Name Date Time

LESSON 9•13

Unit 10: Family Letter

Measurement and Data

This unit has three main objectives:

- To review and extend previous work with measures of length, weight, and capacity by providing a variety of hands-on activities and applications. These activities will provide children with experience using U.S. customary and metric units of measurement.
- To extend previous work with the median and mode of a set of data and to introduce the mean (average) of a set of data.
- To introduce two new topics: finding the volume of rectangular prisms and using ordered pairs to locate points on a coordinate grid.

Children will repeat the personal measurements they made earlier in the year so that they may record their own growth. They will display these data in graphs and tables and find typical values for the class by finding the median, mean, and mode of the data.

They will begin to work with volumes of rectangular boxes, which have regular shapes, and will also compare the volumes of several irregular objects and investigate whether there is a relationship between the weight of these objects and their volumes.

Tables of Measures

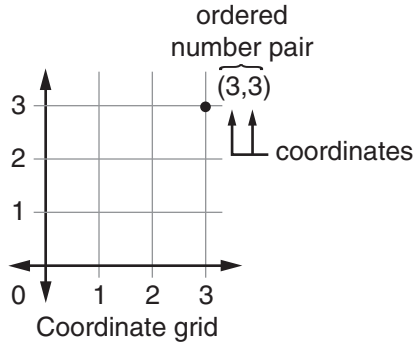
Length	1 kilometer = 1,000 meters 1 meter = 100 centimeters 1 centimeter = 10 millimeters 1 mile = 1,760 yards 1 yard = 3 feet 1 foot = 12 inches
Weight	1 kilogram = 1,000 grams 1 gram = 1,000 milligrams 1 ton = 2,000 pounds 1 pound = 16 ounces
Volume & Capacity	1 liter = 1,000 milliliters 1 gallon = 4 quarts 1 quart = 2 pints 1 pint = 2 cups 1 cubic yard = 27 cubic feet 1 cubic foot = 1,728 cubic inches

Please keep this Family Letter for reference as your child works through Unit 10.

Vocabulary

Important terms in Unit 10:

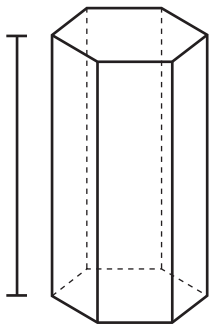
coordinate grid A reference frame for locating points in a plane by means of ordered pairs of numbers. A rectangular coordinate grid is formed by two number lines that intersect at right angles at their zero points.



coordinate A number used to locate a point on a number line; a point's distance from an origin.

ordered number pair A pair of numbers used to locate a point on a coordinate grid.

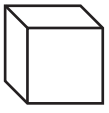
height of a prism The length of the shortest line segment from a base of a prism to the plane containing the opposite face. The height is perpendicular to the base.



volume The amount of space occupied by a 3-dimensional shape.

square centimeter (square cm, cm^2) A unit to measure area. For example, a square centimeter is the area of a square with 1-cm long sides.

cubic centimeter (cubic cm, cm^3) A metric unit of volume or capacity equal to the volume of a cube with 1cm edges.



weight A measure of how heavy something is; the force of gravity on an object.

capacity (of a scale) The maximum weight a scale can measure. For example, most infant scales have a capacity of about 25 pounds.

capacity (of a container) The amount a container can hold. Capacity is often measured in units such as quarts, gallons, cups, or liters.

frequency table A table in which data are tallied and organized, often as a first step toward making a frequency graph.

Waist-to-floor measurement (inches)	Frequency	
	Tallies	Number
27	//	2
28		0
29	𝍸	5
30	𝍸 ///	8
31	𝍸 //	7
32	////	4
	Total = 26	

mode The value or values that occur most often in a set of data. For example, in the frequency table above, 30 inches is the mode.

mean The sum of a set of numbers divided by the number of numbers in the set. Often called the average value of the set.

