

Curriculum Outcome

M1 Demonstrate an understanding of the Système International (SI) by describing the relationships of the units for **length, area, volume, capacity, mass and temperature.**

M2 Demonstrate an understanding of the Imperial system by: describing the relationships of the units for **length, area, volume, capacity, mass and temperature.**

Student Friendly:

The relationship between mass

Mass in the Imperial System

WARM-UP...

Chinook winds are known to cause great changes in temperature over a short period of time. The most extreme temperature change in a 24-hour period occurred in Loma, Montana, on January 17, 1972. The temperature rose from -54°F to 49°F .

a) What was the change in temperature in degrees Fahrenheit?

103°F

Solution?

b) What was the maximum/minimum temperatures in degrees Celsius?

Min: -47.8°C

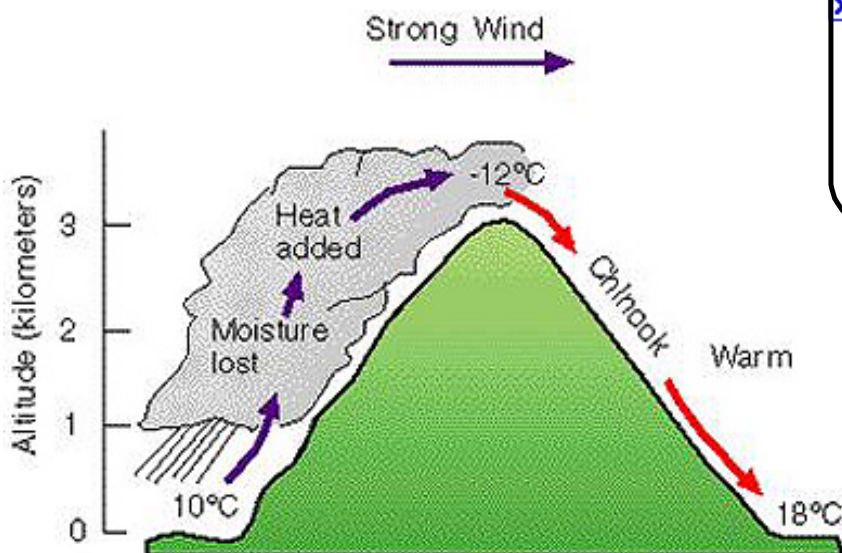
Max: 9.4°C

Solution?

c) What was the change in temperature in degrees Celsius?

57.2°C

Solution?



A Chinook wind is a warm, dry wind that blows east of the Rocky Mountains, often causing significant temperature increases in a short time in winter.

5.2 Mass in the Imperial System

- **Mass** - a measure of the quantity of matter in an object.
 - "the amount of *stuff*".
 - in an imperial system the 'slug' is a measure of mass. $1 \text{ slug} = 1 \frac{\text{lb}_F \cdot \text{s}^2}{\text{ft}}$
 - * use of the pound is commonly used as a measure of mass.

- **Weight** - a measure of the force of gravity on an object.
 - in an imperial system the pound is a measure of weight.

16 ounces (oz) = 1 pound (lb)
1 ton (tn) = 2000 pounds (lb)

1 oz - a slice of bread
1 lb - football
1 tn - an adult bison

*** Compared to the SI system...

1 lb = 0.453 592 37 kg OR 1 kg = 2.2 lbs

Mass vs. Weight

Mass - a measure of the quantity of matter in an object.

Weight - a measure of the force of gravity on an object.

So does this mean your mass changes when you travel to the moon or does your weight change?



What does a scale measure?



I wonder what I weigh?  170lbs?



Try these conversions:

Conversions Between Imperial Mass Units

$$16 \text{ oz} = 1 \text{ lb}$$

$$1 \text{ tn} = 2000 \text{ lbs}$$

$$250 \text{ oz} = \underline{15.63} \text{ lbs}$$

$$75 \text{ lbs} = \underline{1200} \text{ oz}$$

$$750 \text{ lbs} = \underline{0.38} \text{ tn}$$

$$4 \text{ tn} = \underline{8000} \text{ lbs}$$


$$172 \text{ oz} = \underline{10} \text{ lbs } \underline{12} \text{ oz}$$

$$172 \text{ oz} \times \frac{1 \text{ lb}}{16 \text{ oz}} = 10.75 \text{ lb}$$

$$0.75 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}}$$

HOMEWORK...

p. 201 #1 - 5

 5.2 Worksheet - Mass in an Imperial System.docx

See next slides for questions

EXERCISE: Copy and Complete the following Conversions!

