

## Mission Statement

[Inclusion](#) and [equality](#) are paramount principles and we consider the Equality Act of 2010; all pupils are afforded the same opportunities, regardless of ethnic origin, gender, gender reassignment, sexual orientation, class, religion, aptitude or disability.

We seek to increase an individual's [Science Capital](#) (and in turn contribute to their [Cultural Capital](#)) by considering the latest research and thinking underpinning curriculum design, this includes the terminology:

[Mastery](#);

[Longitudinal Learning](#);

[Conscious Connections](#);

[Golden Threads](#).

It is from understanding of these that we offer a [broad, balanced and relevant](#) science curriculum that is rich in experiences, opportunities and challenges which in turn seek to inspire individuals, allowing them to build skills in deeper level thinking and resilience, ultimately affording them opportunity to work towards our over-arching [Golden Threads](#):

- ✓ **We want our students to be able to apply science in their lives and make sensible and mindful decisions to stay safe and take care of themselves**
- ✓ **We want our pupils to increase their sense of belonging to their community and be responsible global citizens.**

## Curriculum Rationale Underpinning Intent

As a science department we aim to base our curriculum on a combination of current academic research in education and personal knowledge, understanding and experience. When considering our curriculum intent, we define four elements, ‘Mastery’, ‘Longitudinal Learning’, ‘Conscious Connections’ and ‘Golden Threads’.

PCA has a whole school commitment to follow a curriculum based on the current National Curriculum in England (Department for Education, 2014). The research for the review of the National Curriculum (2011) concluded that a successful curriculum should “[focus on fewer things in greater depth, in secure learning which persists, rather than relentless, over-rapid progression](#)”; this is known as a ‘[Mastery Curriculum](#)’. Pupils should repeat the content as many times as possible across the key stage and gradually deepen their understanding. ‘Mastery’ is, therefore, not a style of teaching or a standard to meet. It is a concept of [gradual deepening of understanding](#). The aim is not to ‘achieve’ learning in a lesson as if this is a final destination. Instead, pupils should have multiple opportunities to return to content, over time, in order to [gain a growing developmental understanding](#)

Chris Quigley led whole school training and as a department, we consider two of his fundamental principles when considering curriculum intent. Firstly, [longitudinal learning](#) which he describes as:

“how pupils may take their time to learn the things that matter across a much longer period of time than a lesson, perhaps even a whole key stage.” (Quigley, 2017)

Secondly, Quigley accentuates the importance of ‘[conscious connections](#)’ which he explains “shows how several aspects of the curriculum can be learned at the same time” This includes links between subjects (cross-curricular) and within subjects (intra-

curricular). His principles are reinforced by the research of Brooks, 2002; Fletcher-Campbell, 2000; Reason, 2003; Schmidt et al., 2002.

Recently, as a department, we rigorously scrutinised each National Curriculum science theme, and from this, identified '[Golden Threads](#)' in each subject area which in turn link to our overarching Golden Threads; subject Golden Threads can be seen in figure 1.

## Curriculum Intent By Key Stage

### Foundation Stage

Our early years foundation stage curriculum and some of our key stage one curriculum is based on the 2017 Department for Education document: 'Statutory Framework for Early Years and Foundation Stage'.

Your child will be learning skills, acquiring knowledge and demonstrating their understanding through 7 areas of learning and development.

Children should mostly develop the 3 prime areas first:

- Communication and language
- Physical development
- Personal, social and emotional development

These prime areas are those most essential for your child's healthy development and future learning. As children grow, the prime areas will help them to develop skills in 4 specific areas:


- Literacy
- Mathematics
- **Understanding the world – Science lies in here!**
- Expressive arts and design


The following details the different levels of 'Understanding the World'. Our curriculum is provided through an environment of continuous provision, which promotes curiosity and wonder for all. Tailored to meet your child's currently ability and with the understanding that individuals need to guide their own journey at a pace that is suitable for them. The following details the various levels of 'Understanding the World'.



