LETTER TO FAMILY

Cut here and paste onto school letterhead before making copies.

Science News

Dear Family,

Metric Measurement Units	
The meter is about the height from the floor to a typical doorknob.	**The liter** is about the volume of water in a bottle of drinking water.
The gram is about the mass of a standard paper clip.	**Degrees Celsius** room temperature is about 24°C; body temperature is about 37°C.

We are starting a new science unit called **Measuring Matter**. We'll explore the need for standard units, and work with the metric units and tools used by scientists worldwide. This unit introduces the metric system (the International System of Units—SI) as the language used by scientists to communicate the results of their observations and experiments.

It has been found that students learn metric units (liter, gram, meter, degree Celsius) quicker and more thoroughly when they are introduced as a separate system, not converted from the customary units (foot, pound, quart, degree Fahrenheit). Our goal is that the metric concepts will have their own frame of reference in your child's mind, and that, in time, he or she will think metric.

Our study of matter will deal with phase change, including melting (the change from solid to liquid) and evaporation (the change from liquid to gas). Your child is probably familiar with phase changes in water (ice to water to water vapor), but may appreciate for the first time that these processes apply to thousands of materials, ranging from oxygen to rock. We will also investigate what happens when materials are mixed.

Knowing how to measure is important in everyday life as well as in scientific endeavors. Watch for the Home/School Connection sheets that I will be sending home from time to time. These homework assignments suggest ways for your whole family to review the metric measurement already in common usage in the United States and to extend your use of metrics into areas that are less familiar. At this time, the United States is one of a small handful of countries in the world that does not use metric measurement as its national standard.

You can get more information about this module by going to FOSSweb (www.FOSSweb.com). If you have questions or comments or expertise you would like to share with the class, please drop me a note.

Sincerely,

HOME/SCHOOL CONNECTION

Investigation 1: The First Straw

Find a home partner to work with you. Make a list of seven objects that you would like to measure. You and your partner should each estimate the length of each object. Record the **estimates** in the chart below.

Then **measure** each object, using your meter tape. Record the measurement in the table.

Compare the estimates to the actual measurements.

Which estimates were close to the actual measurements?

Which estimates were not close to the actual measurements?

