CHAPTER 9

Family Letter

Section A

What We Are Learning

Customary and Metric Measurement

Vocabulary

These are the math words we are learning:

customary system a system of measurement primarily used in the United States

metric system a system of measurement used all over the world whose units are related by the decimal system

Dear Family,

Your child will be learning about the customary system of measurement. There are different units of measure for length, weight, and capacity. Length can be measured by the inch, the foot, the yard, or the mile. Weight is measured by the ounce, the pound, and the ton. Capacity is measured by the fluid ounce, the cup, the pint, the quart, and the gallon.

While the customary system is used primarily in the United States, other parts of the world use the metric system. This system has different units of measurement that are comparable but not equivalent to the units in the customary system. The metric units of length are millimeters, centimeters, meters, and kilometers. The metric units used to measure mass are milligrams, grams, and kilograms. Capacity is measured in the metric system by milliliters, and liters.

Your child will practice choosing the appropriate units or measurement tools necessary to measure different objects. For example, the length of a certain road would be measured in miles or kilometers, not inches or centimeters. The capacity of a drinking glass would be measured in milliliters or fluid ounces, not liters or gallons. Practice with your child at home by choosing household objects and asking in what units they should be measured.

Your child will also learn how to convert between units in each measuring system. The table below shows the conversions for the customary system.

Length	12 in. = 1 foot; 3 ft = 1 yard; 5,280 ft = 1 mile
Weight	16 oz = 1 lb; 2,000 lb = 1 T
Capacity	8 fl oz = 1 cup; 2 c = 1 pint; 2 pt = 1 quart; 2 qt = 1 gallon

Family Letter

Section A, continued

Notice that some measurement conversions can be made with more than one unit. For example 5,280 ft = 1 mi and since 3 ft = 1 yd, 1,760 yd = 1 mi. This demonstrates how we are able to change, or convert, between different units. To convert a measurement from larger units to smaller units, multiply the measurement with larger units by the number of smaller units it takes to make one of the larger unit; to find feet in inches, multiply by 12. To convert from smaller to larger units, divide the quantity of the measurement in smaller units by the number of smaller units it takes to make one of the larger unit; to convert ounces to pounds, divide by 16.

The metric system works in much the same way. The conversions are below.

Length	10 millimeters = 1 centimeter; 100 cm = 1 meter; 1000 m = 1 kilometer
Mass	1000 milligrams = 1 gram; 1000 g = 1 kilogram
Capacity	1000 milliliters = 1 liter; 1000 l = 1 kiloliter

You may notice that the conversions for the metric system are similar. You can use the same methods of multiplying and dividing from the customary system to convert in the metric system. However, since all these measurements are based on powers of ten, there is a shortcut to conversion in the metric system. To convert to smaller units, move the decimal point to the right based on the number of zeros in the conversion factor. To convert to larger units, move the decimal point to the left. For example:

4.850 kg = 4,850 g

1000 g in 1 kg = 3 zeros
move decimal point 3 places right

5.76 cm = 5.76 m

100 cm in 1 m
move decimal point 2 places left

Your child will also learn about units of time and temperature. There is only one system for measuring time. It is measured in seconds, minutes, and hours. 60 of the smaller units make up 1 of the larger units. There are two systems for measuring temperature: Fahrenheit and Celsius. Both are measured in degrees. Water freezes at 0° C or 32° F and boils at 100° C or 212° F.

Help your child become familiar with these units and conversions. Point out measurements such as capacity of a container or distance on a map and ask how many of another unit that measurement would equal.

Sincerely,

Name _____ Date _____ Class _____

CHAPTER 9

Family Letter

Customary and Metric Measurement

Name the appropriate units to measure each.

Customary

1. the length of a football field _____
2. the capacity of a can of juice _____
3. the weight of an elephant _____

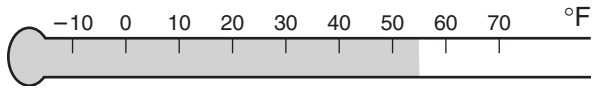
Metric

4. the mass of a pair of scissors _____
5. the length of an eyelash _____
6. the capacity of a bucket _____

Convert.

