

FOSS® AT HOME MEASUREMENT

The FOSS® (Full Option Science System™) program offers a number of ways to get parents involved in their child's science education. Included here are short descriptions of several ways to bridge from classroom to home.

Letter to Parents. The letter to parents can be sent home at the start of a new science module. The letter describes what children will be learning and ways that parents can enrich the science-learning experience.

FOSS Science Stories. *FOSS Science Stories* is a series of original books developed to accompany and enrich the FOSS modules. The books include a variety of articles written in a number of styles, including narrative tales, expository articles, technical readings, and historical accounts.

Here are some suggestions for using *FOSS Science Stories* at home.

- **Expository and Historical/Biographical Readings.** The expository and historical/biographical readings provide excellent opportunities for students and parents to discuss the science content students are learning in the module. Specific articles include *The Metric System*, *Fahrenheit and Celsius*, and *Careers You Can Count On*.
- **Technical Readings.** The technical readings provide good opportunities for students to do a science activity at home with their families or follow instructions for a science project. For example, students could review the measuring activity outlined in *Measure This!* as homework or research further optical illusions for their end-of-module project.
- **"Questions to Explore."** Students can read the article in class and then answer the "Questions to Explore" at home in their science notebooks. You might consider this strategy after students read *The Metric System in the United States* or *Water Everywhere*.
- **After the Story.** See the Science Stories folio in the Teacher Guide for suggestions on how to extend the stories at home. For example, after students read *Mind-Boggling Measurements*, you might have students conduct research at the library or on the Internet for other world records based on metric measurements. You might also assign specific questions to be researched, such as *What is the fastest land animal on Earth?* See page 11 of the Science Stories folio for additional research questions.

LETTER TO PARENTS

Cut here and paste into school letterhead before mailing copies.

SCIENCE NEWS

Dear Parents,

Our class will be learning metric measurement over the next several weeks using the FOSS Measurement Module. We'll explore the need for standard units, and work with the metric units and tools used by scientists worldwide. Our approach will be to introduce the metric system 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 an independent, integrated system—not converted from the English 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.

Knowing how to measure is important in everyday life as well as in scientific endeavors. Watch for the Home/School Connections 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 U.S., and to extend your use of metrics into areas that are less familiar. At this time the U.S. is the only major country in the world that does not use metric measurement as its national standard. It is only a matter of time before the U.S. adopts the metric system, and the students in our class will be ready.

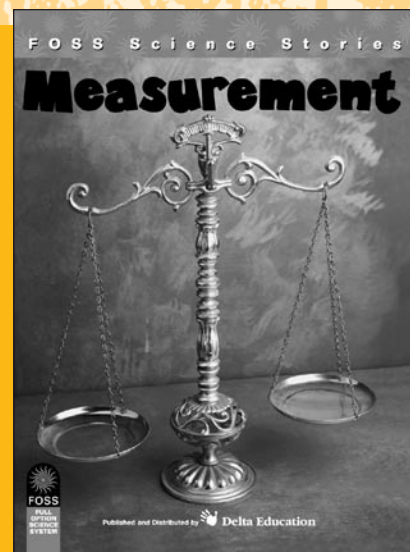
We are looking forward to several weeks of activities designed to provide an interesting introduction to metric measurement. If you have any questions or comments, or have some metric measuring tools you would like to share with the class, please drop me a note.

Comments _____

FOSS Measurement Module
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Investigation 1: The First Street
No. 1—Teacher Sheet

No. 1—Teacher Sheet



Name _____
Date _____

HOME/SCHOOL CONNECTION
INVESTIGATION 2: WEIGHT WATCHING

Have your family help you make a list of measurements that people need to use in daily life. Once a day, ask each family member if they can think of something they did that required something to be measured. Make your list below.

TYPE OF MEASUREMENT	USED FOR...

What kind of measurement does your family use most often?

Can you think of any other measurements that people might need to use that you have not listed above?

FOSS Measurement Module
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Can be photocopied for classroom or workshop use. Investigation 2: Weight Watching
No. 23—Student Sheet

No. 23—Student Sheet

Name _____
Date _____

MATH EXTENSION—PROBLEM OF THE WEEK
INVESTIGATION 1: THE FIRST STRAW

Marry and Max wanted to estimate the length of the playground. It was not important that they have an exact measurement, but they wanted some idea of how big it was for a field-day event they were planning.

