

Kapow
Primary™



Science

Vocabulary progression

Content

Introduction to key vocabulary	3
Receptive vs expressive vocabulary	4
Choosing words to teach	5
Working scientifically and Science in action progression	6
Scientific knowledge and understanding progression: Plants	7
Scientific knowledge and understanding progression: Animals, including humans	8
Scientific knowledge and understanding progression: Living things and their habitats	9
Scientific knowledge and understanding progression: Forces, Earth and space and Energy	10
Scientific knowledge and understanding progression: Materials	11
Grammar notes and references	12

Introduction to key vocabulary

This document outlines the vocabulary progression within our Science curriculum.

It does not include **all** vocabulary that pupils will encounter in their Science lessons, but rather focuses on the essential words and terms crucial for understanding the subject. These words are carefully selected to help students grasp important concepts and ideas outlined in the National curriculum.

The vocabulary is categorised under three curriculum strands: **Working scientifically**, **Science in action**, and **Scientific knowledge and understanding**. This document also organises the words related to scientific knowledge and understanding into our key areas.

Our aim in consolidating these key words is to enable teachers to focus their teaching on the vocabulary outlined for their year group, ensuring a strong understanding of what words pupils should already be familiar with and those they will encounter in future years.

‘What we call “knowledge” is language, and this fact proves that to understand any subject, we first need to understand its language’

Alex Quigley, *Closing the Vocabulary Gap*

Coming soon! Unit hubs are being updated for 24/25 to ensure the ‘Key vocabulary’ listed matches this document.

Receptive vs expressive vocabulary



Receptive vocabulary

The words a person understands when they hear or read them. Vocabulary that an individual can recognise and comprehend even if they do not actively use it in conversation or writing.



Expressive vocabulary

The words that a person can actively use in speech or writing to communicate.

Some vocabulary will be used in lessons earlier than indicated in this document; this is done intentionally. Pupils often understand vocabulary *receptively* before they can confidently use it *expressively*. Our lesson plans guide teachers to model new vocabulary before the vocabulary is explicitly taught and before pupils are expected to use it to communicate ideas themselves. At times, the teacher may model use of new words, but children may use synonyms

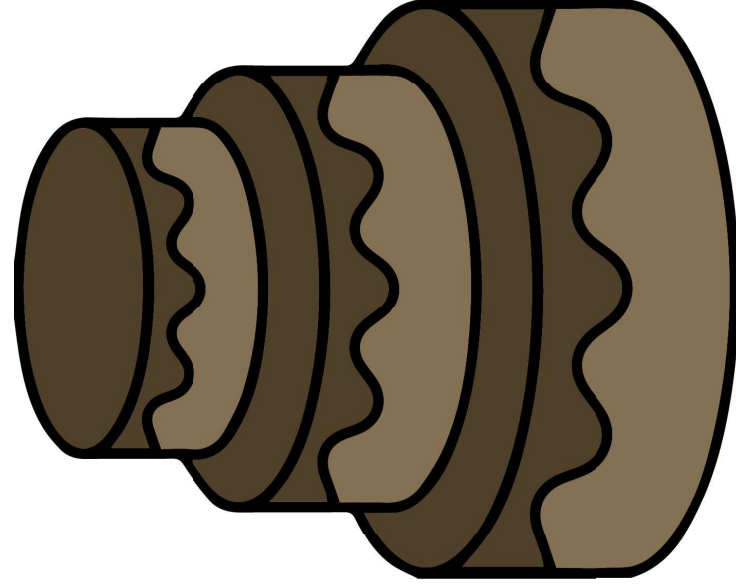
The year groups listed represent when pupils are expected to retain the vocabulary and its meanings, and begin to actively use the words in appropriate contexts. We have chosen to focus on when vocabulary is used *expressively*, as this makes it easier for teachers to assess.

However, active use of new vocabulary does not necessarily imply complete mastery of each word or concept, as understanding continues to evolve and deepen over time. For instance, in Year 1, pupils might recognise the term 'season' as different times of the year characterised by specific weather patterns. By Year 5, they develop a deeper understanding of why seasons occur, exploring the Earth's tilt and its orbit around the Sun.