7. 4 mi to ft _____
8. 675 l to ml _____
9. 48 oz to lb _____
10. 3.762 kg to g _____
11. 64 pt to gal _____
12. 4,391 mm to m _____
13. 2.47 T to lb _____
14. 5.681 l to ml _____
15. 60 in. to ft _____
16. 9.753 m to cm _____
17. 6 gal to c _____
18. 4.8 mg to g _____
19. 1.5 hours to minutes _____
20. 45 minutes to hours _____

Find the temperature.

21. 

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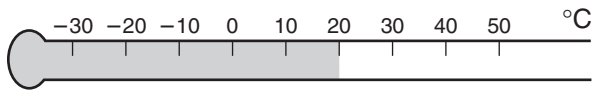
22. 

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Answers: 1. yards 2. fluid ounces 3. tons 4. grams 5. millimeters 6. kiloliters 7. 21,120 ft 8. 675,000 ml 9. 3 lb 10. 3,762 g 11. 16 gal 12. 4,391 m 13. 4,940 lb 14. 5,681 ml 15. 5 ft 16. 975.3 cm 17. 48 c 18. 0.0048 g 19. 90 min 20. 0.75 hr 21. 55° F 22. 20° C

Name _____ Date _____ Class _____

CHAPTER 9

Family Fun

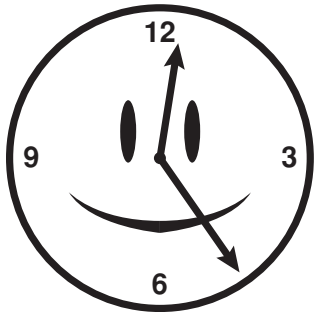
Measurement Jumble

Fill in the answers. Then complete the riddle below by using the selected letter from each answer to fill in the blanks.

1. The appropriate metric unit to measure the capacity of a car's gas tank is the [ ] ___ ___ ___ ___.
2. One minute equals 60 ___ ___ [ ] ___ ___ ___ ___.
3. Water freezes at 32° ___ ___ ___ ___ ___ [ ] ___ ___ ___ ___.
4. One cup equals 8 ___ ___ ___ ___ ___ ___ ___ ___ ___ [ ] ___.
5. Move the decimal to the left to convert grams to ___ ___ ___ ___ ___ ___ [ ] ___ ___.
6. Temperature is measured in ___ ___ ___ ___ ___ ___ [ ].
7. 10 millimeters equals 1 [ ] ___ ___ ___ ___ ___ ___ ___ ___ ___.
8. The appropriate customary unit to measure the length of the classroom is the ___ ___ ___ [ ].
9. The appropriate metric unit to measure the width of a pencil is the ___ ___ ___ ___ ___ ___ [ ] ___ ___ ___.
10. 2,000 pounds equals 1 ___ [ ] ___.
11. One gallon equals 8 [ ] ___ ___ ___ ___.

Where did the clock finish in the race?

___	___	___	___	___	___	___	___	___	___	___
6	4	2	10	3	8	11	1	5	7	9



Answers: 1. liter, 2. seconds 3. Fahrenheit 4. fluid ounces 5. kilograms 6. degrees 7. centimeter 8. yard 9. millimeter 10. ton 11. pints Riddle: second place

CHAPTER 9

Family Letter

Section B

What We Are Learning

Measurement and Geometric Figures

Vocabulary
These are the math words we are learning:

center the given point in a circle from which all points in a plane are the same distance

circle the set of all points in a plane that are the same distance from a given point, called the center

circumference the distance around the circle

diameter a line segment that passes through the center of a circle with endpoints on the circle

