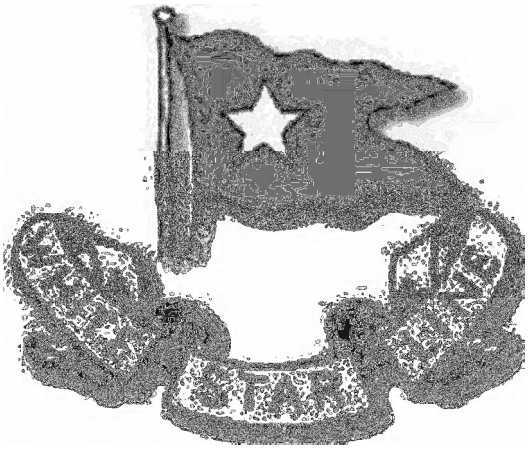
# Measurement & Statistics

# *RMS TITANIC*



## *Royal Mail Steamer Titanic*

**SIXTH GRADE MATHEMATICS**

**CHAPTER 8**

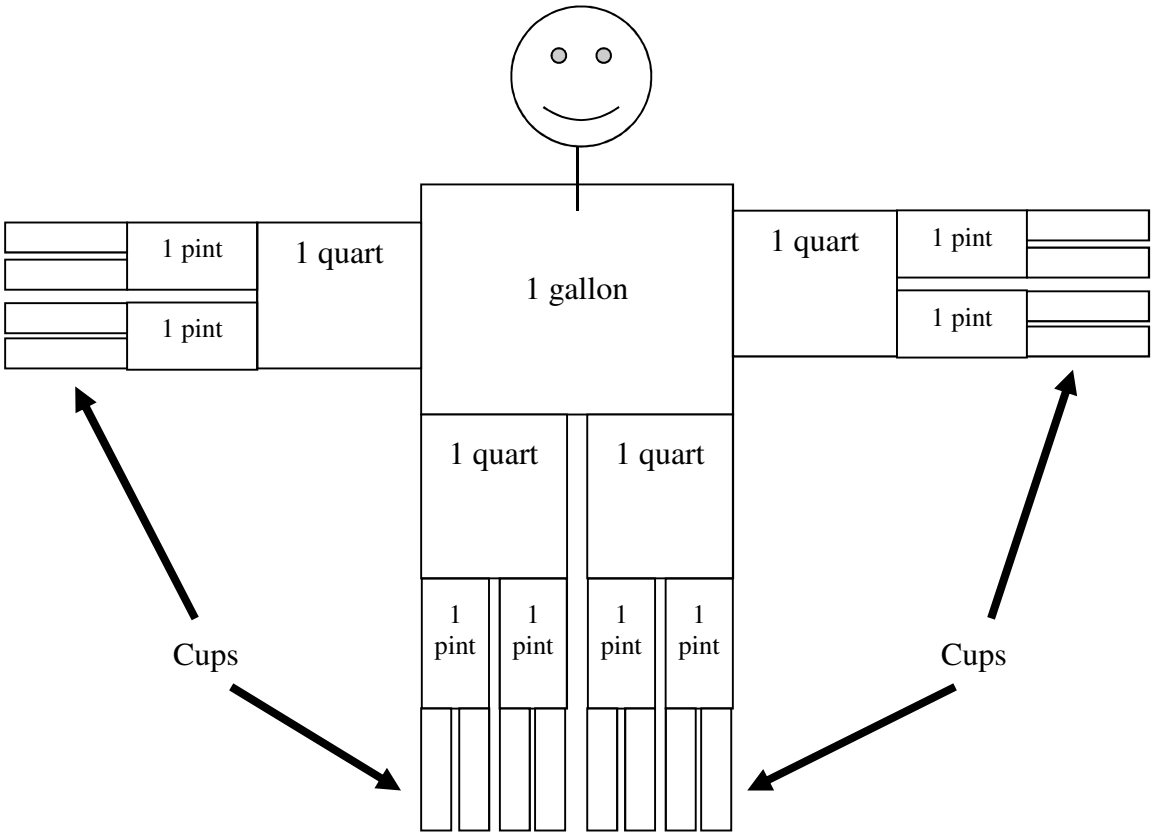
TOPICS COVERED:

- Customary Units (Mass, Capacity, Length)
- Metric Units (Mass, Capacity, Length)
- Time

Numbers are ADJECTIVES. The label (or the unit of measure) is the NOUN.

Created by Lance Mangham, 6th grade teacher, Carroll ISD

Activity 8-1: **Measurement/Gallon Guy** Name:




| **Measurement Conversions** | |
|---|---|
| ***Customary – Length*** | ***Metric – Length*** |
| 1 mile = 1760 yards | 1 kilometer = 1000 meters |
| 1 mile = 5280 feet | 1 meter = 100 centimeters |
| 1 yard = 3 feet | 1 centimeter = 10 millimeters |
| 1 foot = 12 inches | |
| ***Customary – Volume/Capacity*** | ***Metric – Volume/Capacity*** |
| 1 pint = 2 cups | 1 liter = 1000 milliliters |
| 1 quart = 2 pints | |
| 1 gallon = 4 quarts | |
| 1 cup = 8 fluid ounces | |
| ***Customary – Mass/Weight*** | ***Metric – Mass/Weight*** |
| 1 ton = 2,000 pounds | 1 kilogram = 1000 grams |
| 1 pound = 16 ounces | 1 gram = 1000 milligrams |
| ***Time*** | |
| 1 year = 12 months | 1 year = 52 weeks |
| 1 week = 7 days | 1 day = 24 hours |
| 1 hour = 60 minutes | 1 minute = 60 seconds |

