Multiplication and Division

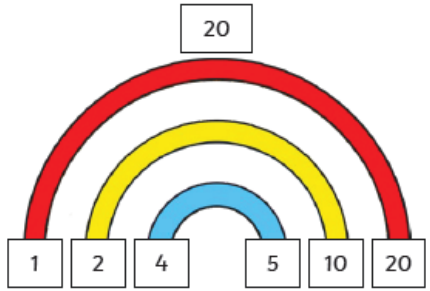
Knowledge Organiser

Key Vocabulary

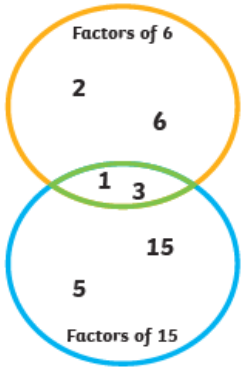
- multiply
- groups of
- lots of
- times
- divide
- share
- remainder
- factor
- multiple
- product

Factors

A factor is a number that divides into another number exactly, without leaving a remainder.



A common factor is a factor of 2 or more numbers.



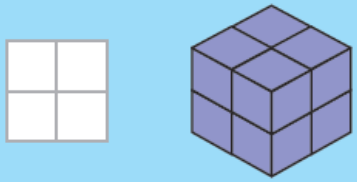
The factors of 20 are 1, 2, 4, 5, 10 and 20.

The factor pairs are:
1 and 20
2 and 10
4 and 5

Prime Numbers

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

Squared[2] and Cubed[3] Numbers

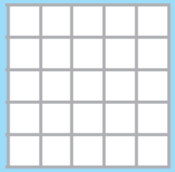


$2^2 = 4$

$2 \times 2 = 4$

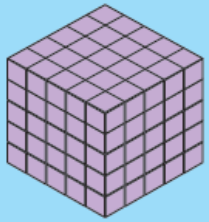
$2^3 = 8$

$2 \times 2 \times 2 = 8$



$5^2 = 25$

$5 \times 5 = 25$



$5^3 = 125$

$5 \times 5 \times 5 = 125$

Related Calculations

$8 \times 9 = 72$

$80 \times 9 = 720$

$9 \times 8 = 72$

$90 \times 8 = 720$

$72 \div 9 = 8$

$720 \div 9 = 80$

$72 \div 8 = 9$

$720 \div 8 = 90$

Multiplication and Division

Knowledge Organiser

Short Multiplication

$2543 \times 7 = 17\,801$

	2	5	4	3
×				7
1	**7**	**8**	**0**	**1**
1	3	3	(2)	

Remember to move any regrouped digits into the next column. After the next multiplication, add the regrouped number to the answer.

Long Multiplication

$2543 \times 67 = 170\,381$

		2	5	4	3
	×			6	7
	1 1	7 3	8 3	0 2	1
1 1	5 3	2 2	5 1	8	(0)
1	**7**	**0**	**3**	**8**	**1**
	1	1			

Before multiplying by the number in the tens column, remember to use zero as a placeholder because the 6 in 67 is 6 tens (60).

Division

$136 \div 4 = 34$

		3	4	
4	1	3	6	
−	1	2	0	→ 30 × 4
		1	6	
	−	1	6	→ 4 × 4
			0	

Short Division

		3	8
4	1	1 5	(3) 2

15 ÷ 4 = 3 remainder 3

Remember to regroup any remainders and move them into the next column.

		4	5	5	r	3
5	2	2	2 7	2 8		

28 ÷ 5 = 5 remainder 3

If your calculation has a remainder, remember to record it in the answer using the letter **r**.

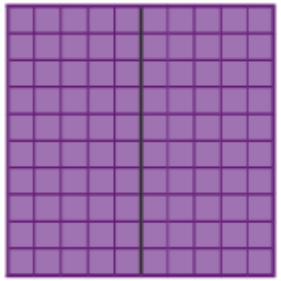
Fractions — Knowledge Organiser

Key Vocabulary

- numerator
- denominator
- unit fraction
- non-unit fraction
- whole
- equivalent
- mixed number
- improper fraction
- simplest form
- multiple
- common denominator
- common numerator

Equivalent Fractions

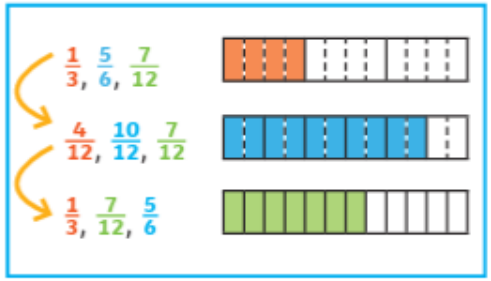
To find equivalent fractions, we multiply or divide the numerator and denominator by the same number.

