

# LETTER TO FAMILY

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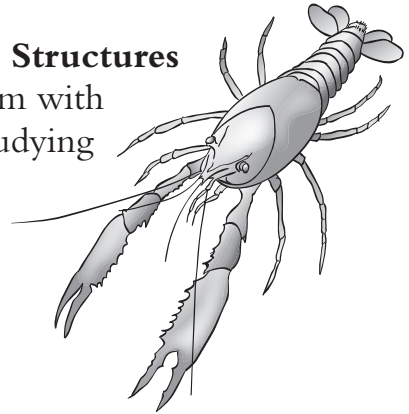
*Cut here and paste onto school letterhead before making copies.*

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## Science News

Dear Family,

Our class is beginning a new science unit using the **FOSS Structures of Life Module**. We will be sharing space in our classroom with plants and crayfish to learn about life cycles. We will be studying the human skeleton and finding out how our bones and muscles function to provide us with support, movement, and protection. It looks as if we have an interesting and exciting couple of months ahead!



In this module, children investigate the structures and behaviors of living things. You can increase your child's understanding and interest by asking about the investigations they do at school and by providing experiences at home. You might search for and count the seeds found in various fruits and vegetables as you prepare dinner (children will learn that all plant parts containing seeds are technically fruits). You could grow plants from seeds, grow and eat edible sprouts, and look for the fruits and seeds of plants in your neighborhood.

Later we will be taking care of crayfish. Anything could happen, from eggs appearing to shells molting as crayfish grow. If you happen to see other animals when you are out and about with your child, you might take a moment to watch what they do or take note of some interesting features of an animal's body. How might that behavior or body structure help the animal survive? Together, you become scientists searching for clues.

Watch for Home/School Connections. Your child may bring home one or more of these homework sheets, providing an opportunity for the whole family to look more closely at the structures of life around you.

Our classroom will be even livelier than usual in the next several weeks. If you have any questions or comments, call or come in and visit our class. You can get more information on this module by going to [www.FOSSweb.com](http://www.FOSSweb.com).

Let me know if your child has any allergies to plants or animals.

Sincerely,

# MATH EXTENSION—PROBLEM OF THE WEEK

## Investigation 1: Origin of Seeds

Two students brought snacks to the math-club party. They made little bags of three different mixtures of dried fruit. Each mix included dates, raisins, and cherries.

Can you figure out how many of each kind of dried fruit they put into each little bag?

### Fruit Mix 1

There are 3 dates.

There are three times as many cherries as dates.

The total number of pieces of dried fruit is 15.

Dates \_\_\_\_\_

Raisins \_\_\_\_\_

Cherries \_\_\_\_\_

### Fruit Mix 2

There are twice as many cherries as raisins.

There are twice as many raisins as dates.

There are 12 cherries.

Dates \_\_\_\_\_

Raisins \_\_\_\_\_

Cherries \_\_\_\_\_

### Fruit Mix 3

The dates and raisins add up to 11.

There are three times more dates than cherries.

The total number of pieces of dried fruit is 14.

Dates \_\_\_\_\_

Raisins \_\_\_\_\_

Cherries \_\_\_\_\_

# HOME/SCHOOL CONNECTION

## Investigation 1: Origin of Seeds

Where there are plants, there are seeds. Take a family walk around the block or to a park. Look for seeds. Weeds are famous for producing lots of seeds—that’s one reason they are so successful.

Make a seed collection. Using a drop of glue or tape, put a few seeds in the spaces on this sheet. If you know the name of the plant the seed came from, write it in the space above the seed.

Look at each seed and try to figure out how it might move from the parent plant to a new location in order to grow.

Look for seeds in fruits that you eat. Put a food seed on the sheet, too.

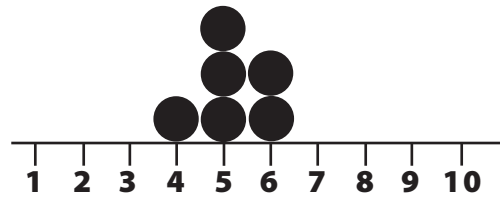
### Seed Collection


**SAFETY NOTE:** Although most plants are harmless, some can cause allergic reactions. Use care to select your seeds. Don’t eat anything you collect, and wash your hands after handling the seeds or plants.

# MATH EXTENSION—PROBLEM OF THE WEEK

## Investigation 2: Growing Further

A class had 1 bean. The students planted it, and 6 bean pods grew on their bean plant. The line plot shows the number of beans that students counted in each pod.



What was the most common number of seeds they found in their pods?

What was the total number of seeds their plant produced?

Next year, the class is going to plant all the seeds. The students predict that the average number of seeds in each pod will be 5.

If 10 seeds grow into bean plants, estimate how many seeds the plants will produce.

- Close to 50
- Close to 100
- Close to 300

Write a note to this class. Tell them how many seeds the plants might produce next year. Explain how you solved the problem.

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# HOME/SCHOOL CONNECTION

## Investigation 2: Growing Further

Do you have houseplants in your home? Can you figure out why they are called houseplants? How do houseplants get the things they need to live, such as water and nutrients?

Take a neighborhood field trip. Look for a plant that has all of the parts listed below. Check the appropriate squares to describe the plant. If you find a weed that is OK to dig or pull up, look at the roots, too.

**The plant:** Is the plant  tall or  short?

**Stems:** Are the stems  long or  short?

**Seeds:** Does the plant have  many or  few seeds?

**Flowers:** Does the plant have  big or  small flowers?

**Roots:** Does the plant have  one main root or  many roots?

**Leaves:** Are the leaves  big or  small?

**Others:** Is the plant  by itself or  with others of its kind?

Is there anything else interesting about the plant? Draw a picture on the back of this sheet.