| Name | Abbreviation | Approximate Comparison |
|---|---|---|
| inch | in | length of half a thumb<br>length of a paper clip |
| foot | ft | length of an adult male foot |
| yard | yd | length from nose to outstretched fingertip |
| mile | mi | length of 14 football fields |
| ounce | oz | weight of a birthday card |
| pound | lb | weight of three apples |
| quart | qt | amount in a medium container of milk |
| gallon | gal | amount in a small bucket |
| kilometer | km | 9 football fields<br>a little more than half a mile |
| meter | m | half the height of a door<br>a meter stick<br>a little bit more than 3 feet<br>the width of a door |
| centimeter | cm | length of a raisin<br>the width of your pinky<br>the width of an M&M<br>the width of a paper clip |
| millimeter | mm | width of a period at the end of a sentence<br>the width of a dime<br>the point of a pencil |
| kilogram | kg | mass of a cantaloupe<br>the mass of a few apples<br>the mass of a hammer |
| gram | g | mass of a raisin<br>the weight of a paperclip<br>the weight of a Cheerio<br>the weight of a marshmallow |
| milligram | mg | the weight of a grain of sand<br>the weight of a grain of rice |
| liter | L | half of a large bottle of soda |
| milliliter | mL | half an eyedropper<br>a raindrop |

There are several different ways to convert between units of measurement. One way to convert metric units is to memorize the sentence:

**King**(Kilo) **Henry**(Hecto) **Died**(Deka) [base units, gram, liter, meter] **Drinking**(deci) **Chocolate**(centi) **Milk**(milli)

Another way is to use proportions:

**Example** 14 gallons = $x$ qt.

Use the fact that 1 gal = 4 qt.

$$\frac{1 \text{ gallon}}{4 \text{ quart}} = \frac{14 \text{ gallons}}{x \text{ quarts}}$$

$$1 \bullet q = 4 \bullet 14$$

$$q = 56 \text{ quarts}$$

**Example #2** 14 qt. = $x$ gal.

$$\frac{1 \text{ gallon}}{4 \text{ quart}} = \frac{x \text{ gallons}}{14 \text{ quarts}}$$

$$\frac{1 \bullet 14}{4} = \frac{4x}{4}$$

$$3.5 \text{ gal} = x$$

Activity 8-4: **Customary Measurement** Name:

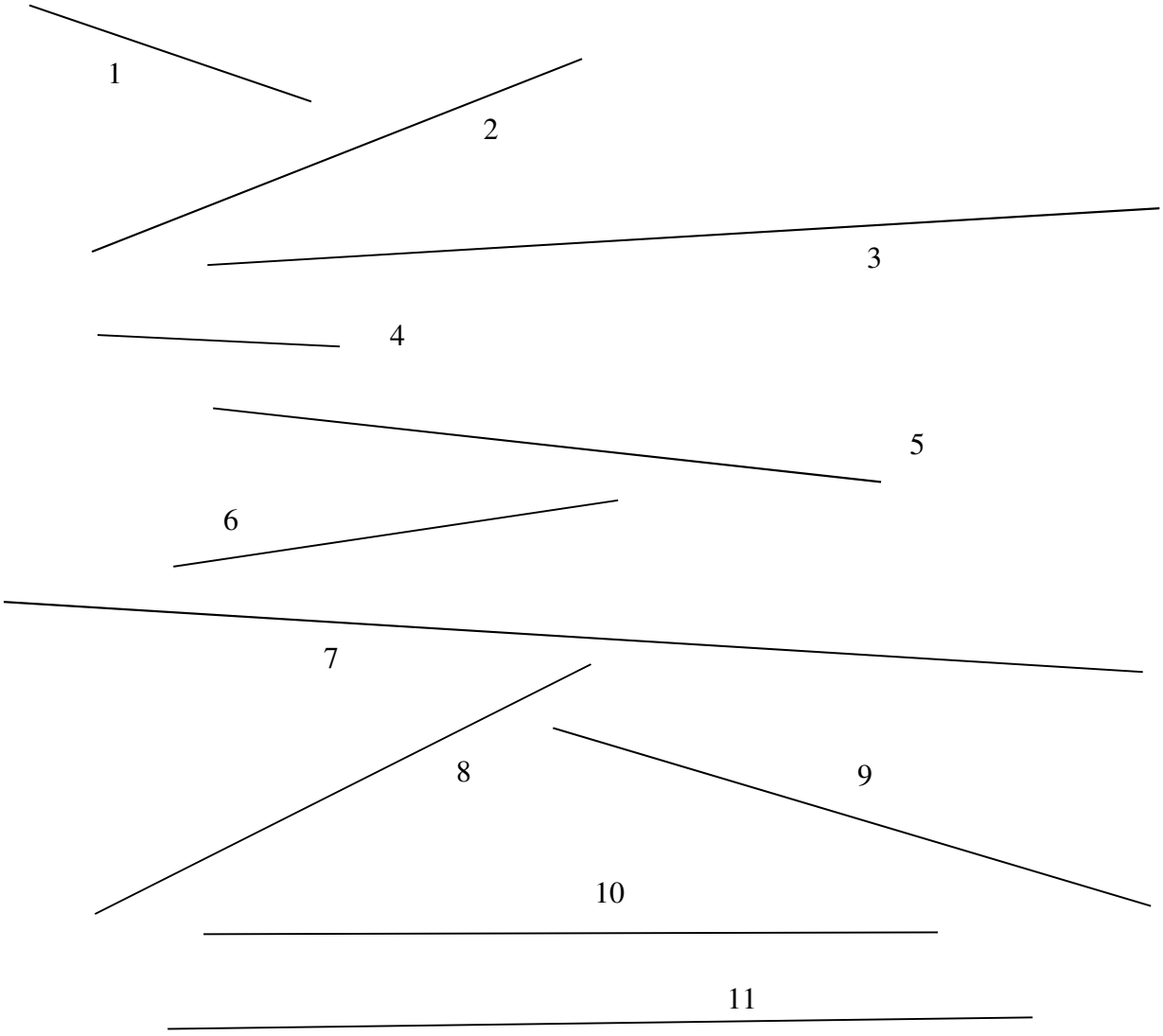
**Solve all problems with proportions and show all steps.**

