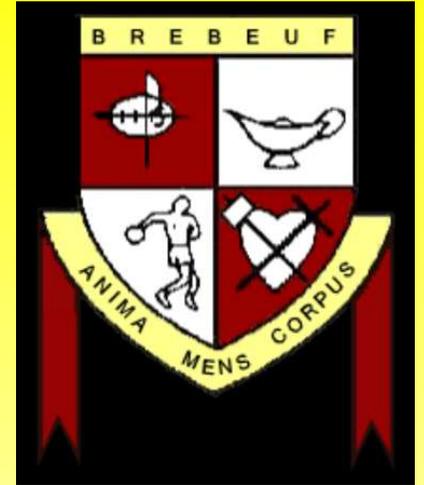


ST. JEAN DE BREBEUF MATHEMATICS



CHAPTER 1 (INTRO)

IMPERIAL AND METRIC

CONVERSIONS

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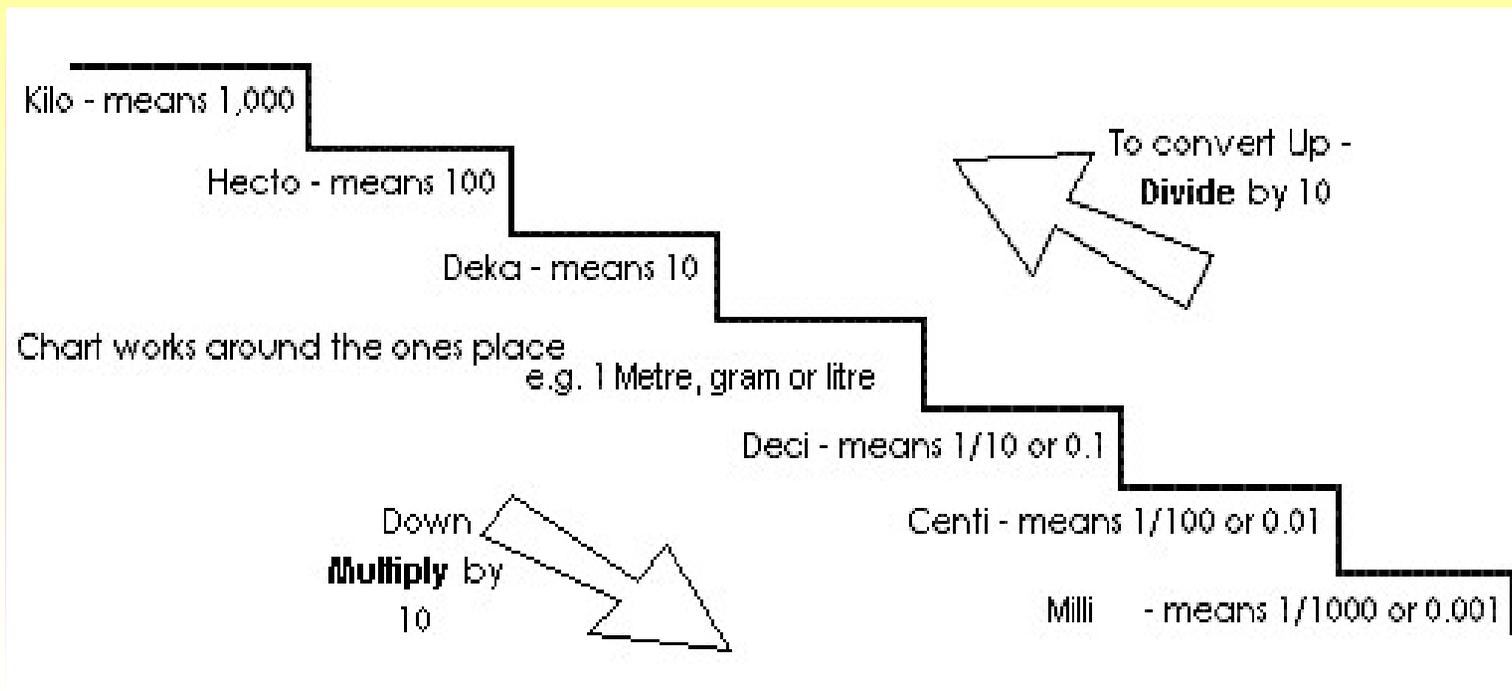
CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Before we begin, let us recall some important information about the metric measuring system.

To convert from a **larger to smaller** metric unit you always **multiply**.

To convert from a **smaller to larger** unit you always **divide**.



