Chapter 4 – Volume, Mass and Temperature

OUTCOMES	ASSESSMENT RUBRICS			
WA 10.3 Demonstrate using concrete, and pictorial models, and symbolic representations, understanding of measurement systems including: SI, The British Imperial System, The US Customary System				
Level / **Criteria**	**Beginning** Spend some extra time with the criteria and ask for help.	**Approaching** Good start. You are beginning to make sense of this on your own. You are consistent with the basic learning goals for this outcome.	**Proficient** You did it and you did it on your own. You are able to complete the processes for this outcome. Your work is thorough and consistently accurate.	**Mastery** Great work! This is going extra well for you. You have understood the outcome, are able to explain your strategies and apply these to situations. Your work is always accurate.
WA 10.3 (4A) Demonstrate using concrete, and pictorial models, and symbolic representations, understanding of measurement systems including: SI, The British Imperial System, The US Customary System	I need more help with becoming consistent with the criteria.	I can consistently develop and apply single step strategies to convert units of temperature, mass, volume, between and within the SI and imperial systems including word problems.	I can set up multi step problems and calculations involving mass and volume which could include conversions between and within systems of measurement.	I can set up a multi step problem involving both mass and volume and will include conversions between and within systems of measurement. I express SI units in decimals and imperial units in fractions and state the proper units of measurement in my answer.

Goals:

- compare and make conversions within and between Celsius and Fahrenheit temperature scales and between Celsius and Fahrenheit temperature scales and between imperial and SI units of mass/weight
- examine the differences between mass and weight in each system
- perform other conversions that are important in the workplace, such as conversions between mass and volume

Key Terms:

Celsius (^{0} C)	Fahrenheit (^{0} F)	Temperature
Conversion Factor	gram (g)	kilogram (kg)
mass	ounce (oz)	pound (lb)
ton (tn)	tonne (t)	weight

Capacity and Volume

SI to Imperial	Imperial to SI	Imperial system	SI
1 mL = 0.033814 fl oz	1 fl oz = 29.5735 mL	4 quarts = 1 gallon	1 L = 1 m^3 or 1000 cm^3
1 L = 33.814 fl oz	16 fl oz = 1 pt = 0.473176 L	2 pints = 1 quart	1 British gallon = 4.5 L
1 L = 0.879877 qt	1 qt = 2 pt = 1.13652 L	2 cups = 1 pint	4 quarts = 1 gallon
1 L = 0.219969 gal	1 gal = 4 qt = 4.54609 L	1 American gallon = 3.8 L	
		1 pint = 16 fluid ounces	

Common Volume Cooking Units

Imperial to SI		Imperial to SI
¼ tsp = 1.25 mL	¼ cup = 60 mL	1 pint = 568.2614 mL
½ tsp = 2.5 mL	½ cup = 125 mL	1 qt = 2 pt = 1.1365 L
1 tsp = 5 ml	1 cup = 250 mL	
1 tbsp = 3 tsp = 15 mL		

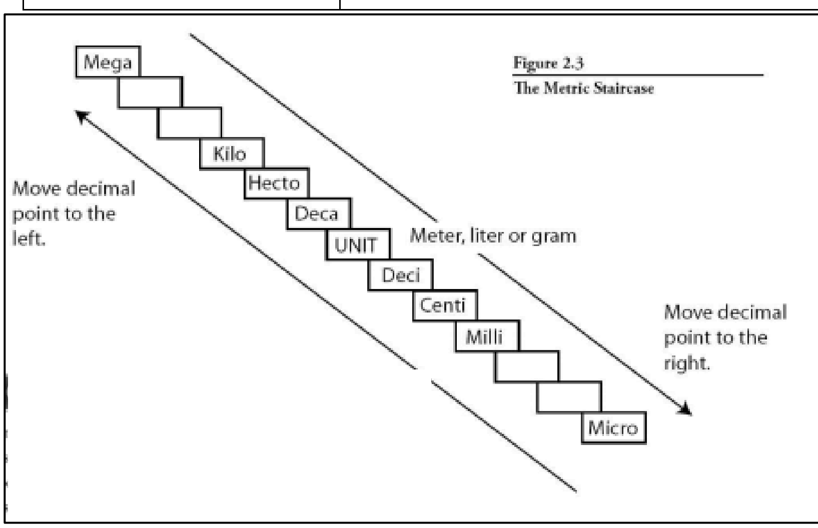
Mass

Imperial to SI			SI to Imperial		
1 American ton (ta) =	2000 pounds	= a small car	1 metric ton (*t*) =	1000 kg	= a hippopotamus
1 pound (lb) =	0.453592 kg	= a guinea pig	1 kilogram (*kg*) =	1000 g = 2.2 pounds	= 1L bottle of water
1 ounce (oz) =	28 349.5 mg	= a slice of bread	1 gram (*g*) =	1000 mg = 0.035274 oz	= a large paper clip
16 ounces (oz) =	1 pound	= 4 bananas	1 milligram (*mg*) =	0.001 g = 0.000035274 oz	= a feather