| | | |
|---|---|---|
| 1. | How many inches wide was the Titanic? | |
| 2. | How many pounds did the Titanic weigh fully loaded? | |
| 3. | How many yards high was the rudder? | |
| 4. | How many inches high was the crow's nest? | |
| 5. | How many cups of drinking water were on board the Titanic? | |
| 6. | How many ounces of fish were on the Titanic? | |
| 7. | How many tons of poultry were on the Titanic? | |
| 8. | How many quarts of fresh milk were on the Titanic? | |
| 9. | If one-fourth of the ice cream was eaten, how many pints of ice cream were eaten? | |
| 10. | How many tons of fresh meat was on the Titanic? | |
| 11. | What is the maximum height of a medium size iceberg in inches? | |
| 12. | Very large icebergs are over how many yards tall? | |
| 13. | By 2:00am on the night of the sinking the Titanic had taken on how many pounds of water? | |
| 14. | What is the maximum number of minutes of expected survival in water between 50 and 60 degrees? | |
| 15. | How many yards deep does the Titanic lie? | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 16. | 13 yd. = | in. | 17. | 12 qt. = | gal. | 18. | 10 c. = | pt. |
| 19. | 5 c. = | fl. oz. | 20. | 16 fl. oz. = | c. | 21. | 12 pt. = | qt. |
| 22. | 7 c. = | pt. | 23. | 24 pt. = | c. | 24. | 53 qt. = | gal. |
| 25. | 3 gal. = | qt. | 26. | 20 qt. = | gal. | 27. | 3.5 c. = | fl. oz. |
| 28. | 5 mi. = | ft. | 29. | 12 qt. = | pt. | 30. | $3\frac{1}{2}$ c. = | fl. oz. |
| 31. | 11 c. = | pt. | 32. | 6 pt. = | c. | 33. | 0.5 qt. = | pt. |

| | | |
|---|---|---|
| 34. | The sign before a bridge says maximum weight 5 tons. Joe's truck weighs 7,350 pounds. Can the bridge support his weight? | |
| 35. | Kroger is selling 16 ounces of cream cheese for $2.79. Costco is selling 4 pounds of cream cheese for $7.99. Which store has the best price on cream cheese? | |
| 36. | Recipe: 1 quart apple juice, 2.75 cups of lemon-lime soda, 64 ounces pineapple juice, 2 quarts cold water, 0.25 cups lemon juice<br>What is the smallest container that will hold all of this punch? 4, 5, 6, or 7 quart | |
| 37. | How long will it take the students at DIS to drink 1,000,000 pints of milk? | |

Use a ruler to measure the following lines to the nearest quarter of an inch.




| | | | | | |
|---|---|---|---|---|---|
| 1. | | 2. | | 3. | |
| 4. | | 5. | | 6. | |
| 7. | | 8. | | 9. | |
| 10. | | 11. | | | |

Activity 8-6: **Measurement – Time** Name: _____

| | | |
|---|---|---|
| 1. | 2 hours and 45 minutes plus 3 hours and 35 minutes equals… | |
| 2. | My clock shows that it is 8:40 am. What time will it be in six and one-half hours? | |
| 3. | How many minutes are in 3.5 hours? | |
| 4. | It is now 6:30 am. What time was it 8.5 hours ago? | |
| 5. | 25 min + 55 min = | |
| 6. | Find the elapsed time:<br>From 4:15am to 11:00am | |
| 7. | Find the elapsed time:<br>From 9:59am to 7:46am | |

**Find the elapsed time.**

| | | |
|---|---|---|
| 8. | 6:45pm to 9:20pm | |
| 9. | 9:57am to 11:50am | |
| 10. | 5:45am to 11:30am | |
| 11. | 3:11pm to 10:40am | |
| 12. | 8:15am to 10:09pm | |
| 13. | 1:35am to 7:28pm | |
| 14. | Martha ran at a pace of 8 miles per hour from 9:30am to 1:00pm. How far did she run? | |

| | | |
|---|---|---|
| 15. | 8 hours equals how many minutes? | |
| 16. | 2 weeks equals how many days? | |
| 17. | 300 minutes equals how many hours? | |
| 18. | 28 days equals how many weeks? | |
| 19. | 600 minutes equals how many hours? | |
| 20. | 120 seconds equals how many minutes? | |
| 21. | How many seconds are in a day? | |
| 22. | Write an equation that can be used to find $m$, the number of minutes in $h$ hours. | |

The metric system is a decimal system of physical units based on its unit of length, the *meter*. Introduced and adopted by law in France in the 1790s, the metric system was subsequently adopted as the common system of weights and measures by a majority of countries, and by all countries as the system used in scientific work.

