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Kip McGrath™

Est. 1976

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*“Education is the bridge
that transforms potential
into achievement,
unlocking the doors to a
brighter future”*

English Resources

"Alice: Would you tell me, please, which way I ought to go from here?"

The Cheshire Cat: That depends a good deal on where you want to get to.

Alice: I don't much care where.

The Cheshire Cat: Then it doesn't much matter which way you go.

Alice: ...So long as I get somewhere.

The Cheshire Cat: Oh, you're sure to do that, if only you walk long enough."

— Lewis Carroll, *Alice in Wonderland*

Aa



Astronaut

Bb



Balloon

Cc



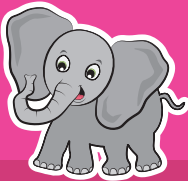
Carrot

Dd



Dinosaur

Ee



Elephant

Ff



Frog

Gg



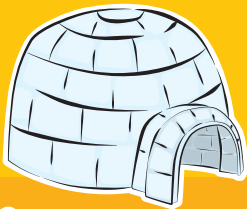
Goat

Hh



House

Ii



Igloo

Jj



Jacket

Kk



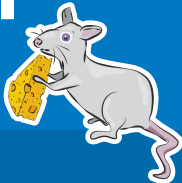
King

Ll



Lollipop

Mm



Mouse

Nn



Necklace

Oo



Octopus

Pp



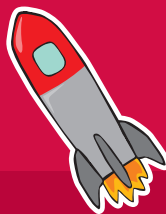
Parrot

Qq



Queen

Rr



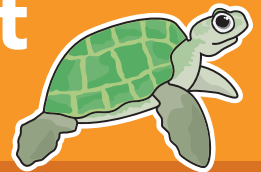
Rocket

Ss



Snake

Tt



Turtle

Uu



Umbrella

Vv



Violin

Ww



Watermelon

Xx



foX

Yy



Yawn

Zz



Zebra

Every name is called a **noun**,
As field and fountain, street and town.

In place of noun the **pronoun** stands,
As he and she can clap their hands.

The **adjective** describes a thing,
As magic wand or bridal ring.

The **verb** means action, something done,
To read and write, to jump and run.

How things are done the **adverbs** tell,
As quickly, slowly, badly, well.

The **preposition** shows relation,
As in the street or at the station.

Conjunctions join, in many ways,
Sentences, words, or phrase and phrase.

The **interjection** cries out, "Hark!
I need an exclamation mark!"

The Floss Rule

The Rule for Doubling the Last Consonant

If a one-syllable word ends in f, l, or s after a short vowel, the final **f, l, or s** is **doubled**.

thrill cliff glass yell
huff hill class sniff



The Rabbit Rule

The Rule for Doubling The Middle Consonant

If there is one middle consonant sound after a short vowel in a two-syllable word, **the middle consonant** is **doubled**.

cotton ribbon tennis puppet
muffin button happen kitten



The Doubling Rule

The Rule for Doubling the Final Consonant

If a base word ends in one short vowel followed by one consonant, the **final consonant** is **doubled** before adding a vowel suffix.

winner sitting stopped thinnest
batter hugged hotter beginner



The Dropping Rule

The Rule for Dropping the Final e

If a base word ends in **final e**, the **e** is **dropped** before adding a vowel suffix.

engaging excitable having becoming
hoped sensible stony writing



The Changing Rule

The Rule for Changing y to i

If a base word ends in **one consonant before a final y**, the **y** is **changed to i** before adding a suffix that does not begin with i.

happiness babies plentiful penniless
beautiful mysterious lazily buried



Most nouns
Just add s



flower → flowers
bee → bees



Nouns ending in s, x, z, ch and sh
Add es



class → classes
box → boxes



Nouns ending in consonant – y
Change y to i and add es



cherry → cherries
library → libraries



Nouns ending in vowel – y
Add s



monkey → monkeys
toy → toys



Nouns ending in consonant – o
Add es

hero → heroes
volcano → volcanoes

Exceptions

photo → photos
piano → pianos

Nouns ending in vowel – o
Add s



video → videos
kangaroo → kangaroos



Some nouns change spelling when made plural



mouse → mice
child → children



Some nouns do not change spelling when made plural



reindeer fish → reindeer fish



Nouns ending in f or fe
Change f to v and add es

elf → elves
wife → wives

Exceptions

chef → chefs
belief → beliefs

Coordinating conjunctions

Connect words, phrases or clauses of equal importance (such as complete sentences).

(FANBOYS)

F is for "for"

A is for "and"

N is for "nor"

B is for "but"

O is for "or"

Y is for "yet"

S is for "so"

Example:

It was raining **so** I took my umbrella.

Example:

We wanted to swim **but** it was too cold.

Subordinating conjunctions

Link dependent clauses to independent clauses. A subordinate clause will not make sense on its own and is dependent on the main clause.

after

however

because

although

meanwhile

whose

as

now

whoever

therefore

even if

unless

as long as

even

while

as much as

neither

before

as soon as

provided

why

as far as

except

so that

that

if

until

by the time

if then

how

either

if only

than

consequently

just as

till

unlike

where

whenever

despite

wherever

supposing

in case

whereas

when

nonetheless

hence

or not

though

whether

what

ultimately

since

still

Example:

I was late to school **because** there was traffic.

Example:

I need to make my lunch **before** I leave for work.

Correlative conjunctions

Always come in pairs to link two similar elements within a sentence.

both / and

whether / or

not only / but also

either / or

neither / nor

just / so

the / the

as / as

if / then

rather / than

no sooner / than

such / that

so / that

Example:

Not only did they block the road **but** they **also** kept the onlookers back.

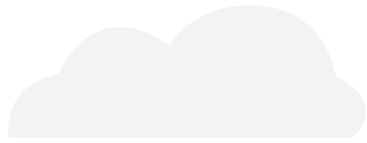
Example:

The kids would **rather** eat pancakes **than** scrambled eggs.

Prefix	A prefix is added to the beginning of a word to change its meaning.					
Examples	disappear informal repaint		misinterpret illegible impolite		unequal preview excommunicate	
Suffix	A suffix is added to the end of a word to change its meaning.					
Examples	wonderful sensible mysterious		fearless reasonable childish		fitness development laughing	
Synonym	A synonym is a word similar in meaning to another word.					
Examples	turn	rotate	fast	speedy	eat	dine
	enquire	question	dwelling	house	big	large
	peaceful	tranquil	sad	unhappy	frequent	often
Antonym	An antonym is a word opposite in meaning to another word.					
Examples	big	small	common	rare	fast	slow
	love	hate	rough	smooth	less	more
	follow	lead	before	after	ugly	pretty
Homophone	A homophone is a word that sounds the same as another word but is spelt differently and has a different meaning.					
Examples	would	wood	tow	toe	sun	son
	whole	hole	hoarse	horse	maid	made
	knew	new	mail	male	steal	steel
Compound Word	A compound word is formed when two or more words come together to form a new word.					
Examples	after + noon	afternoon	to + get + her	together		
	good + bye	goodbye	moon + light	moonlight		
	table + spoon	tablespoon	bath + tub	bathtub		

Alliteration	When words that begin with the same consonant sound are placed close to one another in a sentence. e.g. He is a <u>c</u> apable, <u>c</u> areful <u>c</u> arpenter.
Allusion	A brief and indirect reference to a person, place, thing or significant idea. e.g. She felt like she had won the golden ticket.
Ambiguity	A word or phrase that could have more than one meaning, or could be interpreted in more than one way. e.g. The duck was ready for dinner.
Assonance	When words that have the same vowel sound are repeated and placed close to one another in a text. e.g. The <u>rain</u> in <u>Spain</u> falls <u>mainly</u> on the <u>plain</u> .
Cliché	A phrase or expression that is used so much in everyday life, it is overused and no longer interesting. e.g. in the nick of time
Colloquial	Language in the form of everyday speech. Casual and relaxed, like a conversation.
Connotation	An implied meaning and association of a word, rather than the exact meaning. e.g. 'aroma' has a positive connotation, even though its exact meaning is 'smell'.
Denotation	The dictionary definition of a word.
Emotive language	Words or phrases that have been chosen to evoke an emotional response.
Euphemism	A word or phrase used to avoid saying an offensive or unpleasant word. e.g. saying 'passed away' instead of 'died'.
Figurative / literal	Figurative language uses words that do not mean exactly what they say. This can involve a range of language devices, such as using metaphor, simile, personification or hyperbole. Literal language uses words that mean exactly what is written. e.g. Younger generations are creating mountains of debt with plastic money. Vs. Young people are accruing large amounts of debt on credit cards.
Formal	Language used in professional or academic texts. Generally does not use contractions (don't), colloquial language or first person pronouns (I, we).
Hyperbole	A statement using deliberate exaggeration for expressive or comic effect. e.g. I've told you that a million times.
Idiom	A phrase combining two or more words that is understood to mean something very different from the actual meaning of these words. e.g. Play your cards right.
Imperative	A command or instruction, where the mood of the verb is important. e.g. Listen!
Irony	Saying one thing while really meaning another, contradictory thing. e.g. Great! Now it's broken!