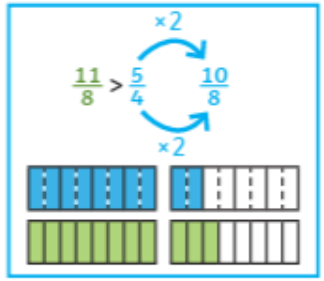


$\frac{1}{2} = \frac{5}{10} = \frac{50}{100}$ (×5, ×10; ×5, ×10)

Compare and Order Fractions

We can compare and order fractions by using common denominators.





Mixed Numbers

Mixed numbers contain a whole number and a fraction.

whole → $2\frac{1}{4}$ ← fraction

Improper Fractions

An improper fraction has a numerator which is greater than or equal to the denominator.

$\frac{5}{3}$

Convert an Improper Fraction to a Mixed Number

$\frac{9}{4}$

$9 \div 4 = 2r1$ → $2\frac{1}{4}$

Divide the numerator by the denominator.

This shows you the whole number and the fraction.

Convert a Mixed Number to an Improper Fraction

Multiply the whole by the denominator to make an improper fraction.

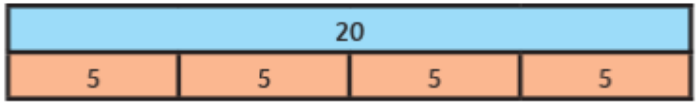
$2\frac{5}{6} = \frac{12}{6} + \frac{5}{6} = \frac{17}{6}$

Add the fractions together.

Fractions of Quantities

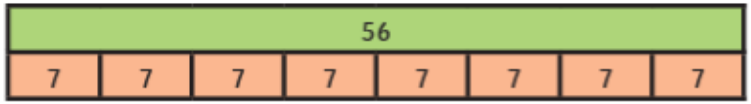
To find a fraction of a number, divide by the denominator and multiply by numerator.

To find quarters of 20:



$\frac{1}{4}$ of 20 = 5 $\frac{2}{4}$ of 20 = 10 $\frac{3}{4}$ of 20 = 15 $\frac{4}{4}$ of 20 = 20

To find eighths of 56:



$\frac{1}{8}$ of 56 = 7 $\frac{2}{8}$ of 56 = 14 $\frac{3}{8}$ of 56 = 21 $\frac{4}{8}$ of 56 = 28

$\frac{5}{8}$ of 56 = 35 $\frac{6}{8}$ of 56 = 42 $\frac{7}{8}$ of 56 = 49 $\frac{8}{8}$ of 56 = 56

Fractions — Knowledge Organiser

Adding and Subtracting Fractions

$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

$\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$

$\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$

$\frac{5}{6} - \frac{2}{3} = \frac{5}{6} - \frac{4}{6} = \frac{1}{6}$

To add or subtract fractions with denominators that are multiples of the same number, we must change one fraction to have the same denominator.

Add Fractions When the Total is Greater Than 1

$\frac{1}{2} + \frac{3}{4} + \frac{5}{8} = \frac{4}{8} + \frac{6}{8} + \frac{5}{8} = \frac{15}{8} = 1\frac{7}{8}$

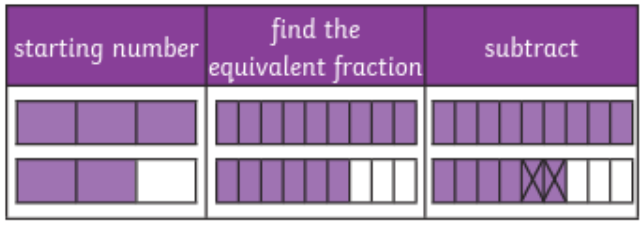
Add Mixed Numbers

$1\frac{1}{4} + \frac{3}{8} = 1\frac{2}{8} + \frac{3}{8} = 1 + \frac{5}{8} = 1\frac{5}{8}$

$1\frac{1}{4} + \frac{3}{8} = \frac{5}{4} + \frac{3}{8} = \frac{10}{8} + \frac{3}{8} = \frac{13}{8} = 1\frac{5}{8}$

