

SUVA SANGAM COLLEGE

YEAR 11

MATHEMATICS LIFE SKILLS

WEEK 1: MONDAY 05/07 TO FRIDAY 09/07

STRAND	11.2 Measurement in every day context
SUB-STRAND	11.2.1 Units of measurement and prefixes
CONTENT LEARNING OUTCOME	11.2.1.1 Explore metric units for measurement and prefixes

Achievement Indicators

1. Give the basic SI units
2. State the values of commonly used prefixes

Notes

SI -International System of Units

Quantity	Symbol	Unit	Abbreviation
Length	<i>l</i>	Meter	<i>m</i>
Mass	<i>m</i>	Kilogram	<i>Kg</i>
Time	<i>t</i>	Seconds	<i>s</i>
Electric current	<i>I</i>	Ampere	<i>A</i>
Temperature	<i>T</i>	Kelvin	<i>K</i>
Amount of substance	<i>n</i>	Mole	<i>mol</i>
Luminous intensity	<i>I_v</i>	candela	<i>cd</i>

Common Prefixes used with S Iunits

Prefix	Symbol	meaning	Order of magnitude
Giga	<i>G</i>	1000 000 000	10^9
Mega	<i>M</i>	1000 000	10^6
Kilo	<i>K</i>	1 000	10^3
hecto	<i>H</i>	100	10^2
deka	<i>da</i>	10	10^1
	<i>Base unit</i>	1	10^0
Deci	<i>d</i>	0.1	10^{-1}
Centi	<i>c</i>	0.01	10^{-2}
Milli	<i>m</i>	0.001	10^{-3}
Micro	μ	0.000 001	10^{-6}
nano	<i>n</i>	0.000 000 001	10^{-9}

INTERNET DATA

1MB(megabyte) = 1024 KB(kilobyte)

1024 MB(megabyte) = 1GB(gigabyte)

Example 1

How many *grams* are there in 15*kg*.

1000g are there in 1kg	
Use the ratio method Cross multiply and solve for <i>x</i>	$\begin{array}{r} 1kg = 1000g \\ \hline 15kg = xg \\ (15 \times 1000) = (1 \times x) \\ 15000 = x \\ 15000g \text{ are there in } 15kg \end{array}$

Example 2

How many centimetres are there in 3.5 meters?

100cm makes 1m	
Use the ratio method Cross multiply and solve for <i>x</i>	$\begin{array}{r} 1m = 100cm \\ \hline 3.5 = xm \\ (3.5 \times 100) = (1 \times x) \\ 350 = x \\ 3.5 m = 350cm \end{array}$

STUDENT ACTIVITY

1. Write the number of
 - a) micro amperes in one ampere.
 - b) Candela in 1 kilocandela.
 - c) Milligram in 1 gram.
2. Find the number of
 - a) kilograms in 1350grams.
 - b) Milliamperes are there in 3 amperes.
3. How many
 - a) kilobytes are there in 5 megabytes.
 - b) megabytes are there in 3 gigabytes.

WEEK 2: MONDAY 12/07 TO FRIDAY 16/07

STRAND	11.2 Measurement in every day context
SUB-STRAND	11.2.2 Units of measurement and prefixes
CONTENT LEARNING OUTCOME	11.2.1.1 Study conversion of units

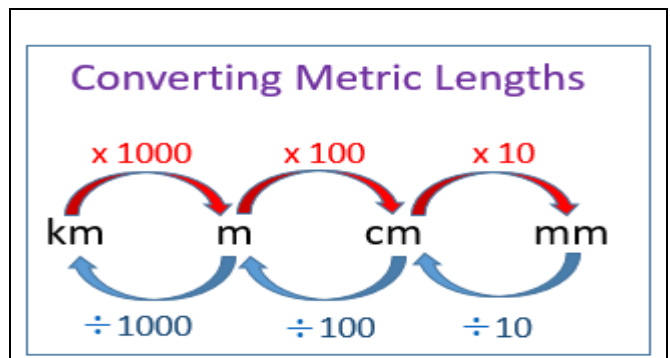
Achievement Indicators

1. convert from one unit to another.

NOTES

A **conversion factor** is a number used to change one set of units to another, by multiplying or dividing.

Length
$1km = 1000m$
$1m = 100cm$
$1cm = 10mm$



Example 1

Change 2.5 km to cm.

$$\begin{array}{ccc} \times 1000 & \times 100 & \\ km & \longrightarrow & m & \longrightarrow & cm \end{array}$$

Therefore

$$(km \text{ to } cm) = (1000 \times 100) = 100\,000$$

$$2.5km = 2.5 \times 100\,000$$

$$= \underline{250\,000cm}$$

Example 2

Convert 4.0m to cm.