Conversions of Volume and Weight

Material	*Volume*	*Estimated weight*	*Volume*	*Weight*
Water	1 ft^3	62 lbs 8 oz	1 bushel = 2220 $inches^3$	---
Printer paper	1 yd^3	655 lbs	45.93 bushels of barley	*1 ton*
Glass bottles (whole)	1 yd^3	500 to 700 lbs	36.74 bushels of wheat	*1 ton*
Glass bottles (crushed)	1 yd^3	1800 to 2700 lbs	39.37 bushels of flax	*1 ton*
Tin can (whole)	1 yd^3	150 lbs	64.84 bushels of oats	*1 ton*

Shape	Volume
rectangular prism	$V = \ell wh$



Conversion Formulas:

Celsius to Fahrenheit:

$$F = \frac{9}{5}C + 32$$

Fahrenheit to Celsius:

$$C = \frac{5}{9}(F - 32)$$

Temperature

SI to Imperial	Imperial to SI
$C = \frac{5}{9}(F - 32)$	$F = \frac{9}{5}C + 32$

Equivalents in degrees Fahrenheit and Celsius	°F	°C
Very cold temperature	-22	-30
Moderate temperature	59	15
Hot temperature	81	27
Normal body temperature	98.6	37
Boiling water	212	100

3.4 VOLUME DAY 1 – COMPARING SI & IMPERIAL UNITS

The volume of a solid is a measure of ow much space it occupies. In the SI, the base unit for measuring volume is the litre. The litre is also the base SI unit for measuring capacity. Capacity: the maximum amount that a container can hold. A litre is one-thousandth of a cubic metre. Why is volume measured in cubic units? What is the formula for calculating volume?

In the imperial system, that base unit for measuring volume and capacity is the pint, but volume can also be measured in cubic inches, cubic feet, or cubic yards.

In Canada, we use the term imperial units to mean British Imperial units. The United States also uses an imperial system, but the sizes of its units for volume and capacity are different from the British units. A British gallon is equal to 4.54609 litres; a US gallon equals 3.785 litres.

In many industries, volume and capacity are measured in imperial units rather than SI units. For example, in the food industry, ingredients are often measured in teaspoons, cups and ounces. Other industries use both the imperial system and the SI. A building contractor estimating the amount of concrete needed for a job may find one supplier who delivers concrete by the cubic metre and another who delivers it by the cubic yard. The contractor would need to know how to convert between the two systems to ensure that she is getting the best price for her client.

Unit	Abbreviation
ounce	oz
fluid ounce	fl oz
pint	pt
quart	qt
gallon	gal

CHART 1: IMPERIAL UNITS FOR CAPACITY

Imperial Units for Capacity (American and British)

Unit	Relationships (US)	Relationships (UK)
fluid ounce (fl oz)	1 fl oz = 2 T (tablespoons)	1 fl oz = 2 T (tablespoons)
cup (c)	1 c = 8 fl oz	1 c = 10 fl oz
pint (pt)	1 pt = 2 c, or ________ fl oz	1 pt = 2 c, or ________ fl oz
quart (qt)	1 qt = 2 pt, or ________ fl oz	1 qt = 2 pt, or ________ fl oz
gallon (gal)	1 gal = 4 qt, or ________ fl oz	1 gal = 4 qt, or ________ fl oz

Example 1 (Imperial)

Evan is making punch for hospital volunteers. He needs $3\frac{1}{2}$ quarts of cranapple juice. How many cups is this?