Subtract From a Mixed Number

$1\frac{2}{3} - \frac{2}{9} = 1\frac{6}{9} - \frac{2}{9} = 1\frac{4}{9}$



Subtract from a Mixed Number - Breaking the Whole

$2\frac{1}{4} - \frac{3}{8} = 2\frac{2}{8} - \frac{3}{8} = 1\frac{10}{8} - \frac{3}{8} = 1\frac{7}{8}$

Subtract Two Mixed Numbers

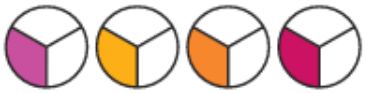
$2\frac{3}{4} - 1\frac{5}{8} = 1\frac{1}{8}$

$2 - 1 = 1$

$\frac{3}{4} - \frac{5}{8} = \frac{1}{8}$

Multiply Unit Fractions by an Integer

$\frac{1}{3} \times 5 = \frac{5}{3}$



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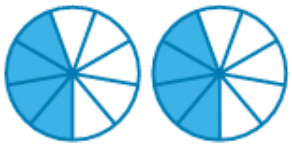
Multiply Non-Unit Fractions by an Integer



$2 \times \frac{4}{9} = \frac{8}{9}$

Multiply Mixed Numbers by Integers

Convert to an improper fraction and multiply the numerator by the integer.

$2\frac{1}{4} \times 2 = \frac{9}{4} \times 2 = \frac{18}{4} = 4\frac{2}{4} = 4\frac{1}{2}$

Use repeated addition.

$2\frac{1}{4} \times 2 = 2\frac{1}{4} + 2\frac{1}{4} = 4\frac{2}{4} = 4\frac{1}{2}$

Writing Mat

Expected Year 5

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Use a mixture of simple, compound and complex sentences. Use a thesaurus to up-level your vocabulary choices.

Check for tense, subject/verb agreement, person, paragraphs and genre features!

Marvellous Modals!

Include modal verbs to show possibility:

can could should
might must may
would will ought

(and their negative versions)

Could you pop in an adverb of possibility?

surely possibly
certainly perhaps

Super Suffixes!

-ation preparation sensation
-ous courageous curious serious
-ly gently angrily frantically

Super Subordination!

Use these conjunctions to create super complex sentences:

if because as
before after until
that since when

Front it Out!

Link your sentences and paragraphs:

Time

At that moment, On Saturday, Finally,

Place

Over the bridge, Inside the chest, Beyond the clouds,

Frequency

Every few weeks, Never before, Occasionally, Often,

Manner/ Behaviour

Breathing heavily, Waiting anxiously, Without warning,

It's All Relative!

Use a 'which', 'who' or 'that' relative clause to add extra information:

The Queen, who has reigned for 60 years, has four children.

Hedgehogs eat garden snails, which is important within the food chain.

The stench was so putrid that it made her eyes water.

Spellings... I need to know most of these:

accommodate	correspond	hindrance	recognise
accompany	criticise	individual	recommend
according	curiosity	interfere	relevant
achieve	definite	interrupt	restaurant
aggressive	desperate	language	rhyme
amateur	determined	leisure	rhythm
ancient	develop	lightning	sacrifice
apparent	dictionary	marvellous	secretary
appreciate	embarrass	mischievous	shoulder
attached	environment	muscle	sincere
available	equip(-ped)	necessary	sincerely
average	equipment	neighbour	soldier
awkward	especially	nuisance	stomach
bargain	exaggerate	occupy	sufficient
bruise	excellent	occur	suggest
category	existence	opportunity	symbol
committee	explanation	parliament	system
communicate	familiar	physical	temperature
community	foreign	prejudice	thorough
competition	forty	privilege	twelfth
conscience	frequently	profession	variety
conscious	government	programme	vegetable
controversy	guarantee	pronunciation	vehicle
convenience	harass	queue	yacht

Expanded Noun Phrases:

Get Descriptive!
the ferocious, snarling beast inside the cage
the breath-taking, scenic view beyond the valley

Punctuation Reminders:

A	Capital letters for sentences, initials and proper nouns.
.	Full stops.
!	Exclamation marks for exclamations or surprise.
?	Question marks.
'	Apostrophes for possession and missing letters and to mark missing letters in contracted words, e.g. didn't.
,	Commas in lists , and to mark parenthesis, fronted adverbials and clauses.
" "	Inverted commas for speech. (Don't forget the commas too!)
-	Hyphen to connect words together.
-	Dashes to show longer pauses or parenthesis.
( )	Brackets for parenthesis.

