TABLE OF CONTENTS

About *Finish Line Georgia Milestones Math* 5

UNIT 1: Big Ideas from Grade 5 7

LESSON 1	MGSE5.NF.6	**Multiplying Fractions** [connects to MGSE6.G.2]	8
LESSON 2	MGSE5.NBT.7	**Operations with Decimals** [connects to MGSE6.NS.3]	16
LESSON 3	MGSE5.G.1, 2	**Using a Coordinate Plane** [connects to MGSE6.NS.8, MGSE6.G.3]	25
LESSON 4	MGSE5.OA.1, 2	**Writing and Evaluating Expressions** [connects to MGSE6.EE.1, 2a, 2c]	33
		UNIT 1 REVIEW	39

UNIT 2: Ratios and Proportional Relationships 45

LESSON 5	MGSE6.RP.1	**Ratios**	46
LESSON 6	MGSE6.RP.3a	**Equivalent Ratios**	53
LESSON 7	MGSE6.RP.2	**Unit Rates**	60
LESSON 8	MGSE6.RP.3b	**Solving Problems with Unit Rates**	66
LESSON 9	MGSE6.RP.3c	**Percents**	72
LESSON 10	MGSE6.RP.3d	**Ratio Reasoning with Measurement Conversions**	79
		UNIT 2 REVIEW	86

UNIT 3: The Number System 92

LESSON 11	MGSE6.NS.2	**Dividing Whole Numbers**	93
LESSON 12	MGSE6.NS.1	**Dividing Fractions**	100
LESSON 13	MGSE6.NS.3	**Adding and Subtracting Decimals**	107
LESSON 14	MGSE6.NS.3	**Multiplying and Dividing Decimals**	114
LESSON 15	MGSE6.NS.4a, 4b	**Greatest Common Factor and Least Common Multiple**	122
LESSON 16	MGSE6.NS.5	**Integers**	129
LESSON 17	MGSE6.NS.6a, 6c	**Rational Numbers on a Number Line**	135
LESSON 18	MGSE6.NS.6b, 6c	**Rational Numbers on a Coordinate Plane**	142
LESSON 19	MGSE6.NS.7a, 7b	**Comparing and Ordering Rational Numbers**	151
LESSON 20	MGSE6.NS.7c, 7d	**Absolute Value**	158
		UNIT 3 REVIEW	165

UNIT 4: Expressions and Equations 169

LESSON 21	MGSE6.EE.1	**Writing Numerical Expressions**	**170**
LESSON 22	MGSE6.EE.2a, 2b, 6	**Writing Algebraic Expressions**	**177**
LESSON 23	MGSE6.EE.1	**Evaluating Numerical Expressions**	**184**
LESSON 24	MGSE6.EE.2c	**Evaluating Algebraic Expressions**	**191**
LESSON 25	MGSE6.EE.3, 4	**Equivalent Expressions**	**198**
LESSON 26	MGSE6.EE.5	**Understanding Equations and Inequalities**	**205**
LESSON 27	MGSE6.EE.7	**Solving Problems Using Equations**	**211**
LESSON 28	MGSE6.EE.8	**Writing and Modeling Inequalities**	**218**
LESSON 29	MGSE6.EE.9a, 9b	**Relationships Between Two Variables**	**224**
LESSON 30	MGSE6.EE.9b	**Graphing Relationships**	**231**
		UNIT 4 REVIEW	**238**

UNIT 5: Geometry 243

LESSON 31	MGSE6.G.1	**Area**	**244**
LESSON 32	MGSE6.G.1	**Solving Problems Using Area**	**251**
LESSON 33	MGSE6.G.2	**Volume**	**258**
LESSON 34	MGSE6.G.3; MGSE6.NS.8	**Coordinate Graphing**	**264**
LESSON 35	MGSE6.G.4	**Nets and Surface Area**	**271**
		UNIT 5 REVIEW	**278**

UNIT 6: Statistics and Probability 283

LESSON 36	MGSE6.SP.1	**Statistical Questions**	**284**
LESSON 37	MGSE6.SP.2	**Data Distributions**	**289**
LESSON 38	MGSE6.SP.3, 5c, 5d	**Using Measures of Center and Measures of Variability**	**296**
LESSON 39	MGSE6.SP.4	**Data Displays**	**304**
LESSON 40	MGSE6.SP.5a–5d	**Summarizing Data**	**311**
		UNIT 6 REVIEW	**317**

Glossary 322

Flash Cards 329

LESSON 10

Ratio Reasoning with Measurement Conversions

MGSE6.RP.3d

PART 1 Introduction

If you know the relationship between two different units of measurement, you can use ratios to convert a measurement from one unit to another.

The relationship between units is known as the **conversion factor.** For example, there are 12 inches in 1 foot. There are two conversion factors that relate inches and feet.

$$\frac{12 \text{ in.}}{1 \text{ ft}} \text{ and } \frac{1 \text{ ft}}{12 \text{ in.}}$$

When you use a conversion factor, you choose the form that has the unit you want to find in the numerator.

Some common conversion factors are:

1 yd = 3 ft
1 mi = 5,280 ft
1 mi = 1,760 yd
1 c = 8 fl oz
1 pt = 2 c
1 qt = 2 pt
1 gal = 4 qt

Convert 15 feet to inches using a conversion factor.

You have feet and you want to know inches. Choose $\frac{12 \text{ in.}}{1 \text{ ft}}$ for the conversion factor.