Marry decided to measure it by walking across the playground. She marked off one walking step and found it was 50 cm long.

Max decided to measure using the wheel on his wheelchair. Marry measured the circumference of the wheel and found out that it was 2 m around. Then they walked and wheeled across the playground to see how big it was.

If Max counted 40 full turns of his wheel from one end of the playground to the other, how many walking steps did Marry take to cover the same distance?

FOSS Measurement Module
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Can be photocopied for classroom or workshop use. Investigation 1: The First Straw
No. 18—Student Sheet

No. 18—Student Sheet

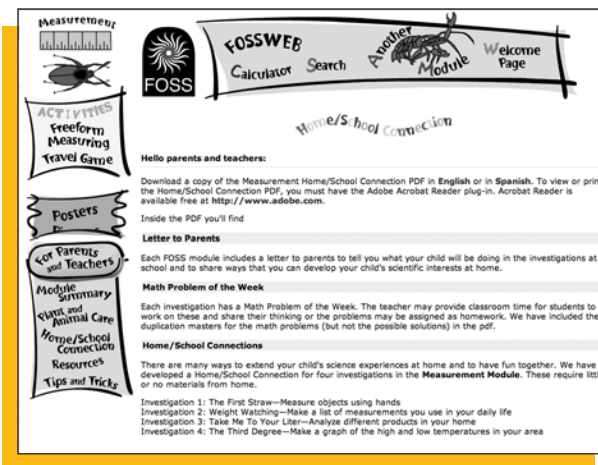
NOTE: All student sheets, including the Letter to Parents, Home/School Connection, and Math Problems of the Week, are available in FOSS Teacher Guides and online at www.fossweb.com. They are also available in Spanish. See For Parents and Teachers: Home/School Connection on page 4 of this folio.

Student Sheets. Throughout the module, students complete various recording and response sheets. Students should bring the sheets and/or their science notebooks home for families to review and discuss. For example, student sheet number 3, *How Long Is It?*, is a good opportunity for students to explain and review with parents estimating and measuring length.

Home/School Connections. Home/School Connections are activities developed specifically for the whole family to enjoy at home. For example, in Investigation 2 (student sheet number 23), students keep a journal for a week, listing all the times someone in the family needs to measure something. Then they choose one or two examples to explain whether an exact measurement was necessary or an estimate was appropriate.

Interdisciplinary Extensions. Each investigation has suggestions for art, language, math, social studies, and science extensions. These are good family activities. For example, after Investigation 2 students can find and compare food product labels at home; students look for labels that use metric measurements, such as cereals, crackers, and canned items. They might also do the *Math Problem of the Week* at home.

FOSSweb (www.fossweb.com). FOSSweb is an interactive website where families can find instructional activities and interactive simulations specifically designed for each FOSS module.



The screenshot shows the FOSSweb website interface. At the top, there are navigation links: "Calculator", "Search", "Another Module", and "Welcome Page". Below this is a banner for "FOSS" with a logo. The main content area is titled "Hello parents and teachers:" and includes several sections: "Download a copy of the Measurement Home/School Connection PDF in English or in Spanish. To view or print the Home/School Connection PDF, you must have the Adobe Acrobat Reader plug-in. Acrobat Reader is available free at <http://www.adobe.com>." Below this is "Inside the PDF you'll find" which lists "Letter to Parents", "Math Problem of the Week", and "Home/School Connections". Each section has a brief description of its content. On the left side of the page, there are several icons and labels: "MEASUREMENT" with a ruler and scale icon, "ACTIVITIES" with a fly icon, "Freeform Measuring Travel Game", "POSTERS", "For Parents and Teachers", "Module Summary", "Plant and Animal Care", "Home/School Connection Resources", and "Tips and Tricks".

NOTE: Pages 3 and 4 of this folio can be photocopied and sent home for parents to read. Those pages provide information on the resources for students and their families on FOSSweb.

FOSSWEB (WWW.FOSSWEB.COM)

The FOSS program maintains a resource-rich website for students and their families and friends. To explore the resources available for the **Measurement Module**, first enter www.fossweb.com in your browser.