## Development matters in the Early Years Foundation Stage (EYFS)

### Specific area: Understanding the World

	Aspect People and communities	Aspect The World	Aspect Technology
<b>Progress</b>	<p><i>The beginnings of understanding of People and communities lie in early attachment and other relationships.</i> See Personal, Social and Emotional Development and Communication and Language</p>	<ol style="list-style-type: none"> <li>1. Moves eyes, then head, to follow moving objects.</li> <li>2. Reacts with abrupt change when a face or object suddenly disappears from view.</li> <li>3. Looks around a room with interest; visually scans environment for novel, interesting objects and events.</li> <li>4. Smiles with pleasure at recognisable playthings.</li> <li>5. Repeats actions that have an effect, e.g. kicking or hitting a mobile or shaking a rattle.</li> </ol> <p><i>See also Characteristics of Effective Learning – Playing and Exploring, and Physical Development</i></p>	<p><i>The beginnings of understanding technology lie in babies exploring and making sense of objects and how they behave.</i></p> <p><i>See Characteristics of Effective Learning - Playing and Exploring and Creating and Thinking Critical</i></p>
	<p><i>The beginnings of understanding of People and communities lie in early attachment and other relationships.</i> See Personal, Social and Emotional Development and Communication and Language</p>	<ol style="list-style-type: none"> <li>6. Closely observes what animals, people and vehicles do.</li> <li>7. Watches toy being hidden and tries to find it.</li> <li>8. Looks for dropped objects.</li> <li>9. Becomes absorbed in combining objects, e.g. banging two objects or placing objects into containers.</li> <li>10. Knows things are used in different ways, e.g. a ball for rolling or throwing, a toy car for pushing.</li> </ol>	<p><i>The beginnings of understanding technology lie in babies exploring and making sense of objects and how they behave.</i></p> <p><i>See Characteristics of Effective Learning - Playing and Exploring and Creating and Thinking Critical</i></p>
	<ol style="list-style-type: none"> <li>1. Is curious about people and shows interest in stories about themselves and their family.</li> <li>2. Enjoys pictures and stories about themselves, their families and other people.</li> </ol>	<ol style="list-style-type: none"> <li>11. Explores objects by linking together different approaches: shaking, hitting, looking, feeling, tasting, mouthing, pulling, turning and poking.</li> <li>12. Remembers where objects belong.</li> <li>13. Matches parts of objects that fit together, e.g. puts lid on teapot</li> </ol>	<ol style="list-style-type: none"> <li>1. Anticipates repeated sounds, sights and actions, e.g. when an adult demonstrates an action toy several times.</li> <li>2. Shows interest in toys with buttons, flaps and simple mechanisms and beginning to learn to operate them.</li> </ol>
	<ol style="list-style-type: none"> <li>3. Has a sense of own immediate family and relations.</li> <li>4. In pretend play, imitates everyday actions and events from own family and cultural background, e.g. making and drinking tea.</li> <li>5. Beginning to have their own friends.</li> <li>6. Learns that they have similarities and differences that connect them to, and distinguish them from, others.</li> </ol>	<ol style="list-style-type: none"> <li>14. Enjoys playing with small-world models such as a farm, a garage, or a train track.</li> <li>15. Notices detailed features of objects in their environment</li> </ol>	<ol style="list-style-type: none"> <li>3. Seeks to acquire basic skills in turning on and operating some ICT equipment.</li> <li>4. Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car.</li> </ol>
	<ol style="list-style-type: none"> <li>7. Shows interest in the lives of people who are familiar to them.</li> <li>8. Remembers and talks about significant events in their own experience.</li> </ol>	<ol style="list-style-type: none"> <li>16. Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.</li> </ol>	<ol style="list-style-type: none"> <li>5. Knows how to operate simple equipment, e.g. turns on CD player and uses remote control.</li> <li>6. Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones.</li> </ol>

<p><b>Progress</b></p> 	<p>9. Recognises and describes special times or events for family or friends.          10. Shows interest in different occupations and ways of life.          11. Knows some of the things that make them unique, and can talk about some of the similarities and differences in relation to friends or family.</p>	<p>17. Can talk about some of the things they have observed such as plants, animals, natural and found objects.          18. Talks about why things happen and how things work.          19. Developing an understanding of growth, decay and changes over time.          20. Shows care and concern for living things and the environment</p>	<p>7. Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.          8. Knows that information can be retrieved from computers</p>
	<p>12. Enjoys joining in with family customs and routines.</p> <p><b>Early Learning Goal</b>  <b>Children talk about past and present events in their own lives and in the lives of family members. They know that other children don't always enjoy the same things, and are sensitive to this. They know about similarities and differences between themselves and others, and among families, communities and traditions.</b></p>	<p>21. Looks closely at similarities, differences, patterns and change.</p> <p><b>Early Learning Goal</b>  <b>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.</b></p>	<p>9. Completes a simple program on a computer.          10. Uses ICT hardware to interact with age-appropriate computer software.</p> <p><b>Early Learning Goal</b>  <b>Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.</b></p>

## Key Stage 1

This curriculum has the potential to overlap with the EYFS Curriculum Intent or Key Stage 2 rolling programme (dependant on ability). The following depicts the Rolling Programme for KS1 and allows us an overview of curriculum Intent. A more detailed account of 'Curriculum Intent' can be found in our separate document 'Science Curriculum Intent'.

