



## GOD'S LOVE IN ACTION

St John's and St Peter's CE Academy is a welcoming school family that seeks to serve the Ladywood community by equipping its children and families for success.

By placing **God's love in action** at the heart of everything we do, we hope to see our **children flourish, our culture transformed, and our community thrive.**

Through **high-quality education** and an **enriching curriculum**, we will equip every child with the knowledge and skills they need to **overcome challenges** and therefore **achieve their full potential.**

Our hope is that every child at St John's and St Peter's CE Academy can **uniquely contribute to the community and make it a place they are proud to call home.**

# Science Implementation

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# 1. Curriculum and Progression

Our Science Curriculum is taken from the newly developed White Rose Science schemes of learning. White Rose Science takes the highly successful approach that was pioneered with White Rose Maths and transfers it to the primary science curriculum. It uses a “small steps” approach to science teaching, and closely follows the national curriculum for science for years 1 - 6. It gives specialist and non-specialist teachers a one stop solution as they help children develop scientific understanding and grasp scientific ideas. Teachers are trained to use the White Rose Science schemes as a foundation for delivering quality Science lessons. However, the expectation is that these are then adapted and suited to the needs of their individual pupils.

Through our online access to the White Rose materials, Teachers are provided with medium term and weekly planning for science lessons. While non-negotiable lesson objectives (small steps) are provided to ensure full coverage of the National Curriculum, teachers are also encouraged to adapt and differentiate these plans to best suit their cohort (making learning challenging yet achievable for all). This is often necessary as the small steps can be condensed or extended across different lesson lengths.

Whilst some topics are year group specific, others are taught across different years and are designed to push the pupils’ knowledge forward. ‘Earth and Space’ and ‘Evolution and Inheritance’ are examples of units that are taught in individual year groups. This is because these units build on each child’s inquisitive nature.

However, ‘Plants’, ‘Animals, including Humans’ and ‘Living Things and their Habitats’ are taught throughout a number of year groups as the children deepen their understanding of key concepts.

Here is an example of progression during the ‘**Animals, Including Humans**’ units across each year group:

| Year 1  | Year 2   | Year 3  | Year 4  | Year 5  | Year 6  |
|---|--|---|---|---|---|
| <ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</li> <li>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</li> </ul> | <ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults</li> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul> | <ul style="list-style-type: none"> <li>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</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> </ul> | <ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans</li> <li>Identify the different types of teeth in humans and their simple functions</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul> | <ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age</li> </ul> | <ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans</li> </ul> |
| Autumn 1<br>Spring 2  | Autumn 1, Autumn 2<br>Spring 2<br>Summer 2, Summer 4   | Autumn 1, Autumn 2,<br>Autumn 3   | Summer 4, Summer 5  | Spring 2  | Summer 3, Summer 4  |

## 2. Lesson Structure

Science lessons begin with a **Do Now** activity. These short burst recaps, help children to recall prior learning, and make connections with the required substantive knowledge for that lesson. The **Learning Objective** and **New Vocabulary** are also shared with the children.

Next, the adult will use high quality instruction and modelling to teach the lesson's new learning. Walkthrus teaching strategies, such as **Live Modelling**, **Modelling Handover (I do, We do, You do)** or **Worked Examples and Backwards Fading** allow pupils opportunity to tackle misconceptions and practice the skills necessary to achieve the learning objective. At a key moment in the lesson, teachers will use a **Check for Understanding** to quickly decide whether pupils are ready to move on. This could be a **Hinge Question**, **Show Me Boards**, **Cold Calling** or other related Walkthrus strategies.

Finally, children are given a chance to apply their learning in an **Independent** or **Group Activity**. The teacher will use this to assess whether the pupils are ready to move onto the part in the sequence of learning.

When appropriate, the teacher will finish the lesson by recapping the learning and addressing any misconceptions that have arisen. This could be in the form of **Whole Class Feedback**, **Feedback that Moves Forward**, or **Feedback as Actions**.

## 3. Practice and Retrieval

The use of Medium-Term Plans and Schemes of Learning support teachers in sequencing learning. Additionally, every lesson starts with a Do Now to activate prior learning and help the children remember things that they have learnt before. We also complete frequent low stake curriculum quizzes which effectively review learning and helps to ascertain whether pupils are confident and accurate in what they have learnt and ultimately that they have retained the knowledge. The aim is to ensure that lessons will develop long-term memory by allowing for repetition of learning within the year and across the years.