Knowledge Organiser-Year 5-Search Engines

Search engines

Algorithm	A sequence of instructions which, when followed, solve a problem.
Company logo	A symbol or motif, used to represent an organisation, so that it can be identified quickly and easily in a busy environment online or in the real world.
Data leak	When information is released without approval from the owner or creator.
Data privacy	The right to keep information private and away from those you do not wish to have access.
Fake news	False and inaccurate information that is shared in a convincing way, usually on social media and in websites.
Inaccurate information	When information is false and untrue. ⚠
Index	A computer saves key information about previously searched results, to make this quicker next time they are accessed.
Keywords (internet)	A set of words used to define and produce an accurate search engine result.
Network	When more than one electronic device is connected in a network through the internet or a local connection in order to share files and information.
Online	When a person is accessing the internet through an electronic device.
Page rank	Web pages are sorted in an order to give the user the most suitable results at the top of the list, the first result could be considered rank one.
Search engine	A way for a user to search the internet's database of information.
TASK	Title, Author, Summary, Kids
Web crawler	A program that uses keywords to search the WWW in a logical and systematic way to find the most suitable results for the user.
Website	A series of web pages and other content, which can be discovered and read through an internet browser, that all belong to a single domain name. For example, Google. The main place where particular web pages can be viewed or accessed.
WWW	The acronym used to express the 'World Wide Web'. It is found at the beginning of website addresses e.g. www.kapowprimary.com

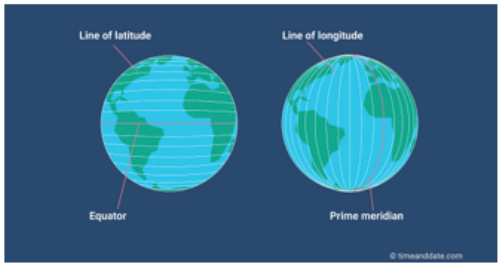
Key facts

Geography Knowledge Organiser-Year 5-Spatial Sense

Key Vocabulary

Vocabulary	Definition
prime meridian	An imaginary line that divides the earth into two sections to show the eastern and western hemispheres. It also used as the basis for world time zones.
longitude	Imaginary lines parallel to the prime meridian line that help map makers locate places with accuracy. (Vertical lines)
latitude	Imaginary lines parallel to the equator that help map makers to locate places with accuracy. (Horizontal lines)
eastern hemisphere	A term used to describe places that are east of the prime meridian line.
western hemisphere	A term used to describe places that are west of the prime meridian line.
relief maps	A map that uses shading and colours to indicate the height of the land.

Lines of longitude, latitude and the prime meridian:

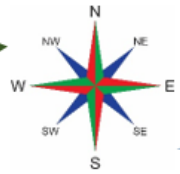


Eastern and western hemisphere:

Example of a relief map:

Eight compass points:

North (N), North East (NE), East (E), South East (SE), South (S), South West (SW), West (W) and North West (NW)



Here are the eight compass points you need to know!

Year 5 RE Knowledge Organiser: Incarnation-Was Jesus the Messiah?

Vocabulary

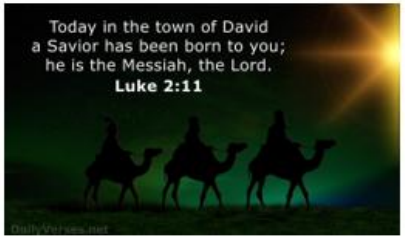
Word	Definition
Messiah	The term Messiah is Hebrew and means 'anointed one'. This is a title given to the person believed to be the saviour, who has been chosen to bring salvation to humankind. The term 'anointed one' is used in both Christianity and Judaism. Christians believe that the Messiah was sent by God to save humanity.
Salvation	Salvation is the act of delivering (or keeping away) from evil or saving from sin .
Saviour	Someone who saves something or someone from danger, harm, failure, etc. —used by Christians to refer to Jesus Christ.
Prophecy	The foretelling or prediction of what is to come.
Gospel	The word *gospel* comes from the Old English *god* meaning "good" and *spel* meaning "news, a story." In Christianity, the term "good news" refers to the story of Jesus Christ's birth, death, and resurrection.
Transfiguration	A complete change of form or appearance into a more beautiful or spiritual state.
Transformation	A marked change in form, nature, or appearance.