The meter (m), which is approximately 39.37 in., was originally defined as one ten-millionth of the distance from the equator to the North Pole on a line running through Paris. Between 1792 and 1799, French scientists measured part of this distance. Treating the earth as a perfect sphere, they then estimated the total distance and divided it into ten-millionths.. The measurements of modern science required greater precision, however, and in 1983 the meter was defined as the length of the path traveled by light in a vacuum during a time interval of 1/299,792,458 of a second .

All metric units were originally derived from the meter, but by 1900 the metric system began to be based on the mks (meter-kilogram-second) system, by which the unit of mass, the gram, was redefined as the kilogram, and the unit of time, the second, was added. Because of the need of science for small units, the cgs (centimeter-gram-second) system also came into use. The unit of volume, the liter, was originally defined as 1 cubic decimeter ($cdm^3$), but in 1901 it was redefined as the volume occupied by a kilogram of water at 4° C at 760 mm of mercury; in 1964 the original definition ($cdm^3$) was restored.

A series of Greek decimal prefixes is used to express multiples; a similar series of Latin decimal prefixes is used to express fractions. These prefixes have been adopted by and expanded in the International System of Units.

The U.S., Great Britain, and other English-speaking countries use inches, feet, miles, pounds, tons, and gallons as units of length, weight, and volume for common measurements. Today, however, within the framework of the International System of Units, these English-system units are legally based on metric standards.

In the U.S. several attempts were made to bring the metric system into general use. In 1821 Secretary of State John Quincy Adams, in a report to Congress, advocated the adoption of the metric system. In 1866 Congress legalized the use of the metric system, and from that time this system was increasingly adopted, notably in medicine and science, as well as in certain sports, such as track. In 1893 the National Bureau of Standards of the U.S. adopted the metric system in legally defining the yard and the pound.

In 1965 Great Britain became the first of the English-speaking countries to begin an organized effort to abandon the older units of measurement. Canada, Australia, New Zealand, and South Africa quickly followed and soon exceeded the speed of change in Great Britain. In 1971, after an extensive study, the U.S. secretary of commerce recommended that the U.S. convert to metric units under a ten-year voluntary plan. On Dec. 23,1975, President Gerald R. Ford signed the Metric Conversion Act of 1975. It defines the metric system as being the International System of Units as interpreted in the U.S. by the secretary of commerce. The act coordinates the metric effort, but does not specify a conversion schedule.

Activity 8-8: **Metric Measurement** Name:

**Choose an appropriate metric unit of mass for each.**

| | | | | | |
|---|---|---|---|---|---|
| 1. | a grain of rice | | 2. | a bag of groceries | |
| 3. | a feather | | 4. | a cat | |
| 5. | a leaf | | 6. | an eraser | |

**Choose an appropriate metric unit of capacity for each.**

| | | | | | |
|---|---|---|---|---|---|
| 7. | a gasoline tank | | 8. | a coffee mug | |
| 9. | 6 raindrops | | 10. | a pitcher of juice | |
| 11. | a swimming pool | | 12. | a can of paint | |

**State whether each of the following is best measured in terms of mass or capacity.**

| | | | | | |
|---|---|---|---|---|---|
| 13. | a bag of potatoes | | 14. | water in a birdbath | |
| 15. | an apple | | 16. | a puppy | |
| 17. | a cup of hot cider | | 18. | the inside of the refrigerator | |
| 19. | juice in a baby's bottle | | 20. | water in a fish tank | |

**Write true or false.**

| | | | | | |
|---|---|---|---|---|---|
| 21. | The mass of a horse is about 500 kg. | | 22. | Jason drank 5.8 L of juice at breakfast. | |
| 23. | A mug holds 250 mL of hot chocolate. | | 24. | A penny is about 3 kg. | |
| 25. | A teaspoon holds about 5 L. | | 26. | A textbook is about 1 kg. | |

**Choose the most reasonable measurement.**

| | | | | | |
|---|---|---|---|---|---|
| 27. | About how tall would your friend be? | | | | |
| | A. 1.5 mm | B. 1,500 cm | C. 1.5 km | D. 1,500 mm | |
| 28. | About how wide would your desk be? | | | | |
| | A. 50 mm | B. 50 m | C. 5 m | D. 50 cm | |
| 29. | A tree is about how tall? | | | | |
| | A. 20 km | B. 20 m | C. 20 cm | D. 2 km | |
| 30. | An envelope is about how long? | | | | |
| | A. 24 cm | B. 2.4 cm | C. 24 mm | D. 2.4 m | |

| | | |
|---|---|---|
| 31. | A beaker contains 62 milliliters of solution. When full it holds 1.5 liters. Which expression shows how much you can still add?<br>a. 0.0015-62 mL b. 1500-62 mL<br>c. 1.5-.62 L d. 1.5-62000L | |