Jargon	Particular words or expressions used by a profession or group, that outsiders find difficult to understand.
Juxtaposition	Two things placed close to each other in order to be seen in contrast. Used to compare, emphasise or highlight a particular aspect.
Litotes	Using negative language to express a positive statement. e.g. <i>You're not wrong.</i>
Metaphor	A word or phrase that is used to make a comparison between unlike things. e.g. <i>He is a shining star.</i>
Neologism	A newly created word or term. e.g. <i>chillax</i>
Onomatopoeia	A word that imitates the sound it makes. e.g. <i>tick tock</i>
Oxymoron	A figure of speech in which two opposites are combined to create an effect. e.g. <i>open secret</i>
Personification	Giving human traits (qualities, feelings, actions, or characteristics) to animals, objects or ideas to create an image. e.g. <i>The stars winked at me.</i>
Prose / poetry	Language with a natural flow, following spoken grammatical structures. Different to poetry, where language follows a distinct style and rhythm.
Pun	Using words in a humorous way that suggests two or more of its meanings. e.g. <i>We got the ball rolling at the bowling alley.</i>
Rhetorical questions	Asking a question for a purpose other than getting an answer. e.g. <i>Is this some kind of joke?</i>
Rhyme	The repetition of similar sounding words, often at the end of lines in poems or songs.
Sarcasm	Language that means the opposite of what it seems to say, in a way intended to mock or insult someone.
Simile	Compares one thing directly to another. You can quickly identify these when you see the words <u>like</u> or <u>as</u> . e.g. <i>I was as cold as ice.</i>
Stereotype	Where a character type fits a particular template. Individuals or groups are defined in narrow, oversimplified, terms.
Superlative	An adjective or adverb indicates that something has more of a certain quality than anything else. e.g. <i>the tallest tree</i>
Symbolism	An object used to represent an idea, quality or meaning, which is different from its literal meaning. e.g. <i>a rainbow symbolises hope.</i>



3. Problem

Now you're at the peak of the story, referred to as the problem, and our characters have come across a great event or an obstacle.

This is the most exciting aspect of the story, but make sure to keep your readers guessing.



2. Build-up

The next stage of the story is called the build-up. Here you start to think about what's happening and build up the main body of your story. You do this by adding detail to interest the reader, foreshadowing details that will lead to a greater conflict. The plot will always be engaging if you add a conflict or mystery. The plot will always be engaging if you add a conflict or mystery.

4. Resolution

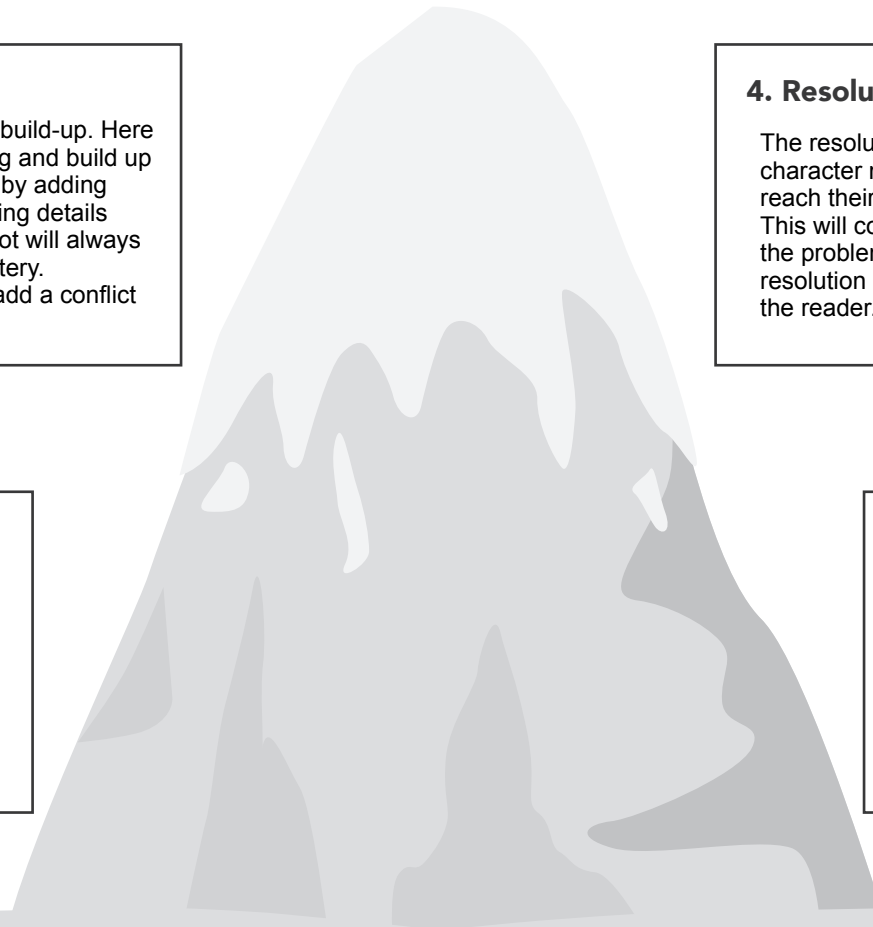
The resolution of a story is the point at which your character must solve or resolve the problem to reach their final goal. This will contain how your character will deal with the problem, and it's a good idea to make your resolution unique so that it's more unexpected for the reader.

1. Opening

The opening of a story introduces important elements such as characters, describes the environment, and sets the story's tone. As this is the beginning of the story, you'll need to introduce your characters and explain when/where the story is taking place. This will give readers a better understanding of the journey.

5. Ending

The ending of the story is when the characters have resolved the problem, and everything has been resolved. Although it's the end of the story, you can still be creative and add an unexpected twist that gives your story a unique ending that possibly hints at the next story.





3. Problem

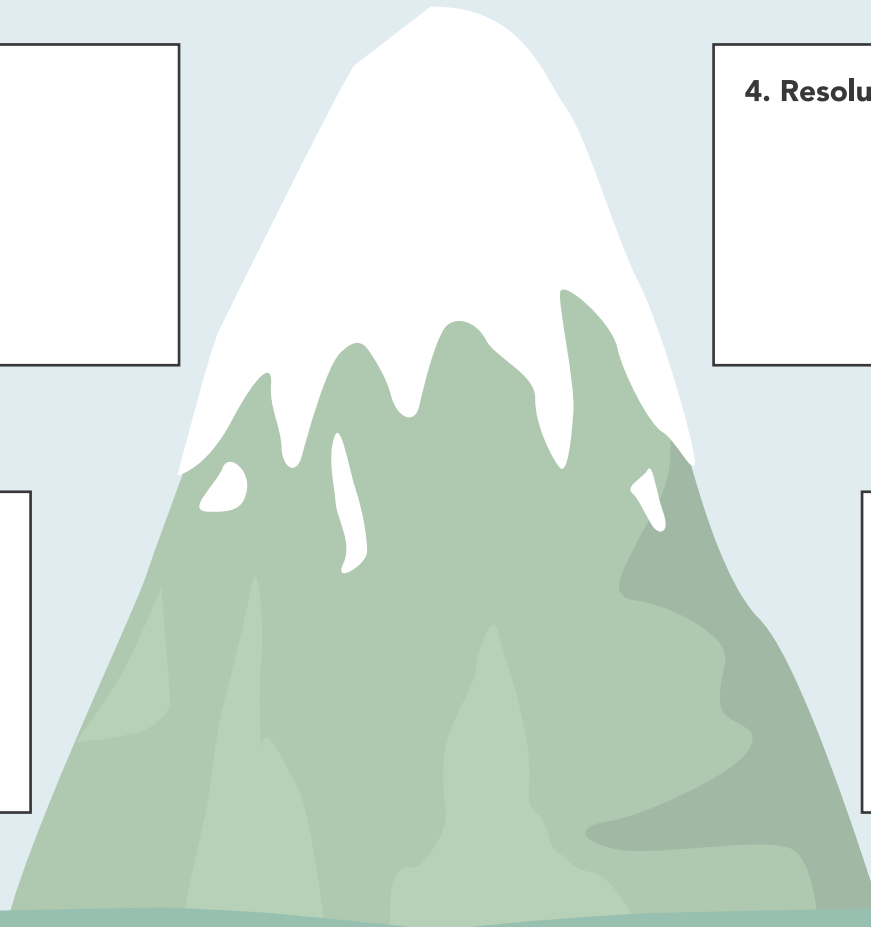


2. Build-up

4. Resolution

1. Opening

5. Ending



Maths Resources

That is, like having a penny, doubling it every day. In a month, you'll be a millionaire.