Example 2 (Imperial)

Express each capacity in the units given.

a) 1 c = ______ pt

b) 3 fl oz = ______ T

c) 4 gal = ______ fl oz (US)

d) 4 gal = ______ fl oz (UK)

e) 7 bu = ______ gal

f) $3\frac{1}{2}$ bu = ______ qt

CHART 2: SI METRIC UNITS FOR CAPACITY

Metric (SI) Units for Capacity

Unit	Relationship to litre
kilolitre (kL)	1 kL = 1000 L or 10^3 L
hectolitre (hL)	1 hL = 100 L or ________ L
decalitre (daL)	1 daL = 10 L or ________ L
litre (L)	
decilitre (dL)	1 dL = 0.1 L or $\frac{1}{10}$ L
centilitre (cL)	1 cL = 0.01 L or ________ L
millilitre (mL)	1 mL = 0.001 L or ________ L

Example 3 (SI METRIC)

1. Express one litre in different ways.

a) 1 L = ______ dL, or ______ cL, or ______ mL

b) 1 L = ______ daL, or ______ hL, or ______ kL

2. Express each capacity in litres.

a) a jar of salsa, 650 mL ______ L

b) a bottle of eyeglass lens cleaner, 60 mL ______ L

c) a can of brass polish, 142 mL ______ L

CHART 3: IMPERIAL UNITS FOR VOLUME

volume
the amount of space occupied by a 3-D object

Unit	Relationships
cubic inches (cu in.)	1 cu in. = 1 in. × 1 in. × 1 in.
cubic feet (cu ft)	1 cu ft = 1 ft × ____ ft × ____ ft 1 cu ft = 12 in. × 12 in. × 12 in., or _____ cu in.
cubic yards (cu yd)	1 cu yd = 1 yd × 1 yd × 1 yd 1 cu yd = _____ ft × _____ ft × _____ ft, or _____ cu ft

Example 4:

Ty is a part-time florist and gardener. He uses about 1000 cu in. of pebbles in each planter he creates. The **volume** of pebbles in his supply bin is 4 cu ft. How many planters can he fill?

Example 5:

Kyle, a bricklayer, needs 245 cu ft of lime to use in mortar. How many whole cubic yards of lime does Kyle need to buy?

CHART 4: SI METRIC UNITS FOR VOLUME

Metric (SI) Units for Volume

Unit	Relationship to cubic metre
cubic kilometre (km^3)	1 km^3 = 1 000 m × 1 000 m × 1 000 m = 1 000 000 000 m^3
cubic hectometre (hm^3)	1 hm^3 = 100 m × 100 m × 100 m, or 1 000 000 m^3
cubic decametre (dam^3)	1 dam^3 = 10 m × 10 m × 10 m, or ________ m^3
cubic metre (m^3)	
cubic decimetre (dm^3)	1 dm^3 = 0.1 m × 0.1 m × 0.1 m, or ________ m^3
cubic centimetre (cm^3)	1 cm^3 = 0.01 m × 0.01 m × 0.01 m, or ________ m^3
cubic millimetre (mm^3)	1 mm^3 = 0.001 m × 0.001 m × 0.001 m = 0.000 000 001 m^3

Example 6 (SI METRIC)

- What is the volume of an aquarium with 17 cm width, 35 cm length, and 23 cm height?
- How much water does it hold? (1 cm^3 = 1 mL)

Example 7: (BETWEEN SYSTEMS)

Express each capacity in the units given.

a) a can of corn, 12 fl oz ≐ ______ mL

b) a soup kettle, 10 L ≐ ______ gal, to the nearest tenth

c) a tube of toothpaste, 130 mL ≐ ______ fl oz

d) a can of varnish, 1 L ≐ ______ pt or ______ qt

Example 8: (BETWEEN SYSTEMS)

What is the volume, to the nearest tenth of a unit?

a) a pile of firewood, 2 cu yd ______ m^3

b) a room, 58 m^3 ______ cu yd

c) a pond, 0.8 cu mi ______ km^3

d) Lake Athabasca, 110 km^3 ______ cu mi

Example 9:

Nigel imported a vehicle that was made in Britain. The capacity of the gas tank is 22 gallons. If the price of gasoline is $1.20 a litre, how much will it cost Nigel to fill his tank when it is empty?

Hint - Convert the British Gallons to litres.

Complete the table below and fill in the missing information to create a conversion chart.