Incarnation

The embodiment of God the Son in human flesh as Jesus Christ.

Christian and Jewish belief in the Messiah

Christians believe Jesus is the Messiah, the "anointed one" predicted in the Jewish Scriptures. The word "Christ" comes from the Greek for "Messiah," (it is actually a title, not a surname). Jews, on the other hand, do not believe Jesus is the Messiah and are still awaiting his future arrival.

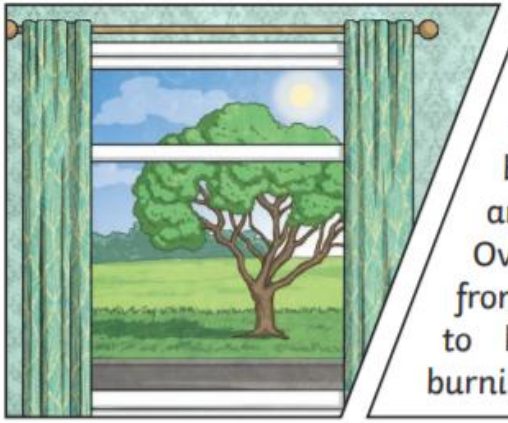


Properties and changes of materials

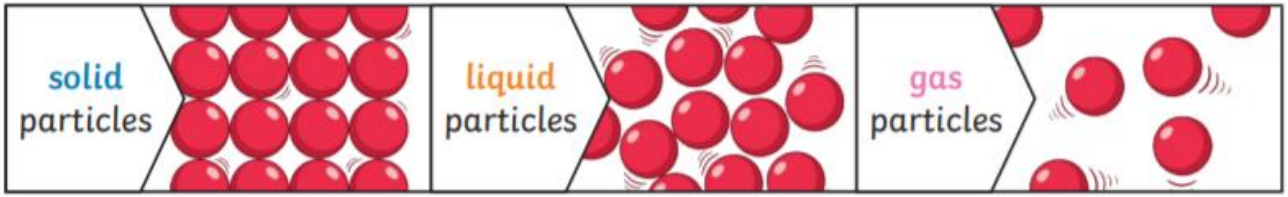
Key Vocabulary	
materials	The substance that something is made out of, e.g. wood, plastic, metal.
solids	One of the three states of matter. Solid particles are very close together, meaning solids, such as wood and glass, hold their shape.
liquids	This state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Examples of liquids include water and milk.
gases	One of the three states of matter. Gas particles are further apart than solid or liquid particles and they are free to move around. Examples of gases are oxygen and helium.
melting	The process of heating a solid until it changes into a liquid.
freezing	When a liquid cools and turns into a solid.
evaporating	When a liquid turns into a gas or vapour.
condensing	When a gas, such as water vapour, cools and turns into a liquid.

Key Knowledge

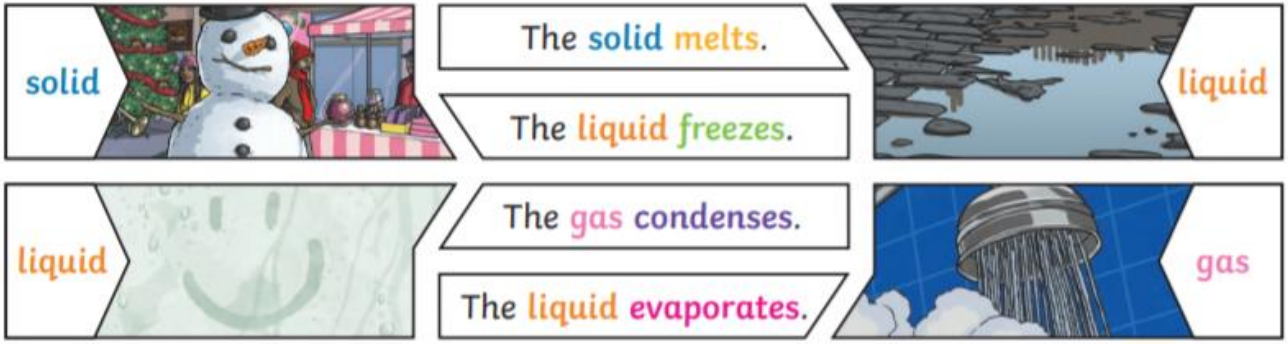
Different **materials** are used for particular jobs based on their properties: electrical **conductivity**, flexibility, hardness, **insulators**, magnetism, solubility, thermal **conductivity**, **transparency**.