CHAPTER 1 (INTRO)

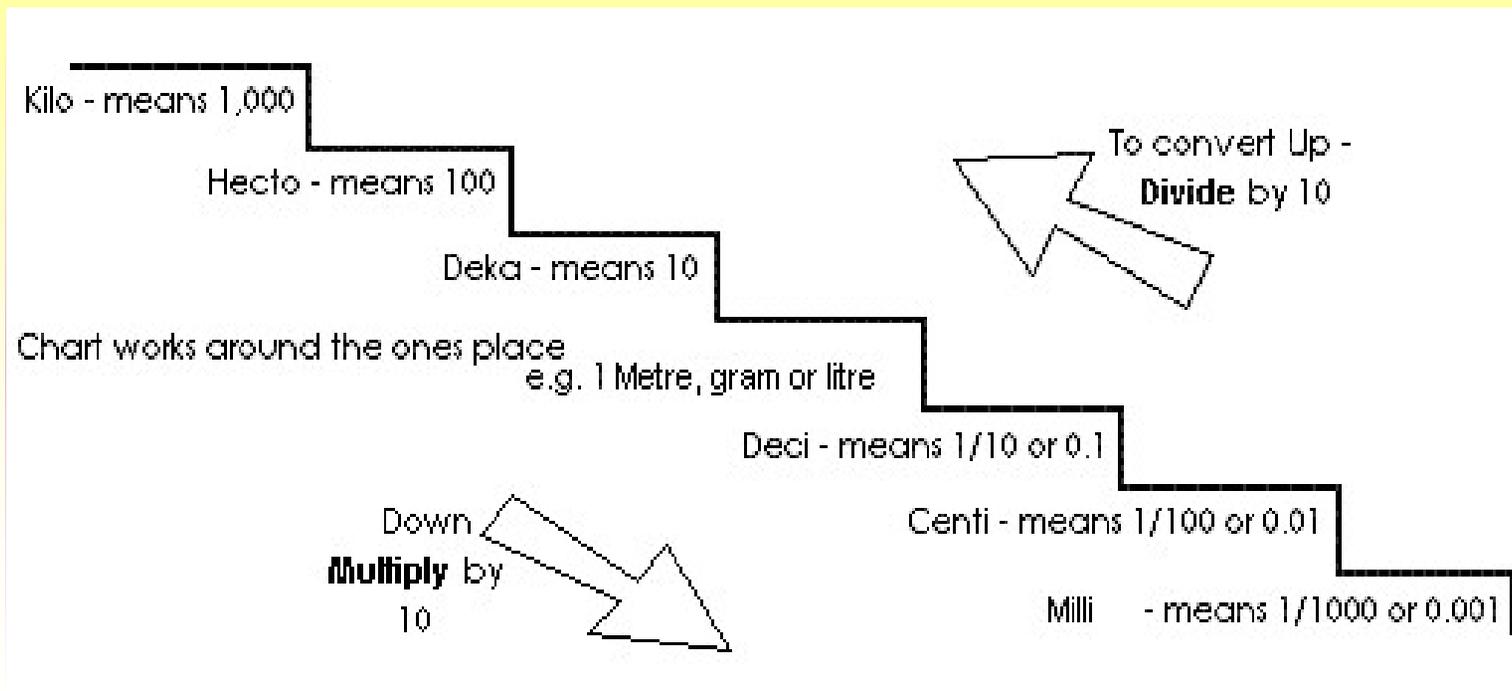
IMPERIAL AND METRIC CONVERSIONS

The base units for metric measurements are:

metres for measuring *length*,

gram for measuring *dry weight*, and

litres for measuring *liquid capacity*.



CHAPTER 1 (INTRO)

IMPERIAL AND METRIC

CONVERSIONS

EXAMPLE

Convert **2400 grams** to **kilograms**.

