

Science - One Voice

Our school aims for Science:

Department of Education - National Curriculum

Children are provided with high-quality science education that provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils are taught essential aspects of the knowledge, methods, processes and uses of science.

- Develop scientific knowledge and conceptual understanding through scientific disciplines.
- Develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Curriculum

Learning is sequenced based on suitability with wider curriculum and seasonal suitability. For example: Year 3 Rocks, Fossils and Soils coincides with The Stone Age.

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| Science overview | | | | | | |
|------------------|-----------------------------------|--------------------------|---------------------------|--|--|-------------|
| Year | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| 3 | Rocks, Fossils and Soils | Animals including humans | Forces and magnets | | Light and shadows | Plants |
| 4 | Animals including humans | Eating and digestion | Solids, liquids and gases | | Sound | Electricity |
| 5 | Earth and space, including forces | | Properties of materials | | Animals including humans - Life cycles, changes and reproduction | |
| 6 | Evolution and inheritance | | Healthy bodies | Classification of living things and their habitats | | Light |

| | Main Topic | Science Topic |
|-----------------|---|--|
| AUTUMN 1 | Mini fieldwork project - What is it like at CCJS? History - Who first lived in Britain? Information booklets/posters about Bronze age, iron age stone age. Make Stonehenge and jewellery from clay, Cave silhouettes. DEAL - Roles in a settlement Geography link - Rivers | What do rocks tell us? Why do our bodies need food? - Continue into spring 1. |
| AUTUMN 2 | | |

How are knowledge and skills built upon through the school?

Clear progression for each topic to outline how each topic is built upon in each year group.

- Teachers have a clear understanding of what has been covered in previous year groups (recorded on topic cover sheets)
- Children are able to see what they have previously covered in their topic cover sheets.

Previous Skills

- Identify and group animals with and without skeletons. Observe and compare their movement.
- Compare and contrast different diets.
- Draw a timeline to indicate stages of growth and development of humans.
- Compare models and images of the digestive system.

Previous Knowledge/understanding

Year 3

- Identify that animals, including humans, need the right types and amount of nutrition.
- Explain what a balanced diet is and which food group each food fits into.
- Identify that humans have skeletons and muscles for support, protection and movement.
- Different parts of the body have special functions.

Year 4

- Describe the simple functions of the basic parts of the digestive system in humans, for example: mouth, tongue, teeth, oesophagus, stomach, small intestine and large intestine.
- Explore questions that help them to understand their special functions.

Year 5

- Describe the changes as humans develop to old age.

The sequencing documents show previous skills, knowledge and understanding within KS2. This is from the year 6 sequencing document, 'Healthy Bodies.'

How are knowledge and skills built upon through the school?

Previous Skills

- Identifying and classifying
- Observing and recording
- Explaining with reasons
- Drawing conclusions

Previous Knowledge

(KS1 – not covered in year 3)

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of a variety of common flowering plants, including trees.
- Identify and name the roots, trunk, branches and leaves of trees.
- Identify and name a variety of common animals including fish, amphibians, reptiles, **birds** and mammals
- Demonstrate a good understanding of reptiles, vertebrates, and invertebrates, items that are living, dead and never lived a range of animals and plants that live in a habitat and micro-habitats that they have studied the features of these animals and plants make them suitable to the habitat what the animals eat in a habitat and how the plants provide shelter for them.

Previous Understanding

- Vertebrate and invertebrate
- Living, dead, never lived
- Characteristics of some animals, their observable features, eating habits and habitats

The sequencing documents show previous skills, knowledge and understanding within KS1. This is from the year 4 sequencing document, 'Animals including Humans.'

| Lower Key Stage 2: Working Scientifically | Upper key Stage 2: Working Scientifically |
|--|--|
| <p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests. • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. | <p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Using test results to make predictions to set up further comparative and fair tests. • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in |

| | |
|---|--|
| <ul style="list-style-type: none"> • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • Identifying differences, similarities or changes related to simple scientific ideas and processes. • Using straightforward scientific evidence to answer questions or to support their findings. | <p>oral and written forms such as displays and other presentation.</p> <ul style="list-style-type: none"> • Identifying scientific evidence that has been used to support or refute ideas or arguments. |
|---|--|

Clear progression documents for the working scientifically skills. Each enquiry type has activities which can be progressed across lower and upper key stage 2.

Clear progression documents for the National Curriculum expectations throughout lower and upper key stage 2.

| Lower Key Stage 2 National Curriculum Expectation | Upper Key Stage 2 National Curriculum Expectation |
|---|--|
| <ul style="list-style-type: none">• Enable pupils to broaden their scientific view of the world around them.• Explore, talk about, test and developing ideas about relationships between living things and familiar environments.• They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.• They should draw simple conclusions and use some scientific language. | <ul style="list-style-type: none">• Enable pupils to develop a deeper understanding of a wide range of scientific ideas.• Explore and talk about their ideas; asking their own questions.• At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.• They should also begin to recognise that scientific ideas change and develop over time.• They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. |

| Animals including Humans | | | |
|---|--|--|--|
| Year 3 | Year 4 | Year 5 | Year 6 |
| Pupils should be taught to: Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection and movement. | Pupils should be taught to: Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey. | Pupils should be taught to: Describe the changes as humans develop to old age. | Pupils should be taught to: Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans. |

Animals including Humans is covered in every year group in KS2 so teachers are aware of what needs to be covered and there is clear progression.

