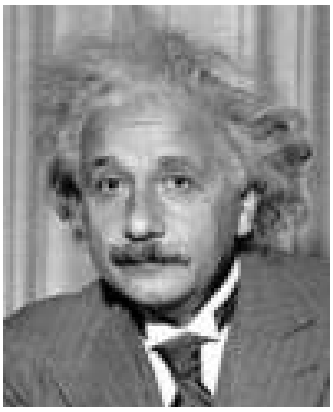
Sir Isaac Newton

Louis Pasteur



Albert Einstein

A SCIENCE Winter Inquiry Land

Answer Key

Grade 1

Winter 2011-2012

Miami-Dade County Public Schools
Curriculum & Instruction

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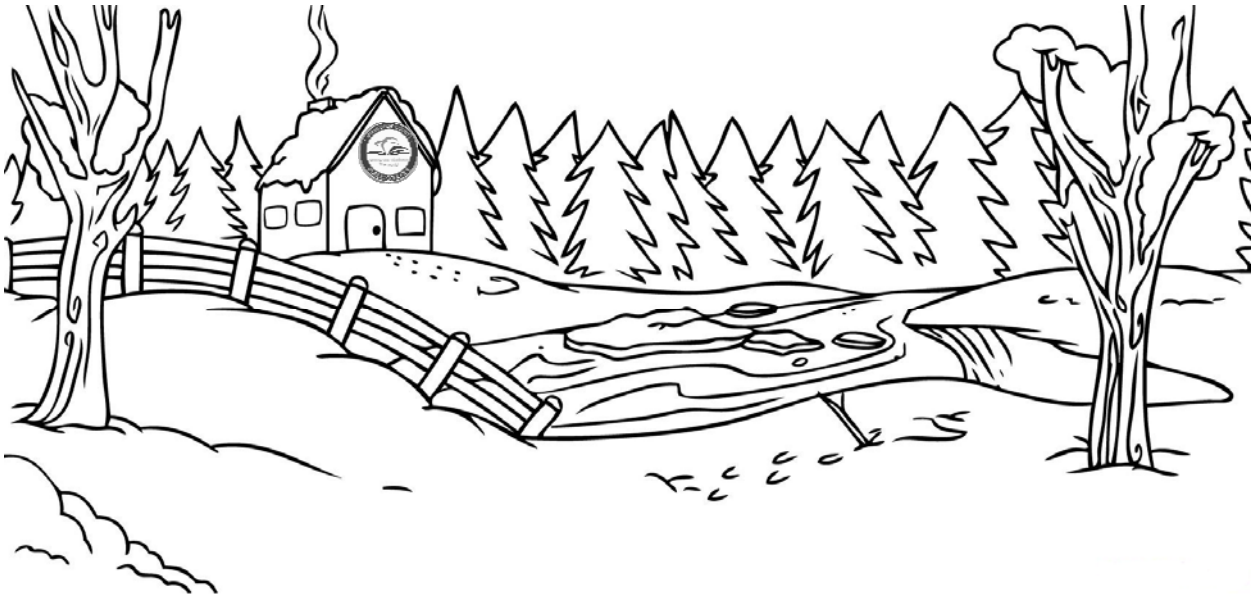