SOLUTION

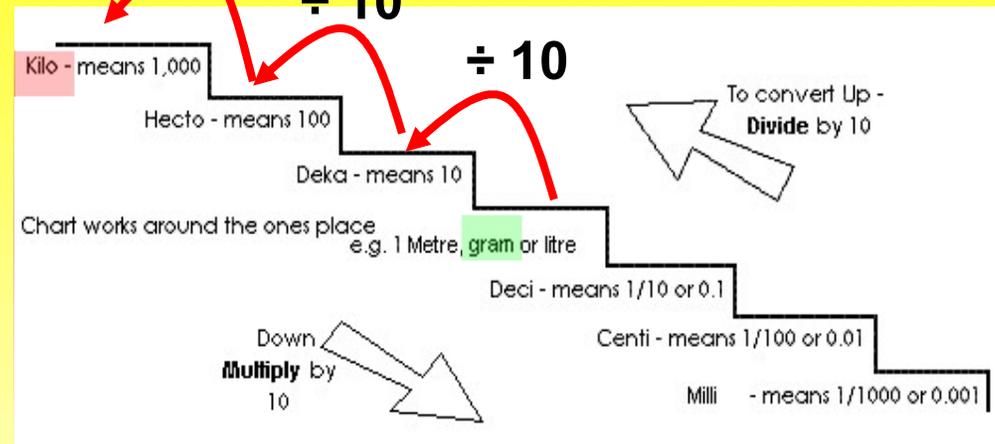
Convert from **grams** to **kilograms**

There are *three* steps between grams and kilograms and you are moving up the stairs,

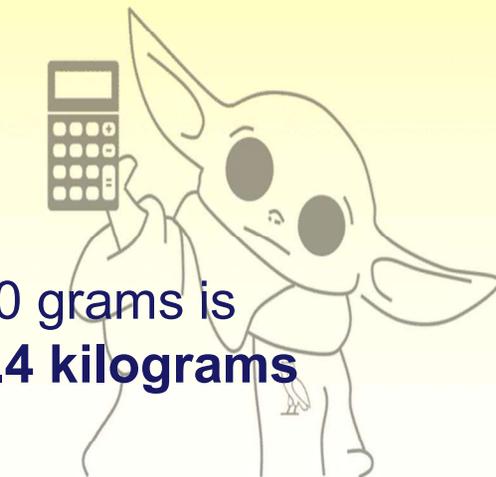
→ therefore you must divide by 1000.

$$\begin{array}{r} 2400 \\ \hline 1000 \end{array}$$

$$= 2.4 \text{ kilograms}$$



Therefore, 2400 grams is equivalent to **2.4 kilograms**



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CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Try these before moving on!

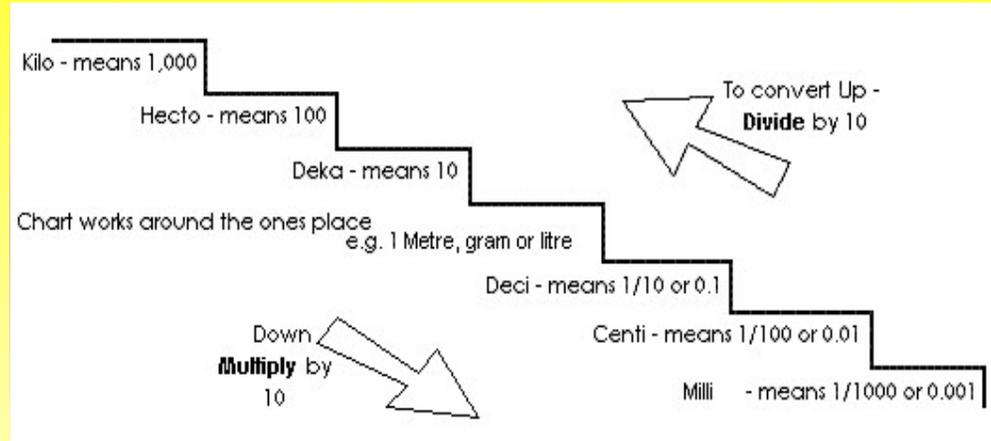
13 meters *Multiply by 100*
= 1300 centimetres

40 litres *Divide by 10*
= 4 dekalitres

680 milligrams *Divide by 1000*
= 0.68 grams

55 kilometres *Multiply by 10*
= 550 hectometres

75 centimetres *Divide by 100*
= 0.75 meters



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CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS



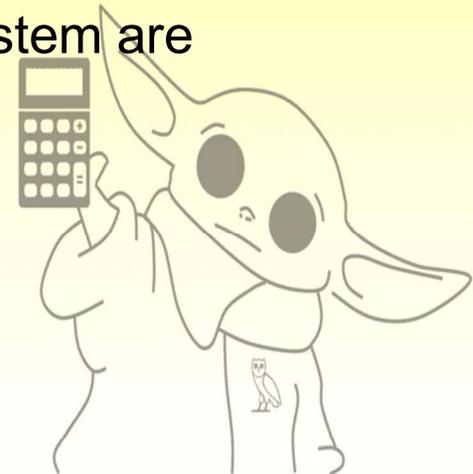
Did You Know?

Canada switched to the *metric* system from the *Imperial* system in 1971? There are still some Canadian industries that continue to use the Imperial system.