Meter to centimetre ($\times 100$)

$$4.0m = 4 \times 100$$

$$= 400cm$$

Example 3

John bought 27.5m of cloth. How many cm of cloth did he buy?

$$1m = 100cm$$

$$27.5m = 27.5 \times 100$$

$$= 2750cm$$

. Please check out this video from YouTube explaining the lesson:

<https://youtu.be/KfofCCmURoI>

Student activity

1. Convert the following measurements to the indicated units:
 - a) 7 cm to mm
 - b) 8 m to cm
 - c) 9000 m to km
 - d) 29km to m
2. Chase measured a line for his art project. It is 200 millimeters long. How many centimeters is the line?
3. Cheryl is moving to a new house. Her old house is 3 kilometers from her new house. How many meters is the old house from the new house?

WEEK 3: MONDAY 19/07 TO FRIDAY 23/07

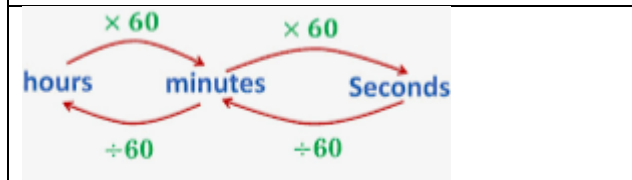
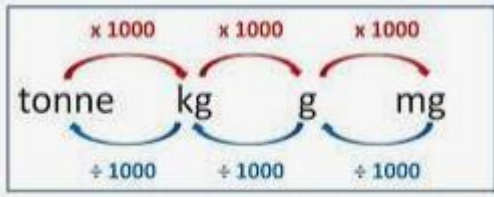
Achievement Indicators

1. convert from one unit to another

NOTES

A **conversion factor** is a number used to change one set of units to another, by multiplying or dividing.

Mass
$1kg = 1000g$
$1\ tonne = 1000kg$
Time
$1\ hour = 60\ minutes$
$1\ minute = 60\ seconds$



Example 1

Convert 1560g to kilograms.

Grams to kilogram ($\div 1000$)

$$1560g = 1560 \div 1000 \\ = 1.56kg$$

Example 2

Change 2 hours to seconds

Hours to seconds = $(60 \times 60 = 3600)$

Therefore

$$2\ hours = 2 \times 3600 = 7200\ seconds$$

Example 2

A school day lasts about 7 hours. How many seconds are there in a school day?

Convert hours minutes	$1\ hour = 60\ minutes$ $7\ hours = 7 \times 60$ $= 420\ mins$
Minutes to seconds	$1\ min = 60\ seconds$ $420\ mins = 420 \times 60$ $= 25\ 200\ seconds$

Please check out this video from YouTube explaining the lesson:

<https://youtu.be/nxA2mt27lM0>

Student Activity

1. James has 14,500 g of sand in his sandbox. He brings home another 7 400g of sand from the beach to add to his sandbox.

How many *kilograms* of sand does James have in his sandbox now?

2. Convert the following.

- 120seconds to minutes
- 32400 seconds to hours
- 2700 minutes to hours

3. Martin is taking a test at school. His teacher gave him 1 hour and 15 minutes to complete the test.

How many minutes does Martin take to finish the test?

WEEK 4: MONDAY 26/07 TO FRIDAY 30/07

STRAND	11.2 Measurement in every day context
SUB-STRAND	11.2.1 Standard form
CONTENT LEARNING OUTCOME	11.2.1.1 Explore the method of expressing large/ small numbers

Achievement Indicators

Write numbers in standard form and vice versa

Standard form is a way of writing down very large or very small **numbers** easily.

Numbers represented as products of powers of 10
To write the number in standard form

1. The first number always has to be between 1 to 10
2. The nth power is based on how many places the decimal point moves.
3. The nth power is positive for big numbers and negative for small numbers.

- On your calculator 1^{12} means 1×10^{12}
- To enter 1×10^{12} on your calculator, type 1 EXP 12.

RULE	FORMALLY	EXAMPLE
1. Numbers are represented as products of powers of 10	$a \times 10^n$	2×10^3 Not 2×11^3
2. a is a decimal between 1 and 10 (or between -1 to -10)	$1 \leq a \leq 10$	2.5×10^5 Not 25×10^4
3. n is an integer	$n \in I$	1.0×10^{-2} Not $1.0 \times 10^{2.5}$

Please check out this video from YouTube explaining the lesson:

<https://youtu.be/HO2krXdWyNo>

Example 1

Write 65 0000 in standard form.