— Sulu, Star Trek

HUNDREDS CHART

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

multiply

- duplicate
- product
- lots of
- times
- groups of



divide

- distribute
- separate
- split up
- share
- quotient



add

- reckon
- tally
- plus
- sum
- altogether



subtract

- take away
- reduce
- minus
- less
- difference



1 TIMES TABLE

1 X 1 = 1
2 X 1 = 2
3 X 1 = 3
4 X 1 = 4
5 X 1 = 5
6 X 1 = 6
7 X 1 = 7
8 X 1 = 8
9 X 1 = 9
10 X 1 = 10
11 X 1 = 11
12 X 1 = 12

2 TIMES TABLE

1 X 2 = 2
2 X 2 = 4
3 X 2 = 6
4 X 2 = 8
5 X 2 = 10
6 X 2 = 12
7 X 2 = 14
8 X 2 = 16
9 X 2 = 18
10 X 2 = 20
11 X 2 = 22
12 X 2 = 24

3 TIMES TABLE

1 X 3 = 3
2 X 3 = 6
3 X 3 = 9
4 X 3 = 12
5 X 3 = 15
6 X 3 = 18
7 X 3 = 21
8 X 3 = 24
9 X 3 = 27
10 X 3 = 30
11 X 3 = 33
12 X 3 = 36

4 TIMES TABLE

1 X 4 = 4
2 X 4 = 8
3 X 4 = 12
4 X 4 = 16
5 X 4 = 20
6 X 4 = 24
7 X 4 = 28
8 X 4 = 32
9 X 4 = 36
10 X 4 = 40
11 X 4 = 44
12 X 4 = 48

5 TIMES TABLE

1 X 5 = 5
2 X 5 = 10
3 X 5 = 15
4 X 5 = 20
5 X 5 = 25
6 X 5 = 30
7 X 5 = 35
8 X 5 = 40
9 X 5 = 45
10 X 5 = 50
11 X 5 = 55
12 X 5 = 60

6 TIMES TABLE

1 X 6 = 6
2 X 6 = 12
3 X 6 = 18
4 X 6 = 24
5 X 6 = 30
6 X 6 = 36
7 X 6 = 42
8 X 6 = 48
9 X 6 = 54
10 X 6 = 60
11 X 6 = 66
12 X 6 = 72

7 TIMES TABLE

1 X 7 = 7
2 X 7 = 14
3 X 7 = 21
4 X 7 = 28
5 X 7 = 35
6 X 7 = 42
7 X 7 = 49
8 X 7 = 56
9 X 7 = 63
10 X 7 = 70
11 X 7 = 77
12 X 7 = 84

8 TIMES TABLE

1 X 8 = 8
2 X 8 = 16
3 X 8 = 24
4 X 8 = 32
5 X 8 = 40
6 X 8 = 48
7 X 8 = 56
8 X 8 = 64
9 X 8 = 72
10 X 8 = 80
11 X 8 = 88
12 X 8 = 96

9 TIMES TABLE

1 X 9 = 9
2 X 9 = 18
3 X 9 = 27
4 X 9 = 36
5 X 9 = 45
6 X 9 = 54
7 X 9 = 63
8 X 9 = 72
9 X 9 = 81
10 X 9 = 90
11 X 9 = 99
12 X 9 = 108

10 TIMES TABLE

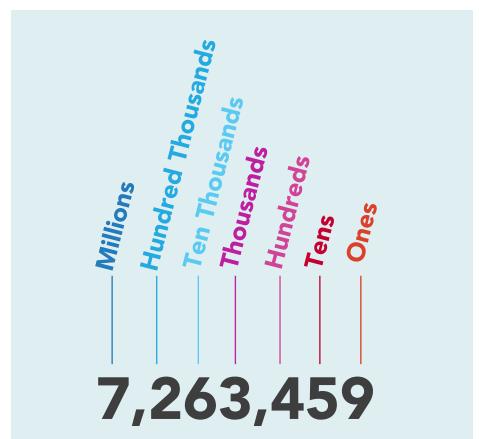
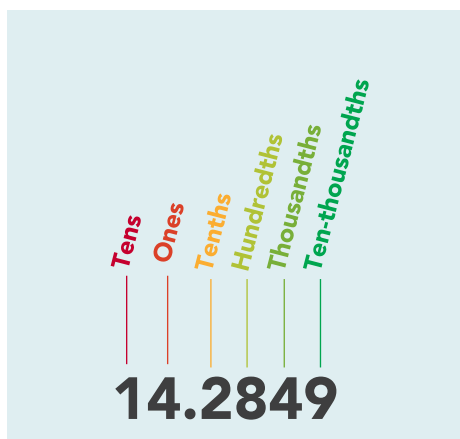
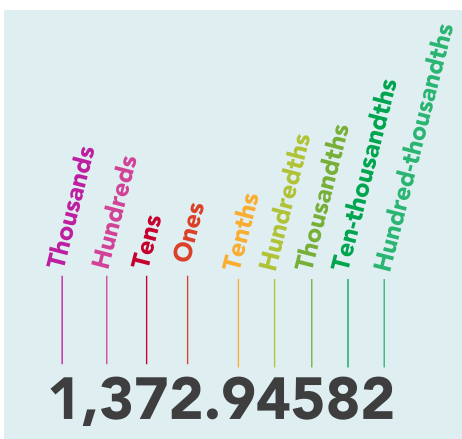
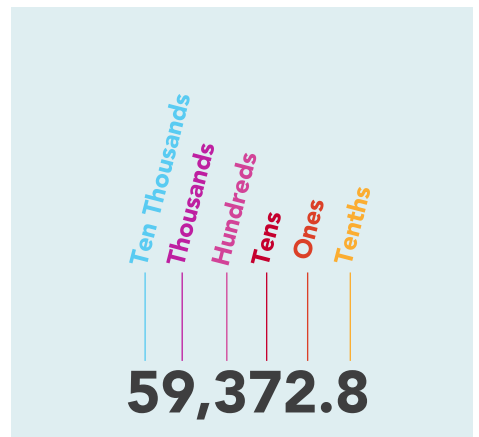
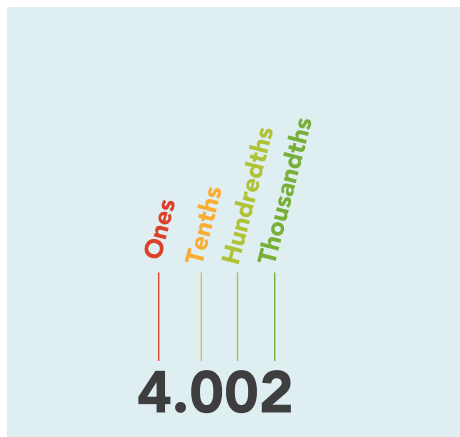
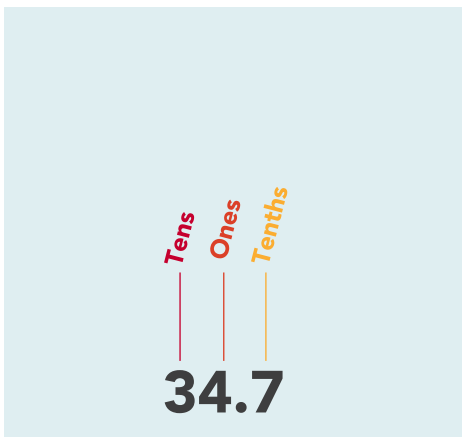
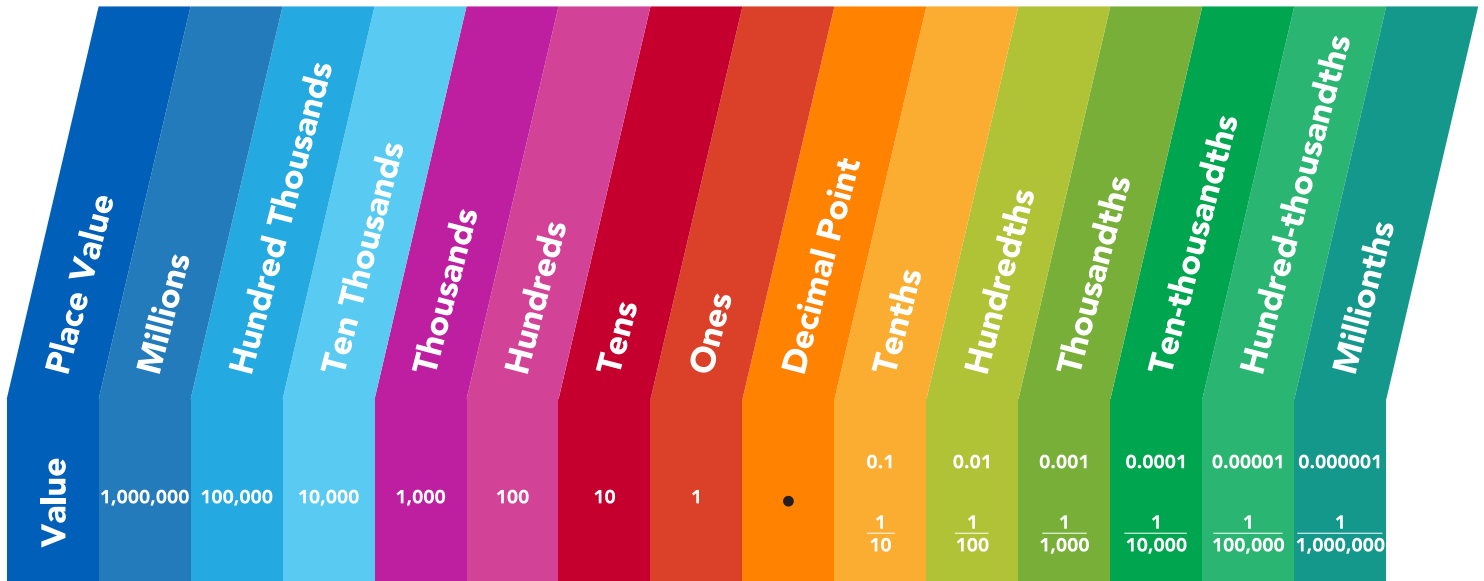
1 X 10 = 10
2 X 10 = 20
3 X 10 = 30
4 X 10 = 40
5 X 10 = 50
6 X 10 = 60
7 X 10 = 70
8 X 10 = 80
9 X 10 = 90
10 X 10 = 100
11 X 10 = 110
12 X 10 = 120