## 4. Assessment

Assessment is an integral part of teaching, as it determines whether the goals of education are being met. However, we recognise that assessment goes far beyond tracking spreadsheets and termly knowledge tests. At its core, assessment should lead children to learn more effectively.

Assessments serve the students by letting them know what errors they made and how they could correct those errors. It also helps students to reinforce the content better in the event they don't remember it very well. Assessments also helps teachers better understand what worked and what didn't in their classes. For example, if the average score in a mini-quiz was lower than expected after the test, then the teacher knows that something didn't click with the students. In such a scenario, it helps the teacher change the way the content was earlier taught and use other ways to teach the same content moving forward.

Assessment at St John's and St Peter's CE Academy is guided by two key pieces of research: McCourt's (2019) '**Mastery Model of Education,**' and Fletcher-Wood's (2018) model of '**Responsive Teaching.**'

### Mastery model of education

|   |  |
|---|--|
| Diagnostic pre assessment with pre teaching               | All children need the foundations for the upcoming new learning.   |
| High quality, group based initial instruction             | Multiple ways of communicating and teaching each and every concept.<br>Lots of practice.                   |
| Progress monitoring through regular formative assessments | Timely action when children have not understood  |
| High quality corrective instruction                       | Intense, individualised assistance offered early.<br>Most children will need this at some point.           |
| Second, parallel formative assessments                    | If the child still has not gripped the idea, then the cycle repeats.<br>All will grasp concepts eventually |
| Enrichment or extension activities                        | Take an idea into much greater depth and well beyond the expectations of the statutory school curriculum.  |

McCourt (2019)

Fletcher-Wood (2018) outlines a model of '**Responsive Teaching**' with three clear principles:

1. **Setting clear goals and planning learning carefully.**
2. **Identifying what children have understood and mis-understood.**
3. **Responding and adapting teaching to support children to improve.**

Our assessment process is designed to align with these three principles and give teachers the opportunity to respond and adapt teaching to support children to improve.

## Before the Unit begins

### High Quality Planning

Long-term and Medium-term planning provided by the Subject Lead ensures that lessons are designed to build on prior learning.

## During each lesson

### Do Now

Each lesson begins with a low-stakes, low threat recap that help children to recall prior learning and make connections with the required substantive knowledge for that lesson.

### Feedback

Teachers finish the lesson with a recap of learning and addressing misconceptions that have arisen. This could be Whole Class Feedback, Feedback that Moves Forward, or Feedback as Actions.

### Check for Understanding

After the learning input, adults will use key strategies such as Hinge Questions, Show Me Boards or Cold Calling to check for understanding. This allows teachers to assess whether the majority of pupils are ready to move to the Independent Activity.

## During or at the end of the Unit

### Unit Check-Ins

Low stakes, low threat check-ins designed to assess the progress of the pupils mid-way through the unit. This could be in the form of questioning, quizzing, or other formative assessment methods.

### Quizzing

A simple routine knowledge quiz that checks students have learned the material that you want them to know. These could take place during a unit, or at the end. Quizzing provides information to student and teacher about where gaps exist.

### Double-Page Spreads

An open response task for pupils to showcase what they have learned. The precise form of this response is not critical, but it may include pictures and labels, key vocabulary, descriptions, or verbal presentations.

### “End Product” Evaluations

This could be a performance in music or a purposeful “product” in D&T. Students and teachers can reflect on the process of creating these end products and evaluate whether they have been successful.

*Teachers have autonomy to choose the most appropriate form of assessment to use during, or at the end of the unit. Although some assessment strategies lend themselves to different subjects, there is no requirement to perform a specific one at a specific time.*