The FOSS website requires plug-ins for your browser. We recommend that you click the “Test Your Browser” link at the bottom of the home page before you begin to ensure your computer has the minimum requirements.

Click the grades 3–6 icon to get a menu that links to each of the 3–6 modules. There you can choose **Measurement** and travel to a wealth of information and activities specific to this module.

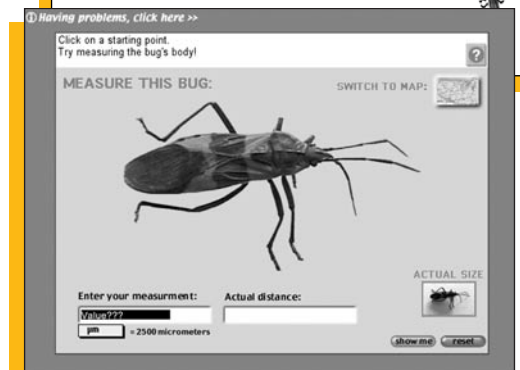
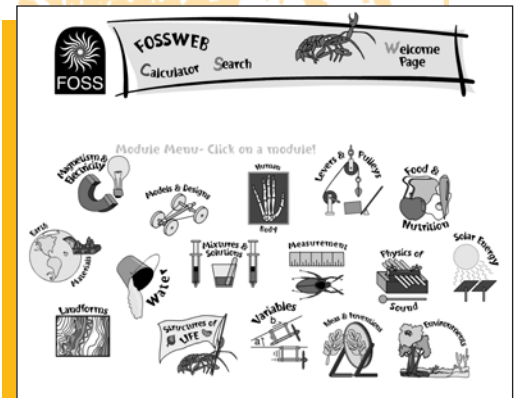
ACTIVITIES

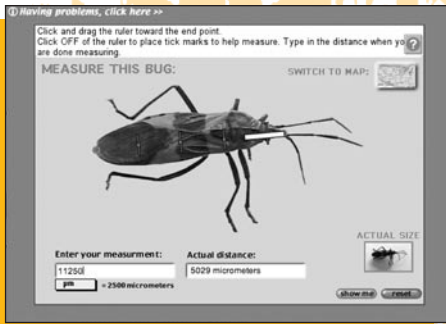
In the **Measurement Module**, you’ll find two activities: Freeform Measuring and Travel Game. These activities should be introduced after students have completed Investigation 1: *The First Straw*. In Freeform Measuring, children estimate and measure the length of a bug. You might ask,

- *What would you do to find out how long a snake is? An ant?*
- *What unit of measurement would you use?*

Review the introductory screen with the children. Click anywhere on the screen to move to the activity. Click the Show Me button and watch the demonstration. Point out that the measurement is in micrometers. Use the pull-down menu at the bottom left to change the measurement comparison to centimeters. One micrometer equals 0.025 centimeters. Open the Help screen by clicking the ? button. Review the game information and do one or two trials.

You can move to the Travel Game from the Freeform Measuring game by clicking the map next to “Switch to Map.” This activity works like Freeform Measuring. Remind children to select appropriate units for measuring. They can switch back to the bug by clicking the bug image next to “Switch to Bug.”





MOVIES

The Movies section includes a discussion about why measurement is important in Earth-orbiting satellites.

PICTURES

In the Pictures section, you can view images of people using measurement, such as a chemist using a graduated cylinder. These pictures might be used as a starting point for further research for the end-of-module project.

WEBSITES

The Websites section includes links to sites that can extend and enrich children's experiences with the **Measurement Module**.

VOCABULARY

In the Vocabulary section, you will find the glossary words and definitions used in the **Measurement Module**. They are provided in English and Spanish.

BOOKS/SOFTWARE

This section includes an annotated list of books, videos, and software recommended for the **Measurement Module**. You should be able to find many of these titles at your local library.

FOR PARENTS AND TEACHERS: HOME/SCHOOL CONNECTION

The For Parents and Teachers section includes the Home/School Connection that describes ways for families to do science together. For example, in Investigation 1, families measure a variety of objects using their hands, feet, fingers, and more for measuring units. The need for a standard unit of measure is reinforced. Look in this section for other resources included in a downloadable PDF file, including a general letter introducing the module, student projects, and math problems that relate to the science investigations.

