Estimation Match-Up

Match each sentence on the left with an appropriate unit on the right.

Possible answers are shown.

1. The weight of Tom's pick-up truck is more than one _____.

2. A cat's tail has a length that is more than one _____.

3. A milk carton holds more than one _____ of milk.

4. A crayon is less than one _____ long.

5. A water balloon is filled with less than one _____ of water.

6. A paper clip weighs less than one _____.

7. Tina's puppy weighs more than one _____.

8. A marathon runner jogged more than one _____.

centimeter

gallon

ton

meter

mile

fluid ounce

pound

ounce

9. **Stretch Your Thinking** Suppose two objects are the same size. Must they weigh the same amount? Give an example to explain.

Possible answer: No. A TV and its cardboard box can be the same size, but the box is much lighter.

Inching Closer

Solve each problem.

1. In a football game, a running back gained $4\frac{1}{2}$ yards on one play. What is this distance in inches?

162 inches

2. Margie is $5\frac{1}{3}$ feet tall. How many inches tall is she?

64 inches

3. A quarterback threw a football 10 yards 2 feet 1 inch. How many inches did the quarterback throw the football?

385 inches

4. From a standing position, Meg jumps 7 feet 4 inches and Victor jumps 9 feet 2 inches. How many inches farther does Victor jump than Meg?

22 inches

5. Jeremy ran 5 yards 2 feet 3 inches. In the same time, John ran 9 yards 1 foot 10 inches. How many inches farther did John run than Jeremy?

139 inches

6. A rectangular flower garden measures 3 yards 1 foot 8 inches wide and 1 yard 2 feet 3 inches long. How many inches of fencing is needed to enclose the entire flower garden?

382 inches

7. Write Math ▶ **Explain** how you solved Problem 6.

Possible answer: I changed the measures for length and width to inches. Then I added the measures. I doubled the sum to get the perimeter.

Weighty Matters

Solve each problem.

1. A truck weighs 1 ton 1,350 pounds. The weight limit for a bridge is given in pounds. How many pounds does the truck weigh?

3,350 pounds

2. Jasmine's new kitten weighs 2 pounds 6 ounces. Feeding instructions are given for weights in ounces. How many ounces does the kitten weigh?

38 ounces

3. At the zoo, one elephant weighs 7 tons 400 pounds. Another elephant weighs 4 tons 1,800 pounds. How many more pounds does the first elephant weigh?

4,600 pounds

4. Jim's dog weighs 18 pounds 10 ounces. His cat weighs 6 pounds 3 ounces. How many more ounces does Jim's dog weigh than his cat?

199 ounces

5. Owen's math book weighs 2 pounds 13 ounces. His science book weighs 1 pound 15 ounces. His backpack weighs 1 pound 1 ounce. What is the total weight in ounces of the backpack and the two books?

93 ounces

6. A truck is transporting 6 cars to a dealership. Each car weighs 1 ton 1,400 pounds. What is the total weight in pounds of the cars the truck is transporting?

20,400 pounds

7. **Write Math** **Explain** how you solved Problem 3.

Possible answer: I changed 7 tons 400 pounds to 14,400 pounds and 4 tons 1,800 pounds to 9,800 pounds. Then I subtracted 14,400 − 9,800.

Using Measures of Liquid Volume

Solve each problem.

1. At his lemonade stand, Ishmael has enough lemonade mix to make 3 gallons 2 quarts 1 pint of lemonade. How many 1-cup servings of lemonade can he make?

58 servings

2. Irene has 1 gallon of milk. She uses 4 fluid ounces of milk in each bowl of cereal. How many bowls of cereal can she fill before she has used all the milk?

32 bowls of cereal

3. One day at lunch, the cafeteria sold thirty-four 1-pint containers of milk. The cafeteria also sold forty-eight 12-fl-oz bottles of water. Did the cafeteria sell more fluid ounces of water or milk? How many more?

water; 32 fluid ounces

4. Mrs. Nelson bought a 2-gallon container of ice cream. How many 2-fl-oz scoops of ice cream can be served from this container?

128 scoops

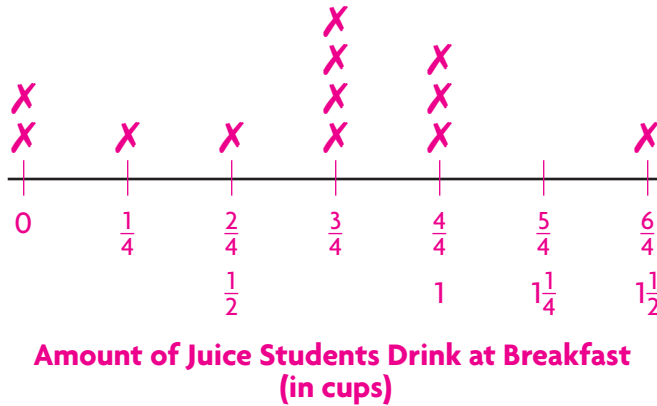**5.** [Write Math] ▶ **Explain** how you solved Problem 3.

