Science

Vocabulary progression

Contents

Introduction to key vocabulary

This document outlines the vocabulary progression within Kapow Primary's Science curriculum.

It does not include **all** vocabulary that pupils encounter in their Science lessons but instead focuses on the essential words and terms crucial for understanding the subject. These words are carefully selected to help pupils 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 Kapow Primary's key areas.

The aim in consolidating these keywords is to enable teachers to focus their teaching on the vocabulary outlined for each 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 heard 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 and this is done intentionally. Pupils often understand vocabulary receptively *before* they can confidently use it expressively. 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 the use of new words while pupils may use synonyms.

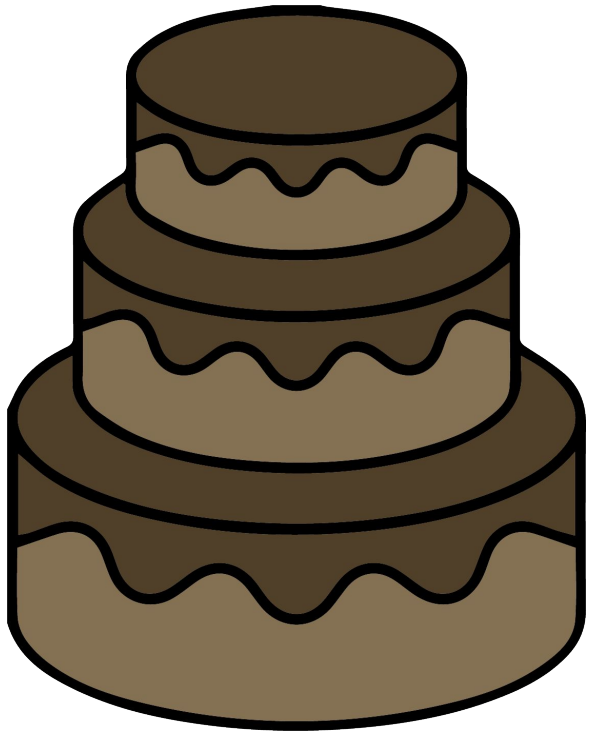
The year groups listed represent when pupils are expected to retain the vocabulary and its meanings and begin to actively use the words in appropriate contexts. The focus is on when vocabulary is used expressively, making it easier for teachers to assess.

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, the 'three-tiers framework' (Beck, McKeown & Omanson, 1987), which advises focusing instruction on tier 2 vocabulary for the most productive gains, has been used.

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 essential that pupils 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. Therefore, these kinds of words have been included in the progression.



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

Tier 2 vocabulary
These words are high-utility as they 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, which typically appear in conversation and are frequently encountered by pupils from an early age. They rarely require explicit teaching because they are already familiar to most pupils.

Vocabulary progression

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

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

Vocabulary progression: Scientific knowledge and understanding

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

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

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Vocabulary progression: Scientific knowledge and understanding

Living things and their habitats

Animals, including humans

Year 1

Sensitive bodies
hearing (1)
senses (1)
sight (1)
smell (1)
taste (1)
touch (1)

Comparing animals
amphibian
bird (1)
carnivore
diet
fish (1)
herbivore
mammal
omnivore
reptile

Year 2

Habitats and Microhabitats
alive (1)
dead (1)
depend (2)
energy* (2)
food chain (2)
habitat (2)
life processes
microhabitat
minibeast
predator (2)
prey (2)
shelter (1)

Life cycles and health
basic needs
egg (1)
health (1)
hygiene (1)
life cycle* (2)
live young
pupa
spawn
survive
teenager (1)
toddler (1)
tadpole

Year 3

Movement and nutrition
balanced (diet) (2)
bone (1)
carbohydrate
fat
fibre
invertebrate
joint
mineral
movement
muscle (1)
nutrient*
protection
protein
skeleton
support
vertebrate
vitamin

Year 4

Classification and changing habitats
conservation (2)
deforestation (2)
endangered (2)
flowering plants*
insect
nature reserve
non-flowering plants
pollution (2)
slug
snail
spider
worm

Digestion and food
canine
digest (2)
digestive system
faeces
incisor
large intestine
molar
mouth (1)
oesophagus
premolar
producer*
saliva
small intestine
stomach (1)

Year 5

Life cycles and reproduction
adolescence* (2)
asexual reproduction
characteristic (2)
fertilisation*
germination
gestation
gills
incubation
lungs*
mating
metamorphosis
offspring
ovule
pollen*
pollination*
reproduction* (2)
sexual reproduction

Human timeline
foetus
gestation period
hormones
period (menstruation)
puberty

Year 6

Classifying big and small
cold-blooded
conifer
exoskeleton
fern
life processes*
microorganism
moss
organism
warm-blooded

Circulation and health
blood (1)
bloodstream
blood vessels
carbon dioxide
circulatory system
drug
heart (1)
heart rate
oxygen
pulse

Evolution and inheritance
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, the vocabulary from these key areas has been combined into a single progression.