$$16 \text{ ounces (oz)} = 1 \text{ pound (lb)}$$
$$1 \text{ ton (tn)} = 2000 \text{ pounds (lb)}$$

$$48 \text{ ounces} = \underline{\hspace{2cm}} \text{ pounds}$$

$$4 \text{ pounds} = \underline{\hspace{2cm}} \text{ ounces}$$

$$1.5 \text{ pounds} = \underline{\hspace{2cm}} \text{ ounces}$$

$$2 \text{ tons} = \underline{\hspace{2cm}} \text{ pounds}$$

$$6000 \text{ pounds} = \underline{\hspace{2cm}} \text{ tons}$$

$$80 \text{ ounces} = \underline{\hspace{2cm}} \text{ pounds}$$

$$8 \text{ pounds} = \underline{\hspace{2cm}} \text{ ounces}$$

$$1.5 \text{ tons} = \underline{\hspace{2cm}} \text{ pounds}$$

$$64 \text{ ounces} = \underline{\hspace{2cm}} \text{ pounds}$$

Section 5.2: Worksheet
Mass in the Imperial System

1) Calculate the conversions:

a. 24 oz = _____ lb

b. 7890 lb = _____ tn

c. 54 oz = _____ lb _____ oz

d. 6lb 2oz = _____ oz

e. 4.54 tn = _____ lb

f. 654oz = _____ lb _____ oz

2) What is the total weight, in pounds and ounces of six books on a shelf if they weigh 1 lb 7 oz, 12oz, 1 lb 2 oz, 15 oz, 9 oz, and 1 lb 3 oz.

3) A bakery uses a recipe for oatmeal cookies that calls for 1lb 4 oz of flour to make 9 dozen cookies, how many ounces of flour are needed to make 3 dozen cookies?

4) Kris needs to transport 5 slabs of concrete to an apartment work site. If each slab weighs 46 pounds, Kris weighs 195 pounds; and the truck weighs 1.5 tons, what is the total weight of the loaded truck in pounds?

5) Jamie is concerned about the weight that paint might add to a delicate structure he built. He estimates that e needs 1.5 gal of paint and that the structure can withstand 15 lbs of weight. The weight of a particular paint is 9lb/gal. When it dries, the weight is only 5.4lb/gal. Can Jamie paint his structure without having collapse?

6) U-Pick organic blueberries sell for \$20.00 for a 12 pound box

a) How much would 1 pound cost?

b) How much would 12 ounces cost?

7) What is the true cost per pound of a 10 pound box of oranges if the original price of the box was \$12.99 and $\frac{1}{4}$ of them to be thrown away because they were mouldy?

Answers:

1a) 1.5 lbs b) 3.945 tn c) 3 lb 6 oz d) 98 oz e) 9080 lb f) 40 lb 14 oz

2) 6 lb 3) 6 $\frac{2}{3}$ oz 4) 3425 lb 5) paint weighs: 13.52 lbs so yes Jamie can paint it

6) a. \$1.67/lb b. \$1.25/12 oz 7) \$1.73/lb

p. 201 #1 - 5

BUILD YOUR SKILLS

1. Choose the correct item to go with each weight. About how much do you think each of the other items weighs?
 - a) About 1 ounce:
 - i) pat of butter
 - ii) loaf of bread
 - iii) house cat
 - b) About 1 pound:
 - i) sofa
 - ii) small basket of raspberries
 - iii) gallon of water
 - c) About 1 ton:
 - i) refrigerator
 - ii) large dog
 - iii) blue whale

2. Which unit—ounce, pound, or ton—would you use to express the weight of the following? Give an alternate choice, if suitable, and justify your answer.
 - a) brick
 - b) plasma TV
 - c) box of chocolates
 - d) hippopotamus
 - e) duck
 - f) box of books
 - g) tractor-trailer truck


3. At birth, Johan weighed 7 pounds 9 ounces.
- Why are newborns' weights given in pounds and ounces and not rounded to the nearest pound?
 - What would Johan's weight be in ounces?
 - Why are newborns' weights not given in ounces alone?
 - The nurse on the maternity ward told Dawn that her baby, Johan, would lose about 10% of his weight in the first week. Then the baby would likely gain about 5 ounces a week for the next four weeks. What should Dawn expect Johan to weigh at 5 weeks of age if he weighed 7 pounds 9 ounces at birth?
 - How does Johan's weight at 5 weeks compare to his weight at birth?
 - Would the comparison be different if he had weighed more or less at birth?
4. A contractor is building a patio behind Polli's house. The cement slab will be 9 feet 8 inches long, 7 feet 3 inches wide, and 4 inches thick. If the concrete weighs 150 pounds a cubic foot, what is the weight of the concrete in Polli's patio?

5. Coffee is the second most highly traded commodity in the world. Jean owns a coffee shop in Caraquet, NB. He buys fresh fair-trade coffee beans because he knows that this helps protect the coffee farmer's income.

The beans he buys weigh 35 pounds a cubic foot. After he roasts them, they weigh only 27 pounds a cubic foot. He sells his coffee for \$17.95 a pound.

- a) What do you think is the most highly traded commodity in the world?
- b) Assume that the farmer selling the beans got a market floor price of \$1.35 a pound. If Jean buys 25 cubic feet of coffee beans, and sells it at \$17.95 a pound after roasting, compare the income of the farmer with Jean's selling price.

NEED ANSWERS???

 Section 5.2 Detailed Solutions.pdf

Let's help Pierre with Math on the Job... p. 196

- Calculate the square footage...

Pierre will need...

Calculate how many pounds of sand...

Attachments

5.2 Worksheet - Mass in an Imperial System.docx

Section 5.2 Detailed Solutions.pdf

Worksheet -Section_5.2_ Mass in Imperial System .docx