Multiply the measurement you have by the conversion factor. Notice that the units of feet cancel out. Then multiply the numerators to get the result in inches.

$$15 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = \frac{15 \text{ ft}}{1} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 180 \text{ in.}$$

There are 180 inches in 15 feet.

Sometimes more than one conversion factor is needed.

Convert 10 pints to ounces.

You need conversion factors to change pints to cups and cups to ounces.

$$\frac{2 \text{ c}}{1 \text{ pt}} \text{ and } \frac{8 \text{ oz}}{1 \text{ c}}$$

Multiply using the conversion factors. Cancel out units.

$$10 \text{ pt} \times \frac{2 \text{ c}}{1 \text{ pt}} \times \frac{8 \text{ oz}}{1 \text{ c}} = 160 \text{ oz}$$

You can put the conversion factors in any order to multiply.

There are 160 ounces in 10 pints.

Think About It

When you convert from a larger unit to a smaller unit, will your number be smaller or larger? What about when you convert from a smaller unit to a larger unit?

_____

_____

PART 2 Focused Instruction

Use conversion factors to convert measurements between systems of measurement.

➤ A tube contains 128 grams of toothpaste. About how many ounces of toothpaste, to the nearest tenth of an ounce, does it contain? Use 1 oz ≈ 28.3 g.

How much toothpaste is in the tube? _____

Is this amount given in a customary unit or a metric unit?

_____

What unit is the problem asking you to convert the amount to?

_____

What system of measurement is this unit in?

_____

Conversion factors between systems are not typically exact numbers.

About how many grams are in 1 ounce? _____

Write the conversion factor as a ratio of ounces to grams. _____

Write an expression to show the number of grams multiplied by the conversion factor. Include the measurement units. _____

What unit of measurement is canceled out in your expression?

_____

The conversion factor should have the units you want in the numerator.

What unit remains? _____

Solve the expression to find the number of ounces of toothpaste, to the nearest tenth of an ounce. _____

Use conversion factors to change rates. Be sure the units cancel out. Look carefully at which units you put in the numerator and the denominator of the conversion factor.

➤ An average horse can run 15 miles per hour. A bird can fly 30 feet per second. Which animal travels at a faster rate?

Convert the horse's speed to feet per second to compare the rates.

Write a conversion factor to convert miles to feet.

_____

How many seconds are in a minute? How many minutes are in an hour?

Write a conversion factor to convert hours to seconds.

_____

Write an expression to convert 15 miles per hour to feet per second. Cancel out units and multiply.

Make sure the units cancel out. If not, you may have used the wrong conversion factor.

Which animal travels at a faster rate? _____

Use what you know about conversions to answer these questions.

1 How many feet is 3,251 yards? _____

2 A glacier moves 152 feet a year. How many inches a day does it move? Round your answer to the nearest whole number. _____

3 A melon has a mass of 1.3 kilograms. To the nearest pound, about how many pounds is that? Use 1 kg ≈ 2.205 lb. _____

Solve the following problems.

1 A gallon of gas costs $3.79. Olive oil costs $6.99 for 16 fluid ounces. Which costs more per ounce? Explain how you arrived at your answer.

Convert to the same units before you compare.

_____

_____

2 A fish tank at an aquarium holds 216,000 gallons of water. The tank is filled at a rate of 1 gallon per second. How many days will it take to fill this tank?

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day

Answer _____ days

3 Convert 18 feet per second to inches per minute.

How many conversion factors do you need to use?

Answer _____ inches per minute

Solve the following problems.

1 About how many pints of soda are in a 2-liter bottle? Use 1 L ≈ 33.8 fl oz.

A 2.11

B 3.64

C 4.23

D 8.45

2 A car travels 294 miles on a full tank of gas. The car's gas tank holds 14 gallons. How many yards per gallon can this car travel?

A 21

B 63

C 24,640

D 36,960

3 The speed of light is approximately 3,000,000,000 meters per second. What is the speed of light in kilometers per minute? Show your work.

Answer _____ km/min

4 If 1 inch is about 2.54 centimeters, how many inches long is an 8-centimeter piece of ribbon? Give your answer to the nearest hundredth.

Answer _____ inches

5 Four pounds of hamburger can be made into 12 patties of equal weight. Each patty will be weighed in ounces.

Part A Write the conversion factor for pounds to ounces.

Answer _____

Part B How many ounces do 4 pounds of hamburger weigh?

Answer _____ ounces

Part C To the nearest whole number, how many grams will each hamburger weigh? Use 1 oz ≈ 28.3 g.

Answer _____ grams

6 One knot equals one nautical mile per hour. One nautical mile equals 1,852 meters.

Part A What conversion factors are used to convert knots to meters per second?

Answer _____

Part B What is the speed, in meters per second, of a ship traveling at a rate of 9 knots? Show your work or explain how you know.

_____

_____

_____

7 Mark True or False for each of the following statements.

	True	False
50 feet = 4 inches	☐	☐
5 miles = 8,800 yards	☐	☐
477 feet = 1,431 yards	☐	☐
20 quarts = 10 gallons	☐	☐
4 pints = 64 fluid ounces	☐	☐
80 ounces = 6 pounds	☐	☐
4,500 pounds = $2\frac{1}{4}$ tons	☐	☐

8 The area of a living room is 30 square yards. The width is 10 feet.

Part A What is the width of the living room in yards?

Answer _____ yards

Part B What is the length of the living room, in inches? Show your work.

Answer _____ inches