*This word also appears 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					
deciduous tree* evergreen tree* season (1) weather (1)	N/A	attract (2) contact force force (2) friction (2) magnet (2) magnetic material magnetism (2) non-contact force north pole repel (2) south pole	N/A	celestial bodies day (daytime) gravity (2) moon (1) night (nighttime) orbit (2) phase (2) planet (1) spherical star (1) year Solar System Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Pluto air resistance balanced (2) gear gravity lever pivot pulley surface area unbalanced (2) water resistance	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 mirror non-luminous opaque reflect reflection reflective (shiny) shadow (1) the Sun translucent transparent	air (1) eardrum insulator* pitch (2) sound vibration volume (2) appliance battery/cell bulb buzzer circuit (2) electrical conductor* electrical insulator* electricity (1) mains motor power source property* switch (2) wire (1)	N/A	light ray pupil ray diagram reflective cell circuit diagram current resistance voltage

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Vocabulary progression: Scientific knowledge and understanding

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

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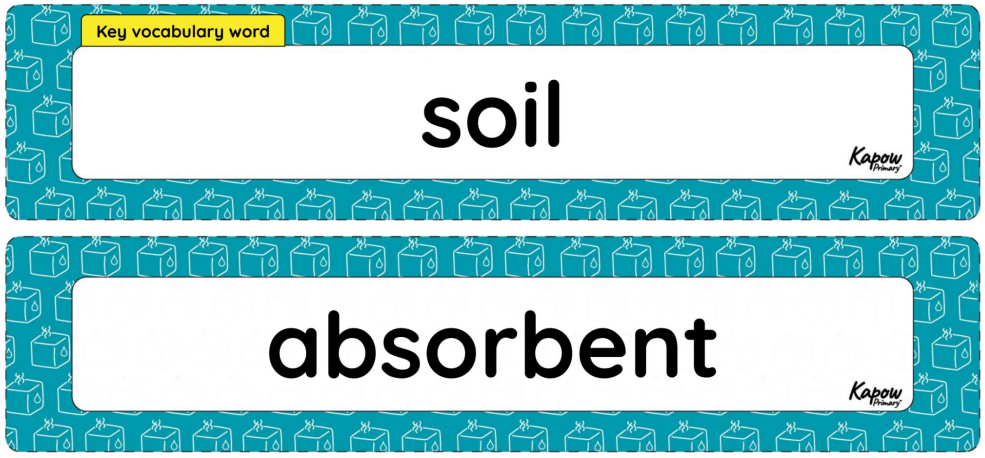
Vocabulary displays

Each unit hub contains a 'Key vocabulary' section which lists the relevant unit vocabulary from this document. The Key vocabulary section only shows vocabulary for the year group in question, not words from previous year groups.

For the 'Working scientifically' vocabulary, words from earlier phases (KS1, LKS2 and UKS2) that are crucial to understanding the unit may also be included. In these cases, the phase in which the word was first introduced is shown in brackets.



Key vocabulary

control variable (LKS2)
dissolve
filtering
insoluble
mixture
sieving
soluble
solution
stopwatch (LKS2)
variable (LKS2)

Displaying vocabulary can be a simple but effective way to support pupils' understanding and the use of subject-specific language. Regularly seeing keywords helps reinforce their meaning and spelling, while also encouraging pupils to use them in their spoken and written work.

Vocabulary displays make learning visible and promote independence by giving children a reference point during lessons.

To support this, each unit includes a printable vocabulary display which highlights the key vocabulary pupils are expected to focus on and includes other useful words they may use during the unit.

Notes

Not all the equipment recommended in the scheme is listed in this document. This is partly due to variations in equipment availability across schools and partly because it is not always necessary for pupils to name the equipment they use (e.g., lux meter). Where equipment has been listed (e.g. thermometer), it is because naming it is considered important for the children's understanding.

Not all units of measurement are included in this document. These terms are typically taught explicitly during Maths lessons, while Science lessons provide opportunities to revise, use and apply them effectively.

All terms from the **National curriculum** are addressed within the 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 understanding the different states of matter is crucial for students following the scheme, active use of this specific vocabulary is not required, which is why it has been omitted from the list.

The vocabulary in this document has been classified as tier 1, tier 2, or tier 3. 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 their most commonly used forms in Science lessons. For example, 'evaporating' may be listed because it is commonly used in discussions. However, as pupils grow more confident, it is important to teach them how to adapt and use all related forms of the word. From the root 'evaporate,' pupils should learn to use 'evaporating,' 'evaporated' and 'evaporation' with confidence. This approach ensures pupils can recognise these words and 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.