Activity 8-9: **Metric Measurement** Name:

**Solve all problems with proportions and show all steps.**

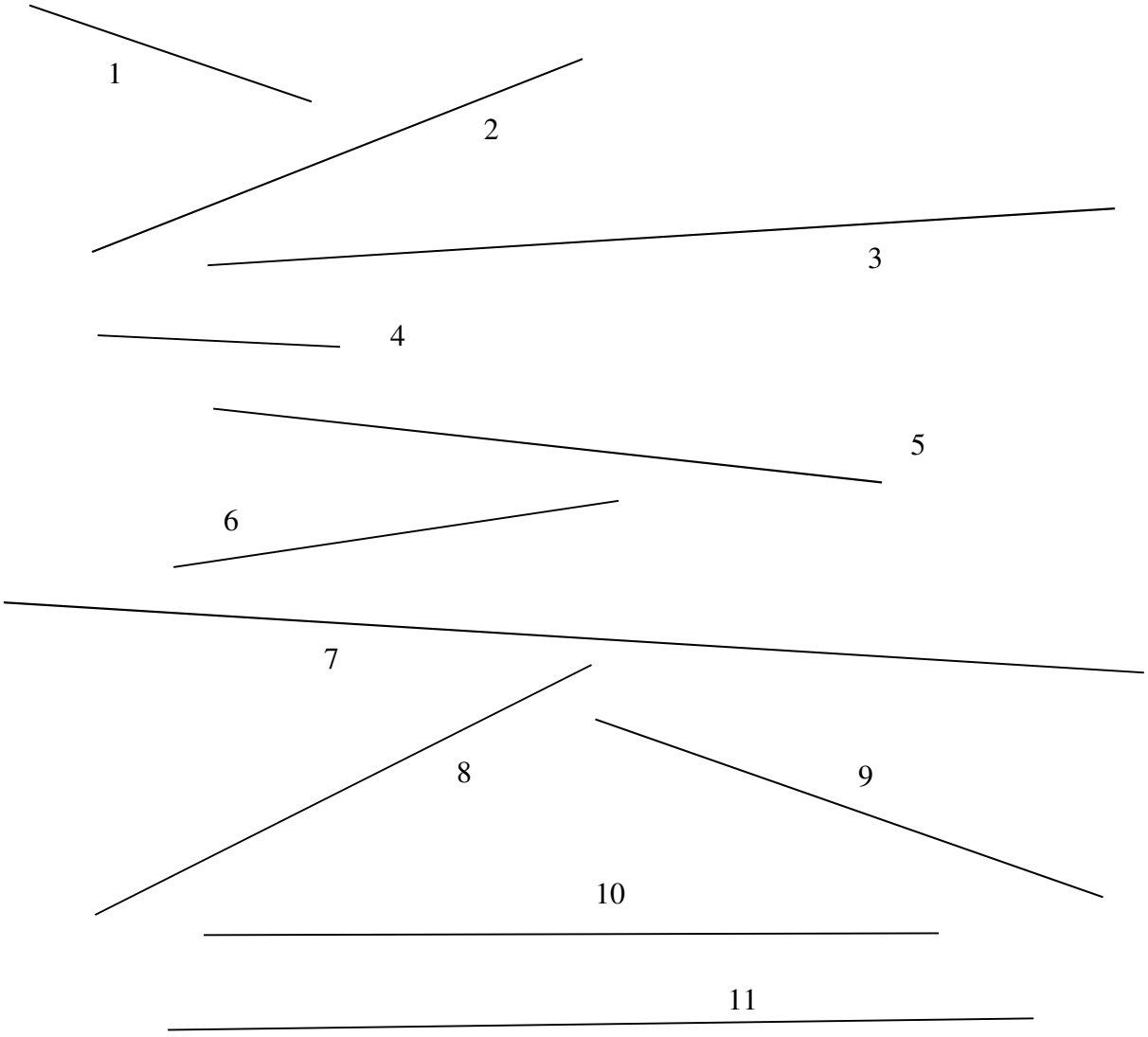
| | | |
|---|---|---|
| 1. | How many kilometers long was the Titanic? | |
| 2. | How many millimeters did the Titanic travel from Southampton to Cherbourg? Write your answer in scientific notation. | |
| 3. | How many kilometers high is very large iceberg? | |
| 4. | What is the maximum height of a bergy bit in millimeters? | |
| 5. | What is the sum of the lengths of slits 2 through 5 on the Titanic in centimeters? | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6. | 3.72 L = | mL | 7. | 9.75 m = | cm | 8. | 6.8 g = | kg |
| 9. | 0.018 kg = | g | 10. | 149 cm = | m | 11. | 524 cm = | m |
| 12. | 0.56 kg = | g | 13. | 3 mm = | cm | 14. | 14 L = | mL |
| 15. | 6.7 g = | mg | 16. | 9.3 L = | mL | 17. | 0.89 m = | cm |
| 18. | 0.085 g = | mg | 19. | 4,600 mm = | m | 20. | 3.904 L = | mL |
| 21. | 205 g = | kg | 22. | 609 mg = | g | 23. | 0.0019 m = | mm |
| 24. | 38 mL = | L | 25. | 720 m = | km | 26. | 150 cm = | mm |