11 TIMES TABLE

1 X 11 = 11
2 X 11 = 22
3 X 11 = 33
4 X 11 = 44
5 X 11 = 55
6 X 11 = 66
7 X 11 = 77
8 X 11 = 88
9 X 11 = 99
10 X 11 = 110
11 X 11 = 121
12 X 11 = 132

12 TIMES TABLE

1 X 12 = 12
2 X 12 = 24
3 X 12 = 36
4 X 12 = 48
5 X 12 = 60
6 X 12 = 72
7 X 12 = 84
8 X 12 = 96
9 X 12 = 108
10 X 12 = 120
11 X 12 = 132
12 X 12 = 144

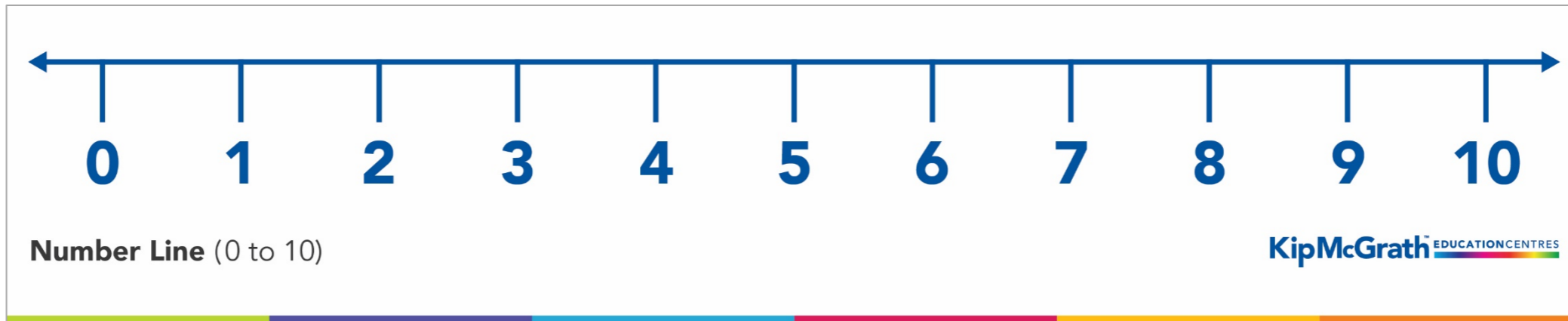


DIVIDING		MULTIPLYING	
÷ 10	Decimal moves 1 place LEFT	× 10	Decimal moves 1 place RIGHT
÷ 100	Decimal moves 2 places LEFT	× 100	Decimal moves 2 places RIGHT
÷ 1,000	Decimal moves 3 places LEFT	× 1,000	Decimal moves 3 places RIGHT
÷ 10,000	Decimal moves 4 places LEFT	× 10,000	Decimal moves 4 places RIGHT
÷ 100,000	Decimal moves 5 places LEFT	× 100,000	Decimal moves 5 places RIGHT
÷ 1,000,000	Decimal moves 6 places LEFT	× 1,000,000	Decimal moves 6 places RIGHT

Number Lines Summary

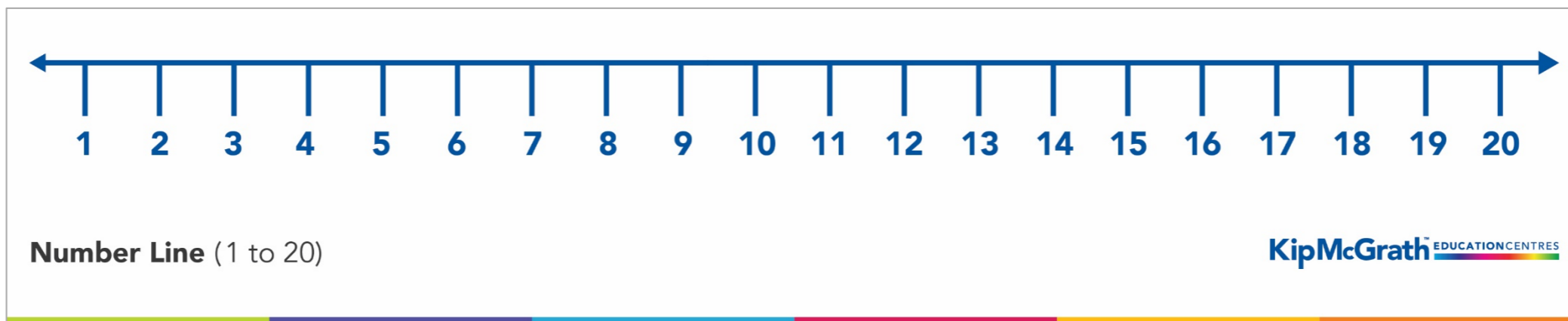
0 to 10

(297mm wide x 60mm high)