Sequencing document

| | | |
|---|--|---|
| Year 6 – Unit name Evolution and Inheritance | | |
| Suggested Class Texts: <ul style="list-style-type: none"> • Moth: An Evolution Story – Isabel Thomas and Daniel Egneus • Amazing Evolution: The Journey of Life – Anna Claybourne • When Darwin Sailed the Sea – David Long • The Explorer – Katherine Rundell • Evolution and Inheritance – Eleanor Atkinson | | |
| Topic Outcomes: <ul style="list-style-type: none"> • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. | | |
| Topic Reflection: <ul style="list-style-type: none"> • Recognise the impact the work of Mary Anning and Charles Darwin has had on Science. • Raise questions about evolution. • Consider how the environment a living thing adapt to their environment. | | |
| Scientific concepts: | | Vocabulary <ul style="list-style-type: none"> • Off-spring • Adaptation • Evolution • Inheritance • Palaeontologist • Charles Darwin • Genes • Chromosomes • Syndrome • Genotype |
| EYFS + KS1 <ul style="list-style-type: none"> • Observing • Raising questions • Comparing | KS2 <ul style="list-style-type: none"> • Making systematic and | |

Sequencing document

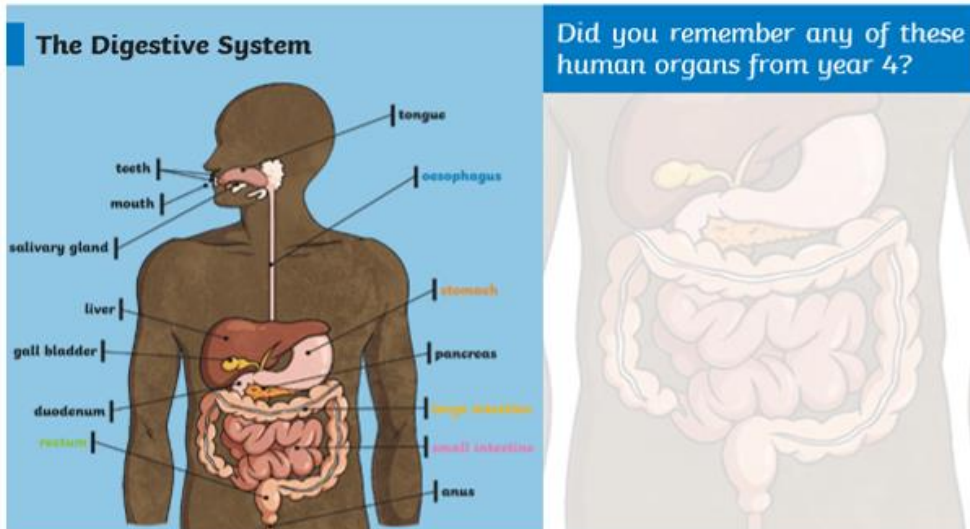
Bespoke schemes of work are created for each individual topic - NC objectives are used to create six lessons.

| | Prior Learning / Recall | Learning Objective | Lesson Outcome- Children will be able to: | Suggested Resources |
|---|---|---|--|---|
| 1 | <p>Different parts of the body have special functions.</p> <p>Recap the simple functions of the basic parts of the digestive system in humans</p> | Identify and name the main parts of the human circulatory system, and describe the function of the heart, blood vessels and blood. | To know the three main parts of the circulatory system and describe the job of the heart. | <p>Lesson 1 - The Heart</p> <p>Worksheet heart diagram</p> <p>Mini whiteboards and pens,</p> <p>PE Equipment: hula hoops, skipping ropes, cone markers,</p> |
| 2 | <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> | <p>Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> | To describe the important jobs of the blood vessels and blood. | <p>Lesson 2 - Blood</p> <p>Plastic container, Cheerios Ketchup Yellow food colouring Mini marshmallows Porridge oats</p> |
| 3 | <p>Identify that animals, including humans, need the right types and amount of nutrition.</p> | <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; record data and results of increasing complexity using classification keys, tables, scatter graphs, bar and line graphs; report findings from enquiries, including conclusions and degree of trust in results, in written forms</p> | <p>To be able to describe the importance of exercise and how it affects the heart.</p> <p>To be able to plan a scientific enquiry.</p> <p>To be able to record, report and present results appropriately</p> | <p>Lesson 3 – Heart rate</p> <p>Worksheet for investigation iPad – stopwatch trainers</p> |

Pedagogy

Expand and Elaborate

| | |
|---|--------|
| Exercise is important. | Year 3 |
| The digestive system contains different organs. | Year 4 |
| It's good to have a balanced diet. | Year 3 |



1) What is the name of this organ?