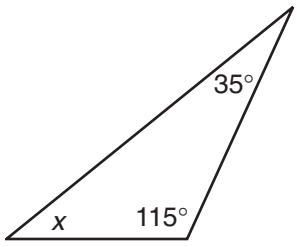
perimeter the distance around a polygon

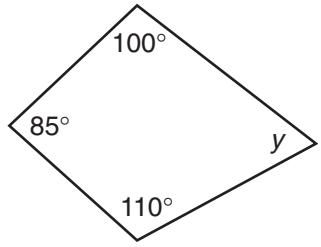
pi the ratio of the circumference of a circle to the length of its diameter, $\frac{C}{d}$; represented by the Greek letter, π

radius (radii) a line segment with one endpoint at the center of the circle and the other endpoint on the circle

Dear Family,

Your child will learn about angle measures within polygons. The measures of the angles inside a triangle will always add to 180°. The angle measures in any quadrilateral will always equal 360°. Therefore, if you know all but one of the angle measures you can always find the last by using an algebraic expression. For example:

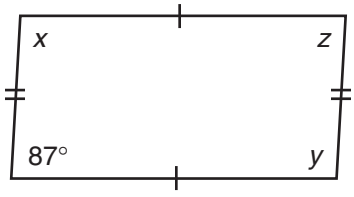




$35° + 115° + \angle x = 180°$
$150° + \angle x = 180°$
$\angle x = 30°$

$100° + 85° + 110° + \angle y = 360°$
$295° + \angle y = 360°$
$\angle y = 65°$

There are some special rules for regular quadrilaterals. Opposite pairs of angles in a regular quadrilateral are equal. Any two adjacent angles will total 180°. All angles in squares and rectangles are 90°. Therefore, by knowing only one angle of a regular quadrilateral, you can find all the angles.



$87° + \angle x = 180°$
$\angle x = 93°$

$\angle x = \angle y$
$\angle y = 93°$

$\angle y + \angle z = 180°$
$93° + \angle z = 180°$
$\angle z = 87°$

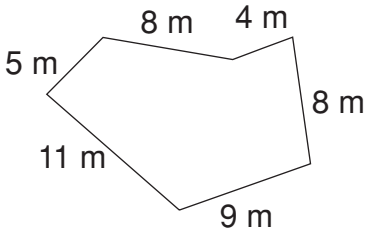
You can also tell that $\angle z = 87°$ because it is congruent with its opposite angle.

Your child will be learning to find the perimeter and area of different figures. The **perimeter** of a figure is the distance around the polygon. To find the perimeter your child will find the sum of the lengths of all sides of a figure.

Family Letter

Section B, continued

Find the perimeter of the figure.

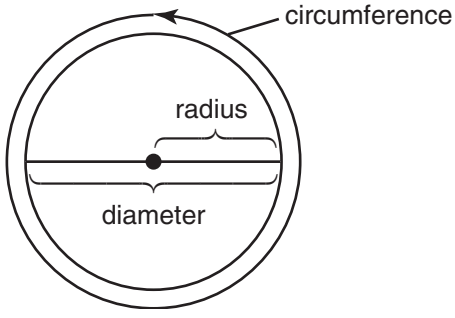


5 + 8 + 4 + 8 + 9 + 11 = 45

The perimeter is 45 m.

Your child may find the perimeter of a rectangle by using a simple formula: $P = 2\ell + 2w$.

The perimeter of a circle is called the circumference. Your child can begin to understand this concept by wrapping a flexible tape measure around a cylinder. The length the tape measures around the object is equal to the circumference of the cylindrical base. There is also a formula your child can use to find the circumference.



Circumference = πd

Since the diameter is twice the length of the radius, it may help your child to use the formula $2\pi r$. The pi symbol stands for the ratio between the circumference and the diameter and can be represented by the decimal 3.14 or the fraction $\frac{22}{7}$. In other words, the circumference is a little more than three times the diameter.

You can help your child study these concepts by providing objects for her or him to measure and providing “missing angle” problems for her or him to solve.