**What unit of measure would you use to measure each item?**

| | | |
|---|---|---|
| 27. | the height of an office building<br>A. km B. cm C. m D. mm | |
| 28. | the width of a page of text<br>A. km B. cm C. m D. mm | |
| 29. | the length of an ant<br>A. km B. cm C. m D. mm | |
| 30. | the depth of a lake<br>A. km B. cm C. m D. mm | |
| 31. | Suzy wants to build a doghouse for Buster. She wants the doghouse to be 4 meters by 3 meters. When she arrives at the lumber store, the clerk tells her the lumber is measured in centimeters. What are the dimensions for Buster's doghouse in centimeters? | |
| 32. | Sammy needs to replace all the strings on his kite collection. George's Hobby Shop sells kite string for $15.00/meter. Hobby Depot sells kite string for $13.50/50 centimeters. Sammy needs 8 meters of kite string. How much would Sammy pay for the string at George's Hobby Shop? How much would Sammy pay for the string at Hobby Depot? | |
| 33. | Sarah is trying to determine which container to use for her leftovers. She has 2 liters of soup leftover. One of her containers can hold 1000 milliliters of a liquid and the other container can hold 0.1 kiloliters. Which container should she use? | |
| 34. | Brian is trying to choose the best deal. He can buy 1 liter of soda for $1.39 or he can buy 1500 milliliters of soda for $1.99. Which soda should he buy? | |

Use a ruler to measure the following lines to the **nearest centimeter and the nearest millimeter**.




| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. | | | 2. | | | 3. | | |
| 4. | | | 5. | | | 6. | | |
| 7. | | | 8. | | | 9. | | |
| 10. | | | 11. | | | | | |

**Which weighs more: an ounce of water or an ounce of lead?**
Surprise! The water weighs more because it is measured by volume, while lead is measured by weight. If you set a cup with a fluid ounce of water on a balance scale across from an ounce of lead in an identical cup, the scale will tip toward the water.

Created by Lance Mangham, 6th grade teacher, Carroll ISD

Activity 8-11: **Measurement Scavenger Hunt** Name:

Find three objects or activities that you estimate are close to each measurement below. Write the names of the objects or activities next to the appropriate measure.

| | | | | |
|---|---|---|---|---|
| 1. | weighs 2 pounds | | | |
| 2. | is 16 inches in diameter | | | |
| 3. | holds 2 pints when full | | | |
| 4. | takes 25 seconds to complete | | | |
| 5. | is 8 feet long | | | |
| 6. | requires 2 cups to fill | | | |
| 7. | can be recited in 12 minutes | | | |
| 8. | is 6 centimeters wide | | | |
| 9. | weighs 7 ounces | | | |
| 10. | is half a yard long | | | |
| 11. | takes 5 minutes to walk to | | | |
| 12. | is one meter long | | | |
| 13. | holds 10 gallons when full | | | |
| 14. | can drive to in half an hour | | | |
| 15. | weighs 5 grams | | | |
| 16. | holds 5 liters when full | | | |
| 17. | weighs 10 kilograms | | | |
| 18. | takes 5 seconds to do | | | |

Activity 8-12: **Metric Treasure Hunt** Name:

To become more familiar with metric units of measurement, the class is going to take a walk around the school. During your walk around the school find three items to fit into each category. Choose items that *best fit* into the category given. For example, one could measure the distance from DIS to EIS in millimeters, but kilometers would be a more appropriate choice.

For one of your three items in each category make an estimate of its metric measurement.

| ***Metric Length*** | | | |
|---|---|---|---|
| | **Item 1** | **Item 2** | **Item 3** |
| **Meters** | | | |
| **Centimeters** | | | |
| **Millimeters** | | | |

| ***Metric Volume/Capacity*** | | | |
|---|---|---|---|
| | **Item 1** | **Item 2** | **Item 3** |
| **Liters** | | | |
| **Milliliters** | | | |

| ***Metric Weight/Mass*** | | | |
|---|---|---|---|
| | **Item 1** | **Item 2** | **Item 3** |
| **Kilograms** | | | |
| **Grams** | | | |
| **Milligrams** | | | |

Activity 8-13: **Metric Measurement** Name:

**Helpful reminders:**
A shovel is about a meter long. The head of a thumbtack is about a centimeter wide. The point of a thumbtack is about a millimeter wide. The landing strip at an airport is about a kilometer long.

The mass of a hammer is about a kilogram. The mass of a nail is about a gram. The mass of a piece of sawdust is about a milligram.

A can of motor oil contains 1 liter. The spill of a drop of oil is about 1 milliliter.

**Write the unit that you would use to measure each of the following.**

| | | | | | |
|---|---|---|---|---|---|
| 1. | mass of a bicycle | | 2. | mass of a pencil | |
| 3. | glass of juice | | 4. | grain of sand | |
| 5. | mass of a penny | | 6. | water in a swimming pool | |
| 7. | mass of a feather | | 8. | mass of a bowling ball | |
| 9. | hot chocolate in a large thermos | | 10. | loaf of bread | |
| 11. | mass of a watermelon | | 12. | cup of hot cider | |
| 13. | water in an aquarium | | 14. | mass of a car key | |
| 15. | mass of a vitamin pill | | 16. | can of soup | |
| 17. | mass of an egg | | 18. | mass of a cat | |
| 19. | water in a team's cooler | | 20. | mass of a sewing needle | |
| 21. | mass of a mosquito | | 22. | liquid in a test tube | |
| 23. | mass of student's desk | | 24. | mass of a sandwich | |
| 25. | bottle of expensive perfume | | 26. | mass of a sugar cube | |
| 27. | water in a washing machine | | 28. | mass of a bag full of groceries | |
| 29. | mass of an apple | | 30. | mass of a leaf | |