Converting common Cooking Units	
Imperial	SI
$\frac{1}{4}$ teaspoon	________mL
$\frac{1}{2}$ teaspoon	________mL
1 teaspoon	5 mL
1 tablespoon (3 teaspoons)	________mL
1 cup	250 mL
1 pint	568.2614 mL
1 quart (2 pt)	1.1365 L
1 gallon (4 qt)	4.5461 L

Example 10:

You are making a batch of raisin bannock to take to a community feast. Your grandmother has given you her recipe, but the ingredients are in imperial units and you only have SI measuring equipment.
Convert the following recipe.

Raisin Bannock Recipe		
Imperial	Ingredients	SI
3 cups	Flour	_______mL
$1\frac{1}{2}$ teaspoons	Baking Powder	_______mL
$\frac{1}{2}$ teaspoon	Salt	_______mL
$\frac{1}{4}$ cup	Shortening	_______mL
$1\frac{1}{4}$ cups	Water	_______mL
1 cup	Raisins	_______mL

Example 11:

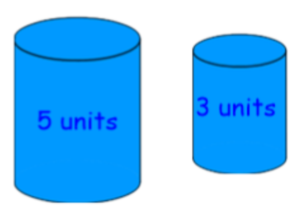
The cooling system of a car's 6-cylinder, 250-cubic-inch displacement engine has a capacity of $3\frac{1}{2}$ gallons. To protect the engine against freezing temperatures, an antifreeze solution of $\frac{3}{8}$ ethylene glycol and $\frac{5}{8}$ water is added to the cooling system. If the cooling system is filled to capacity with the antifreeze solution, how many quarts of ethylene glycol are in the cooling system?

Example 12:

Reshma built 24 wood planters for her garden. The inside of each planter measures 4' long, 2' deep, and $1\frac{1}{2}$ ' wide. She needs to order soil to fill the planters. At K & R Soils, potting soil sells for $17.00/yd^3, while Bob's Best Buy sells potting soil for $21.50/m^3. Where should Reshma buy her soil?

Puzzle It Out

You have two empty containers. One has a capacity of 5 units and the other has a capacity of 3 units. Neither container has any unit markings. Your job is to fill one of the containers with exactly 4 units of water. You can fill a container, empty a container, and pour water from one container to the other without spilling over.
Find the fewest number of pours needed to reach your goal.



Math on the Job page 124
Anthony is a warehouse technician in the City of Yellowknife Public Works Department. His job is to manage storage, shipping, and inventory of government assets such as furniture and office supplies. Anthony uses math to plan how and where to store his inventory.

Anthony needs to know how many boxes can be stored in a storage bay in his warehouse. The storage bay is 24 feet long and 12 feet wide. The maximum height that boxes can be stacked is 9 feet. Each box is 24 inches X 36 inches X 18 inches. What is the maximum number of boxes that will fit in the storage bay?

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4.1 Temperature Conversions

https://www.youtube.com/watch?v=1TV6JFxMEcI

In 1714, Gabriel Daniel Fahrenheit invented the mercury thermometer. The imperial unit for measuring temperature is degrees **Fahrenheit** (°F).

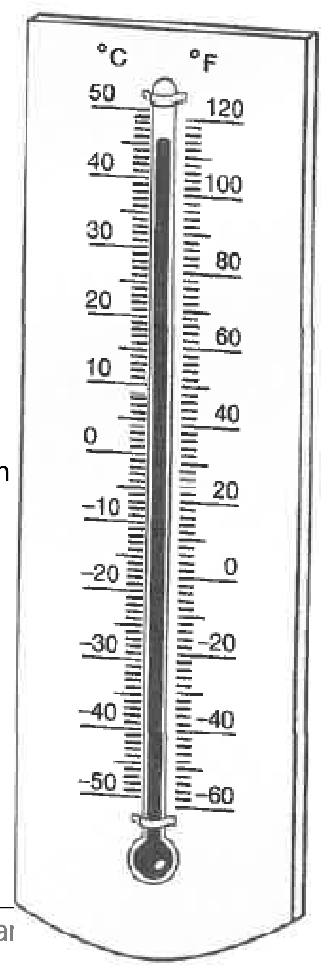
In 1742, Anders Celsius created a Celsius temperature scale. The metric unit for measuring temperature is degrees **Celsius** (°C).

The Celsius scale used to be called the centigrade scale, and it is sometimes referred to this way.

If you travel to the United States, you will notice that a different temperature scale is used there. The US uses the Fahrenheit scale (°F) of the imperial system, while Canada uses the Celsius scale (°C) of the SI.