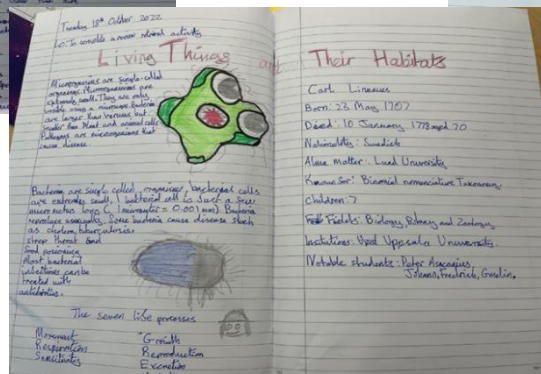
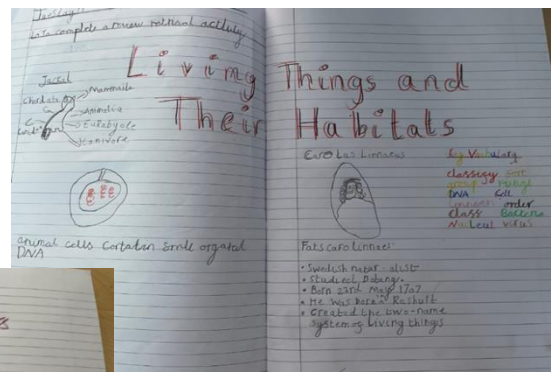
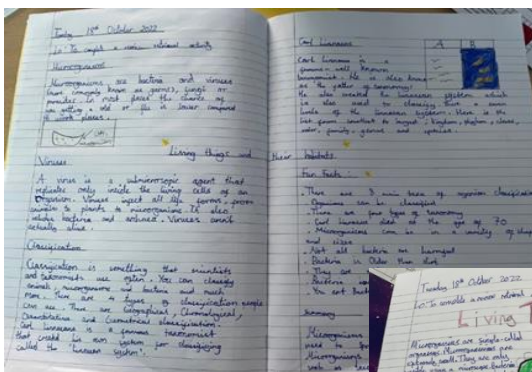
## Summative Assessment:

Throughout our assessment week at the end of each term, children now do 'End of Unit Assessments' linked to the topics that have been taught throughout that term to measure the level of knowledge sustained. This will also allow teachers to see where children need more practice of a certain skill or topic and allow for any misconceptions to be addressed before they continue into the next term. This will also allow for children to be assessed in a core subject that they may thrive in.

## Knowledge Captures

We also use 'Knowledge Captures' as a way of evidencing the knowledge that certain children have who may struggle to record this in their book. These are uploaded to Solar, our digital tracker for SEND pupils and those working below the expected standard.

## Double Page Spreads



## 5. Supporting pupils with SEND

At St John's and St Peter's CE Academy, we aim for all Science lessons to be accessible for all pupils. We recognise that high-quality teaching is what is best for all pupils, including those with SEND or other additional needs. Our consistent approach to teaching is underpinned by Walkthrus instructional coaching, equipping teachers with a toolkit of research-based strategies that have been proven to work in the classroom.

Where pupils may have additional needs that could prevent them from engaging with the content of a lesson, the class team will make adaptations to ensure that each child can access the learning. Some pupils may require extra time or support in the classroom, while others may require pre-teaching of specific vocabulary or concepts. Teachers are encouraged to use word banks and sentence stems to



aid with writing, and may also use additional programmes such as InPrint to dual-code resources for the children. Knowledge organisers are also used to aid understanding and recall.

The practical, investigatory nature of Science means that pupils can learn in a hands on, exploratory way, discovering the world around them.

As part of termly Pupil Progress meetings, the Deputy Head and SENDCo meet with the class teacher to identify any barriers to learning that may be hindering progress, liaising with the Pastoral Care Manager to build up a holistic view of all pupils. Staff are confident to raise any concerns they have about specific pupils, and regularly seek guidance for additional strategies or advice.

Science in the Hub is a key part to our SEND pupil’s learning. The children follow a tailored a curriculum which has been designed by the Science Lead, SENDCo, and hub staff. It has elements of the White Rose Science curriculum but leads with a practical focus. The children are given multiple opportunities to learn the vocabulary in a sensory way to ensure their learning is taught in context for their individual needs.

