent (not automatic dishwashing detergent)

Procedure

- 1) Instruct children to pour enough water in the baby food jars to fill them to the half way point.
- 2) Add Epsom salts to one jar and stir with plastic spoon.
- 3) Add 3 drops of dishwashing detergent (liquid) to both jars.
- 4) Instruct children to secure the lids on the jars. You may want to practice this prior to filling the jars.
- 5) Shake the jars vigorously back and forth 15 times.
- 6) Allow the jars to stand for 10 seconds.
- 7) Observe and describe the appearance of the liquid in the jars.

Results

You should observe that soap suds form in both jars. The jar without the Epsom salts should have a larger amount of soap suds than the jar with the Epsom salts. Why?

The minerals in the Epsom salts, magnesium sulfate, transformed the soft water into hard water. Hard water contains calcium and magnesium. The calcium and magnesium hinder the cleaning action of soap or detergent because they react with it and cause a scum that does not dissolve well in water. This reaction reduces the effectiveness of the detergent.