In the SI, water freezes at 0°C and boils at 100°C. In the imperial system, water freezes at 32°F and boils at 212°F. Since water freezes at 0°C and 32°F, the relationship between the two temperature systems can be calculated with the following formulas, where C represents degrees Celsius and F represents degrees Fahrenheit.

$C = \frac{5}{9}(F - 32)$ or $F = \frac{9}{5}C + 32$



Example 1: The thermometer on the right shows the highest temperature recorded in Canada. It was on July 5, 1937 in Yellow Grass, Saskatchewan. Use the Thermometer to estimate is the temperature in Fahrenheit. What is the Temperature in Celsius?

Conversion Formulas:

Celsius to Fahrenheit:

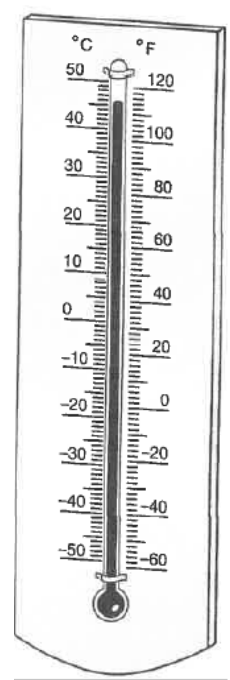
$$F = \frac{9}{5}C + 32$$

Fahrenheit to Celsius:

$$C = \frac{5}{9}(F - 32)$$

Example 2: Élise is training to become a chef. A recipe for tourtière says to bake it at 190 °C. To what temperature should Élise set an oven with temperatures in degrees Fahrenheit?

Example 3: While visiting Florida, Kathy heard a local person say that it had been very cold overnight, as it was only 42°. At first, she thought this was not cold, but then Kathy realized the person meant degrees Fahrenheit. What was the temperature in degrees Celsius?



Example 4:

Luke and some friends made a snow sculpture for Festival du Voyageur in Winnipeg. Cross out the temperatures at which their snow sculpture would start to melt.

6 °C −7 °F 30 °F −3°F −1 °C 12 °F 32 °C 43 °F

Example 5: Harpreet is transporting frozen food from Los Angeles to Vancouver in a refrigerated truck. The external temperature in Los Angeles is 90^0 F when he leaves. He knows that the safest temperature for preserving the frozen food is between 0^0 F and -4^0 F. When he arrives at the Canadian border, the border guard determines the temperature of the truck to be -19^0 C. Is this within the acceptable range of temperature for preserving frozen food? Give your answer to the nearest half a degree.

Example 6: While travelling in the US, Jennifer and Richard are concerned because their daughter Isabella has a temperature of 39^0 C, so they take her to a medical clinic. The nurse takes Isabella's temperature on the Fahrenheit scale. What will Isabella's temperature be in degrees Fahrenheit?

Discuss the Ideas

When crude oil is refined, it is heated and separated into different fuels, such as gasoline, kerosene, diesel oil, and fuel oil. As the crude oil is heated, it turns into vapour. When the vapour cools the different fuels condense at predictable temperatures.

FUEL CONDENSATION POINTS

Fuel	*Condensation point (°C)*
Gasoline	150
Kerosene	200
Diesel	300
Fuel oil	370

1. Rewrite the conversion formula $F = \frac{9}{5}C + 32$ using decimals.
2. Convert the four fuel condensation points from Celsius to Fahrenheit using decimals.
3. Use your understanding of equations to solve for C so that Sian can convert directly from Fahrenheit to Celsius.
4. What advantage is there to using decimals rather than fractions in conversion formulas?

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4.2 Mass in the Imperial System

Although people often use the terms mass and weight interchangeably, there is a difference between them. **Mass refers to the quantity of matter in an object.** Mass is usually measured using a balance to compare a know amount of matter to an unknown amount of matter. **Weight is a measure of the force of gravity on a object.** Weight is therefore a measurement of the heaviness of a body, the force with which a body is attracted to a celestial body (planet or moon, for example) and is equal to the product of the object's mass and the acceleration of gravity.

What does this mean? Wherever an object is, its mass will remain constant. However if you take that object to another planet, that object would weigh a different amount because the force of gravity is different than it is on earth.
In the imperial system, there are three commonly used units of weight:

- 1 ton (tn) = 2000 pounds An adult bison may weigh 1 ton.
- 1 pound (lb) = 16 ounces (oz) A football weighs approximately 1 lb.
    - One slice of bread weighs about 1 oz.