## 6. Science in EYFS

At St John’s and St Peter’s we have one curriculum. However, the end points for EYFS and Years 1 – 6 come from different places. The EYFS framework is structured very differently to the National Curriculum as it is organised across seven areas of learning rather than subject areas. The statements from the 2020 Development Matters are prerequisite skills for science within the National Curriculum. The most relevant statements for science are taken from the following areas of learning:

- Communication and Language
- Personal, Social and Emotional Development
- Understanding of the World

At St John’s and St Peter’s Academy, we incorporate science into our learning environment as the children explore and learn by ‘working scientifically’. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Reception to match the programme of study for Science.

|                  |  |  |
|------------------|--|--|
| <b>Reception</b> | Communication and Language                 | <ul style="list-style-type: none"> <li>• Learn new vocabulary.</li> <li>• Ask questions to find out more and to check what has been said to them.</li> <li>• Articulate their ideas and thoughts in well-formed sentences.</li> <li>• Describe events in some detail.</li> <li>• Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.</li> <li>• Use new vocabulary in different contexts</li> </ul> |
|                  | Personal, Social and Emotional Development | <ul style="list-style-type: none"> <li>• Know and talk about the different factors that support their overall health and wellbeing:               <ul style="list-style-type: none"> <li>- regular physical activity</li> <li>- healthy eating</li> <li>- toothbrushing</li> <li>- sensible amounts of ‘screen time’</li> </ul> </li> </ul>  |

|     |  |   |   |
|-----|--|---|---|
|     |  | <ul style="list-style-type: none"> <li>- having a good sleep routine</li> <li>- being a safe pedestrian</li> </ul>  |   |
|     | Understanding of the World                 | <ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel while they are outside.</li> <li>• Recognise some environments that are different to the one in which they live.</li> <li>• Understand the effect of changing seasons on the natural world around them.</li> </ul> |   |
|     | Communication and Language                 | Listening and Attention and Understanding   | <ul style="list-style-type: none"> <li>• Make comments about what they have heard and ask questions to clarify their understanding.</li> </ul>  |
| ELG | Personal, Social and Emotional Development | Managing Self   | <ul style="list-style-type: none"> <li>• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices</li> </ul>   |
|     | Understanding the World                    | The Natural World   | <ul style="list-style-type: none"> <li>• Explore the natural world around them, making observations and drawing pictures of animals and plants.</li> <li>• Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</li> <li>• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</li> </ul> |

At St John's and St Peter's CE Academy, the EYFS curriculum has planned topics to ensure that statements above are met. These include minibeads; where children can observe, predict and document their findings, The stars; where children explore the topic of space and nature, Dinosaurs; where children explore fossils, habitats and diets, Seasonal Changes; where children discuss and explore the seasons, Materials; where children explore and experiment with different materials to build bridges, and food science; where children prepare and taste a variety of food.

Alongside this, children 'work scientifically' by asking questions to clarify understanding, use talk to help work out problems and learn new vocabulary. The classroom environment is set up to enable children to access resources independently which encourages thinking, problem solving and experimentation. Adults in the classroom use tiered vocabulary to enhance children's understanding and targeted questioning to scaffold learning within the environment. Specific adult-led activities are designed to challenge and develop the children's knowledge and understanding.

## 7. Supporting classroom teachers

At St John's and St Peter's CE Academy, we aim to offer our classroom teachers a high level of support. Our Science lead gives all teams a Long Term plan overview with all the units which should be taught



and the order in which they need to be taught. All lesson plans and resources are available through our White Rose Science subscription. Our Science lead always encourages teachers to adapt and change lessons depending on their pupil's need however the foundations are in place for all members of staff. Teachers have access to all online resources, including PowerPoints, Do Now activities and classroom-based resources. Staff are given staff INSETs led by the Science lead when changes are occurring or when the expectations of the classroom are changing. Our science lead is continuing their own CPD so they are able to support all staff to the best of their ability. Teachers are given a detailed and well thought out educational visits/workshops document to run alongside their planning, so they can offer the pupils the best possible learning experiences. As a school, we have a fully stocked resource cupboard, so teachers are able to carry out practical lessons with the children and ensure they engage in hands on experiences. We pride ourselves on offering support to all staff, in turn staff know they have on hand support whenever needed.

## 8. Additional Information

At St John's and St Peter's, our aim is to create lifelong learners. We understand that Science is a big part of the wider world, so we strive to give the pupils the best opportunities. By taking part in British Science Week, staff and children are allowed to see Science in a different light. Three afternoons are dedicated for Science and the lessons may not link to their current unit but it allows children to think like scientists and explore science in many different ways. During 21-22 the theme was all about **growth**, **connections** was the theme of 22-23 and **time** was the theme for 23 -24.

