

## 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.
  - \* 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

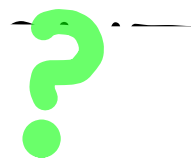
Mass - a measure of the quantity of matter in an object.

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 who weighs 170lbs?



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

- Calculate the square footage...

**Pierre will need... 5200 lbs**

$$\text{Sides } 48\text{ft} \times 20\text{ft} \times 2 = 1920\text{ft}^2$$

$$\text{ends } 30\text{ft} \times 20\text{ft} \times 2 = \frac{1200\text{ft}^2}{}$$

$$\text{Total S.A.} = \frac{3120\text{ft}^2}{}$$

Calculate how many pounds of sand...

$$\frac{100\text{lb}}{60\text{ft}^2} \times 3120\text{ft}^2 = 5200\text{lbs}$$

## Conversions Between Imperial Mass Units

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

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

$$1. 250 \text{ oz} \times \frac{1 \text{ lb}}{16 \text{ oz}}$$

$$2. 75 \text{ lbs} \times \frac{16 \text{ oz}}{1 \text{ lb}}$$

$$3. 750 \text{ lbs} \times \frac{1 \text{ tn}}{2000 \text{ lb}}$$

$$4. 4 \text{ tn} \times \frac{2000 \text{ lbs}}{1 \text{ tn}}$$

Try these conversions:

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

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

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

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

**EXERCISE:** Copy and Complete the following Conversions!

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

$$48 \text{ ounces} = \underline{3} \text{ pounds}$$

$$4 \text{ pounds} = \underline{64} \text{ ounces}$$

$$1.5 \text{ pounds} = \underline{24} \text{ ounces}$$

$$2 \text{ tons} = \underline{4000} \text{ pounds}$$

$$6000 \text{ pounds} = \underline{3} \text{ tons}$$

$$80 \text{ ounces} = \underline{5} \text{ pounds}$$

$$8 \text{ pounds} = \underline{128} \text{ ounces}$$

$$1.5 \text{ tons} = \underline{3000} \text{ pounds}$$

$$64 \text{ ounces} = \underline{4} \text{ pounds}$$

## EXAMPLE 1:

Kelly needs 1 pound 2 ounces of Gruyere 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?

Solution is... 2 lb 9 oz

$$\begin{array}{r} 1\text{ lb } 2\text{ oz} \\ \phantom{1\text{ lb }} 12\text{ oz} \\ \phantom{1\text{ lb }} \underline{11\text{ oz}} \\ 1\text{ lb } 25\text{ oz} \\ \curvearrowright 2\text{ lb } 9\text{ oz} \end{array}$$

**EXAMPLE 2:**

The cab of Andy's semi-trailer 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 load in...

- a) tons?
- b) pounds?

Solutions are... a) 6.2 tons & b) 12 400 lbs

$$\begin{aligned} \text{a) Weight} &= 21.3 - 8.7 - 6.4 \\ &= 6.2 \text{ tons} \end{aligned}$$

$$\text{b) } 6.2 \text{ tons} \times \frac{2000 \text{ lb}}{1 \text{ tn}} = 12\,400 \text{ lbs}$$





# HOMWORK...

p. 201 #1 - 5

# NEED ANSWERS???

Section 5.2 Detailed Solutions.pdf



## Attachments

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Worksheet\_5.2.pdf

5.2 Worksheet - Mass in an Imperial System.docx

Section 5.2 Detailed Solutions.pdf