LETTER TO PARENTS

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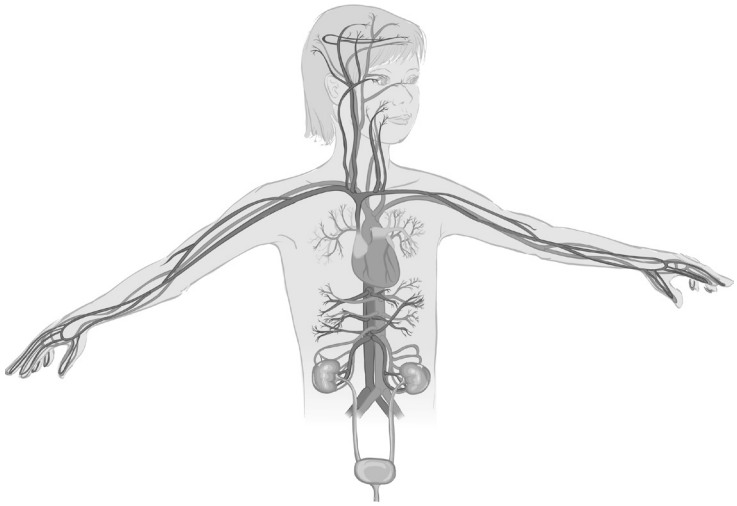
SCIENCE NEWS

Dear Parents,



Our class is beginning a new science unit using the **FOSS Living Systems Module.** We will be investigating transport systems in multicellular organisms that provide each cell with food, water, gas exchange, and waste removal. Students will learn about the structures, functions, and interactions of the circulatory, respiratory, digestive, and excretory systems in humans. They will learn about the vascular system in plants (xylem and phloem), and they will compare that system for moving water, minerals, and sugar to the transport system in humans. They will also be introduced to the chemical process of photosysthesis and how sugar is broken down in cells during cellular respiration.

Students will be designing and conducting controlled experiments to investigate some of these systems (water movement in plants and use of sugar by yeast cells). I may be asking you to send small samples of breakfast cereals to school for us to use in an experiment dealing with metabolism of sugar by yeast.

And we will be discussing food in terms of its nutrients—fats, carbohydrates, proteins, and water. You might find as a result of our study that your family's dinner conversation will actually focus on the meal!

Watch for the home/school connection sheets I will be sending home with your child. These suggest ways for the whole family to investigate interesting aspects of our life science study. In addition, you and your child can visit the FOSS website (www.fossweb.com/ca), where there are instructional activities, interactive simulations, and resources related to the Living Systems Module.

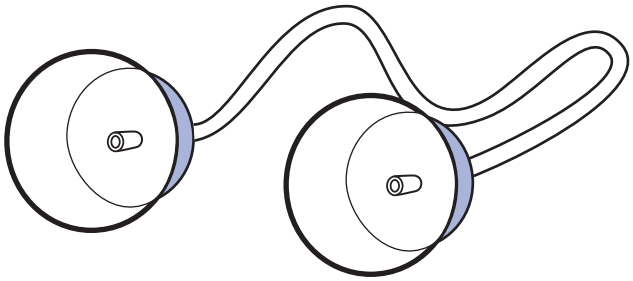
If you have any questions or comments, or have family or cultural traditions involving food that you would like to share with the class, please drop me a note or come in and visit our class. We are looking forward to many weeks of exciting investigations.

Name _____

Date _____

HOME/SCHOOL CONNECTION

INVESTIGATION 1: LIVING CELLS



Listen to your body's transport systems—they make sounds. Use a stethoscope to listen, if you have one. You can make a simple listening device with two small plastic cups and a short piece of plastic tubing.

Make a small hole in the bottom of both cups with a nail. Force the tubing into the holes. It should fit very tightly.

Put the mouth of one cup over the thing you want to hear. Put the other cup over your ear. Listen to your heart, lungs, stomach, intestines, your throat swallowing, and your teeth chewing.

1. Everyone gets the hiccups (babies get them a lot). What causes hiccups? What transport system(s) are they related to? And what are some remedies for hiccups?

2. You have felt and heard your own stomach growl. When does it growl? What makes it growl? What transport system is involved?

3. Everyone burps now and then (babies burp a lot). What is going on when you burp? What transport system is involved?

4. What is a sneeze? What transport system is involved?

Name _____

Date _____

HOME/SCHOOL CONNECTION

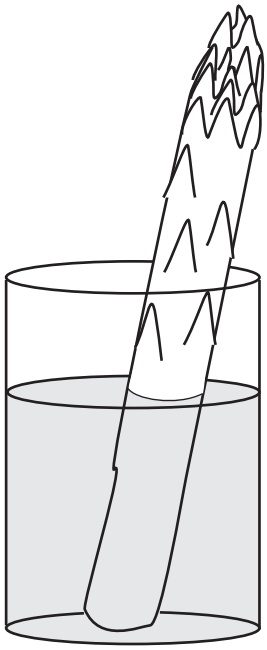
INVESTIGATION 2: VASCULAR PLANTS

Celery stalks have vascular bundles. The xylem tubes transport water from the roots (base of the stem) to the leaves. This is how the cells in the celery leaves get water and minerals to stay alive.