1 to 20

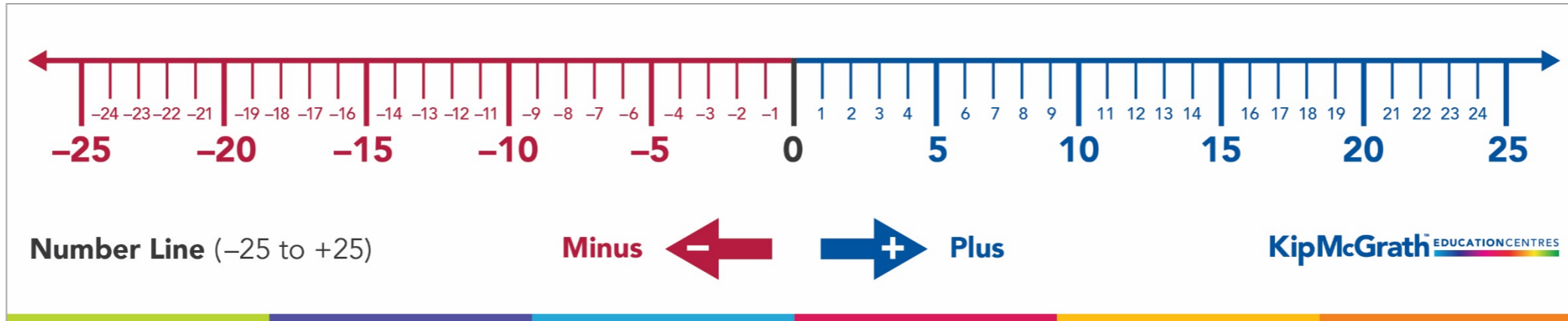
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Number Lines Summary

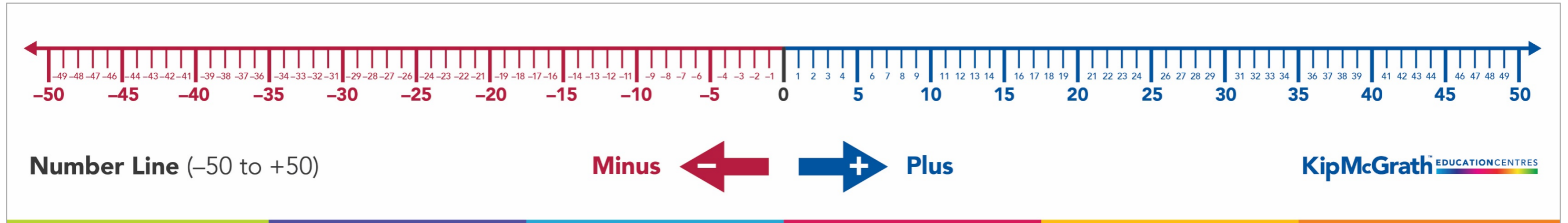
-25 to +25

(297mm wide x 60mm high)



-50 to +50

(420mm wide x 60mm high)



O'clock

Five To

Five Past

Ten To

Ten Past

Quarter To

Quarter Past

Twenty To

Twenty Past

Twenty-five To

Twenty-five Past

Half Past

To

Past

The hand moves this way on the clock

A.M. is from midnight until noon

P.M. is from noon until midnight

The little hand shows the hour

The big hand shows the minutes

Each line shows one minute

The number shows the hour

Analogue Time
A.M. and P.M.

Digital Time
A.M.

00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00

Digital Time
P.M.

12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00

Telling time after the hour

12:05
Five Past Twelve

12:15
Fifteen Past Twelve

12:25
Twenty-five Past Twelve





Telling time before the hour

12:35
Twenty-five To One

12:45
Quarter To One

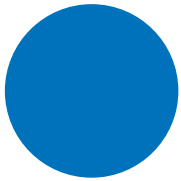
12:55
Five To One

January	31 days
February	28/29 days
March	31 days
April	30 days
May	31 days
June	30 days
July	31 days
August	31 days
September	30 days
October	31 days
November	30 days
December	31 days

Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
 Autumn	 Winter
 Summer	 Spring

60 seconds	=	1 minute
60 minutes	=	1 hour
24 hours	=	1 day
7 days	=	1 week
52 weeks	=	1 year

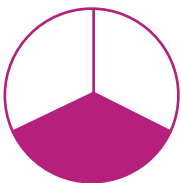
365 days	=	1 year
12 months	=	1 year
Decade	=	10 years
Century	=	100 years
Millennium	=	1,000 years



One Whole



Halves



Thirds



Quarters



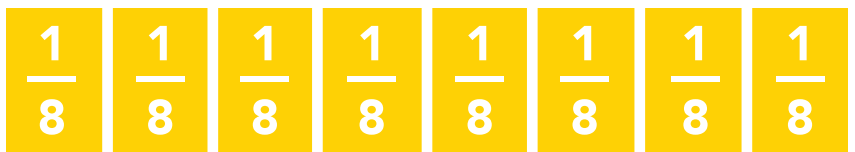
Fifths



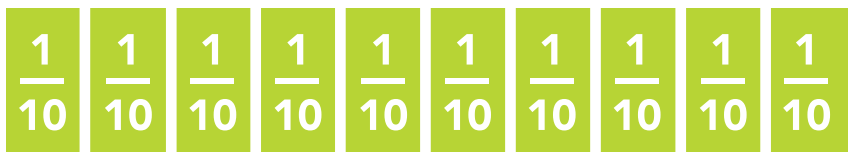
Sixths



Eighths



Tenths



Twelfths



ADDITION +

FRACTIONS WITH LIKE DENOMINATORS	
STEP 1	Keep denominators the same $\frac{4}{8} + \frac{2}{8}$
STEP 2	Add numerators $\frac{4}{8} + \frac{2}{8} = \frac{6}{8}$
STEP 3	Simplify $\frac{6}{8} = \frac{3}{4}$

FRACTIONS WITH UNLIKE DENOMINATORS	
STEP 1	Find the lowest common denominator and change to equivalent fractions $\frac{2 \times 3}{4 \times 3} + \frac{1 \times 2}{6 \times 2} = \frac{6}{12} + \frac{2}{12}$
STEP 2	Add numerators $\frac{6}{12} + \frac{2}{12} = \frac{8}{12}$
STEP 3	Simplify $\frac{8}{12} = \frac{2}{3}$

MIXED NUMBERS	
STEP 1	Convert to improper fractions $2\frac{1}{2} + 1\frac{1}{5} = \frac{5}{2} + \frac{6}{5}$
STEP 2	Find the lowest common denominator and change to equivalent fractions $\frac{5 \times 5}{2 \times 5} + \frac{6 \times 2}{5 \times 2} = \frac{25}{10} + \frac{12}{10}$
STEP 3	Add numerators $\frac{25}{10} + \frac{12}{10} = \frac{37}{10}$
STEP 4	Simplify $\frac{37}{10} = 3\frac{7}{10}$

SUBTRACTION -

FRACTIONS WITH LIKE DENOMINATORS	
STEP 1	Keep denominators the same $\frac{5}{12} - \frac{2}{12}$
STEP 2	Subtract the numerators $\frac{5}{12} - \frac{2}{12} = \frac{3}{12}$
STEP 3	Simplify $\frac{3}{12} = \frac{1}{4}$

FRACTIONS WITH UNLIKE DENOMINATORS	
STEP 1	Find the lowest common denominator and change to equivalent fractions $\frac{2 \times 2}{3 \times 2} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6}$
STEP 2	Subtract the numerators $\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$
STEP 3	Simplify $\frac{3}{6} = \frac{1}{2}$

MIXED NUMBERS	
STEP 1	Convert to improper fractions $2\frac{2}{3} - 1\frac{1}{2} = \frac{8}{3} - \frac{3}{2}$
STEP 2	Find the lowest common denominator and change to equivalent fractions $\frac{8 \times 2}{3 \times 2} - \frac{3 \times 3}{2 \times 3} = \frac{16}{6} - \frac{9}{6}$
STEP 3	Subtract the numerators $\frac{16}{6} - \frac{9}{6} = \frac{7}{6}$
STEP 4	Simplify $\frac{7}{6} = 1\frac{1}{6}$

Proper Fraction

$$\frac{2}{3}$$

← Numerator
← Denominator

Mixed Number

$$4\frac{3}{5}$$

Contains a whole number and a fraction

Improper Fraction

$$\frac{12}{10}$$

When the numerator is larger than the denominator

Equivalent Fractions

$$\frac{1}{4} = \frac{2}{8} = \frac{4}{16}$$

Diagram showing multiplication factors: $\times 2$ (1 to 2, 4 to 8), $\times 2$ (2 to 4, 8 to 16), and $\times 4$ (1 to 4, 4 to 16).

$$\frac{3}{4} = \frac{75}{100}$$

Diagram showing multiplication factors: $\times 25$ (3 to 75, 4 to 100).