2) When we exercise, our heartbeat _____.

3) Which object is not a light source?



4) What is a vertebrate?



Pedagogy: Teaching and Learning Strategy

Our Teaching and Learning Strategy outlines the 7 lenses of our approach to pedagogy. These lenses are present in Science lessons, and are embedded in our Science lessons. These can be found on page 2 of our policy and are **sequencing, modelling, scaffolding, questioning, practice/review/retrieve, DEAL strategies and vocabulary.**

| | |
|--------------------------------|--|
| Sequencing | Our sequencing document provides teaching staff with information that outlines what the children have learnt previously. This informs the planning and provides opportunities for retrieval practice. |
| Modelling | Experiments are modelled with clear instructions prior to the children doing them. The write up of experiments is also modelled regularly to ensure that children have a good understanding of the different sections they are expected to complete. |
| Scaffolding | Our school uses the Adaptive Teaching model for all subjects. Our Provision Map for our universal, targeted and individualised approach to Science can be found on page 21. |
| Questioning | Children are questioned regularly throughout the lesson with a particular focus on vocabulary and retrieval of previously learnt knowledge. Question focus frames are used during enquiries to give the children the opportunity to generate their own questions. |
| Practice, review and retrieval | This is done through Flashback 4, expand and elaborate, knowledge organisers, learning new vocabulary and exploring the scientific enquiries through concept labels. |
| DEAL strategies | DEAL strategies are used to interview different scientists. |
| Vocabulary | New vocabulary is learnt each lesson and put up on our displays to remind children. This vocabulary is revisited multiple times during the lesson and the week after. In upper KS2, children are encouraged to use it in the appropriate context in their writing within the lesson. |

Topic knowledge mats are used to reflect on new knowledge and recap on vocabulary. Progression is shown through the school with higher year groups filling in the definitions for new vocabulary.

Year 3 - Rocks

| Key vocabulary | Definition |
|------------------|--|
| Igneous rock | Rock that has been formed from magma or lava. |
| Sedimentary rock | Rock that has been formed by layers of sediment being pressed down hard and sticking together. |
| Metamorphic rock | Rock that started out as igneous or sedimentary rock but changed due to being exposed to extreme pressure or heat. |
| Magma | Molten rock that remains underground. |
| Lava | Molten rock that comes out of the ground is called lava. |
| Sediment | Natural solid material that is moved and dropped off in a new place by water or wind, e.g. sand. |
| Permeable | Allows liquid to pass through it. |
| Impermeable | Does not allow liquids to pass through it. |
| Fossilisation | The process by which fossils are made. |
| Palaeontology | The study of fossils. |
| Erosion | When water, wind or ice wears away land. |

Knowledge Organiser
Rocks

New Knowledge

Lesson 1 —


 Lesson 2 —

 Lesson 3 —

 Lesson 4 —

What do I want to explore further?

Did you know...
 The oldest igneous rock is 4.28 billion years old.
 The earth's crust is made up of rocks.



Igneous Rock

Sedimentary Rock

Metamorphic Rock

I can set up a fair test and explain why it's fair.

I can compare and group rocks based on their appearances and physical properties.

I can identify differences and similarities between rocks.

I can use observations and knowledge to answer scientific questions.

Key Skills

Year 4 – States of matter

| Key vocabulary | Definition |
|----------------|--|
| Water vapour | |
| Condensation | When water vapour that is around us changes from a gas back to water. |
| Precipitation | Any watery substance such as rain, water, snow, hail or sleet that falls to water. |
| Evaporation | |
| Substance | |
| Matter | Any solid, liquid or gas that exists in the universe. |
| Solid | A substance that stays the same shape. Its particles do not move. |
| Liquid | |
| Gas | Gaseous matter is made up of matter that is so loose that it is always |

Knowledge Organiser
States of Matter

New Knowledge

Lesson 1 —

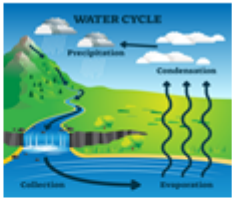
 Lesson 2 —

 Lesson 3 —

 Lesson 4 —

What do I want to explore further?

Did you know...
 The water cycle began about 3.8 billion years ago, when the oceans formed as a result of rain falling on a cooling earth.



I can describe how some materials can change state.

I can explore how materials change state.

I can describe the water.

I can measure the temperature at which materials change state.

Key Skills

Topic knowledge mats are used to reflect on new knowledge and recap on vocabulary. Progression is shown through the school with higher year groups filling in the definitions for new vocabulary.