Choosing words to teach

In selecting the words to include in this vocabulary progression, we have used the 'Three-tiers framework' (Beck, McKeown & Omanson, 1987) which advises focusing instruction on Tier 2 vocabulary for the most productive gains.

Words typically classified as Tier 1 vocabulary, such as 'bird', are familiar to most learners due to their frequent use in everyday language. However, in science lessons, it is crucial that children learn the specific scientific meanings of these words, which often involve more detailed and precise definitions than their general usage. For example, while 'bird' is commonly known as a type of animal, scientifically, it specifically refers to a group of warm-blooded vertebrates with feathers, wings, and a beak, most of which are able to fly. We have included these kind of words in our progression, therefore.



Tier 3 vocabulary

These words are used infrequently in conversation and often their use is subject-specific. Textbook glossaries usually focus on Tier 3 words as they can tend to be abstract in nature. They require explicit teaching and contextualisation.

Tier 2 vocabulary

These words are of high-utility as they are words which appear across the school curriculum and in written texts. Often explicit teaching of Tier 2 words is not planned for but this can be the most productive place to focus vocabulary instruction.

Tier 1 vocabulary

The most basic words. These are the words that typically appear in conversation, meaning children are exposed to them often from a very early age. They rarely require explicit teaching because they are already familiar to the majority of children.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working scientifically						
Question	plan	predict	variable fair method investigate	control variable	model testable safety hazard	rate
Plan and predict						
Observe, test and measure	observe measure diagram table sort group	test research	record bar chart results table stopwatch	classify classification key	temperature thermometer relationship estimate line of best fit line graph data anomaly	mean average secondary data/source units scale
Record						
Conclude	compare similarity difference	results pattern	conclusion trustworthy	proof	evidence advantage/ disadvantage/ strength/ weakness	evaluate reliable
Evaluate						
Science in action						
	science scientist	invention		ethics	discovery	theory

*The words on this page are Tier 2 words, with high utility across a number of subjects. However, it is important to ensure that in science lessons, children understand the scientific meaning of these words, which may differ from their general usage or usage across other subjects.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants					
growth (1) garden plants wild plants deciduous* evergreen* fruit (1) seed (1) bulb flower (1) leaf (1) roots (1) stem (1) trunk (1)	germinate energy* (2) nutrient* (2) life cycle* (2) shoot	female (1) male (1) petal pollen pollination seed formation disperse (2) support (2) transport (2)	N/A	N/A	N/A

*This word occurs in the vocabulary progression for another key area.

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Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Living things and their habitats						
Animals, including humans						
senses (1) sight (1) smell (1) taste (1) touch (1) hearing (1) amphibian bird (1) fish (1) mammal reptile carnivore herbivore omnivore diet	habitats/microhabitats microhabitat minibeast habitat (2) shelter (1) alive (1) dead (1) predator (2) prey (2) food chain (2) energy* (2) depend (2) teenager (1) toddler (1) health (1) hygiene (1) basic needs survive life cycle* (2) egg (1) pupa tadpole live young spawn	N/A balanced (diet) (2) carbohydrate fat fibre vitamin mineral nutrient* protein skeleton vertebrate invertebrate bone (1) joint muscle (1)	conservation (2) deforestation (2) endangered (2) pollution (2) nature reserve flowering plants non-flowering plants saliva small intestine stomach (1) mouth (1) oesophagus large intestine digest (2) faeces incisor canine molar premolar producer*	adolescence* (2) characteristic (2) asexual reproduction sexual reproduction fertilisation* mating offspring reproduction (2) incubation gestation gills lungs* ovule germination foetus gestation period hormones period (menstruation) puberty	organism life processes warm-blooded cold-blooded Insect (1) exoskeleton micro-organism circulatory system heart (1) blood (1) bloodstream blood vessels lungs pulse heart rate carbon dioxide oxygen drug	adaptation (2) competition (2) environment (2) environmental (2) evolution (2) extinct (2) fossil* gene inherit/inheritance (2) natural selection parent (biological) (1) population (2) selective breeding survival of the fittest (2) variation (2)

The 'Living things and their habitats' and 'Animals, including humans' units share strong connections and overlap. To avoid repetition, we have combined the vocabulary from these key areas into a single progression.

