

DAY 5 5TH GRADE SCIENCE



Matter and Mixtures

Performance Indicator: 5.P.2B.5: Conduct controlled scientific investigations to test how different variables (including temperature change, particle size, and stirring) affect the rate of dissolving.

Essential Question(s):

How can I change the rate at which a substance will dissolve in a solvent?

I-Can Statements:

I can conduct investigations to test different ways to change rate a substance will dissolve in a given solvent.



Engage Activity



Which candy will dissolve the quickest and why?

Exploration Time

Solutions are a special type of mixture in which one substance is dissolved evenly into another substance.



The substance in a solution that has the greatest amount is the **solvent**. It is usually the liquid.



The substance in a solution that has the least amount is the **solute**. It is usually the solid.



Concentration is a measure of the amount of solute dissolved in a solvent.

Exploration Time

Points to Remember:

Temperature change

- Usually, if the temperature increases, more of the solute will dissolve faster.

Particle size

- Usually, if the particle sizes are smaller, more of the solute will dissolve faster.

Stirring

- Usually, if the solution is stirred, more of the solute will dissolve faster.

How soluble is it?



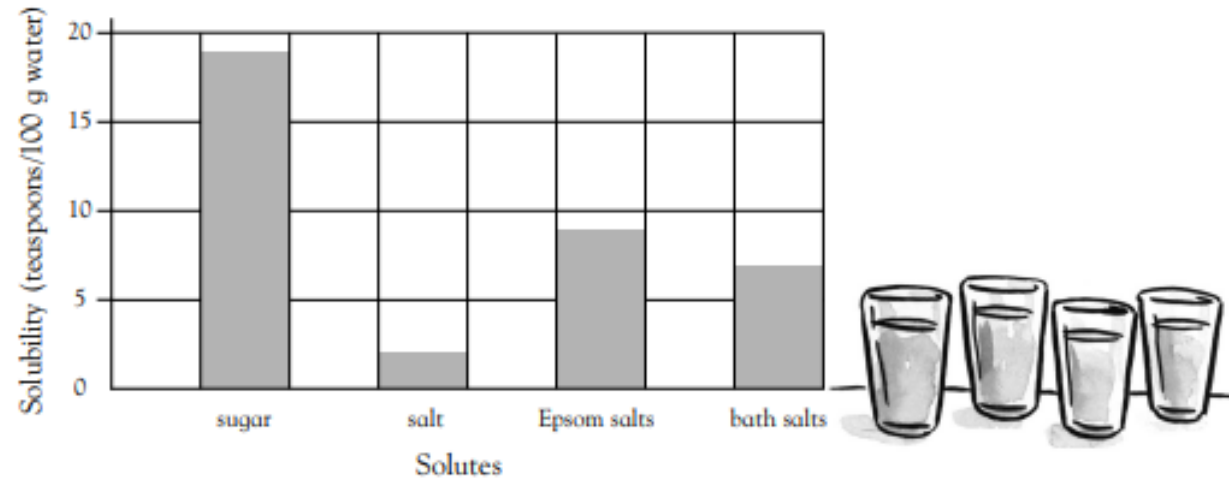
Exploration Time

Background knowledge

All soluble substances do not dissolve equally well. Sugar dissolves very easily, while other substances, such as salt, dissolve less easily. The amount of solute that will dissolve in a solvent is a measure of its *solubility*.

Science activity

Below is a graph showing the solubility of different substances.



About how many teaspoons of salt dissolve in the water?

About how many teaspoons of bath salts dissolve in the water?

Another substance is more soluble than bath salts but less soluble than Epsom salts. What range of teaspoons would you expect to dissolve?

List the solutes in the bar graph in order of their solubility.
Write the name of the most soluble substance first.

Use the graph to answer the questions. Make sure that you read all information and questions carefully.

Temperature and solubility



Exploration Time

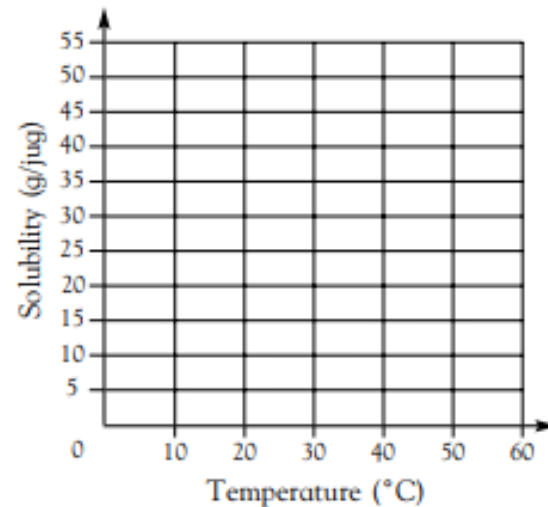
Background knowledge

It is easier to dissolve soluble substances in warm water than in cold water. However, heat increases the solubility of some substances more than of others.

Science activity

Make a line graph to plot the data from the table. Be sure to connect all the points after they are plotted. The data shows the solubility of table salt and of Epsom salts as temperature increases.

Temperature (°C)	Amount dissolved per jug (in grams)	
	Salt	Epsom salts
20	10	20
30	12	30
40	14	40
50	16	50
60	18	55



Use the graph to answer the questions. Make sure that you read all information and questions carefully.

1 Do you see a relationship between temperature and the solubility of table salt? Explain.

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2 Is this relationship the same for Epsom salts? Explain.

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3 Describe any differences temperature has on the solubility of Epsom salts as compared to table salt.

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Dissolving matter

Background knowledge

Substances that can be dissolved in a liquid are said to be *soluble*. Substances that do not dissolve are *insoluble*. The liquid in which a substance dissolves is called the *solvent*. The substance that dissolves is called the *solute*. When mixed together, they make a solution. Water is an excellent solvent. It dissolves many substances. Sugar and salt are very soluble in water, while substances such as sand and chalk are insoluble.

Science activity

Rosa collected two different plant fertilizers from a garden center. The directions said to mix each fertilizer with water and to sprinkle the solution on her plants. When she mixed the first fertilizer in the water, it seemed to disappear. However, when she mixed the second fertilizer, she noticed it sank to the bottom of the watering can.



Which fertilizer should Rosa use for her plants? Explain.

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Exploration Time

Use the graph to answer the questions. Make sure that you read all information and questions carefully.



Exploration Time

Directions: Give examples of items that would dissolve easily based upon each of the three factors that you learned about.

Items that would dissolve easily if you stir them:

Items that would dissolve easily if you heat them:

Items that would dissolve easily based on particle size:

So What Have I Learned?

Create an original song, rap, poem or story about the factors that affect the dissolving rate of a solute.