Simplifying Fractions

$$\frac{15}{20} = \frac{3}{4}$$

Diagram showing division factors: $\div 5$ (15 to 3, 20 to 4).

$$\frac{80}{100} = \frac{8}{10} = \frac{4}{5}$$

Diagram showing division factors: $\div 10$ (80 to 8, 100 to 10), $\div 2$ (8 to 4, 10 to 5), and $\div 20$ (80 to 4, 100 to 5).

Converting a mixed number to an improper fraction

$$3\frac{3}{4} = \frac{15}{4}$$

Diagram showing: \times (3 to 12), $+$ (12 to 15), and \div (15 to 15, 4 to 4).

Step 1

Identify the **whole number**, **numerator** and **denominator**

$$3\frac{3}{4} = \frac{15}{4}$$

Diagram showing: \times (3 to 12), $+$ (12 to 15), and \div (15 to 15, 4 to 4).

Step 2

Multiply the denominator by the whole number

$$4 \times 3 = 12$$

Step 3

Add the numerator

$$12 + 3 = 15$$

Step 4

Keep the denominator the same

$$3\frac{3}{4} = \frac{15}{4}$$

Converting an improper fraction to a mixed number

$$\frac{15}{4} = 3\frac{3}{4}$$

Step 1

Divide the numerator by the denominator

$$\frac{15}{4} = 4 \overline{)15} \begin{matrix} 3r3 \end{matrix}$$

Step 2

This becomes the **whole number**

$$\frac{15}{4} = 4 \overline{)15} \begin{matrix} 3r3 \end{matrix}$$

Step 3

This becomes the **numerator**

$$\frac{15}{4} = 4 \overline{)15} \begin{matrix} 3r3 \end{matrix}$$

Step 4

Keep the denominator the same

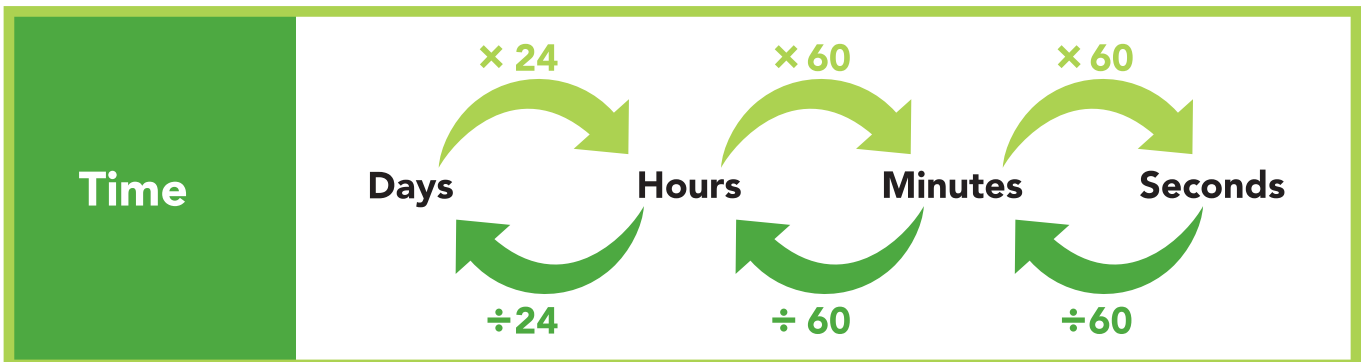
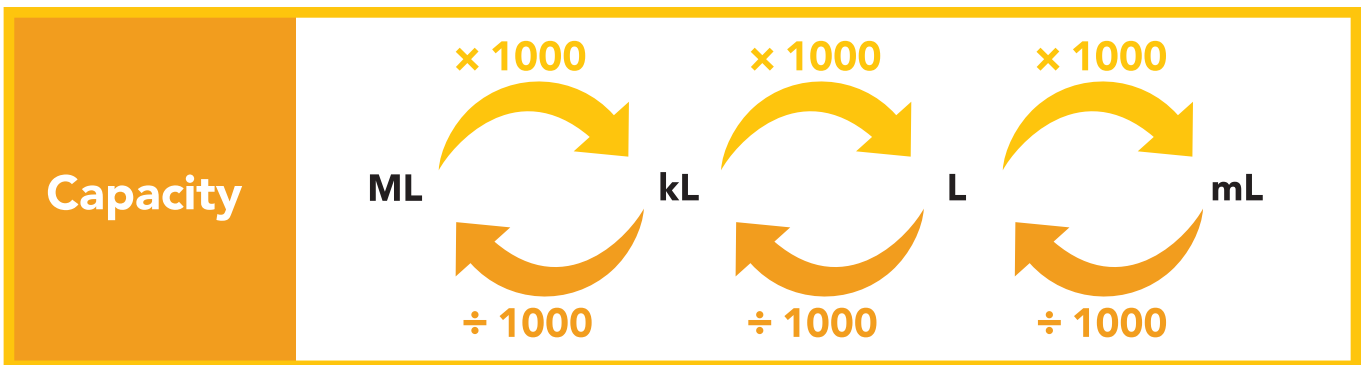
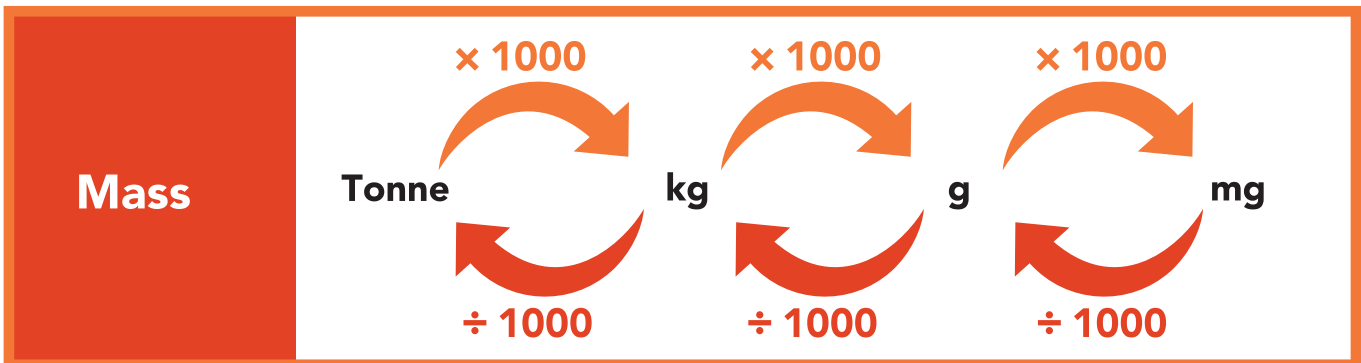
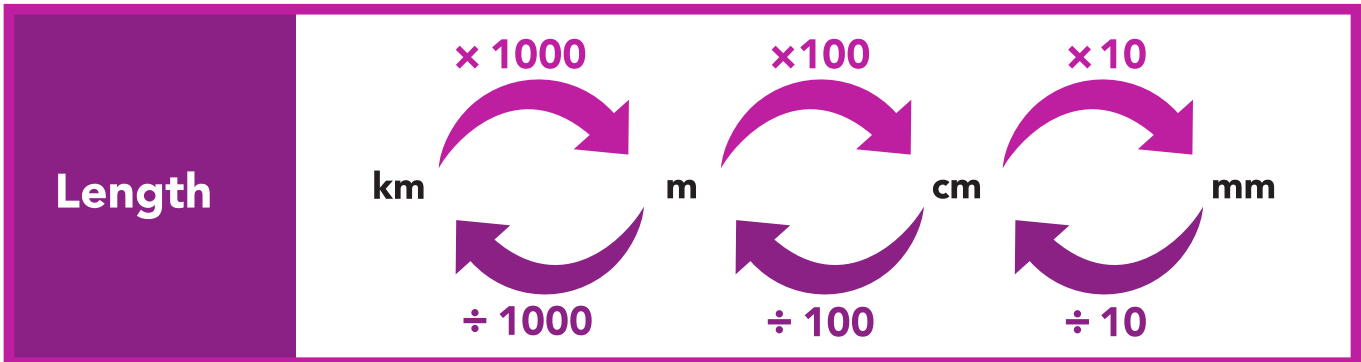
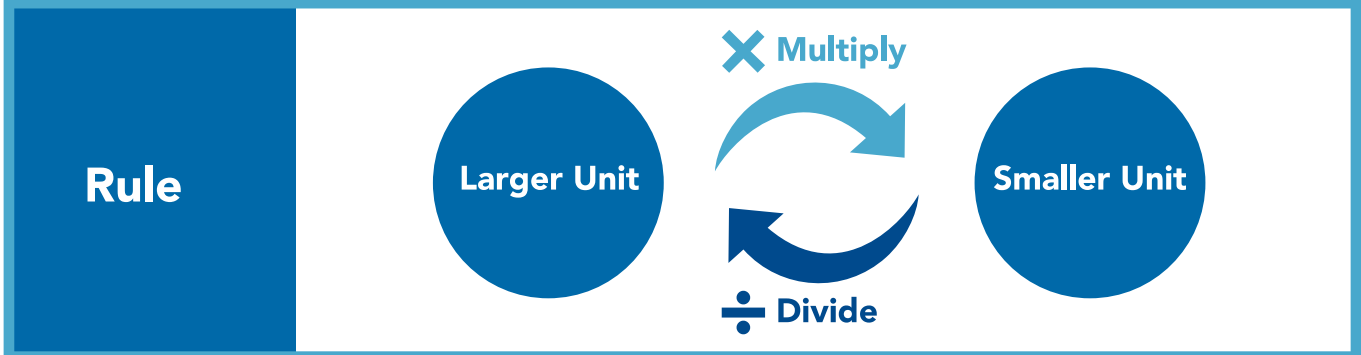
$$\frac{15}{4} = 3\frac{3}{4}$$