**Circle the appropriate measure.**

| | | |
|---|---|---|
| 31. | mass of a screwdriver | 46 mg 46 g 46 kg |
| 32. | mass of a tennis racket | 5 g 50 g 500 g |
| 33. | mass of a baby | 75 g 7.5 kg 0.75 kg |
| 34. | mass of a dictionary | 0.2 kg 2 kg 20 kg |
| 35. | mass of a grain of sand | 1 mg 1g 1 kg |
| 36. | paint can | 4 L 4mL |
| 37. | drinking glass | 250 L 250mL |
| 38. | bathtub | 400 mL 400 L |
| 39. | soup spoon | 1.5 mL 15 mL |
| 40. | length of a roadrace | 6 m 6 km |

Activity 8-14: **Metric Measurement** Name:

**Helpful reminders:**
A shovel is about a meter long. The head of a thumbtack is about a centimeter wide. The point of a thumbtack is about a millimeter wide. The landing strip at an airport is about a kilometer long.

The mass of a hammer is about a kilogram. The mass of a nail is about a gram. The mass of a piece of sawdust is about a milligram.

A can of motor oil contains 1 liter. The spill of a drop of oil is about 1 milliliter.

**Circle the appropriate measure.**

| | | |
|---|---|---|
| 1. | A pen is about 14 ____ long. | km m cm mm |
| 2. | A pencil point is a bout 1 ____ wide. | km m cm mm |
| 3. | A coffee mug is about 90 _____ tall. | km m cm mm |
| 4. | An ear of corn is about _____ long. | km m cm mm |
| 5. | Two cities could be 12 _____ apart. | km m cm mm |
| 6. | Motion picture film is 35 _____ wide. | km m cm mm |
| 7. | A discuss is thrown 56 _____. | km m cm mm |
| 8. | A person can jump 1.5 _____ high. | km m cm mm |
| 9. | A pilot flew 5,000 _____ yesterday. | km m cm mm |
| 10. | A newborn baby is about 50 _____ long. | km m cm mm |

Activity 8-15: **Measure With Pleasure** Name:

**Follow the directions, measure carefully, and you will get the picture!**

| | |
|---|---|
| 1. | Draw rectangle ABCD on another sheet of paper. The rectangle is 7 in. wide and $9\frac{1}{2}$ in. high. Place Point A at the top left, B at the top right, C at the bottom right, and D at the bottom left. |
| 2. | Place your ruler on $\overline{AB}$. Measure $3\frac{1}{8}$ in. across from point A. Make a dot at this point and label it Point E. |
| 3. | Place your ruler on $\overline{BC}$. Measure down $1\frac{1}{4}$ in. from point B. Make a dot at this point and label it point F. |
| 4. | On $\overline{BC}$, measure down $5\frac{7}{8}$ in. from B. Label this Point G. |
| 5. | Point H is on $\overline{BC}$, $7\frac{1}{2}$ in. from B. |
| 6. | Point I is on $\overline{BC}$, $8\frac{3}{8}$ in. from B. |
| 7. | Point J is on $\overline{AD}$, 7 in. from A. Connect points H and J. |
| 8. | Point K in on $\overline{AD}$, $8\frac{1}{2}$ in. from A. Connect points I and K. |
| 9. | Point L is on $\overline{JH}$, $3\frac{1}{8}$ in. from J. Draw $\overline{EL}$. |
| 10. | Point M is on $\overline{EL}$, $\frac{7}{8}$ in. from E. Draw $\overline{GM}$. |
| 11. | Point N is on $\overline{AD}$, $5\frac{3}{4}$ in. from A. Draw $\overline{MN}$. |
| 12. | Line up your ruler on Points E and F. Mark a point 1 in. from E and label it point O. Connect points E and O. |
| 13. | Point P is on $\overline{EL}$, $\frac{5}{8}$ in. from E. Draw $\overline{OP}$. |
| 14. | Point Q is on $\overline{EL}$, $6\frac{1}{4}$ in. from E. Draw $\overline{GQ}$. |
| 15. | Point R is on $\overline{EL}$, $6\frac{5}{8}$ in. from E. Draw $\overline{NR}$. |
| 16. | Point S is on $\overline{NR}$, $2\frac{3}{4}$ in. from N. Draw $\overline{MS}$. |
| 17. | Point T is on $\overline{KI}$, $1\frac{1}{8}$ in. from K. Draw $\overline{JT}$. |
| 18. | Point U is on $\overline{KI}$, 6 in. from K. Draw $\overline{HU}$. |

**Mission:** Create a picture that includes the following.

1. A circle with an area of 78.5 $cm.^2$
2. A square with an area o 64 $cm.^2$
3. A triangle with an area of 24 $cm.^2$
4. A trapezoid with an area of 22 $cm.^2$

You will need to use a ruler with cm. on it and a compass to draw your shapes accurately.

Your picture should….

- Include a title
- Include geometric shapes with correct parts labeled with units
- Be at least somewhat colorful and represent something more than just 4 shapes sitting on a piece of paper

"Let's see how old you weigh. Hmm…five till."