Something as simple as your *ruler* can have *metric* units (centimetres and millimetres) and *Imperial* units (inches).

The most common units of the Imperial system are

inches (in. or “),
feet (ft. or ‘),
yards (yd.)
and **miles** (mi.).



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CHAPTER 1 (INTRO)

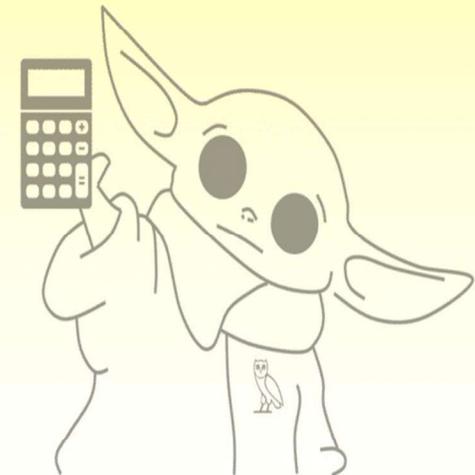
IMPERIAL AND METRIC CONVERSIONS



Some basic Imperial conversions are:

To convert from	To	Multiply by
Feet	Inches	12
Yards	Feet	3
Miles	Yards	1760

To convert from	To	Divide by
Inches	Feet	12
Feet	Yards	3
Yards	Miles	1760



CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

To convert from	To	Multiply by
Feet	Inches	12
Yards	Feet	3
Miles	Yards	1760

To convert from	To	Divide by
Inches	Feet	12
Feet	Yards	3
Yards	Miles	1760

Therefore, the football player must run **14.7 lengths**

EXAMPLE



If a football player must run 1 mile (up and down the length of the football field) as a warm up, how many lengths of the field must he run? (Fact: there are **120 yards** in a football field)!

SOLUTION

First, convert *miles* to *yards*

→ Multiply by **1760**

$$1 \text{ mile} \times 1760$$

$$= \mathbf{1760 \text{ yards}}$$

Next, find the number of field lengths

$$= \# \text{ of total yards} / \text{length of field}$$

$$= 1760 \text{ yards} / 120 \text{ yards}$$

$$= \mathbf{14.7}$$



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CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

To convert from	To	Multiply by
Feet	Inches	12
Yards	Feet	3
Miles	Yards	1760

To convert from	To	Divide by
Inches	Feet	12
Feet	Yards	3
Yards	Miles	1760

EXAMPLE

A hockey rink is **200 feet** in length. What is the length of a hockey rink in **yards**?



SOLUTION

First, convert **feet** to **yards**

→ Divide by 3

$$\begin{aligned} &200 \text{ feet} / 3 \\ &= \mathbf{66.7 \text{ yards}} \end{aligned}$$

Therefore, a hockey rink is **66.7 yards**

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CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

To convert from	To	Multiply by
Feet	Inches	12
Yards	Feet	3
Miles	Yards	1760

To convert from	To	Divide by
Inches	Feet	12
Feet	Yards	3
Yards	Miles	1760

EXAMPLE

Alexis goes to the doctor on her second birthday for a regular check up. Her doctor tells her mom that she is **35 inches** tall. How tall is she in **feet and inches**?



SOLUTION

Convert **inches to feet**
→ Divide by **12** (since there are **12 inches in a foot**)

$$35 \text{ inches} / 12 \text{ inches} \\ = \mathbf{2.917 \text{ feet}}$$

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Therefore, she is **2.917 feet**.

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

To convert from	To	Multiply by
Feet	Inches	12
Yards	Feet	3
Miles	Yards	1760

To convert from	To	Divide by
Inches	Feet	12
Feet	Yards	3
Yards	Miles	1760

EXAMPLE

Therefore, she is **2.917** feet.



The “2” represents two feet but the decimal portion (**0.917**) represents a portion of an *inch*.

To find the number of inches in **0.917 feet**
→ Multiply by **12**

$$0.917 \text{ feet} \times 12 = 11 \text{ inches}$$

Therefore, Alexis is **2 feet 11 inches** (or **2' 11"**).

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Other Imperial conversions are:

To convert from	To	Multiply by
Pounds	Ounces	16
Tons	Pounds	2000
Pint	Fluid Ounces	16
Quarts	Pints	2
Gallons	Quarts	4



PRACTICE

1. A new baby is born with a weight of **5 pounds**. How many ounces was the baby?

SOLUTION

Convert from **pounds to ounces**
→ Multiply by **16**

$$\begin{array}{l} 5 \text{ pounds} \times 16 \\ = \mathbf{80 \text{ ounces}} \end{array}$$

Therefore, the baby weighed **80 ounces**.