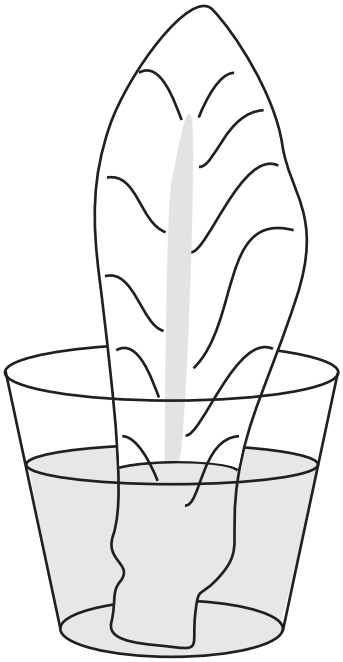
Do other vegetables transport water? You can use colored water to find out.

Visit the produce section when you are at the market. Get a few things to test. Try different kinds of cabbage and lettuce, green onions and leeks, asparagus, and other interesting things. Bring the results of your investigations to school to share.

Cabbage



Asparagus



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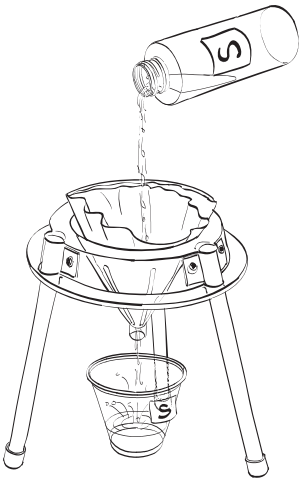

Our class is beginning a new science unit, the **FOSS Mixtures and Solutions Module.** We will be studying basic concepts in chemistry, finding out how materials interact with each other. Children will learn what happens when simple materials, like gravel, salt, and water, are put together. They will also learn techniques for separating the resulting mixtures and solutions. As our studies continue, we will investigate combinations of materials, like baking soda and calcium chloride (the salt used to melt ice on roads), that react when mixed, producing new products, like chalk, carbon-dioxide gas, and table salt. These are exciting discoveries.

The U.S. Consumer Products Safety Commission (CPSC) requires the following label to be on student sheets associated with the use of these chemicals in the FOSS investigations: calcium chloride, citric acid, diatomaceous earth, Epsom salts, and kosher salt. It is a reminder to the students to exercise particular safety precautions when working with materials in the classroom.

WARNING — This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

You can bring chemistry to life at home by exploring familiar household materials in a scientific way. Some of the interesting chemicals you may have at hand include baking soda, baking powder, alum, table salt, Epsom salts, flour, sugar, cornstarch, and vinegar. Add to these a few pieces of "laboratory equipment" such as jars, margarine tubs, plastic cups, and spoons, and you are ready to extend the classroom experiences into your home. A reminder: just as we do at school, you and your child should review and follow important safety procedures, even when working with the most familiar materials.

- Have a plan before starting an investigation.
- Avoid skin contact with experimental materials, and clean up spills immediately.
- Rinse with water if materials contact skin, eyes, or clothes, and wash hands after completing experiments.
- Never taste the experiments.

Watch for the home/school connection sheets I will be sending home with your child. These suggest ways for the whole family to investigate interesting aspects of chemistry.

We are looking forward to many weeks of exciting investigations with mixtures and solutions. If you have any questions or comments, or have expertise you would like to share with the class, please drop me a note.

HOME/SCHOOL CONNECTION

INVESTIGATION 1: SEPARATING MIXTURES

Make a mixture known as oobleck.

Materials

1 Mixing bowl
1 Spoon
1 Measuring cup
- Cornstarch
- Water

Directions

1. Put about 1 cup of cornstarch in the mixing bowl.
2. *Slowly* add water to make a mixture, stirring as you go.
3. When the starch is all wet, it will turn into oobleck.

Things to find out

Explore the properties of oobleck.

- Is it a solid or a liquid?
- What happens when you place solids, like coins or spoons, on the surface?
- What happens when you try to push your hand gently into the oobleck? When you try to push your hand hard and fast into the oobleck?
- Pick up a handful of oobleck. Can you hold it?
- Can you cut a ribbon of oobleck with scissors?
- What happens to the properties of oobleck when you change the amounts of the two ingredients in the mixture? More water? More cornstarch?

NOTE: If you want to keep oobleck to work with it another day, store it in a covered container in the refrigerator.