## Attributes That Can Be Measured

Time/Age
Weight/Mass
Temperature
Length – height, distance, depth, perimeter, circumference, width
Density
Capacity/Volume
Speed/Velocity
Area/Surface Area
Value/Money
Energy/Light/Heat
Economy
Central Tendancy
Sound
Force
Acceleration
Momentum
Inertia
Viscosity
IQ
Pressure
Buoyancy
Probability
Gravity
Radiation
Strength
Acidity
Memory
Power/Work
Magnetism
Humidity
Angles
Solubility
Ductility
Malleability

Teaching measurement as part of fraction/decimal conversions.

Activity 8-18: **Unfamiliar Units of Measure** Name:

| | | | |
|---|---|---|---|
| 1 | cord | volume of firewood | 8 ft. by 4 ft. by 4 ft. stack |
| 2 | hogshead | capacity of liquid | 63 gallons |
| 3 | peck | volume of dry items | 537.61 cu. in. |
| 4 | carat | weight of precious stones | one-fifth of a gram |
| 5 | karat | amount of gold | 24k = 100% |
| 6 | watt | electric work capability | based on current, resistance |
| 7 | bolt | length of cloth or paper | varies |
| 8 | barrel | capacity, wet or dry | 31.5 gallons |
| 9 | calorie | heat energy or fuel value-food | energy to raise temperature |
| 10 | rod | length – land | 16.5 ft. |
| 11 | furlong | length – land | 200 yd. |
| 12 | hand | length – horse height | about 4 in |
| 13 | acre | area – land | 43,560 sq. ft. |
| 14 | board foot | volume – lumber | 1 in. by 12 in. by 12 in. |
| 15 | ream | amount of paper | about 500 sheets |
| 16 | hertz | frequency –light wave | waves per second |
| 17 | gross tonnage | volume – ship | 100 cu. ft. |
| 18 | Mach 1 | speed – ships and planes | speed of sound |
| 19 | light year | length – space | about 6 trillion miles |
| 20 | jigger | capacity – liquid | 2 mouthfuls |
| 21 | gill | capacity – liquid | one-fourth pint |
| 22 | Troy pound | weight – precious metals | 12 oz. |
| 23 | knot | speed – ships and planes | 1.852 mph |
| 24 | quire | amount of paper | 25 sheets |
| 25 | gross | amount of items | 12 dozen |
| 26 | bit | capacity – computer memory | 8 bits |
| 27 | nose | length – horse racing | small distance |
| 28 | magnum | capacity – liquid | 2 quarts |
| 29 | lux | illumination | light 1m from candle source |
| 30 | horsepower | work capability – engine | energy for one horse to life 33,000 lbs. 1 ft. in 1 min. |

Activity 8-19: **What It Takes To Be A Leader** Name:

*(Taken from Credibility: How Leaders Gain and Lose It, Why People Demand It by Kouzes and Posner)*

Based on a survey of more than 15,000 people, which of these traits do you think was selected as the key to effective leadership:

- Being fair?
- Being cooperative?
- Being honest?
- Being imaginative?

If you guessed "honest", you get a high mark. It scored far above any of the others in a list of 20. In fact, the top four characteristics of admired leaders and the percentage of people who selected them are:

- Being honest – 87%
- Being forward-looking – 71%
- Being inspirational – 68%
- Being competent – 58%

Honest people have credibility and that's what gives leaders the trust and confidence of their people. High credibility leaders foster such things as greater pride in organization, a stronger spirit of cooperation and teamwork, and more feelings of ownership and personal responsibility. What are some of the other characteristics of credible leaders?

- They do what they say they will do. They keep their promises and follow through on their commitments.
- Their actions are consistent with the wishes of the people they lead. They have a clear idea of what others value and what they can do.
- They believe in the inherent self-worth of others.
- They are capable of making a difference in the lives of others and finding the leader in everyone.
- They admit their mistakes. They realize that attempting to hide mistakes is much more damaging and hurts credibility. But when they admit to making a mistake, they do something about it.
- They create optimistic feelings and enable people to hold positive thoughts about the possibilities of success.
- They create a climate of learning characterized by trust and openness.

When I was a manager in the business world, one of my branch managers became involved in a dispute with a branch manager from another region. The two could not work it out, so the dispute went to the supervisory level. When the other supervisor called me, I was ready for him with both barrels loaded, and early on in the conversation I let him have it! Quietly he responded, "Very well." I waited for further argument. There was none. Total nonresistance. Somehow, I was not happy with my overwhelming victory of this man. It was a hollow victory. I had not given him a chance to express his point of view. I didn't even know what he thought. After a few moments of silence, I asked, "What more do you have to say?" He replied, "Nothing," quietly and without malice.

By this time all the wind had been taken out of my sails. "Oh, c'mon, Fred, let's talk about it." "Okay," he said, and we talked. I was much more receptive to his problem than I ever would have been if he had attacked me as I had attacked him. The result of our conversation was a solution in which both our branches became winners. Another result was that I found a friend. So did he.

I learned a lot from this encounter. So much energy is wasted in the struggle to be right. This does not mean we are doormats, but it does mean we are willing to listen and to discover merit in another's point of view. We may even learn something. And we will certainly gain something of far greater value than winning an argument: winning a friend.

Today I assert myself softly.