MULTIPLY ×

2 FRACTIONS		$\frac{2}{8} \times \frac{1}{2}$	FRACTION & WHOLE NUMBER		$5 \times \frac{3}{4}$	MIXED NUMBERS		$2\frac{1}{3} \times \frac{7}{8}$
STEP 1	Multiply numerators	$\frac{2}{8} \times \frac{1}{2} = 2$	STEP 1	Rewrite the whole number as an improper fraction	$5 = \frac{5}{1}$	STEP 1	Convert mixed numbers to improper fractions	$2\frac{1}{3} = \frac{7}{3}$
STEP 2	Multiply denominators	$\frac{2}{8} \times \frac{1}{2} = \frac{2}{16}$	STEP 2	Multiply across	$\frac{5}{1} \times \frac{3}{4} = \frac{15}{4}$	STEP 2	Multiply across	$\frac{7}{3} \times \frac{7}{8} = \frac{49}{24}$
STEP 3	Simplify	$\frac{2}{16} = \frac{1}{8}$	STEP 3	Simplify	$\frac{15}{4} = 3\frac{3}{4}$	STEP 3	Simplify	$\frac{49}{24} = 2\frac{1}{24}$

DIVIDE ÷

2 FRACTIONS		$\frac{1}{2} \div \frac{3}{4}$	WHOLE NUMBER BY A FRACTION		$5 \div \frac{1}{2}$	FRACTION BY A WHOLE NUMBER		$\frac{2}{3} \div 4$
STEP 1	Find the reciprocal of the 2nd number	$\frac{1}{2} \div \frac{3}{4} = \frac{4}{3}$	STEP 1	Convert whole number to improper fraction	$5 = \frac{5}{1}$	STEP 1	Convert whole number to improper fraction	$4 = \frac{4}{1}$
STEP 2	Replace ÷ with ×	$\frac{1}{2} \times \frac{4}{3}$	STEP 2	Find the reciprocal of the 2nd number	$\frac{5}{1} \div \frac{1}{2} = \frac{2}{1}$	STEP 2	Find the reciprocal of the 2nd number	$\frac{2}{3} \div \frac{1}{4} = \frac{1}{4}$
STEP 3	Multiply across	$\frac{1}{2} \times \frac{4}{3} = \frac{4}{6}$	STEP 3	Replace ÷ with × now multiply across	$\frac{5}{1} \times \frac{2}{1} = \frac{10}{1}$	STEP 3	Replace ÷ with × now multiply across	$\frac{2}{3} \times \frac{1}{4} = \frac{2}{12}$
STEP 4	Simplify	$\frac{4}{6} = \frac{2}{3}$	STEP 4	Simplify	$\frac{10}{1} = 10$	STEP 4	Simplify	$\frac{2}{12} = \frac{1}{6}$



Mass



A measurement of how much matter an object has.

1 gram	=	1000 milligrams
1 kilogram	=	1000 grams
1 tonne	=	1000 kilograms

Length



A measurement of an object from one end to the other.

1 centimetre	=	10 millimetres
1 metre	=	100 centimetres
1 kilometre	=	1000 metres

Volume



A measurement of how much liquid a container can hold.

1 millilitre	=	0.001 litre
1 decilitre	=	0.1 litres
1 hectolitre	=	100 litres
1 kilolitre	=	1000 litres

Data



A measurement of the size of an information file on a computer.

1 byte	=	8 bits
1 kilobyte	=	1024 bytes
1 megabyte	=	1024 kilobytes
1 gigabyte	=	1024 megabytes

Temperature



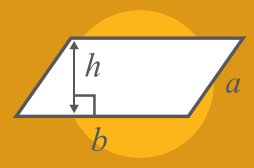
A measurement of how hot or cold an object is.

The metric system uses degrees Celsius to measure temperature.

The boiling point of water is 100°C.

The freezing point of water is 0°C.

Area

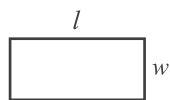


A measurement of the space inside a 2D shape.

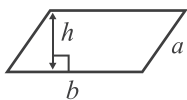
Area is expressed in:
centimetres²
metres²
kilometres²

Areas

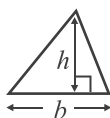
Rectangle = $l \times w$



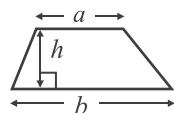
Parallelogram = $b \times h$



Triangle = $\frac{1}{2} b \times h$



Trapezium = $\frac{1}{2} (a + b) h$



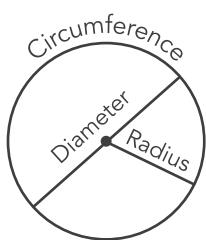
Circles

Circumference = $\pi \times \text{diameter}, C = \pi d$

Or

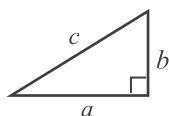
Circumference = $2 \times \pi \times \text{radius}, C = 2\pi r$

Area of a circle = $\pi \times \text{radius squared}, A = \pi r^2$



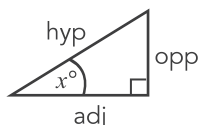
Pythagoras

Pythagoras' Theorem
For a right-angled triangle,
 $a^2 + b^2 = c^2$



Trigonometric ratios (new to F)

$\sin x^\circ = \frac{\text{opp}}{\text{hyp}}, \cos x^\circ = \frac{\text{adj}}{\text{hyp}}, \tan x^\circ = \frac{\text{opp}}{\text{adj}}$

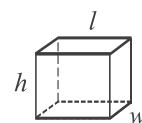


Quadratic Equations

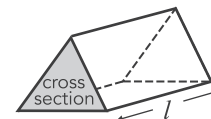
The solutions of $ax^2 + bx + c = 0$,
where $a \neq 0$, are given by $x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Volumes

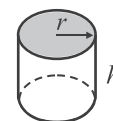
Cuboid = $l \times w \times h$



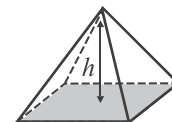
Prism = area of cross section $\times l$



