Name _____

Measurement Benchmarks

Essential Question How can you use benchmarks to understand the relative sizes of measurement units?

Common Core **Measurement and Data—4.MD.A.1**

MATHEMATICAL PRACTICES
MP1, MP5

Unlock the Problem Real World

Jake says the length of his bike is about four yards. Use the benchmark units below to determine if Jake's statement is reasonable.

Customary Units of Length			
 1 in.	 1 ft	 1 yd	
about 1 inch	about 1 foot	about 1 yard	1 mile in about 20 minutes

A **mile** is a customary unit for measuring length or distance. The benchmark shows the distance you can walk in about 20 minutes.

A baseball bat is about one yard long. Since Jake's bike is shorter than four times the length of a baseball bat, his bike is shorter than four yards long.

So, Jake's statement _____ reasonable.

Jake's bike is about _____ baseball bats long.

Example 1 Use the benchmark customary units.

Customary Units of Liquid Volume				
				
1 cup = 8 fluid ounces	1 pint	1 quart	1 half gallon	1 gallon

- About how much liquid is in a mug of hot chocolate? _____

Customary Units of Weight		
		
about 1 ounce	about 1 pound	about 1 ton

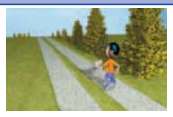
- About how much does a grapefruit weigh? _____

Math Talk MATHEMATICAL PRACTICES 2

Use Reasoning Use benchmarks to explain how you would order the units of weight from heaviest to lightest.

Benchmarks for Metric Units Like place value, the metric system is based on multiples of ten. Each unit is 10 times as large as the next smaller unit. Below are some common metric benchmarks.

Example 2 Use the benchmark metric units.

Metric Units of Length				
 about 1 millimeter	 about 1 centimeter	 about 1 decimeter	 about 1 meter	 1 kilometer in about 10 minutes

A **kilometer** is a metric unit for measuring length or distance. The benchmark shows the distance you can walk in about 10 minutes.

- Is the length of your classroom greater than or less than one kilometer?

_____

Metric Units of Liquid Volume	
 1 milliliter	 1 liter

- About how much medicine is usually in a medicine bottle?

about 120 _____

Metric Units of Mass	
 about 1 gram	 about 1 kilogram

- About how much is the mass of a paper clip?

_____

Math Talk MATHEMATICAL PRACTICES 7

Look for Structure
Explain how benchmark measurements can help you decide which unit to use when measuring.

Name _____

Share and Show

MATH BOARD

Use benchmarks to choose the metric unit you would use to measure each.

1. mass of a strawberry

_____

2. length of a cell phone

_____

Metric Units
centimeter
meter
kilometer
gram
kilogram
milliliter
liter

Circle the better estimate.

3. width of a teacher's desk

10 meters or 1 meter

4. the amount of liquid a punch bowl holds

2 liters or 20 liters

5. distance between Seattle and San Francisco

6 miles or 680 miles

Math Talk MATHEMATICAL PRACTICES 3

Apply Which metric unit would you use to measure the distance across the United States? Explain.

On Your Own

Use benchmarks to choose the customary unit you would use to measure each.

6. length of a football field

_____

7. weight of a pumpkin

_____

Customary Units
inch
foot
yard
ounce
pound
cup
gallon

Circle the better estimate.

8. weight of a watermelon

4 pounds or 4 ounces

9. the amount of liquid a fish tank holds

10 cups or 10 gallons

Complete the sentence. Write *more* or *less*.

10. Matthew's large dog weighs _____ than one ton.

11. The amount of liquid a sink can hold is _____ than one cup of water.

12. A paper clip has a mass of _____ than one kilogram.

Problem Solving • Applications Real World

For 13–15, use benchmarks to explain your answer.

13. THINK SMARTER Cristina is making macaroni and cheese for her family. Would Cristina use 1 pound of macaroni or 1 ounce of macaroni?

Math on the Spot

_____

_____

14. Which is the better estimate for the length of a kitchen table, 200 centimeters or 200 meters?

_____

_____

15. GO DEEPER Jodi wants to weigh her cat and measure its standing height. Which two units should she use?

_____

16. MATHEMATICAL PRACTICE 1 **Evaluate Reasonableness** Dalton used benchmarks to estimate that there are more cups than quarts in one gallon. Is Dalton's estimate reasonable? Explain.

_____

_____

17. THINK SMARTER Select the correct word to complete the sentence.

Justine is thirsty after running two miles.

She should drink | 1 pint / 1 meter / 10 pounds | of water.

Name _____

Measurement Benchmarks

Common Core

COMMON CORE STANDARD—4.MD.A.1
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

Use benchmarks to choose the customary unit you would use to measure each.

1. height of a computer

foot

2. weight of a table

3. length of a semi-truck

4. the amount of liquid a bathtub holds

Customary Units	
ounce	yard
pound	mile
inch	gallon
foot	cup

Use benchmarks to choose the metric unit you would use to measure each.

5. mass of a grasshopper

6. the amount of liquid a water bottle holds

7. length of a soccer field

8. length of a pencil

Metric Units	
milliliter	centimeter
liter	meter
gram	kilometer
kilogram	

Circle the better estimate.

9. mass of a chicken egg

50 grams 50 kilograms

10. length of a car

12 miles 12 feet

11. amount of liquid a drinking glass holds

8 ounces 8 quarts

Problem Solving Real World

12. What is the better estimate for the mass of a textbook, 1 gram or 1 kilogram?

13. What is the better estimate for the height of a desk, 1 meter or 1 kilometer?

14. WRITE Math Use benchmarks to determine the customary and metric units you would use to measure the height of your house. Explain your answer.

Lesson Check (4.MD.A.1)

1. What unit would be best to use for measuring the weight of a stapler?

2. Which is the best estimate for the length of a car?

Spiral Review (4.NF.B.4c, 4.NF.C.6, 4.MD.C.5a, 4.MD.C.5b, 4.G.A.2)

3. Bart practices his trumpet $1\frac{1}{4}$ hours each day. How many hours will he practice in 6 days?

4. Millie collected 100 stamps from different countries. Thirty-two of the stamps are from countries in Africa. What is $\frac{32}{100}$ written as a decimal?

5. Diedre drew a quadrilateral with 4 right angles and opposite sides of the same length. What kind of polygon did Diedre draw?

6. How many degrees are in an angle that turns through $\frac{1}{2}$ of a circle?

FOR MORE PRACTICE GO TO THE Personal Math Trainer