CHRISTMAS GINGERBREAD COOKIE SCIENCE

CHRISTMAS SCIENCE WITH GINGERBREAD

Name: _____ **Date:** _____

The main reason people know about gingerbread is that they make tasty cookies. There's also an old tale connected to these holiday treats. Once, a gingerbread man suddenly came to life. He fled to a river to escape. He was afraid to wade across, so he hitched a ride with a fox. The sly fox ate him! Why was the gingerbread man afraid to cross the river? It was because of science!

Like most cookies or crackers, a gingerbread cookie will break apart when it's submerged in certain liquids. This is known as dissolving. Dissolving happens when a **solute** (such as a cookie) is placed in a **solvent** (such as water). The solute eventually breaks up and is absorbed into the solvent. The result is known as a **solution**.

Not every liquid is a solvent, and not every solvent will dissolve the same solute at the same speed. The speed at which a solvent is broken down can depend on many things. One big factor is the temperature of the solvent. A hot solvent will often dissolve substances such as sugar more quickly than a cold solvent. Also, acidity is a major factor. Solvents with higher acidity will break down sugar and other substances faster than those with lower acidity.

Gingerbread cookies, as you probably know, have a lot of sugar. In many sweets, such as cookies, sugar is the glue that holds the delicious treat together. Without the sugar, it would be a crumbly mess. It also wouldn't taste as good! That's why taking a closer look at the acidity of solutions is going to give you helpful clues about which solutions will lead to a quicker cookie crumble.

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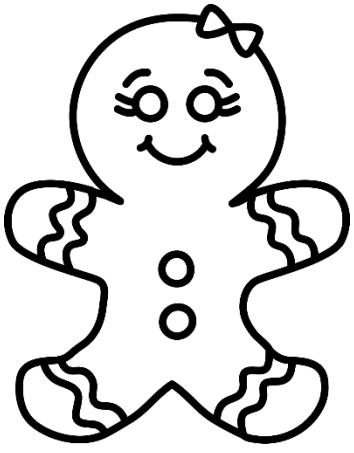

1. According to legend, science kept the gingerbread man from crossing the river. What about science made the gingerbread man afraid of the river?

_____

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2. What do you think might be two examples of solutes? What could be two examples of solvents?

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3. What factors affect the speed at which a solvent breaks down solute?

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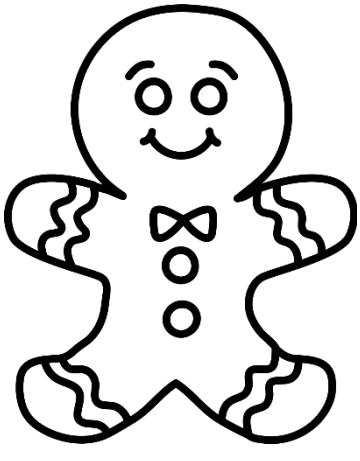

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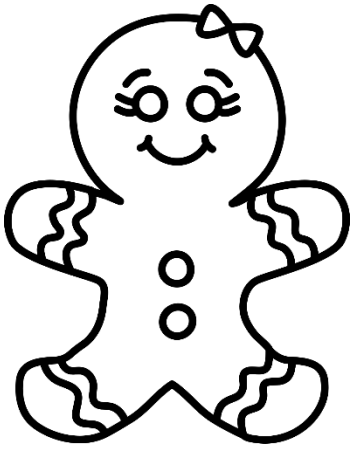


1. According to legend, science kept the gingerbread man from crossing the river. What about science made the gingerbread man afraid of the river?

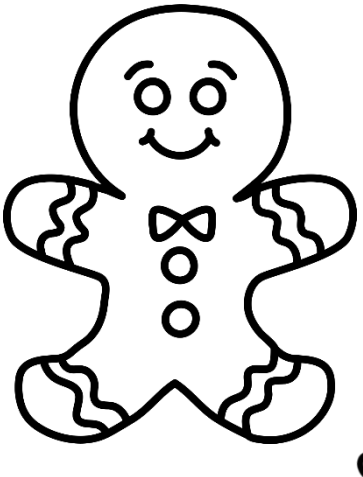
The gingerbread man was made of flour, sugar, and salt. All of these ingredients dissolve in water. The river was made of water, so if the gingerbread man went in the water, he would fall apart and dissolve into the water.

2. What do you think might be two examples of solutes? What could be two examples of solvents?

Answers will vary but might include salt, sugar, flour, etc. Examples of solvents could be water, gas, milk, etc.

3. What factors affect the speed at which a solvent breaks down solute?

The higher the temperature of the solvent and the more acidic the solvent is causes the solute to be dissolved faster than a solvent with a lower temperature or acidity.



GINGERBREAD PREDICTIONS

Name: _____ **Date:** _____

LIQUID	PREDICTION	ACTUAL RESULT
baking soda water		
milk		
plain water		
salt water		
sugar water		
vinegar		

BAKING SODA WATER

SALT WATER

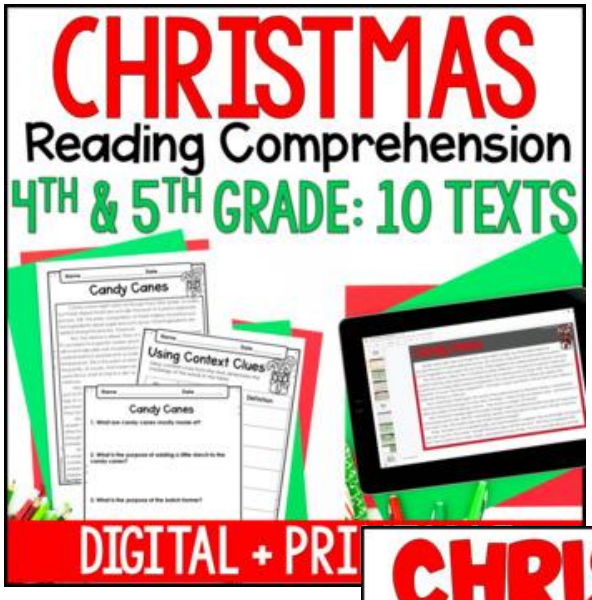
MILK

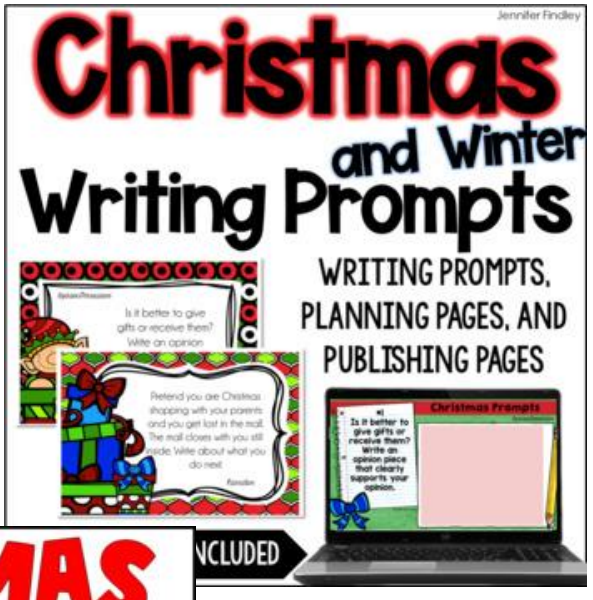
SUGAR WATER

PLAIN WATER

VINEGAR

WANT MORE CHRISTMAS RESOURCES?





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