Solution

$$\begin{aligned}65\ 0000 &= 6.5 \times 100\ 000 \\ &= 6.5 \times 10 \times 10 \times 10 \times 10 \times 10 \\ &= 6.5 \times 10^5\end{aligned}$$

The n value is 5 because the decimal point has moved 5 places to the left.

Example 2

Write 0.00029 in standard form.

Solution

$$0.000029 = 2.9 \times 10^{-4}$$

The n value is -4 because the decimal point is moved 4 places to the right.

Example 3

Write 70 thousand in standard form.

$$\begin{aligned}70\ \text{thousand} &= 70\ 000 \\ 70\ 000 &= 7 \times 10^4\end{aligned}$$

The n value is positive because the decimal point has moved 4 places to the left.

Student Activity

1. write the following numbers in standard form.
 - a) 58 000
 - b) 270 000 00
 - c) 146 thousand
 - d) 2 million
2. There are about 10 000 000 000 cells in your brain. Write this number in standard form.
3. The earth is 152 000 000 km from the sun.
 - a) How will you read this number?
 - b) Write the number in standard form.

WEEK 5: MONDAY 02/08 TO FRIDAY 06/08

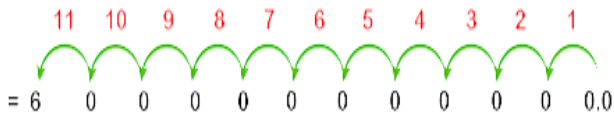
Achievement Indicators

Write numbers in standard form and vice versa (ordinary numbers)

Rules

1. Move the decimal point the same number of places as the power.
2. If the power is negative it is a small number (less than 1) move left.
3. If the power is positive it is a big number (less than 1) move right.
4. Fill the empty spaces with zero.
5. When inputting a very large or small ordinary number in the calculator, it will automatically convert to standard form. When inputting the number as standard form it will generally leave as standard form.

6.0×10^{11}



- Converting into a small ordinary number
 $2.4 \times 10^{-6} = 0.0000024$
- Converting into a large ordinary number
 $5.67 \times 10^9 = 5\,670\,000\,000$

Please check out this video from YouTube explaining the lesson:

<https://youtu.be/vbbVJYeQDV4>

Example 1

Convert 2.37×10^5 to an ordinary number.

$2.37 \times 10^5 = 237000$

Move the decimal point 5 places to the right

Example 2

Convert 7×10^4 to ordinary number.

$7 \times 10^4 = 70\,000$

Move the decimal point 4 places to the right

Example 3

Convert 7.13×10^{-3} to ordinary number.

$7.13 \times 10^{-3} = 0.00713$

Move the decimal point 3 places to the left and fill the empty spaces with zero.

Student Activity

1. Convert the following numbers to ordinary form.
 - a) 1.204×10^3
 - b) 8.9×10^{-5}
 - c) 6.72×10^{-7}
2. The speed of light is $3 \times 10^8 \text{ m/s}$. What is this as an ordinary number.
3. An aeroplane has travelled approximately $3.5 \times 10^5 \text{ km}$ in the past 6 months. Convert this distance as an ordinary number.

WORKSHEET

1.	Convert between the units of length a) 90 mm = cm b) 67,000,000 mm = km c) 9.2 mm = cm										
2.	Convert the following a) 25 g = mg b) 10 kg = tonnes										
3.	Complete the table <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td style="text-align: center;">Kilograms</td><td style="text-align: center;">1</td><td style="text-align: center;">$\frac{1}{2}$</td><td style="text-align: center;">$\frac{3}{4}$</td><td style="text-align: center;">$\frac{1}{4}$</td></tr><tr><td style="text-align: center;">Grams</td><td style="text-align: center;">1000</td><td></td><td></td><td></td></tr></table>	Kilograms	1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{4}$	Grams	1000			
Kilograms	1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{4}$							
Grams	1000										
4.	A container of a powdered fruit drink mix has a mass of 1.25 kilograms. What is that mass in milligrams?										
5..	Write in standard form a) 70×10^5 b) 40×10^5 c) 0.8×10^6										
6..	Peter planted 220 kg of potatoes and harvested twelve times more of them. How many tons of potatoes has he harvested?										