For example, glass is used for windows because it is hard and **transparent**. Oven gloves are made from a thermal **insulator** to keep the heat from burning your hand.



Changes of State

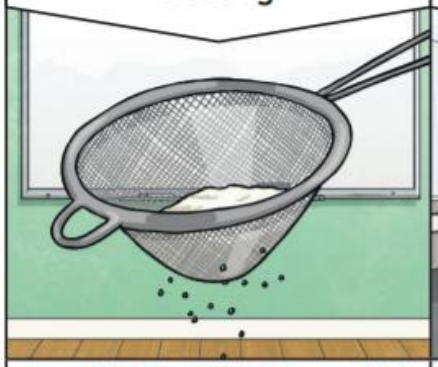
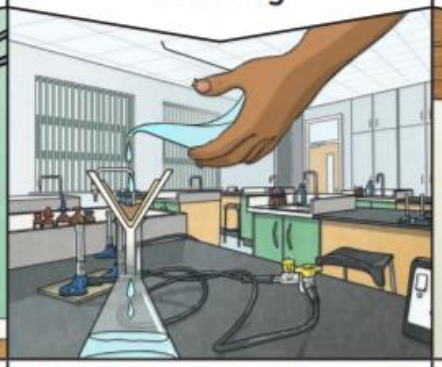
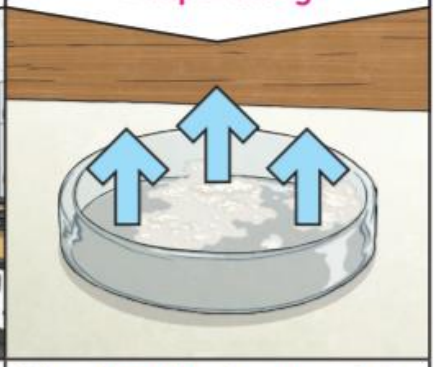


Key Vocabulary

conductor	A conductor is a material that heat or electricity can easily travel through. Most metals are both thermal conductors (they conduct heat) and electrical conductors (they conduct electricity).
insulator	An **insulator** is a material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical **insulators**.
transparency	A **transparent** object lets light through so the object can be looked through, for example glass or some plastics.

Key Knowledge

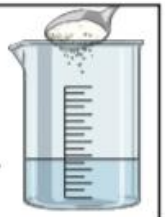
Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by:

Sieving	Filtering	Evaporating
		
Smaller materials are able to fall through the holes in the sieve, separating them from larger particles.	The solid particles will get caught in the filter paper but the liquid will be able to get through.	The liquid changes into a gas, leaving the solid particles behind.

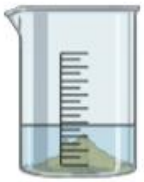
Dissolving

A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.

Sugar is a soluble material.



Sand is an insoluble material.



Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic.

Knowledge Organiser

D&T - Cooking and nutrition: Developing a recipe

adaptation	The process of changing something.
cook	To prepare food by heating it.
cross-contamination	When something harmful spreads from one food to another.
farm	To grow crops or keep animals as a business.
hygiene	Keeping things clean to prevent illness.
ingredients	The foods a recipe is made from.
label	Something that provides information about the product it is attached to.
nutrient	Substances that help living things stay healthy and grow.
nutritional value	The nutrients a food or recipe provides.
process	A series of actions.

Farmers rear cows. | The cows are killed and the meat matures. | The meat is processed and packaged. | The food is transported to shops. | Customers buy beef products. | The food is consumed.

D&T - Cooking and nutrition: Developing a recipe

Nutritional value helps us understand how healthy a food is. Nutrition information on food labels can help us make better choices for our bodies by showing us the amounts of nutrients like fibre, protein and sugar.

Cross-contamination is when harmful bacteria from one food get onto another. To prevent it, use different coloured chopping boards for different types of food.

- Red - raw meat
- Blue - raw fish
- Yellow - cooked meat
- Green - salad and fruit
- Brown - root vegetables
- White - bakery and dairy

Spaghetti bolognese is a popular dish that can be adapted in many ways. Adapting and developing the recipe by adding, substituting and removing ingredients can ensure that it suits dietary needs and tastes.

Taste testing | Juicing | Snipping | Grating | Mixing | Cutting | Measuring