Do-Anytime Activities

To work with your child on the concepts taught in this unit and in previous units, try these interesting and rewarding activities:

1. Review equivalent names for measurements. For example: *How many inches in 1 foot? How many pints in 3 quarts? How many centimeters in 1 meter? How many grams in 1 kilogram?*
2. Review multiplication facts. For example: *How much is 6 times 3? 7×8? 4 [5s]?*
3. Review division facts. For example: *How many 2s in 12? What number multiplied by 4 equals 12? How much is 18 divided by 2?*
4. Practice multiplication with multiples of 10, 100, and 1,000. For example: *How much are 10 [30s]? How much is 4×100? What number times 100 equals 4,000?*
5. Practice division with multiples of 10, 100, and 1,000. For example: *How much is $\frac{1}{10}$ of 300? How many 50s in 5,000? How much is 200 divided by 50?*

Building Skills through Games

In Unit 10, your child will practice mental-math skills by playing the following games:

Memory Addition/Subtraction

Partners agree on a target number. They take turns adding or subtracting any number from 1 to 5 into the memory of their calculators while keeping track of the sums or differences in their heads. Then they press the MRC key to see if the final memory sums match their initial target number.

Multiplication Top-It

Players turn over two cards and call out the product. The player with the higher product keeps all the cards. The player with more cards at the end wins! *You will receive more detailed directions for* Multiplication Top-It *when we begin to play it in class.*

As You Help Your Child with Homework

As your child brings home assignments, you may want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through this unit's Home Links.

Home Link 10•1

1. 60; 96 **2.** 9; 12; 17

3. 33; 6; 12 **4.** 2; 4; 6

5. $\frac{1}{2}$; $\frac{1}{320}$; $\frac{1}{8}$; $\frac{1}{4}$; $\frac{1}{2}$ **6.** 90; 152; 117

Home Link 10•2

1. Boxes B, C, and D

2. Answers vary.

3. Answers vary.

Home Link 10•3

1. 2,052 **2.** 3,854

Home Link 10•5

1. inch **2.** gram

3. square yard **4.** centimeter

5. inch **6.** liter

7. 1 liter **8.** 140

9. 186 **10.** 864

Home Link 10•6

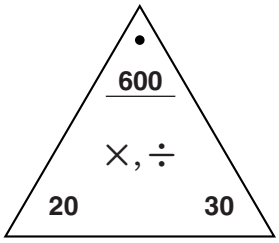
4. 3

Home Link 10•7

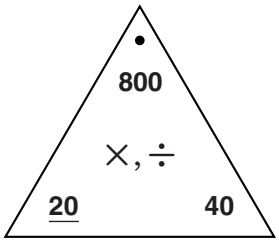
1. 60.3 **2.** 12.8

Home Link 10•8

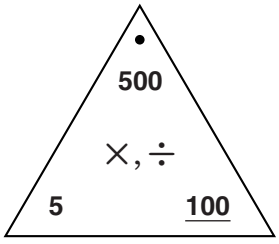
1. $20 \times 30 = 600$
$30 \times 20 = 600$
$600 \div 30 = 20$
$600 \div 20 = 30$



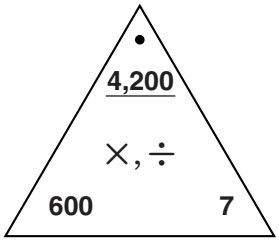
2. $40 \times 20 = 800$
$20 \times 40 = 800$
$800 \div 40 = 20$
$800 \div 20 = 40$



3. $100 \times 5 = 500$
$5 \times 100 = 500$
$500 \div 100 = 5$
$500 \div 5 = 100$



4. $600 \times 7 = 4{,}200$
$7 \times 600 = 4{,}200$
$4{,}200 \div 600 = 7$
$4{,}200 \div 7 = 600$



Home Link 10•10

1. (3,6) Algeria **2.** (6,3) Tanzania **3.** (5,5) Sudan
4. (4,5) Chad **5.** (5,6) Egypt **6.** (4,6) Libya