*This word occurs in the vocabulary progression for another key area.

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Vocabulary progression: Scientific knowledge and understanding

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Forces, Earth and Space						
weather (1) season (1) deciduous tree* evergreen tree*	N/A	force (2) contact force non-contact force friction (2) magnetism (2) magnet (2) north pole south pole attract (2) repel (2)	celestial bodies spherical orbit (2) moon (1) star (1) planet (1) gravity (2) phase (2)	solar system Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Pluto	unbalanced (2) balanced (2) air resistance water resistance gear lever pulley	N/A

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Energy						
N/A	N/A	cast (a shadow) light source luminous non-luminous opaque reflect reflection reflective (shiny) shadow (1) translucent transparent	air (1) vibration eardrum insulator* pitch (2) volume (2)	appliance electricity (1) power source mains circuit (2) bulb buzzer cell/battery motor switch (2) wire (1) property* electrical conductor* electrical insulator*	N/A	light ray optical fibre periscope pupil ray diagram circuit diagram current resistance (2) voltage

*This word occurs in the vocabulary progression for another key area.

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Vocabulary progression: Scientific knowledge and understanding

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials					
material object fabric glass (1) metal (1) plastic (1) rock (1) wood (1) absorbent tough waterproof (1)	property suitable (1) elastic flexible (2)	crystal fossil grain hard hardness sediment sedimentary rock sedimentation soft	boiling condensing evaporating evaporation rate freezing gas liquid melting precipitation solid steam the water cycle	conductor* insulator* electrical conductivity* thermal conductivity mixture irreversible change reversible change rust/rusting burning dissolve soluble insoluble solution filtering (2) sieve/sieving	N/A

*This word occurs in the vocabulary progression for another key area.

The words on this page have been classified as Tier 3 vocabulary. Words that may also be considered Tier 1 or Tier 2 vocabulary are indicated with parentheses. However, it is important to ensure that in science lessons, children understand the scientific meaning of these words, which may differ from their general usage or usage across other subjects.

Notes:

Not all the equipment recommended in the scheme is listed in this document. This is partly because schools have different equipment available, and partly because it is not always necessary for children to be able to name the equipment they use (e.g. lux meter). Where we have listed equipment (e.g. thermometer), it is because we feel it is important for children to be able to name it.

Not all units of measurement are included in this document. The explicit teaching of these terms is typically conducted during Maths lessons, while Science lessons provide an opportunity to revise, use, and apply these terms effectively.

All terms from the National Curriculum are addressed within our scheme of work, although they may not all be explicitly listed in this document. For instance, the National Curriculum for Year 6 includes 'States of matter.' While we believe it is important for students following our scheme to grasp the concepts of different states of matter, we do not require them to actively use this specific vocabulary, hence its omission from this list.

We have classified the vocabulary in this document as Tier 1, Tier 2, or Tier 3. Please note that classifying vocabulary can be subjective and challenging. Factors such as the age of the target audience and the context in which words are used may influence how familiar these words are considered.

Grammar note:

The vocabulary list includes words in various forms, as these are the versions most frequently used in our Science lessons. For example, we might list 'evaporating' because it is commonly used in discussions. However, as pupils grow more confident with these specific forms, it is beneficial to teach them how to adapt and use all related forms of the word. For instance, from the root 'evaporate,' they should learn to use 'evaporating,' 'evaporated' and 'evaporation' with confidence. This approach ensures that pupils not only recognise these words but can also apply them accurately in different contexts.

References

Quigley, A., *Minding the Vocabulary Gap*, (Routledge, 2017), p. 95.
Beck, I., McKeown, M., & Kucan, L., *Bringing Words to Life*, (Guilford Press, 2013), p. 9.

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