Cylinder = $\pi r^2 h$

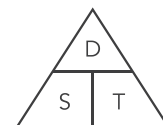


Pyramid = $\frac{1}{3} \times \text{area of base} \times h$



Compound Measures

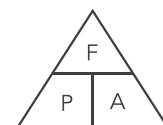
Speed = $\frac{\text{distance}}{\text{time}}$



Density = $\frac{\text{mass}}{\text{volume}}$



Pressure = $\frac{\text{force}}{\text{area}}$

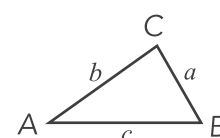


Trigonometric Formulae

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of a triangle = $\frac{1}{2} ab \sin C$



QUADRATIC FORMULA

$$ax^2 + bx + c = 0 \text{ are } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

SINE RULE

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

COSINE RULE

$$a^2 = b^2 + c^2 - 2bc \cos A \text{ or } \cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

AREA OF A TRIANGLE

$$A = \frac{1}{2} ab \sin C$$

VOLUME OF A SPHERE

$$V = \frac{4}{3} \pi r^3$$

VOLUME OF A CONE

$$V = \frac{1}{3} \pi r^2 h$$

VOLUME OF A PYRAMID

$$V = \frac{1}{3} Ah$$

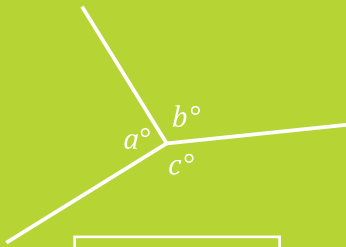
STANDARD DEVIATION

$$s = \sqrt{\frac{\Sigma(x - \bar{x})^2}{n - 1}}$$

$$\text{or } s = \sqrt{\frac{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}{n - 1}}, \text{ where } n \text{ is the sample size.}$$

Angles at a Point

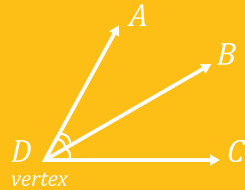
add to 360°



$$a^\circ + b^\circ + c^\circ = 360^\circ$$

Adjacent Angles

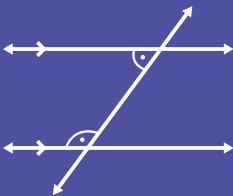
share a vertex and a side



$\angle ADB$ is adjacent to $\angle BDC$

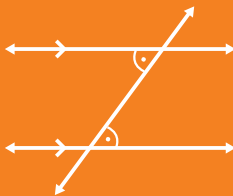
Co-interior Angles

add to 180°



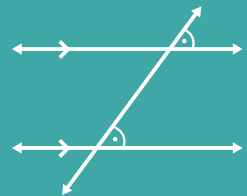
Alternate Angles

always equal



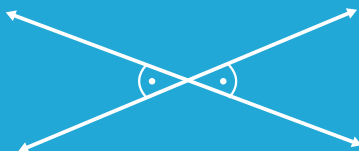
Corresponding Angles

always equal



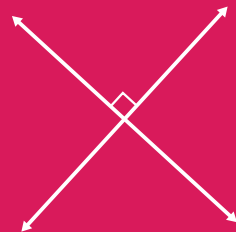
Vertically Opposite Angles

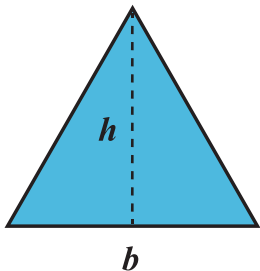
always equal



Perpendicular Lines

lines that meet at a right-angle (90°)

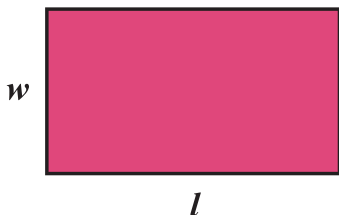




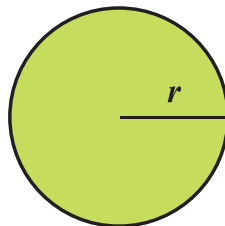
$$\text{Triangle} = \frac{1}{2} \times b \times h$$



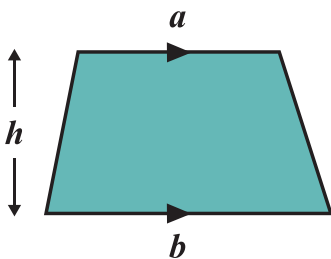
$$\text{Square} = s^2$$



$$\text{Rectangle} = l \times w$$

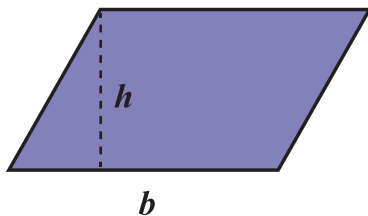


$$\text{Circle} = \pi \times r^2$$

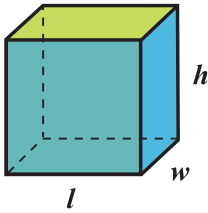


$$\text{Trapezium} = \frac{1}{2} \times h \times (a + b)$$

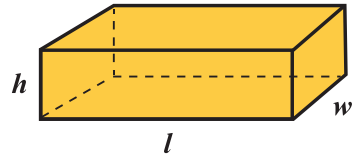
$$\text{or} = \frac{(a + b)}{2} \times h$$



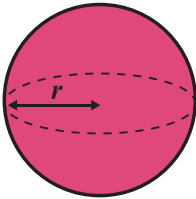
$$\text{Parallelogram} = b \times h$$



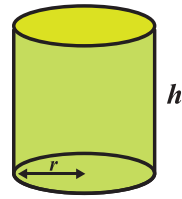
Cube = $l \times w \times h$



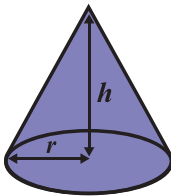
Rectangular Prism = $l \times w \times h$



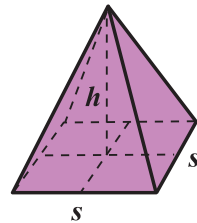
Sphere = $\frac{4}{3} \times \pi \times r^3$



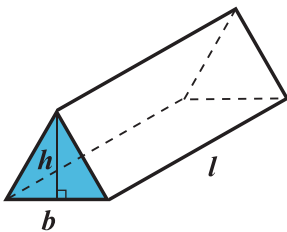
Cylinder = $\pi \times r^2 \times h$



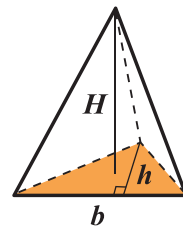
Cone = $\frac{1}{3} \times \pi \times r^2 \times h$



Square-based Pyramid = $\frac{1}{3} \times \text{area of base} \times h$



Triangular Prism = $\frac{1}{2} \times b \times h \times l$



Triangular Pyramid = $\frac{1}{3} \times (\frac{1}{2} bh) \times H$

MULTIPLICATION	$a^n \times a^m = a^{n+m}$	$2^6 \times 2^4 = 2^{6+4}$ $= 2^{10}$
MULTIPLICATION WITH BRACKETS	$(ab)^n = a^n b^n$	$(5 \times 2)^3 = 5^3 \times 2^3$ $= 125 \times 8$ $= 1000$
DIVISION	$\frac{a^m}{a^n} = a^{m-n}$	$\frac{9^5}{9^3} = 9^{5-3}$ $= 9^2$
POWER OF A POWER	$(a^n)^m = a^{n \times m}$	$(4^3)^4 = 4^{3 \times 4}$ $= 4^{12}$
NEGATIVE POWER	$a^{-n} = \frac{1}{a^n}$	$5^{-4} = \frac{1}{5^4}$ $= \frac{1}{625}$
	$\frac{1}{a^{-n}} = a^n$	$\frac{1}{3^{-2}} = 3^2$
ZERO INDEX / ZERO POWER	$a^0 = 1$	$3^0 = 1$
	$(ax)^0 = 1$	$(3x)^0 = 1$
	$ax^0 = a$	$3x^0 = 3 \times 1$ $= 3$
POWER OF A QUOTIENT	$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$	$\left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2}$ $= \frac{4}{9}$
POWER AS A FRACTION	$a^{1/n} = \sqrt[n]{a}$	$8^{1/3} = \sqrt[3]{8}$ $= 2$

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