Example 1:

Express each mass in ounces.

a) a bushel basket of tomatoes, 60 lb ______ oz

b) a small bag of pet food, $3\frac{1}{2}$ lb ______ oz

Example 2:

What fraction of a pound is each mass?

a) a small box of plant food, 9 oz ________ lb

b) a mini hockey stick, 14 oz ________ lb

Example 3:

Manuela needs 1 pound 2 ounces of Gruyère cheese, 12 ounces of cheddar cheese, and 11 ounces of Swiss cheese for a fondue recipe. How many pounds of cheese does she need in all?

Example 4:

The cab of Arthur's semi-trailer truck weighs 8.7 tons and the trailer weighs 6.4 tons. If the loaded gross weight of the truck is 21.3 tons, what is the weight of the load:

a) in tons?

b) in pounds?

Example 5: Stephan is building a rectangular water cistern on an acreage outside Beausejour, Manitoba so that he can collect rainwater for his garden. The inside dimensions of the finished cistern will be 10 feet 8 inches by 8 feet 4 inches by 4 feet 6 inches. A cubic foot of water weighs about 62 pounds 8 ounces. If the cistern is completely filled with water, what will the weight of the water expressed in tons?

Example 6: George estimates that each bale of hay in his field weighs 62.5 pounds on average. There are 892 bales to be picked up. If his truck can carry 8 tons on one trip, how many trips will he have to make to move his bales?

Example 7:

A 12-ounce can of vegetables costs $1.49. A 1 lb 2-oz can of the same vegetables costs $2.19. Which is the better buy?

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4.3 Mass in the Systeme International

In the last section, you discussed the differences between mass and weight and determined that in the imperial system, we tend to use the term pound - a unit of weight - for both mass and weight. In the SI units, we do the opposite. The correct term for a unit of weight is the newton, but we use the term kilogram, a unit of mass, to refer to mass and weight.

Since the kilogram is the basic unit of mass in the SI system, use your understanding of the prefixes you know to determine:

1. the number of grams in a kilogram
2. the name of 1000 kilograms
3. the name of $\frac{1}{1000}$ of a gram

Definitions:

Kilogram is the mass of one litre of water at 4 C. 1 kilogram = 1000g

Metric tonne = 1000 kg. Can also be called a megagram

Review the METRIC (SI) CONVERSION INFO

Unit	Symbol
Kilometer	km
Hectometer	hm
Decameter	dam
Meter	m
Decimeter	dm
Centimeter	cm
Millimeter	mm

Metric Conversion

1000 grams (g) = 1 kilogram (kg)

1000 milligrams (mg) = 1 gram

1 tonne (t) = 1000 kilograms

Note that a tonne (t) is not the same as a ton (tn). A tonne is sometimes referred to as a metric ton.

Metric (SI) Units for Mass

Unit	Relationship to gram
tonne (t)	1 t = 1000 kg, or 10^3 kg
kilogram (kg)	1 kg = 1000 g, or _______ g
hectogram (hg)	1 hg = 100 g, or _______ g
decagram (dag)	1 dag = 10 g, or _______ g
gram (g)	
decigram (dg)	1 dg = 0.1 g, or $\frac{1}{10}$ g
centigram (cg)	1 cg = 0.01 g, or _______ g
milligram (mg)	1 mg = 0.001 g, or _______ g

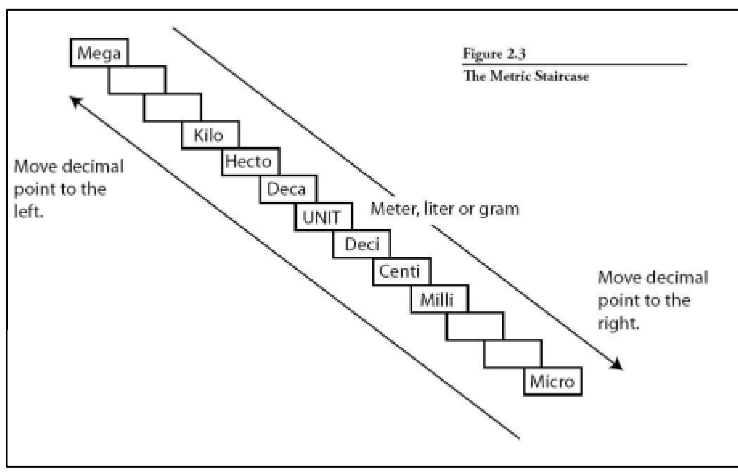

Figure 2.3
The Metric Staircase

Example 1:

Nick works at a diamond mine north of Yellowknife. Most years, the mine produces about 8 million carats, which is about 1600 kg of diamonds. How many metric tonnes is this?