Sincerely,

Name _____ Date _____ Class _____

CHAPTER 9

Family Letter

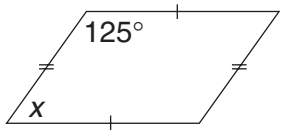
Measurement and Geometric Figures

Find the measure of $\angle x$.

1.

_____

2.



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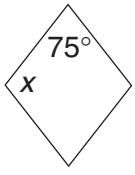
3.



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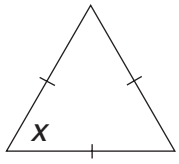
4.



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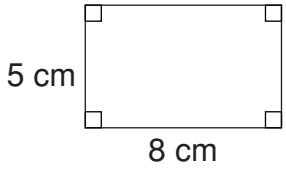
Find the perimeter of each figure.

5.



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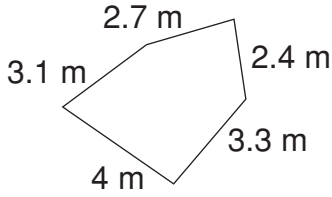
6.



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Find each unknown measure.

7. The length of a rectangle is 11 meters. What is the perimeter of the rectangle if the width is 4 meters less than the length?

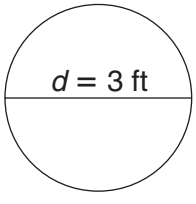
_____

8. An equilateral triangle has a perimeter of 18 cm. What is the length of each side?

_____

Find the circumference.

9.



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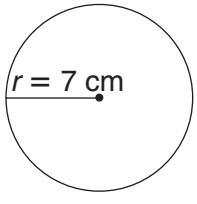
10.



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Answers: 1. 65° 2. 55° 3. 105° 4. 60° 5. 26 cm 6. 15.5 m 7. 36 m 8. 6 cm 9. 9.42 ft 10. 43.96 cm

Name _____ Date _____ Class _____

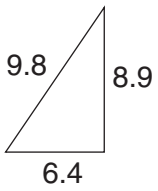
CHAPTER 9

Family Fun

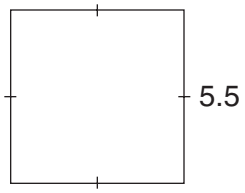
Perimeter and Circumference Match Up

Find the perimeter of each polygon and the circumference of each circle (round to the nearest tenth). All measurements are in centimeters. Then draw lines to match the circles and polygons whose perimeter and circumference most closely match.

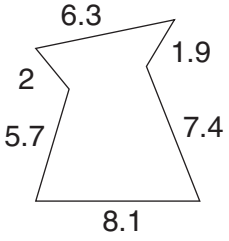
1.



2.



3.



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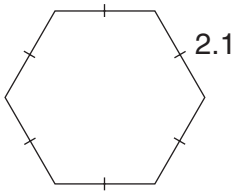
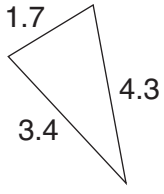
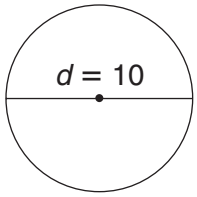


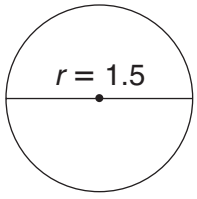
5.



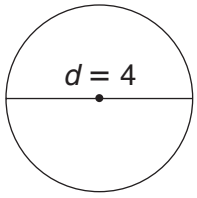
A



B



C



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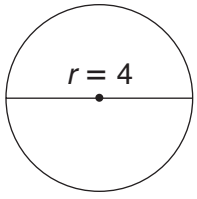
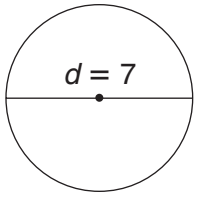


E



Answers: 1. D 2. E 3. A 4. C 5. B