

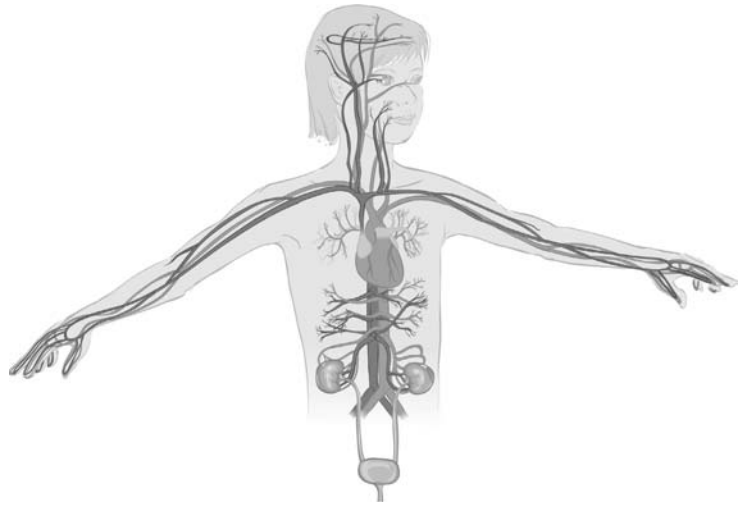
LETTER TO PARENTS

Cut here and paste onto school letterhead before making copies.

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 photosynthesis 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), 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 _____

MATH EXTENSION—PROBLEM OF THE WEEK

INVESTIGATION 1: LIVING CELLS

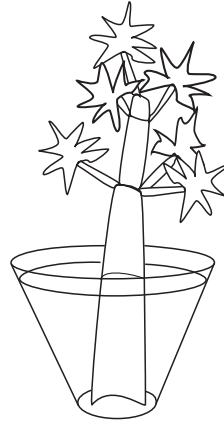
Jan and Rosa were playing a game with two dice. It seemed like the number 7 came up all the time. They wondered why.

Does 7 come up more often than the other numbers? (The grid might help you answer the question.)

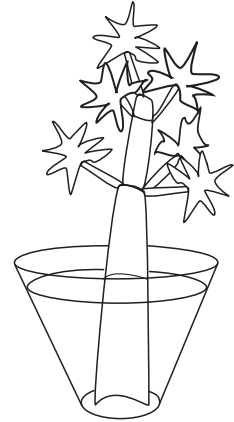
MATH EXTENSION—PROBLEM OF THE WEEK

INVESTIGATION 2: VASCULAR PLANTS

Roger put a stalk of celery with six leaves in 100 mL of water. The celery leaves were all about the same size. Sixteen hours later there was only 88 mL of water left in the cup.

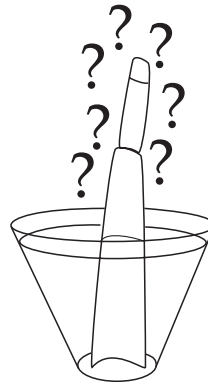


Roger's setup at starting time

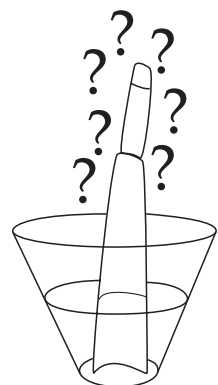


Roger's setup 16 hours later

Lucetta put a stalk of celery in 100 mL of water. Two days (48 hours) later only 40 mL of water was left in the cup.



Lucetta's setup at starting time



Lucetta's setup 2 days later

How many leaves were on Lucetta's celery stalk?

Think: What do you need to find out using Roger's results in order to answer the question?

MATH EXTENSION—PROBLEM OF THE WEEK**INVESTIGATION 3: SUGAR AND CELLS**

You get energy from food.

Three classes of nutrients provide energy: carbohydrates, proteins, and fat.

Food energy is measured in calories. You get calories from carbohydrates, protein, and fat.

You get different numbers of calories from different nutrients.