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Other Imperial conversions are:

To convert from	To	Multiply by
Pounds	Ounces	16
Tons	Pounds	2000
Pint	Fluid Ounces	16
Quarts	Pints	2
Gallons	Quarts	4

PRACTICE

2. A recipe calls for $\frac{1}{2}$ a **pint** of milk. How many **fluid ounces** would you need?

SOLUTION

Convert from **pints** to **fluid ounces**
→ Multiply by **16**

$$0.5 \text{ pints} \times 16 = 8 \text{ fluid ounces}$$

Therefore, the recipe requires **8 fluid ounces**.

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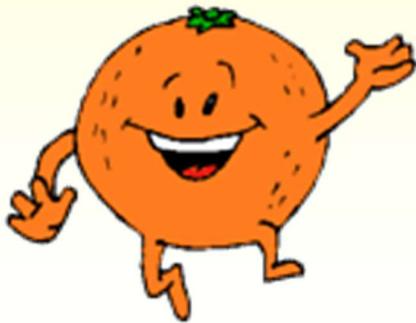


CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Other Imperial conversions are:

To convert from	To	Multiply by
Pounds	Ounces	16
Tons	Pounds	2000
Pint	Fluid Ounces	16
Quarts	Pints	2
Gallons	Quarts	4



PRACTICE

3. If you went to the grocery store and bought **two gallons** of orange juice, how many **quarts** would you have?

SOLUTION

Convert from **gallons** to **quarts**
→ Multiply by 4

$$2 \text{ gallons} \times 4 = 8 \text{ quarts}$$

Therefore, two gallons of orange juice is equivalent to **8 quarts**.

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Other Imperial conversions are:

To convert from	To	Multiply by
Pounds	Ounces	16
Tons	Pounds	2000
Pint	Fluid Ounces	16
Quarts	Pints	2
Gallons	Quarts	4

*Since we are going from fluid ounces to pint, we have to perform the **opposite** operation!*

PRACTICE

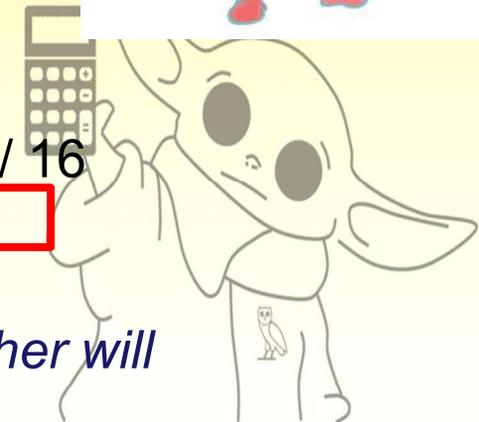
4. A pitcher holds **32 fluid ounces**. How many **pints** will it hold?

SOLUTION

Convert from **fluid ounces** to **pints**
→ Divide by **16**

$$32 \text{ fluid ounces} / 16 = \mathbf{2 \text{ pints}}$$

*Therefore, the pitcher will hold **2 pints**.*



CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Other Imperial conversions are:

To convert from	To	Multiply by
Pounds	Ounces	16
Tons	Pounds	2000
Pint	Fluid Ounces	16
Quarts	Pints	2
Gallons	Quarts	4

*Since we are going from pound to tons, we have to perform the **opposite** operation!*

PRACTICE

5. If a truck weighs **4000 pounds**, how many **tons** is the truck?



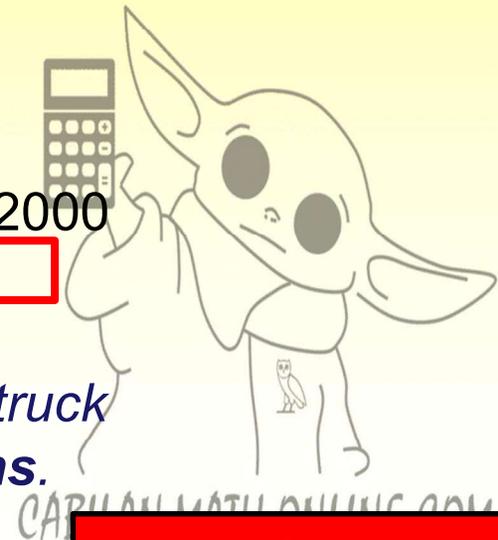
SOLUTION

Convert from **pounds** to **tons**

→ Divide by **2000**

$$4000 \text{ pounds} / 2000 = 2 \text{ tons}$$

*Therefore, the truck weighs **2 tons**.*



END OF DAY 1

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Imperial to Metric Conversion