Answer Key

Bubbles

Learn more about surface tension and about change just from blowing bubbles

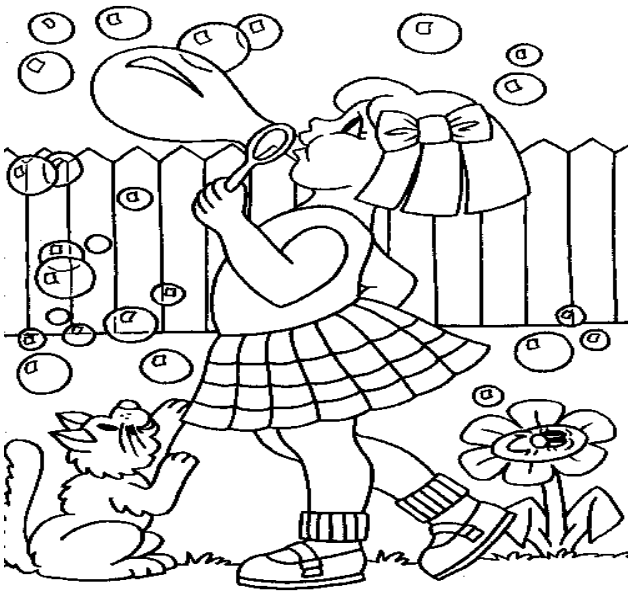
What to Do

Mix the dishwashing liquid with the water and pour it into the pan. Give your child a straw and tell him/her to gently blow through it as he/she moves it slowly across the surface of the solution. Ask him/her to notice the size of the bubbles that he makes. Next, have your child try to make a very big bubble that covers the surface of the pan. Have him do the following: Dip one end of the straw into the solution. Then hold the straw slightly above the surface. Blow into it very gently. He/she may have to try several times to make a really big bubble. When he's/she's made a bubble, have him/her touch it gently with a wet finger to see what happens. Have him/her make another big bubble, then touch it with a dry finger.

What is happening?

Bubble films form because of surface tension. Water molecules are attracted to each other. This attraction is particularly strong at the surface, where it makes the surface of the water act like a stretched-out balloon skin. This effect is called surface tension. The surface tension of ordinary water is so great that it can't form bubble films. When you add the detergent, the surface tension is reduced just enough that it can form the films, but not tear apart. The sugar helps slow the rate that the bubble mix evaporates, so it takes longer to dry out and burst.

Bubbles burst because they dry out, so your bubbles will last longer when they won't dry out. Bubble-blowing works best at night or on a cool, humid day. Undercover on a rainy day is ideal.



Answer Key

Splish Splash

There are many ways to measure things. At bath time, use different sized containers to measure volume.

What to do

1. Fill a small container (such as a quart) with water. Then pour the water (using the funnel, if necessary) into a larger container (a half-gallon or gallon). Ask your child how many small containers does it take to fill one large one? *Answers will vary depending on the container.*
2. Another good question to ask is how many tablespoons does it take to make half a cup and how many cups to make a quart? *8 tablespoons in a half a cup; 4 cups in a quart*
3. Help your child find out how many quarts (or liters) it takes to fill a gallon (or a 4-liter container). *4 quarts fill one gallon*
4. Next, fill the gallon (or 4-liter) container, and use the funnel to pour the water into the little containers. How many times will it fill the pint (or 1/2-liter) container? *8 pints fill one gallon*
5. Fill the short, squat container with a given amount of water--3 cups, for example. Pour this water into the tall, thin container. Ask your little scientist record their observations in their science journal. *Observations will vary depending on the amount of water and the size of the container.*

Answer Key

Celery Magic

Did you ever wonder how a paper towel can soak up a spill, or how water gets from a plant's roots to its leaves? The name for this is "capillary action."

What to do

1. Lay the 4 pieces of celery in a row on a cutting board or counter so that the place where the stalks and the leaves meet matches up.
2. Cut all 4 stalks of celery 4 inches (about 10 centimeters) below where the stalks and leaves meet.
3. Put the 4 stalks in 4 separate cups of purple water (use 10 drops of red and 10 drops of blue food color for each half cup of water).
4. Label 4 paper towels in the following way: "2 hours," "4 hours," "6 hours," and "8 hours." (You may need newspapers under the towels).
5. Every 2 hours from the time you put the celery into the cups, remove 1 of the stalks and put onto the correct towel. (Notice how long it takes for the leaves to start to change.) *Leaves usually begin to change in a few hours.*
6. Each time you remove a stalk from the water, carefully peel the rounded part with a vegetable peeler to see how far up the stalk the purple water has traveled.
7. What do you observe? *Answers will vary*.
   Notice how fast the water climbs the celery.
   Does this change as time goes by? In what way? *The longer the celery is in the water, the more it changes color. Allow 12 hours for best results.*
8. Measure the distance it has traveled and record this amount in your science journal.
9. Make a list of other objects around your house or in nature that enable liquids to climb by capillary action. *Observations will vary.*
   Look for paper towels, sponges, old sweat socks, brown paper bags, and flowers.

Capillary action happens when water molecules are more attracted to the surface they travel along than to each other. In paper towels, the molecules move along tiny fibers. In plants, they move through narrow tubes that are actually called capillaries. Plants couldn't survive without capillaries because they use the water to make their food.

What is happening?

The leaves of the celery will have purple marks. Take the celery out of the glass. On a cutting board, an adult will use a knife to cut a cross section of the celery stalk. You will see lines or what we sometimes call "strings" of the celery are purple. On the outer edge of the stalk, you will also see little purple dots.

This is evidence that water is absorbed or sucked up by a plant. It travels up the stalk and then into the leaves. This is how water is conducted and circulated in plants.

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