HOME/SCHOOL CONNECTION

INVESTIGATION 2: REACHING SATURATION

You can make your own play putty right at home. Here's what you will need.

Materials

20 ml White household glue (Colored glue won't work.)
15 ml Borax
• Water
1 Measuring cup
1 Plastic bag
1 Set of measuring spoons
• Food coloring
2 Plastic cups or small jars (Baby-food jars work great.)

Directions

1. Mix 15 ml (1 tablespoon) of borax in a cup or jar with enough water to dissolve it (about 40–50 ml). This will make a saturated solution.
2. In a separate plastic cup, mix 20 ml (4 teaspoons) of white glue with 5 ml (1 teaspoon) of water and a few drops of food coloring.
3. Add 5 ml of the saturated borax solution to the cup of glue.
4. Mix the mixture for a few minutes and watch what happens.
5. Now test your play putty for stretching, bouncing, newsprint transfers, and so forth. How long will it stretch? How high will it bounce? Record your observations and bring them to class.
6. Store the putty in a plastic bag.

HOME/SCHOOL CONNECTION

INVESTIGATION 3: FIZZ QUIZ

Baking soda (sodium bicarbonate—$NaHCO_3$) reacts with acid. One of the products is carbon dioxide (CO_2). You can use a baking-soda solution to test unknown liquids to see if they are acids. If CO_2 bubbles form when you mix the two solutions, the unknown probably contains an acid.

Materials

- Baking soda

1 Tablespoon

1 Measuring cup

- Water
- Unknown liquids

1 Small glass for testing

1 Spoon

Directions

1. Put 1 heaping tablespoon of baking soda in the measuring cup.
2. Add water to the 1-cup level. Stir to dissolve the soda.
3. Put a small amount of the baking-soda solution in a glass.
4. Add an equal amount of unknown solution. Record your observations.

Things to try

Fruit juices (particularly citrus)

Vinegar

Vitamin C dissolved in water

Coffee

Soda drinks

Unknown	Observations

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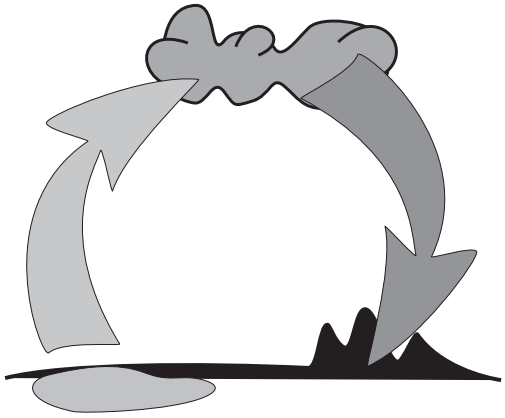


Our class is beginning a new science unit using the **FOSS Water Planet Module.** We'll begin with a survey of the solar system, finding out about the properties of the planets, moons, comets, and asteroids that orbit our magnificent star, the Sun. We'll ponder how the force of gravity keeps Earth and the other planets in orbit around the Sun.

We will then turn our attention to Earth, the water planet. We'll investigate the variables (temperature and surface area) that affect the evaporation of water and develop explanations for the formation of dew and frost. We'll place containers of water and dry soil in the sunshine to find out if they heat up equally. We'll use the results of these experiments to consider how uneven heating of Earth's surface produces convection currents. These concepts come together in the form of the water cycle, which continually renews the supply of fresh water. Finally we'll develop the big idea of weather. Major factors that influence California's weather include abundant solar energy and moisture from the Pacific Ocean.

You can increase your child's interest in Earth's place in the solar system and the importance of water by asking him or her to talk about the science investigations. Keep track of the changes in weather together. Is it a sunny day or cool and foggy? What is influencing the day's weather? Check out the weather maps in the daily newspaper or on-line or watch the evening news for weather reports. Find out more about where the water that flows from your faucets originates and how it gets to your home.

Watch for Home/School Connection sheets that I will be sending home from time to time. These activities describe ways the whole family can extend our classroom science activities into your home. There will be suggestions for how to locate some of our companion planets in the night sky, activities for investigating evaporation, and more. Your child will have a chance to share his or her experiences with the rest of the class.

We are looking forward to weeks of fun with the solar system, solar energy, and water on planet Earth. If you have questions or comments, or have expertise you would like to share with the class, please drop me a note.

HOME/SCHOOL CONNECTION

INVESTIGATION 1: SOLAR SYSTEM

What solar-system objects can you see in the night sky? Only one star is a solar-system object, the Sun. But it can't be seen in the night sky.

Four solar-system objects can be seen easily with your bare eyes at night. They are the Moon, Venus, Mars, and Jupiter. They are brighter than the stars. But you have to know when and where to look for them. They aren't visible all night, every night.