Possible answer: I multiplied 34 by 16 to find the number of fluid ounces of milk. I multiplied 48 by 12 to find the number of fluid ounces of water. Then I compared and subtracted.

Discover the Line Plot

The students in Richie's class were asked how much juice they drink at breakfast. Use the clues to make a line plot. Draw your line plot in the space below. Remember to include a title.

1. The most any student drinks is $1\frac{1}{2}$ cups of juice.
2. The response given most often was $\frac{3}{4}$ cup. The number of responses was 1 more than the next greatest amount.
3. Two students said that they don't drink any juice in the morning.
4. The students drink a total of $8\frac{1}{4}$ cups of juice.
5. Three students drink 1 cup of juice each.
6. Together, only three students gave a response of $\frac{1}{4}$, $\frac{1}{2}$, $1\frac{1}{4}$, or $1\frac{1}{2}$; and none of these had more than 1 response.

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                         X
                         X
           X             X        X
           X       X     X        X                    X
           X    X  X  X  X     X  X                    X
        ───┼────┼──┼──┼──┼─────┼──┼────────┼──────┼────
           0    1  2  3  4     5              6
                4  4  4  4              4
                   1     3          1      1
                   2     4          1      1
                                    4      2
```

Amount of Juice Students Drink at Breakfast
(in cups)

7. Stretch Your Thinking What fraction of the students drank more than $\frac{1}{2}$ cup of juice? **Explain.**

$\frac{2}{3}$; **Possible explanation: From the clues and the line plot, 8 students out of the 12 drink more than $\frac{1}{2}$ cup, and $\frac{8}{12} = \frac{2}{3}$.**

Going to Greater Lengths

**The kilometer is a metric unit of length that is equal
to 1,000 meters. Use this information and what you already
know about metric length to answer the questions.**

1. Edward entered into a 5-kilometer
race. How many meters will he need
to run?

<div align="center">

5,000 meters
</div>

2. Nancy walked 2 kilometers from
her house to the library. How many
decimeters did she walk?

<div align="center">

20,000 decimeters
</div>

3. Jed rode his bike 1.5 kilometers
from home to school. How many
centimeters did Jed ride?

<div align="center">

150,000 centimeters
</div>

4. Ursula hiked $6\frac{1}{2}$ kilometers through
the woods. How many decimeters did
she hike?

<div align="center">

65,000 decimeters
</div>

5. An Olympic swimming pool is
50 meters long. How many lengths
would Ian have to swim in order to
swim 1 kilometer?

<div align="center">

20 lengths
</div>

6. Terence ran 3 kilometers in the same
time it took Ali to run 2,400 meters.
Who ran farther? How much farther?

<div align="center">

Terence; 600 meters
</div>

7. **Stretch Your Thinking** The **hectometer** is another
metric unit of length. 1 hectometer = 100 meters. What is the
relationship between kilometers and hectometers?

<div align="center">

1 kilometer = 10 hectometers
</div>

More Volume, Less Mass

**The milligram is a metric unit of mass. One gram is equal
to 1,000 milligrams. The kiloliter is a unit of metric volume
that is equal to 1,000 liters. Use this information and what you
know about metric units to answer the questions.**

1. A small swimming pool contains
6 kiloliters of water. How many liters
of water does the pool contain?

6,000 liters

2. A scientist has a 3-gram sample of soil
to analyze. How many milligrams is the
soil sample?

3,000 milligrams

3. About 1 kiloliter of water runs past a
certain point in a freshwater stream
each minute. How many 2-liter
bottles could be filled from 1 kiloliter
of water?

500 bottles

4. A pill contains 200 milligrams of
medicine. If Barb takes one pill each day,
how many grams of medicine does she
take in 10 days?

2 grams

5. Helen places a 2-gram mass on
one side of a scale. How many
milligrams would it take to balance
the scale?

2,000 milligrams

6. A storage tank holds 4 kiloliters of
water. How many liters of water
does the tank hold?

4,000 liters

7. `Write Math` **Explain** how you found the answer to Problem 4.

**Possible answer: I multiplied 200 by 10 to
find the mass of the pills she takes in 10
days, 2,000 milligrams. Every gram is 1,000
milligrams, so 2,000 milligrams is 2 grams.**

Name _____

Passing the Time

Solve each problem.

1. Barry left his flashlight on. The batteries lost power after 2 weeks 5 days 15 hours. How many hours was it before the flashlight lost power?

471 hours

2. A rocket launch is scheduled to take place in 3 weeks 4 days 22 hours. How many hours is it until the rocket is launched?