Example 2:

Express each mass in the units given.

a) a women's javelin, 600 g _______ kg

b) a container of black pepper, 75 g _______ kg

c) a sharp-tailed grouse, 0.9 kg _______ g

d) a huge block of ice, 770 kg _______ t

e) 15 mg of sodium _______ g

f) 5 g of protein _______ mg

Mass									
Imperial to SI				**SI to Imperial**					
1 American ton (ta) =	2000 pounds	=	a small car	1 metric ton (*t*)	=	1000 kg		=	a hippopotamus
1 pound (lb) =	0.453592 kg	=	a guinea pig	1 kilogram (*kg*)	=	1000 g	= 2.2 pounds	=	1L bottle of water
1 ounce (oz) =	28 349.5 mg	=	a slice of bread	1 gram (*g*)	=	1000 mg	= 0.035274 oz	=	a large paper clip
16 ounces (oz) =	1 pound	=	4 bananas	1 milligram (*mg*) =		0.001 g	= 0.000035274 oz =		a feather

Example 3:

Calculate each mass to the nearest tenth of the metric unit.

a) an empty tractor trailer, 30 000 lb _______ t

b) a baseball bat, 24 oz _______ g

c) a keg of nails, 99 lb _______ kg

d) a large polar bear, $\frac{3}{4}$ T _______ t

e) the mass that a tool cabinet can hold, 600 lb _______ kg

Example 4:

Lorinda is baking apple pies. According to her recipe, she needs 6 pounds of apples. The bag of apples she bought only shows the weight in kilograms. How many kilograms of apples does she need?

To estimate a conversion from pounds to kilograms, you can think of a pound as being about $\frac{1}{2}$ kg.

Example 5: You and your 5 friends want to use your motorboat to cross the bay and you are the only one who can pilot the boat. The maximum capacity for your boat is listed as 0.55 tonnes. You weight 75 kg and your friends weight 76 kg, 82 kg, 63 kg, 68 kg, and 78 kg respectively. You also have 104 kg of supplies. How many trips will you have to make in order for everyone (and your supplies) to get across the water safely? Give reasons for your answer.

Example 6:

The cost of bananas is \$0.49/lb at one store, but you see an advertisement for bananas on sale at another store for \$1.05/kg. Which is the better buy?

Example 7:

1. Which item would weigh 1 gram? a) a brick b) a penny c) a book
2. Which item weighs about 1 kilogram? a) this textbook b) a dime c) an MP3 player
3. Which item weight about 1 tonne? a) a bull b) two men c) a laptop computer

Example 8:

Read each statement and judge whether the estimate makes sense. If you disagree with the statement, justify your solution by estimating the approximate weight of the object.

a) A loaded truck has a mass of about 500 kg.

b) a small boy has a mass of about 100 g.

c) a hockey puck has a mass of about 2 kg.

d) A headache table has a mass of 1 mg.

e) Two loaves of bread have a mass of about 1 kg.

f) A piece of gum has a mass of about 1 g.

Activity: Using SI Prefixes

Work with a partner to discuss the following two situations. Write a justification of your solutions. The megagram is generally referred to as a tonne, a metric ton, or a long ton.

1. Use your understanding of weights to determine a referent for:
   a) 1 tonne (t)
   b) 1 kilogram (kg)
   c) 1 gram (g)
   d) 1 milligram (mg)
2. 2.8 t, 2800 kg, and 2 800 000 g are equivalent masses. Each represents the mass of a truck. Which would be the most appropriate unit to use if you were discussing the mass of a truck? Why?
3. When you are cooking, there is more than one way to determine how much of an ingredient to use. Some recipes give amounts in volume and others use mass, especially those from Europe. If you use a measuring cup, you are measuring volume. To measure mass, you need a kitchen scale.

It would be unusual to give a truck's weight in grams.

You are measuring the amount of flour you need to make a cake, but some of your batter has splashed on your recipe and hidden the unit of measurement. You can see that the number is 250. Would this be tonnes, kilograms, grams, or milligrams? Give examples of items that might weigh each of these amounts. Do not use the referents suggested above.

4.3 Assignment : WORKBOOK

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