Two more planets can be seen with bare eyes if you know where to look, Mercury and Saturn. They are only as bright as stars.

Look for solar-system time and place information in the newspaper or on the Internet. Stardate is a good site. Go to www.stardate.org and then go to stargazing/planet viewing. See how many solar-system objects you can find in the night sky.

HOME/SCHOOL CONNECTION

INVESTIGATION 2: SWINGERS

There was a time when pendulums played an important role in everyday life as time regulators. The predictable swinging of the pendulum was linked to the hands of a clock. Now pendulum clocks are historical curiosities for the most part. Some clock fanciers still have a cuckoo clock, school clock, or grandfather clock as a reminder of a time past.

MAKE A SECOND TIMER

You can make a second timer at home with a mass, like a fishing weight or a big washer, and some string or thread. Try to get it as accurate as possible. Fine-tune it until you can call 15 seconds at the same time another family member sees the second hand on a clock hit 15 seconds.

MAKE A MINUTE TIMER

This might be a little more demanding, as pendulums tend to lose energy as they swing (because of friction at the pivot and air resistance). What variables can you increase to improve your chances of making the pendulum swing for a minute?

RIDE THE PENDULUM

What's a playground swing but a big pendulum you can ride? Can you guess how many cycles (complete swings back and forth) a swing will make in 30 seconds? Will longer swings complete more or fewer cycles in 30 seconds? Take a ride and find out.

HOME/SCHOOL CONNECTION

INVESTIGATION 3: WATER VAPOR

INVISIBLE WATER

1. Moisten your forearm with a damp washcloth.
2. Either blow gently on the wet spot or fan your arm with a stiff sheet of paper.
   - How does the wet spot on your arm feel? What happens to the water on your arm?
   - How does sweating help keep your body cool?

NOTE: It takes heat to evaporate water and turn it into water vapor.

INTO THIN AIR

How fast does water evaporate in your home?

Set up an evaporation gizmo to find out.

You will need

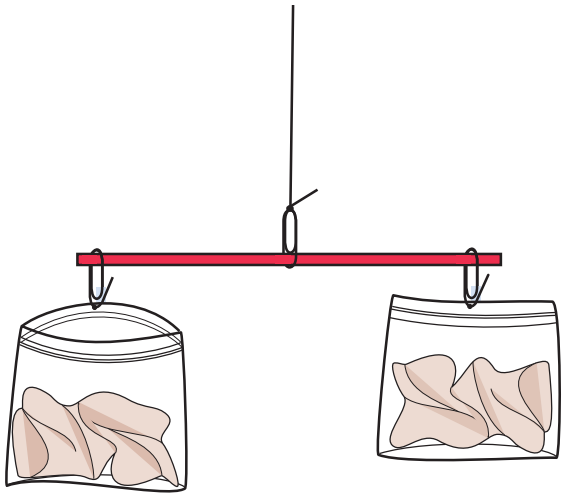
1 Plastic soda straw

3 Paper clips, regular size

1 Piece of string about a meter (3') long

2 Plastic bags, identical (zip-type is nice)

2 Paper towels



Directions

1. Slide a paper clip to the middle of the straw. Tie the string here.
2. Slide a paper clip on each end of the straw. Open up the clips a bit to make hooks.
3. Moisten the paper towels. Put one in each bag. Seal one bag and leave the other open.
4. Hang the bags on the two hooks. Slide things around until you achieve balance.
5. Hang the rig where it can be monitored closely. Observe.

THINK ABOUT HUMIDITY

Where did the water go? The amount of water vapor in the air is called **humidity.** When air contains as much water vapor as it can possibly hold, the humidity is 100%. Warm air can usually hold more water vapor than cool air.

- Watch a weather report or read one in the newspaper. What is the local humidity?
- How could the humidity of the air affect the rate of evaporation?

HOME/SCHOOL CONNECTION

INVESTIGATION 4: HEATING EARTH

Plants depend on solar energy for their survival. They use the Sun's energy to make food. The food is stored in the plant's leaves, fruit, and seeds.

People depend on plants for food. When you eat plants, you take in stored solar energy. Your body uses the energy from plants to keep all your systems going.

Plants need different amounts of time in the sunshine to produce the fruits and vegetables we use for food. Here's one way to look at the amount of solar energy needed to feed you: each day a plant spends in the sunshine growing and storing energy is one sun day. For example, it takes 70 days for a corn seed to grow and produce an ear of corn. When you eat an ear of corn, you are consuming 70 sun days.

Find out how many sun days it takes to prepare your favorite fruits and vegetables for the market. To help you find out how long it takes each plant to produce, look on seed packages, in seed catalogs, and on the Internet. For favorite foods like cereals and breads, you will have to discover the kinds of grains they are made of.

Make a sun-day table. Organize the foods in order from those that need the most sun days to those that need the fewest sun days.

Kind of food	Number of sun days