The following conversion chart lists several common metric conversions:

To convert from	To	Multiply by
Inches	Centimetres	2.54
Feet	Metres	0.3048
Yards	Metres	0.9144
Miles	Kilometres	1.609
Nautical Miles	Kilometres	1.852
Fluid Ounces	Millilitres	29.5735
Quarts	Litres	0.94664
Gallons	Litres	3.785
Ounces	Grams	28.3495
Pounds	Kilograms	0.4536

EXAMPLE

The doctor tells a new mother her new baby weighs **9 pounds**. The mother wants to know her son's weight is in **kilograms**. Show the conversion.

SOLUTION

Convert **pounds** to **kilograms**

→ Multiply by **0.4536**

$$9 \text{ pounds} \times 0.4536 = \mathbf{4.0824 \text{ kilograms}}$$

Therefore, her son's weight is **4.0824 kilograms**.

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Imperial to Metric Conversion

The following conversion chart lists several common metric conversions:

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Pounds	Kilograms	0.4536

EXAMPLE

An environmental company volunteers to help clean up a spill that has occurred in their community. The spill is estimated at **80 quarts** of waste. The company needs to know how many **litres** of waste they will have to clean up. Convert from **quarts to litres** for the company.

SOLUTION

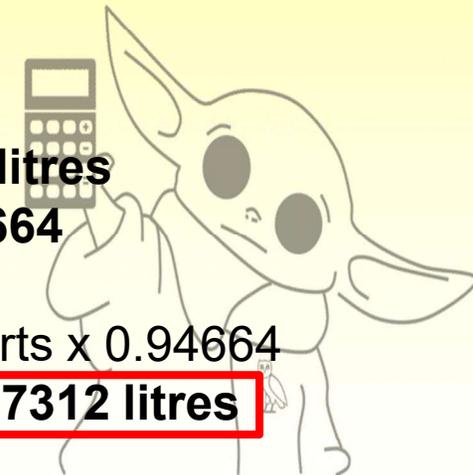
Convert **quarts to litres**

→ Multiply by 0.94664

$$80 \text{ quarts} \times 0.94664$$

$$= \mathbf{75.7312 \text{ litres}}$$

Therefore, there are approx. **76 litres** of waste



CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Imperial to Metric Conversion

The following conversion chart lists several common metric conversions:

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Ounces	Grams	28.3495
Pounds	Kilograms	0.4536

PRACTICE

Fill in the blanks – round to the nearest tenth where appropriate

27 inches = 68.6 centimetres
Multiply by 2.54

14 miles = 22.5 kilometres
Multiply by 1.609

40 ounces = 1134.0 grams
Multiply by 28.3495

20 liters = 21.1 quarts
Divide by 0.94664

15 centimetres = 5.9 inches
Divide by 2.54

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

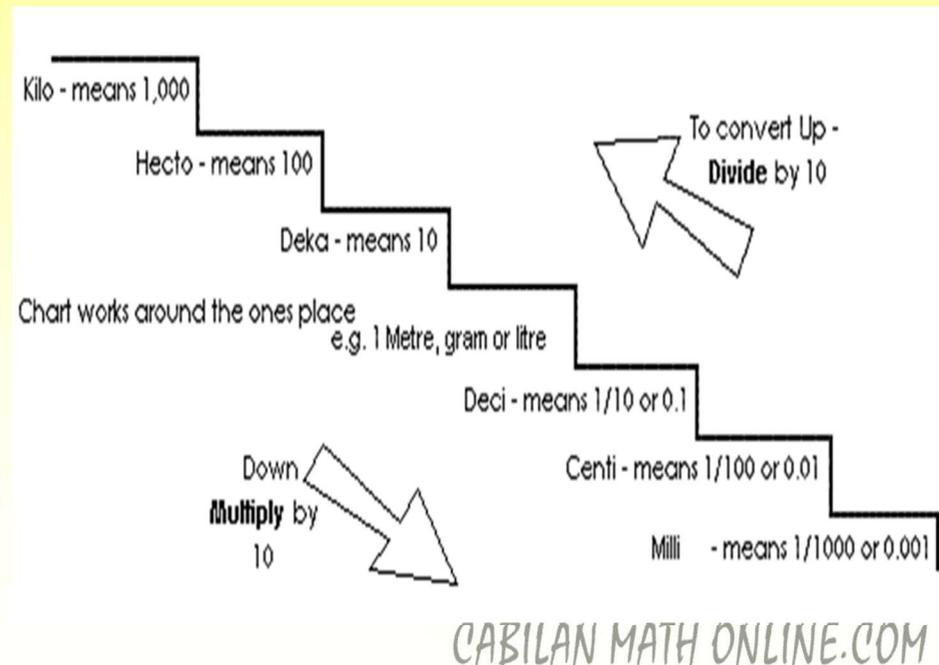
Imperial to Metric Conversion

The following conversion chart lists several common metric conversions:

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Inches	Centimetres	2.54
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Sometimes when you are converting from one unit to another you may not be able to do it in one step.

For example, using the charts given, see if you can find how to convert from inches to millimetres?



CHAPTER 1 (INTRO)

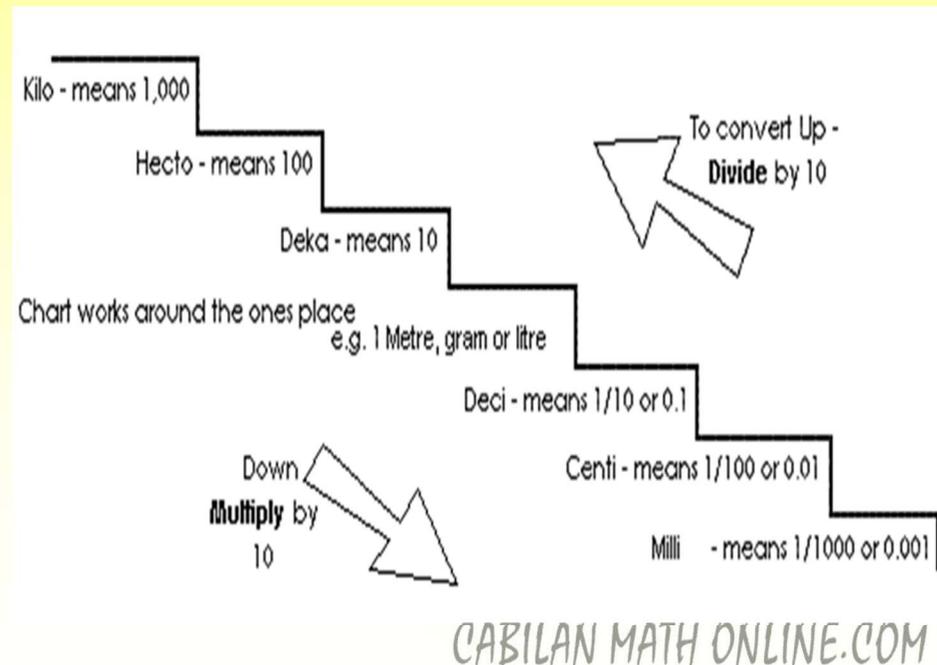
IMPERIAL AND METRIC CONVERSIONS

Imperial to Metric Conversion

The following conversion chart lists several common metric conversions:

To convert from	To	Multiply by
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Quarts	Litres	0.94664
Gallons	Litres	3.785
Ounces	Grams	28.3495
Pounds	Kilograms	0.4536

You hopefully see that there is not a one-step way to do the conversion. BUT, because you know how to convert from **inches** to **centimetres** and you know how to convert **centimetres** to **millimetres**, you can do this conversion in two steps



CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

To convert from	To	Multiply by
Inches	Centimetres	2.54
Feet	Metres	0.3048
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Gallons	Litres	3.785
Ounces	Grams	28.3495
Pounds	Kilograms	0.4536

EXAMPLE

Convert **25 inches** to millimetres.

STEP 1:

Convert **inches** to **centimetres**

→ Multiply by **2.54**

$$25 \text{ inches} \times 2.54 \\ = \mathbf{63.5 \text{ centimetres}}$$

STEP 2:

Convert **centimetres** to **millimetres**



CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

EXAMPLE

Convert **25 inches** to millimetres.