Year 5 - Forces

| Key vocabulary | Definition |
|------------------|---|
| Friction | |
| Gravity | |
| Air resistance | Air resistance is a type of friction between air and another material. For example, when an aeroplane flies through the air. |
| Water resistance | |
| Levers | A lever can be described as a long rigid body with a fulcrum along its length. |
| Pulleys | Pulley is a simple machine and comprises of a wheel on a fixed axle, with a groove along the edges to guide a rope or cable. |
| Parachute | A parachute is a device used to slow down an object that is falling towards the ground. As the parachute opens, the Air resistance increases. |
| Galileo | |
| Newton | |
| Gears | |

Knowledge Organiser Forces

New Knowledge

Lesson 1 —


Lesson 2 —

Lesson 3 —

Lesson 4 —

What do I want to explore further?

Galileo was the inventor of the _____.



I can control variables in an enquiry.

I can explain a conclusion from an enquiry.

Key Skills


Year 6 - Classification

| Key | Definition (including observable characteristics) |
|---------------|---|
| invertebrate | |
| vertebrate | |
| amphibian | |
| annelid | |
| arachnid | |
| bird | |
| crustacean | |
| insect | |
| mammal | |
| microorganism | |
| reptile | |
| | |
| | |
| | |
| | |


Knowledge Organiser Classification

Key Knowledge

What do I want to explore further?



Carl Linnaeus



Key Skills

Linking learning and remembering learning:

- **Vocabulary and concepts recapped regularly:** Use of working walls to refer to vocabulary and key concepts on a regular basis.
- **Assessment strategies:** Knowledge mats with a focus on 'what you have learnt' and vocabulary, end of unit assessments, 'I can' statement highlighting once an understanding has been shown, questioning at the beginning of each lesson reflecting on new vocabulary learnt last lesson, flashback 4.
- **Sticky learning:** Visitors coming into school, hands on investigations, DEAL strategies.
- **Revisiting and remembering more overtime:**
 - Class discussions 'last year, you learnt... and this year you'll... before next year when you study...'
 - **Green pen time** - An opportunity to recap on previous knowledge and vocabulary.
 - **Flashback 4** - Recalling information from previous topics, in addition to more recent ones.

Assessment: Formative and Summative

In summary, Formative assessments are used to improve learning during a course and Summative assessments are used to evaluate learning at the end of a course.

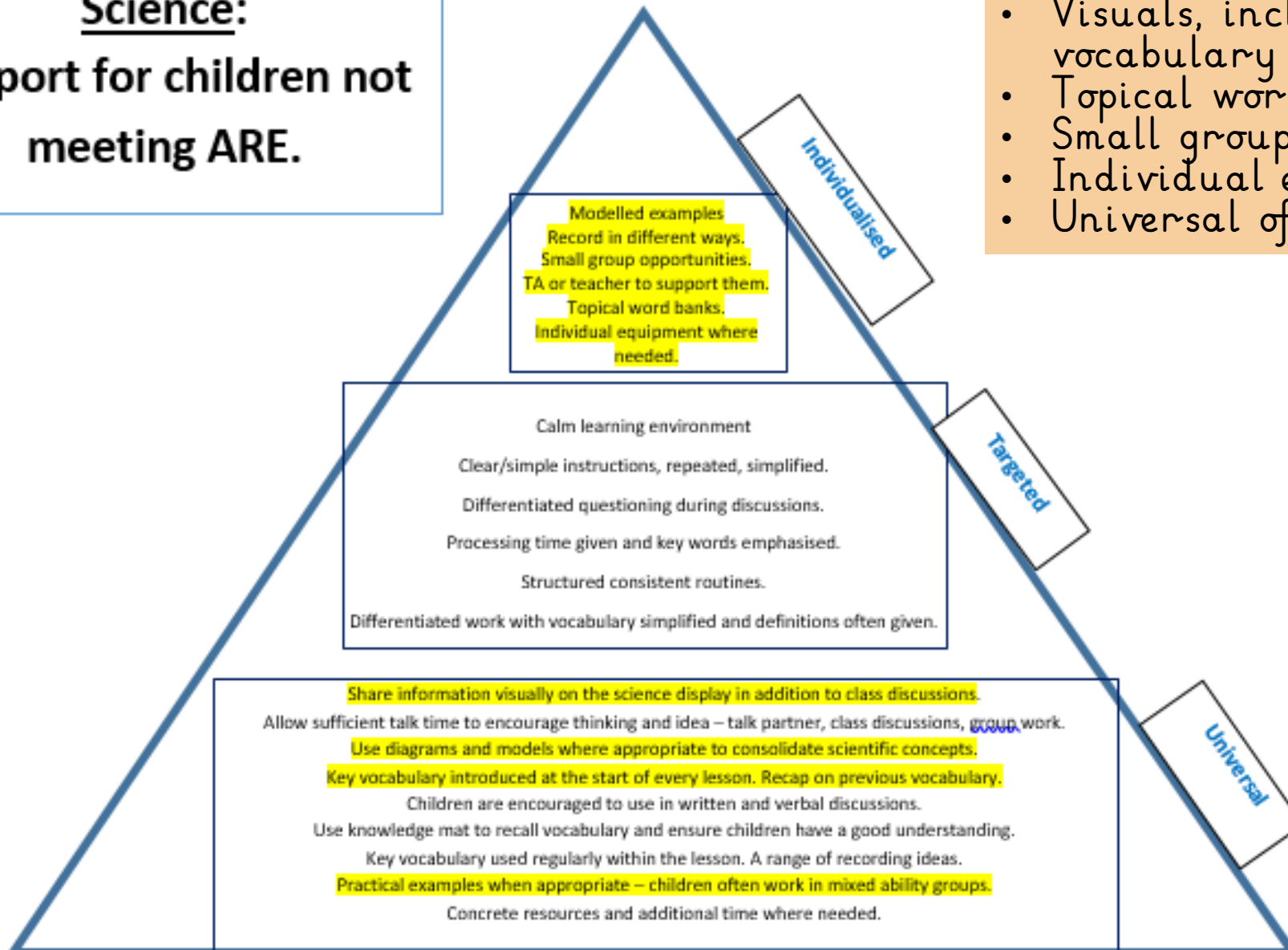
| | Formative Assessment | Summative Assessment |
|---------------------------------|--|---|
| What is it? | Formative assessment is used in Science to help students improve their learning and performance as their work progresses. Teachers consider the student's strengths and areas for improvement, praise their strengths and guide them in mastering their skills. | The goal of summative assessment at our school is to provide an accurate and fair evaluation of student learning and performance. Then using this information to inform and adapt our lessons. |
| What does it look like at CCJS? | Children are assessed throughout topics based on: <ul style="list-style-type: none">• Questioning• Green pen responses• Understanding of scientific concepts shown through the scientific enquiry labels used each lesson.• Ability to use vocabulary in the correct context.• Flashback 4 - Are they able to recall information learnt last lesson, last month, last year, etc. | This year, we have started following White Rose Science and are moving towards all of the assessments being done using them. By September 2024, all year groups will be using these assessments. Currently a mixture of White Rose and CGP assessments are used to measure children's attainment in Science. Teachers then use these assessment grades to judge whether children are meeting year group expectations within that topic. |