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**SAFETY NOTE:** Although most plants are harmless, some can cause allergic reactions. Examine your samples with care. Don't eat anything you collect, and wash your hands after handling the plants.

# MATH EXTENSION—PROBLEM OF THE WEEK

## Investigation 3: Meet the Crayfish

Your class teamed up with a class in North Dakota as FOSS website penpals. The North Dakota class recorded the movements of their four crayfish for 2 weeks. Below are the data they collected. The data are not well organized. Your job is to reorganize the data to see if you can predict where each of the North Dakota crayfish will be on Day 11.

The crayfish are named Speedy, Tiny, Rosie, and Flipper.

The four houses are coded with geometric shapes: ●, ▲, ■, and ▬.

Day 1	Rosie	●	Speedy	▲	Tiny	■	Flipper	▬
Day 2	Tiny	▬	Speedy	▲	Flipper	■	Rosie	●
Day 3	Rosie	▬	Flipper	●	Speedy	▲	Tiny	■
Day 4	Speedy	●	Rosie	▲	Tiny	▬	Flipper	■
Day 5	Flipper	■	Tiny	●	Rosie	▬	Speedy	▲
Day 6	Rosie	▬	Speedy	▲	Flipper	■	Tiny	●
Day 7	Tiny	■	Speedy	●	Flipper	▬	Rosie	▲
Day 8	Rosie	▲	Flipper	■	Speedy	●	Tiny	▬
Day 9	Speedy	●	Rosie	▲	Tiny	▬	Flipper	■
Day 10	Flipper	■	Tiny	▬	Rosie	▲	Speedy	●

Reorganize the crayfish information in a more useful chart.

Make 4 bar graphs of the data.

Predict in which house each crayfish will be on Day 11, and explain why you think so.

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# HOME/SCHOOL CONNECTION

## Investigation 3: Meet the Crayfish

Animals have adaptations that help them get food. An adaptation is a structure or behavior that helps an organism survive and reproduce. A hawk captures its prey with powerful talons. Pocket gophers, beavers, and other rodents use their front teeth (incisors) to eat tough plant stems. This wears down their incisors, but rodent incisors continue to grow as they wear down. We call adaptations such as a hawk’s talons or a rodent’s incisors food-gathering devices.

**Part 1:** Design a food-gathering device for an animal. Design a predator device or a plant-eating device. Select one of the challenges below, and use materials around your home to make your device.

Test your device at home to make sure it really works. Change your design until it works. You will have several days to work on this project. Bring it to school to share with your class.

### Possible Materials

- |                                 |   |
|---------------------------------|---|
| Toothpicks                      | Glue or tape  |
| Craft sticks                    | String, yarn, or pipe cleaners                      |
| Rubber bands                    | Cotton, cloth, or netting                           |
| Paper clips                     | Clay or play dough                                  |
| Construction paper or cardboard | Natural items from outdoors (sticks, rocks, leaves) |

Challenge	Animals that might have that adaptation
Make a predator device that could catch a flying insect.	Frog, spider, bat, flycatcher, bat, warbler
Make a device that could dig up roots.	Rabbit, gopher, bear
Make a device that could bite off and grind up leaves.	Deer, rabbit, giraffe
Make a predator device to grab or pick up an egg.	Blue jay, raccoon, crow, snake
Make a predator device for catching worms.	Robin, fish
Make a predator device for getting at animals that live underground in mud or soil.	Shorebird, gopher, mole
Make a predator device that could grab animals from the water.	Osprey, eagle, pelican, duck, raccoon, bear
Make a device to catch or gather any food of your choice.	

**Part 2:** Select one animal that has the food-gathering adaptation you created in Part 1. With the help of a parent or teacher, look up the animal on the Internet or in a book, and read about it. Record some information about how the animal gathers food, and bring this to school.

## **MATH EXTENSION—PROBLEM OF THE WEEK**

### Investigation 4: Human Body

An after-school science club was studying owls. They discovered that owls live longer in captivity than they do in the wild. The barn owl lives about 16 years in the wild, and it lives three times longer in captivity. How long does the barn owl live in captivity?

Show your work and explain your answer.

The great horned owl lives 12 years less in captivity than the barn owl. How many years does the great horned owl live in captivity?

Show your work and explain your answer.

The great horned owl lives one-fourth fewer years in the wild than it does in captivity. How many years does the great horned owl live in the wild?

Show your work and explain your answer.



# HOME/SCHOOL CONNECTION

## Investigation 4: Human Body

Living bone is composed of two tissues.

- **Bone cells** and the blood vessels and nerves that maintain them.
- A **dense matrix** that fills the space between the cells.

It is the dense matrix that we associate with bone. The matrix is hard, strong, and resilient, making bone an ideal material for providing structure and protection.

The matrix is composed of two main materials.

- Mineral salts, mostly calcium phosphate, 65%.
- Long fibers of collagen, a flexible protein, 35%.

To find out more about bones, try this investigation at home.

1. Remove all the meat from a cooked chicken wing or drumstick. Wash the bone well, perhaps using a metal scrub pad.
2. Let the bone dry overnight.
3. Place the bone in a jar. Cover the bone with regular household vinegar.
4. In a day or two, pour off the old vinegar, and replace it with new vinegar.
5. Repeat this process of refreshing the vinegar for a week or 10 days.
6. Rinse the bone thoroughly with water, and check it for rigidity.

What were your results? Describe the bone and how it has changed.

Vinegar is a mild acid. What do you think happened when you put the bone into acid?