622 hours

3. In October 2010, the winning time in the men's division of the Chicago Marathon was 2 hours 6 minutes 24 seconds. How many seconds did it take the winner to run the marathon?

7,584 seconds

4. Patti and her friends want to see one of two movies. One movie starts in 1 day 2 hours 20 minutes. The other movie starts in 1 day 4 hours 10 minutes. The later movie starts at 5:00 P.M. At what time does the earlier movie start?

3:10 P.M.

5. ⬛ Write Math ▶ **Explain** how you solved Problem 1.

Possible answer: 2 weeks is 14 days, so it is 19 days total. I multiplied 19 by 24 to find the number of hours in 19 days, and then added 15 hours to get 471 hours.

Do You Have the Time?

Read each problem to find the time.

1. Jordan needs to leave for school at 8:15 A.M. It takes her 20 minutes total to get dressed and brush her teeth, and 15 minutes to eat breakfast. What time does she need to wake up?

7:40 A.M.

2. Louis starts walking at 4:30 P.M. He walks for 35 minutes before stopping for a snack. He takes 15 minutes to eat his snack. At what time will he start walking again?

5:20 P.M.

3. Trevor spent 15 minutes in the shoe store, 25 minutes in the candle store, and then 10 minutes in the card store. Trevor left the card store at 10:45 A.M. What time did he arrive at the shoe store?

9:55 A.M.

4. Soccer practice begins at 5:30 P.M. The team spends the first 15 minutes doing stretches, and then the next 10 minutes doing dribbling drills. If the coach gives a 5-minute water break before the next activity, what time will that activity start?

6:00 P.M.

5. Betsy finished her math and science homework at 4:25 P.M. If she took 15 minutes to complete her math homework and 20 minutes to complete her science homework, what time did she start?

3:50 P.M.

6. **Write Math** ▸ Describe the steps you took to solve Problem 4.

Possible answer: start at 5:30. Move forward 15 minutes to 5:45; move forward 10 more minutes to 5:55. Then move forward 5 minutes to 6:00 P.M.

Mixed Measures

Solve each problem.

1. Ted's new puppy weighed 8 pounds 11 ounces two months ago. One month later, the puppy had gained 2 pounds 7 ounces. During the second month, the puppy gained 3 pounds 5 ounces. How much does Ted's puppy weigh now?

14 pounds 7 ounces

2. Gilda made 2 gallons of lemonade to sell at her lemonade stand. At the end of the day, she had 2 quarts 1 pint left over. How many 1-cup servings did Gilda sell?

22 1-cup servings

3. Four friends competed in a relay race. Each friend ran one leg of the race. Ann ran her leg in 2 minutes 15 seconds. Kyra ran her leg in 1 minute 53 seconds. Marie ran her leg in 2 minutes 9 seconds. Zoe ran the final leg in 1 minute 58 seconds. What was the total time for the relay team?

8 minutes 15 seconds

4. Ron timed his flight from Los Angeles to New York. The plane was in the air for 4 hours 52 minutes 45 seconds. The return trip took longer because of a headwind. Ron recorded the flight time as 5 hours 34 minutes 14 seconds. How much longer was the return flight?

41 minutes 29 seconds

5. **Write Math** ▶ **Explain** how you converted units to solve Problem 2.

Possible answer: I converted the measures to cups: 2 gallons = 32 cups; 2 quarts 1 pint = 8 cups + 2 cups, or 10 cups. I subtracted 32 − 10 = 22. So, 22 cups were sold.

Two-Step Patterns

Use unit relationships and write a pattern to solve each problem.

1. Jessie hops for 1 minute then rests for 15 seconds. She repeats this pattern for several minutes. Write a pattern showing the number of seconds when Jessie switches from one activity to the next. After how many seconds will she start resting for the fourth time?

60, 75, 135, 150, 210, 225, 285...; 285 seconds

2. A snail creeps up a plank 8 centimeters each day and slides back down 15 millimeters each night. Write a numerical pattern showing the number of millimeters where the snail changes direction. On which day will the snail have moved 275 millimeters up from its starting point?

80, 65, 145, 130, 210, 195, 275...; fourth day

3. Joel is doing an experiment. He adds 2 gallons of water to a large tub each week. During the week, 1 quart 1 cup of water evaporates. Write a numerical pattern showing the number of cups of water before and after Joel adds water. How long will it take until there are more than 100 cups of water in the tub?

32, 27, 59, 54, 86, 81, 113...; 4 weeks

4. Stretch Your Thinking In Problem 2, after how many days will the snail be 65 centimeters ahead? **Explain.**

10 days; 65 centimeters is 650 millimeters. Each day the snail gains 65 millimeters, 80 − 15. Since 650 ÷ 65 = 10, it will take the snail 10 days.