Inclusion

Science:
Support for children not meeting ARE.

SEND & EAL:

- Modelled examples
- Pre teach vocabulary
- Visuals, including photos and vocabulary on display
- Topical word banks
- Small group opportunities
- Individual equipment where needed
- Universal offer



Adaptive Teaching - How are children challenged at CCJS?

Challenge:

- Green pen questions to extend their knowledge.
- Classroom secret challenges - often used as an extension or starter. Some children may receive support in order to answer these.
- The opportunity to write up experiments independently starting from year 3.
- Use new vocabulary in sentences.
- Answering questions on the display that require more thinking.
- White Rose scheme used.
- Weekly retrieval practice through a mixture of ways, including flashback 4.
- Knowledge organisers that show progression (see previous slide).

Development and Systems For Renewal

Book Study

Each term or half term, subject leaders complete a Book Study, informed by the Bedford Study. Teachers and a member of SLT choose an area upon which to focus. Subject leads then create a line of questioning and meet with a small group of children from each year group to evaluate that area of the curriculum.

Book Flicks

Every Wednesday morning, teachers meet for a 'Book Flick', bringing a pre-decided selection of books, (for example all teachers bring books 4-8 in the register). Each week will be lead by a different subject lead and books from the correlating subject will be brought. This is a great opportunity to monitor progression, magpie ideas and assess the effectiveness of teaching and learning.

Pupil Voice

Pupil's thoughts and ideas are regularly discussed. After Book Flicks, teachers often ask for pupils to meet and discuss their work. Here, we are able to gauge children's ability to explain and recall their learning. Pupil voice activities are often undertaken in a variety of ways, for example after assemblies, book flicks, during lessons, school council meetings, etc.

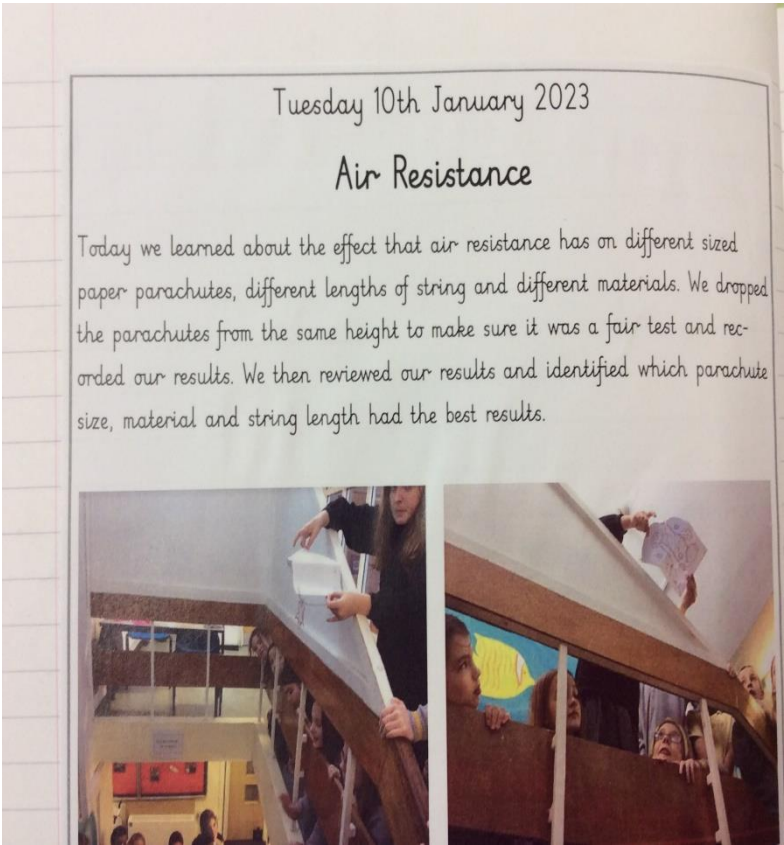
Science - Children's books and outcomes:

Are there non-negotiables for the presentation of science and children's expectations?

- Knowledge mats for each science unit containing the unit's learning objectives, a 'what I have learnt' section and key vocabulary.
- Date and learning objective evident in children's work.
- Sticky labels with the new vocabulary for each week on.
- Presentation and outcomes consistent across year groups: Ensure all classes are presenting learning in the same format and with the same high expectations to challenge children and ensure high quality presentation.

- **Broad, rich and balanced science curriculum** - This is evident through the children's learning which involves a mixture of practical and written work.
- **Knowledge mats** - Rolling out of evidencing progression within year groups. In year 3, children are given the definitions of new vocabulary on their knowledge mats, whereas by year 6 they are writing all of the definitions themselves.
- **Vocabulary emphasis:** children are using vocabulary within their written work and spoken in classroom discussions. It is also visible to all children on the working walls/science displays.

Children's books and outcomes:



Science investigations
This is evidence from an investigation that took place in year 5 based on air resistance. Children were able to make predictions and write up their analysis using scientific vocabulary.

Tuesday 10th January

Air resistance

Complete your results in the table below:

| | Description of parachute (e.g. size/shape/material) | Variable to measure (e.g. time taken for parachute to hit the ground) |
|-------------|--|---|
| Parachute 1 | • Different lengths of string • Same paper, same object | Time Length of string |
| Parachute 2 | • Same length string (30cm) • Same object (Angel) | • A3, A4 and A5 size paper |
| Parachute 3 | • (different size paper) • Same length string (30cm) • Same height, same object • different shape | • Time • Shape |

Prediction

I think the parachute that will fall the slowest is parachute number 3.

I think this parachute will have the most air resistance because it has the same length string, same height, same object and a different shape.

Fair test

We will make our test fair by dropping the parachute ~~at~~ the same time and the same length.

Designing the perfect parachute results

| Type of Parachute (with variables) | Measurements (when appropriate) | First Reading (Time in Seconds) | Second reading (Time in Seconds) | Analysis: Fastest/Slowest |
|---|---|---------------------------------|----------------------------------|---------------------------|
| Parachute using different lengths of string | 30cm 20cm 10cm | 2.10 2.01 1.10 | 2.05 1.58 1.05 | Slowest Fastest |
| Parachute using different sizes of paper | A3 A4 A5 | 1.56 1.85 1.95 | 1.60 1.75 1.51 | Slowest Fastest |
| Parachutes with different shapes | Thin rectangle Cloud shape Oval shape | 1.17 2.20 2.08 | 1.07 2.00 2.01 | Fastest Slowest |
| Parachutes using different weight of paper (Tissue paper) | Rolled up Folded Flat area | 1.75 2.43 3.44 | 1.66 2.38 2.75 | Fastest Slowest |

I wonder whether changing the weight of the paper will make a difference? We will keep the length of string, the object and height the same but will change the tissue paper.

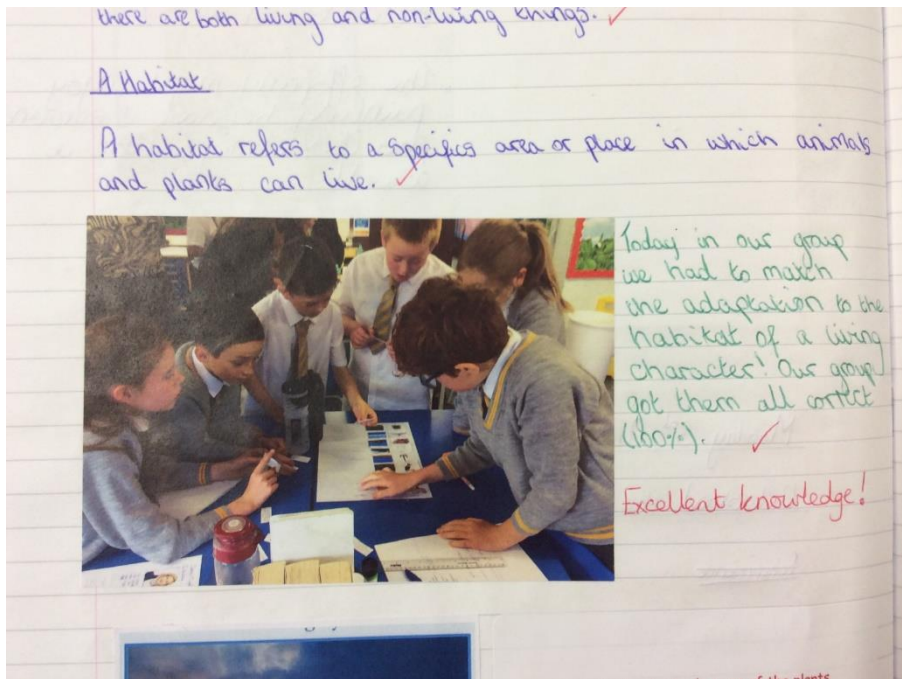
We tested the parachutes twice because we wanted to make it fair.