STEP 1:

Convert **inches** to **centimetres**

→ Multiply by **2.54**

$$25 \text{ inches} \times 2.54 = \mathbf{63.5 \text{ centimetres}}$$

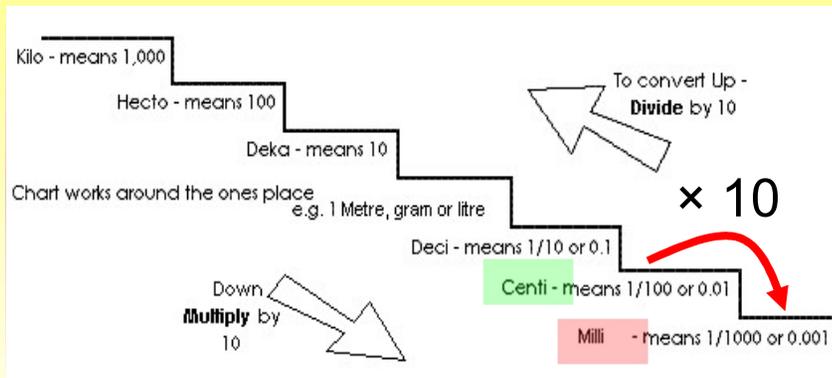
STEP 2:

Convert **centimetres** to **millimetres**

→ Multiply by **10**

$$63.5 \text{ centimetres} \times 10 = \mathbf{635 \text{ millimetres}}$$

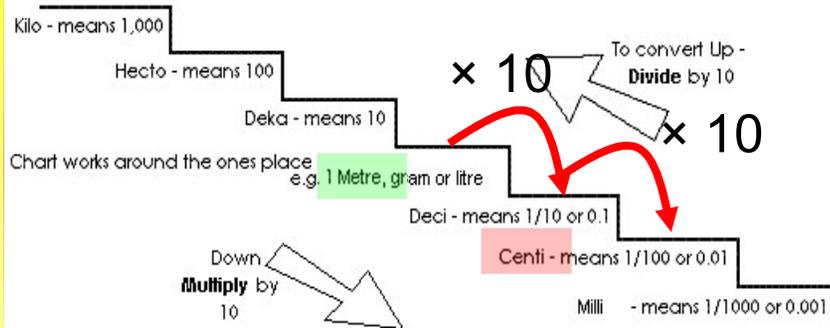
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Therefore, *25 inches* is equivalent to **635 millimetres**

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS



To convert from	To	Multiply by
Inches	Centimetres	2.54
Feet	Metres	0.3048
Yards	Metres	0.9144
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Pounds	Kilograms	0.4536

PRACTICE

1. A piece of wood is **6 feet long**; convert to **centimetres**.

STEP 1:

Convert from **feet to metres**

→ Multiply by 0.3048

$$6 \text{ feet} \times 0.3048 = 1.8288 \text{ metres}$$

STEP 2:

Convert **metres to centimetres**

→ Multiply by 100

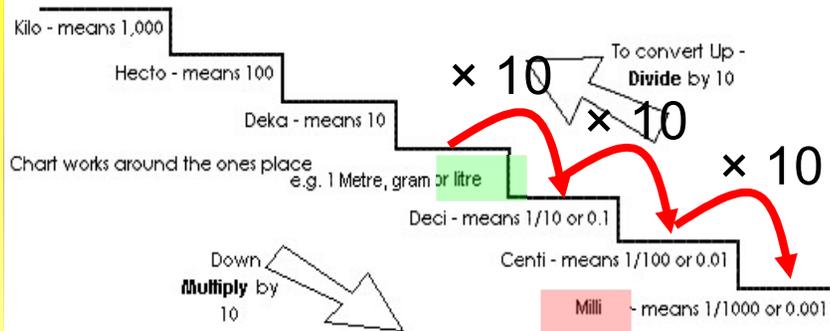
$$1.8288 \times 100 = 182.88 \text{ centimetres}$$

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Therefore, 6 feet is equivalent to **182.88 centimetres**

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS



To convert from	To	Multiply by
Inches	Centimetres	2.54
Feet	Metres	0.3048
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Gallons	Litres	3.785
Ounces	Grams	28.3495
Pounds	Kilograms	0.4536

PRACTICE

2. A herbicide is sold in **0.5 gallon bottles**; convert to **millilitres**.

STEP 1:

Convert from **gallons to litres**

→ Multiply by 3.785

$$0.5 \text{ gallons} \times 3.785 = 1.8925 \text{ litres}$$

STEP 2:

Convert **litres to millilitres**

→ Multiply by 1000

$$1.8925 \text{ litres} \times 1000 = 1892.5 \text{ millilitres}$$

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Therefore, **0.5 gallons is equivalent to 1892.5 millilitres**

CHAPTER 1 (INTRO)

IMPERIAL AND METRIC CONVERSIONS

Homework

(Day 1) Page 4 #3, 4

(Day 2) Page 4 #5, 6 +

Supplementary
handouts