1 gram of carbohydrate = 4 calories (Cal)

1 gram of protein = 4 calories (Cal)

1 gram of fat = 9 calories (Cal)

If you know how much carbohydrate, protein, and fat is in a piece of food, you can calculate how many calories it has. For instance, if a baked potato has 50 grams of carbohydrate, 1 gram of protein, and 1 gram of fat, you can calculate the total calories.

$$50 \text{ g carb} \times 4 \text{ Cal/g} = 200 \text{ Cal}$$

$$1 \text{ g protein} \times 4 \text{ Cal/g} = 4 \text{ Cal}$$

$$1 \text{ g fat} \times 9 \text{ Cal/g} = 9 \text{ Cal}$$

$$\text{Total} = 213 \text{ Cal}$$

Problem

Bif went to a baseball game. During the game he ate a hot dog, a bag of chips, and a soda. When he got home, he wondered how many calories he got from his fast-food meal. He looked up the average calories for the items he ate. The data are shown in the table.

Food item	Protein (g) (4 Cal/g)	Carbohydrate (g) (4 Cal/g)	Fat (g) (9 Cal/g)
Hot dog	8	20	16
Potato chips	4	31	20
Soda	0	36	0

How many calories was Bif's meal?

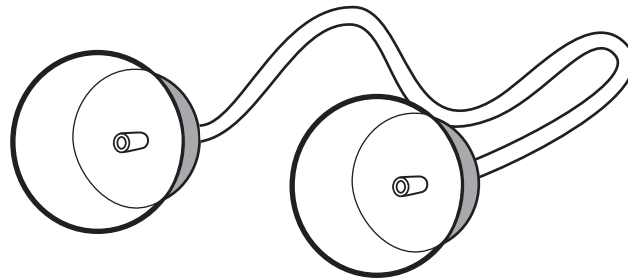
Bif was happy with the total calories in his meal. But he wants to have only 30% of his calories from fat. Does fat provide more than 30% of the calories in Bif's meal?

If Bif has too much fat in his meal, how many grams of fat will he have to remove? How many grams of carbohydrate and/or protein will he have to add?

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?

HOME/SCHOOL CONNECTION

INVESTIGATION 2: VASCULAR PLANTS

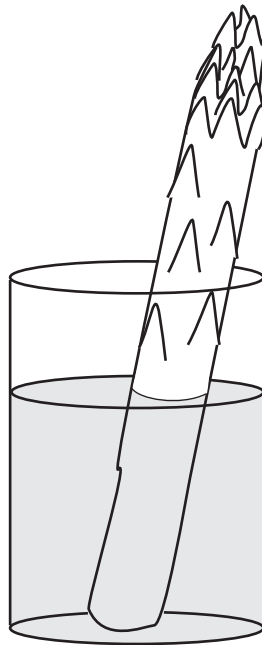
Celery stalks have vascular bundles. The xylem tubes transport water from the roots (base of the stem) to the leaves. This is how the cells in the celery leaves get water and minerals to stay alive.

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

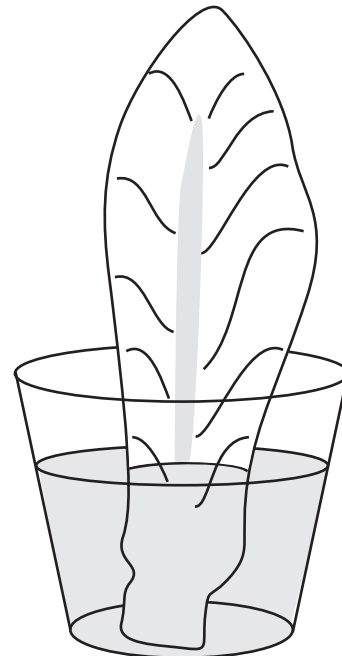
Visit the produce section when you are at the market. Get a few things to test. Try different kinds of cabbage and lettuce, green onions and leeks, asparagus, and other interesting things. Bring the results of your investigations to school to share.



Cabbage



Asparagus



Romaine