The A5 paper was the fastest to fall in that category because it was the smallest and therefore it has the least air.

The parachute that was the most successful was the flat tissue paper because it had taken it 3.44 seconds to fall.

The parachute that was the least successful was the 10cm paper because its time it took to land was 1.05 seconds.

Children's books and outcomes:



Science investigations take place regularly across all year groups within every topic.



Thursday 13th October

Explain what soil is and how it is formed.

Soil: Soil is a mix of organic material (decayed plants and animals) and broken bits of rocks and minerals.

Organic matter: Organic matter has come from a recently living organism. It is capable of decaying.

Clay: Limestone, Sand, Clay, Chalk → Lighter

Moisture: Sand, Limestone, Clay, Chalk → Darker

Texture: Sand, Limestone, Clay, Chalk → Smooth

Ice causes rocks to freeze inside so they turn into bits.

Soil is made up of things like sand and pebbles and things that grow in the soil.

People dig and dig to get things like sand and pebbles and things that grow in the soil.

The wind and the rain make the rocks break up into bits and pieces and mix them into the soil.

Soil is made of worn down bits of rocks mixed with water, air and organic matter. Organic matter is anything that came from plants and animals. Soil is important because we need it to grow plants for food.

Tuesday 15 November

Sir Isaac Newton and gravity

Sir Isaac Newton

Who was he? Isaac Newton was born in 1643 and died in 1727 and he was buried in Westminster Abbey next to some very famous people. I came to an M.P., Master of royal mint and a Master of the royal British society.

What makes him famous? Newton discovered laws of motion, light spectrum and most importantly gravity. He discovered this when he was next to an apple tree and an apple fell on his head.

Did you know? Did you know that the Moon's gravity is $\frac{1}{6}$ of the Earth's and you know? Did you know that weight and mass are measured in kilograms.

WOW! The bigger the object the smaller the matter and the smaller the object the bigger the matter. Gravity is an invisible force that is everywhere.

Excellent work Eabha!

Monday 12th December 2022

How does the skeleton support the body?

Endoskeleton

Hedgehog, Giraffe, Frog, Snake

An animal with an endoskeleton has a back bone (vertebrae). These grow inside their body. The advantage of a giraffe endoskeleton is that it can reach up high to get its food or trees. The disadvantage of a giraffe having an endoskeleton is that it can't get through small gaps.

Exoskeleton

Giraffe, Grasshopper, Spider, Scorpion

An animal with an exoskeleton has no back bone (vertebrae). This grows on the outside of their body. The advantage of a plan having an exoskeleton is that it has protection so it doesn't get eaten easily. The disadvantage of a grasshopper having an exoskeleton is that it is very small so it could get eaten.

Hydrokeleton

Worm, Octopus

Is I was an animal and could pick a which type of skeleton I could have I would have an endoskeleton because I could stand up and reach for things and bend instead of wiggling.

Hydrokeletons do not have any bones or hard substance in their bodies. An advantage of a worm is it can get through small holes. A disadvantage of an octopus having a hydrokeleton it doesn't have protection and it's sloppy.

Thursday 3rd November

Understand how humans have evolved

Physical Appearance

| Australopithecus Afarensis | Human |
|--|-------|
| | |
| Similarities <ul style="list-style-type: none"> - They are the same height - They both have 10 fingers and 10 toes - They both have hair - They have the same posture | |
| Differences <ul style="list-style-type: none"> - The Australopithecus Afarensis has a different head shape - The Afarensis has more spread out teeth - The Afarensis has much more fur - The Human has clothes on | |

Green Pen Time

Which kingdom do humans belong to? Animal

Which domain do humans belong to? Eukaryote

Skeletons

| Australopithecus Afarensis Skeleton | Human Skeleton |
|---|----------------|
| | |
| Similarities <ul style="list-style-type: none"> - The spines are the same length - The same number of bones - Both have a cranium - Both have a pelvis | |
| Differences <ul style="list-style-type: none"> - The skulls are different as the humans is bigger - Humans have hair - The shape of the cranium are different as the humans are - Australopithecus Afarensis shoulders are sticking up | |

Green Pen Time

How can we use fossils as evidence of evolution? They are used to look like to us to date.