Object	My estimate	My partner's estimate	Measurement

HOME/SCHOOL CONNECTION

Investigation 2: Fact of the Matter

Estimate Mass and Volume of Home Products

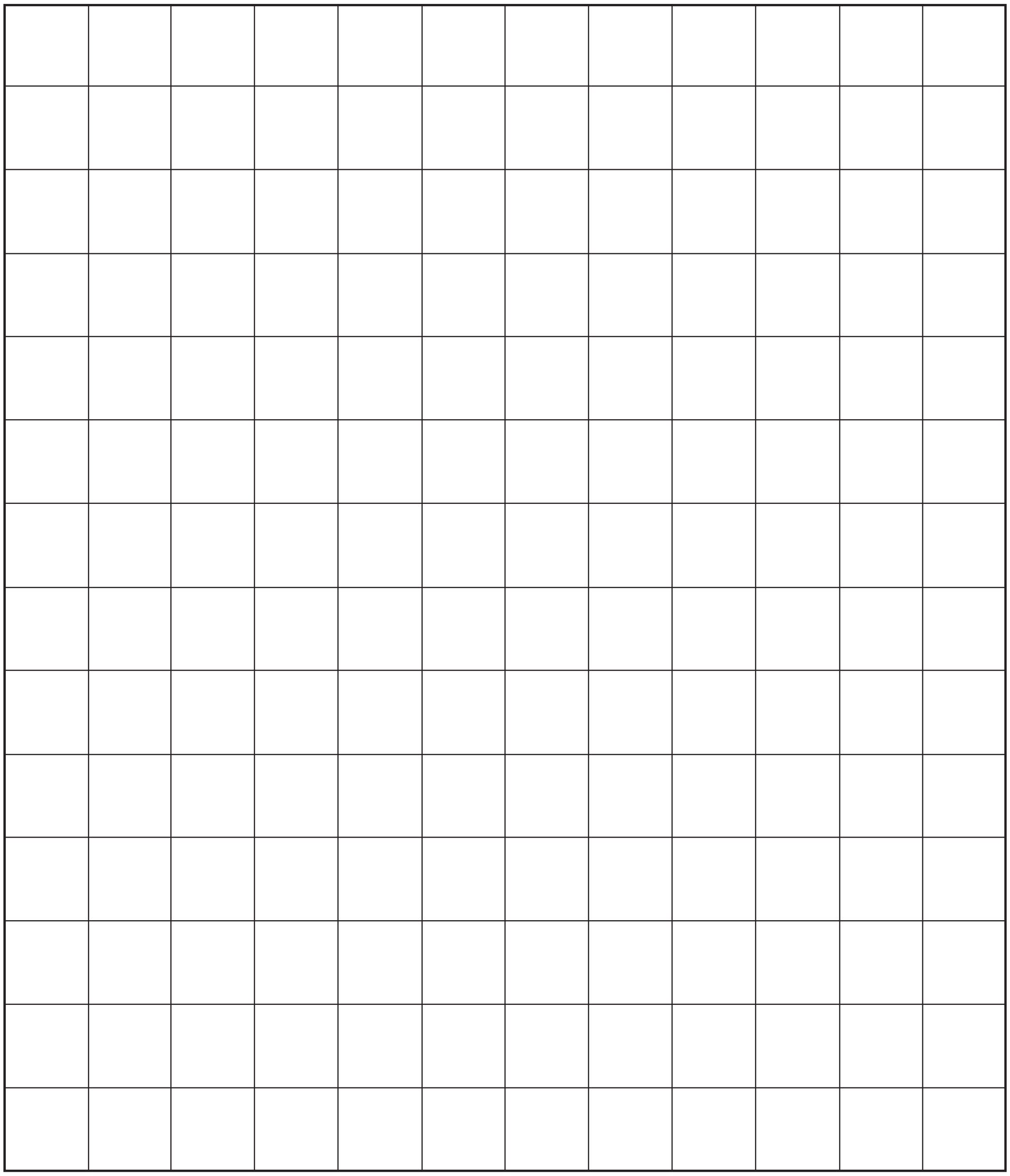
Find five packages of solid food, such as rice or cereal. Also find five liquid containers, such as fruit juice or dishwashing detergent. Estimate the mass of the solid products in grams and the volume of the liquid products in milliliters. Then check the labels to see how accurate your estimates are.

Solid products	**Mass estimate**	**Mass on label**
Liquid products	**Volume estimate**	**Volume on label**

HOME/SCHOOL CONNECTION

Investigation 3: Changing Matter

Use the newspaper, a TV weather report, or the Internet to find and record the high and low temperatures in your city (or one close by) for 5 days. Then draw two graph lines, one for high and one for low, to show the change in temperature over those 5 days.



HOME/SCHOOL CONNECTION

Investigation 4: Mixtures

How does temperature affect how much sugar will dissolve in water?

Materials

- Sugar
- Room-temperature water
- Ice water
- Hot tap water (not boiling)

3 Clear containers
1 Measuring spoon (5 mL or teaspoon)
1 Measuring cup
1 Mixing spoon

Procedure

1. Measure 100 mL (1/2 cup) room-temperature water into one clear container.
2. Measure one level 5 mL spoon (1 teaspoon) of sugar, and put it into the water.
3. Use the mixing spoon to mix the sugar until it has all dissolved. (How do you know it has all dissolved?)
4. Continue to add and mix spoonfuls of sugar until no more sugar dissolves. (How do you know when no more sugar will dissolve?)
5. Record your data in the table below.
6. Predict how many spoonfuls of sugar will dissolve in ice water and in hot water. (Do you think there will be a difference? Why?)
7. Repeat steps 1–5, using ice water, and then using hot water.
8. In the last column of the table, record the difference, if any, in number of spoonfuls of sugar when mixed with water at different temperatures.
9. Answer the questions below the table.

Water temperature	Prediction (spoonfuls of sugar)	Actual (spoonfuls of sugar)	Difference (compared to room-temperature water)
Room temperature			
Ice water			
Hot water			

How did the amount of sugar you could dissolve change when you used different temperatures of water?

What is the relationship between water temperature and amount of sugar that will dissolve?