What else can we use as evidence of evolution? Scientists now use technology to study these type of things can also now compare.

Tuesday 8th November

Explain why we have different seasons

| Time of Sunrise (am) | | | | | | | | | | | |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 8.05 | 7.40 | 6.45 | 6.35 | 6.32 | 6.49 | 6.48 | 6.25 | 6.14 | 7.02 | 6.55 | 7.44 |

| Time of Sunset (pm) | | | | | | | | | | | |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 4.02 | 4.49 | 5.41 | 7.34 | 8.24 | 9.09 | 9.21 | 8.48 | 7.45 | 6.37 | 4.33 | 3.55 |

When the earth leans towards the Sun, it is Summer. The sun will rise earlier and set later.

When the earth is leaning further away from the sun, it is winter. The sun will rise later and set earlier.

Children demonstrate that presentation is important and produce high quality work. There is also evidence in all year groups of cross curricular activities, particularly maths using bar charts, line graphs, etc to present their findings following experiments.

Book Flick and Pupil Voice - Autumn term

'I find science really interesting, especially when we learnt about magnets attracting and repelling. I also loved learning about rocks eroding.' Year 3

'I love doing experiments in science and feel like I am challenged a lot.' – Year 4

'We learnt about what happens to your body as you get older recently and I found it very useful to know. We do lots of experiments, my favourite is making blood.' – Year 6

'I love learning new things every week. I find some things challenging like air resistance but it's also interesting.' – Year 5

'I liked it when we learnt about muscles because it was a really practical lesson that was fun but taught us a lot. I found out that the funny bone is actually called a the humerus.' – Year 3

'I like that science is part of so many jobs, we learnt this during science week.' – Year 4

Book Flick and Staff Voice - Autumn term

Whole school book flick feedback

- Each year group is encouraging children to provide new vocabulary in their written work.
- Books throughout key stage 2 clearly evidence progression and increase in expectations.
- Children are actively using key vocabulary.
- Expectations are made clear and children produce work to a high quality with outstanding presentation in all areas of Science.

'I enjoy teaching science giving the children an opportunity to learn more about the world. I feel that my knowledge of the subject is definitely a strength that enables me to teach it well.'

'My strength in science is planning experiments.'

'Science is an essential part of children's education that is needed in order to develop their minds.'

'I sometimes have to familiarise myself with new topics but I feel that this is good for my own subject CPD.'

Areas of strength and next steps -Spring term

Strengths

- The concept labels are being used effectively.
- Lots of evidence of adaptive teaching → real life predictions, photos showing step by step experiments for children to use when writing it up, scaffolds for writing, pictures with explanations for vocabulary, visuals.
- Correcting scientific vocabulary.
- White Rose is being used regularly → Challenge questions and flashback 4.
- Opportunities for pupils to challenge themselves through green pen time/extension questions (CGP and White Rose).
- Evident retrieval practice → Lots of 'I can still',
- Big questions being used to encourage deeper thinking (on the server in the science folder)
- Cross curricular links to maths through the use of bar charts/line graphs.
- Presentation was good 😊 It is clear that children see it as important as other subjects.

Next steps

- Consistency in marking. Can we challenge the children in other ways without having to write lengthy comments in their books?
- Incorrect use of vocabulary to be revisited.
- More fieldwork or trips that link to science topics.

Book Flick and Pupil Voice - Spring term

'I loved learning about rocks. We got to use tools to make the rocks erode and that was cool. I wouldn't remember what the word erosion meant if we hadn't have done that.' Year 3

'The states of matter topic has been my favourite. There are lots of experiments involved and it's interesting seeing it go from a solid to a liquid through the process of melting.
Year 4

'The forces topic was by far my favourite. The experiments are so much fun and helped me understand it better.'
Year 5

'The evolution topic was really interesting despite it being difficult. I particularly enjoyed learning about Darwin's theory of Evolution.
Year 6

This year's science week theme was 'Time'. Each year group was given a topic that they had previously covered within the last two years and went back in 'time' to revisit it.

Tuesday 12th March
Science week - life cycles

Chicken Life Cycle:

- Independent adults** seek the company of opposite sex and mate.
- eggs** are laid by the mother. They care for the egg until it hatches.
- chick** (The young bird is fed until it is old enough to find its own food.)
- adult**

Butterfly Life Cycle:

- adult** (The adult escapes out of the egg, matures and lays the eggs.)
- eggs** (eggs are laid by the female insect.)
- caterpillar** (The egg hatches into this. It's not the caterpillar under the leaf, it's the caterpillar.)
- pupa** (The pupa is usually where a bird case is formed around the larva...)
- adult** (The pupa is usually where a bird case is formed around the larva...)

Comparison:

These life cycles are diploid because a chicken goes through a different amount of life. There is also a difference between a butterfly going through metamorphosis and a chicken. A chicken was a hen, a butterfly doesn't.

[illegible]