<b>Key Stage 1 Rolling Programme Science</b>								
*Seasonal Changes to Include 'Plants'								
	Autumn		Spring			Summer		
1	Seasonal changes*	All About Me Humans – The Body	Seasonal changes*	Materials (Plastic)	Animals (sea)	Seasonal changes*	Material (Wood)	Animals (Farm)
2	Seasonal changes*	All About Me Humans – The Body	Seasonal changes*	Materials (Metal)	Animals (Wild)	Seasonal changes*	Materials (Fabric)	Animals (Pets)



## Key Stage 2

This curriculum has the potential to overlap with EYFS, Key Stage 1 or Key Stage 3 (dependent upon ability). The following rolling programme allows an overview of Curriculum Intent at Key Stage Two. A more detailed account can be found in our separate document 'Science Curriculum Intent'

<b>Key Stage Two Rolling Programme Science</b>			
	Autumn	Spring	Summer
1	Animals Inc Humans - Animals	Materials and their properties	STEM
2	Earth and Space (Investigations)	Animals inc Humans - Humans (Excluding Teeth and Digestion)	States of Matter
3	STEM	Forces and Magnetism	Plants (Seasonal Changes)
4	Electricity and light	Animals inc Humans - Teeth and Digestion	Living Things and their Habitats

### Key Stage Three

This curriculum has the potential to overlap with EYFS, Key Stage 1, Key Stage 2 or, more difficult, Key Stage 4 content, dependent upon ability. The following rolling programme allows an overview of Curriculum Intent at Key Stage Two. A more detailed account can be found in our separate document 'Science Curriculum Intent'

<b>Key Stage Three Rolling Programme Science</b>			
	Autumn	Spring	Summer
1	Animals inc Humans - Animals	Materials	Electricity and Light
2	Earth and Space	Animals inc Humans - Humans (Excluding Teeth and Digestion)	States of Matter
3	Animals inc Humans - Teeth and Digestion	Forces and Magnetism	Plants Evolution and Inheritance

## Key Stage Four

In Key Stage 4 we offer Nationally accredited qualifications in various levels, again, dependent upon ability. Some pupils may follow a more vocational 2 route which includes Entry Level 2 modules such as 'animal care' or 'plant care' and allows for continuance of science Golden Threads to be taught through 'science skills for life'.

We offer a more academic pathway incorporating Entry Level 3 modules in more challenging topics such as 'Science and our Universe', however, it should be noted that this course allows Science Golden Threads to be continued in our teaching. We also accommodate those who can fulfil Science GCSE requirements through a separate science curriculum; this is created and provided as needed. The following rolling programme allows us to see an overview science intent at KS4.

<b>Key Stage Four Rolling Programme Science – Academic Pathway</b>			
In Year 11 Pupils will study 'Sex and Relationship Education when they have completed accreditation.			
	Autumn	Spring	Summer
1	Science and Our Universe 3 credits	Introduction to Animal Care – Entry Level 3 3 credits	STEM
2	Science: Health and Safety 3 credits	Working with Electrical Circuits 3 credits	STEM
3	Variation and Adaptation 3 credits	Science and the Human Body 3 credits	STEM

## Key Stage Four Rolling Programme Science – Vocational Based

In Year 11 Pupils will study 'Sex and Relationship Education when they have completed accreditation.

	Autumn	Spring	Summer
1	Introduction to Animal Care – Entry Level 2 3 Credits	Looking after our planet -Science skills for life-	STEM
2	Looking after ourselves Science skills for life	Introduction to Plant Care 3 Credits	STEM

As can be seen from the rolling programmes of curriculum intent, at the end of their course, Year 11 students will study sex and relationship education, helping to prepare them for adulthood and at the end of year 10 students study STEM activities, which allow them to think creatively and develop resilience.

## Curriculum Implementation

As a department, we want to implement our subject, based on current research, parent voice, pupil voice and reflection on our professional practice and experience.

### Parent and Pupil Voice

We want to ensure that both [Parent and Pupil voice](#) have opportunity to be expressed and considered. Every three years we collate a pupil and parent science survey so that we understand what values and approaches to teaching are important to our families. The answers are collated ranked and displayed in our '[Science Principles](#)'. These underpin our approach to teaching and can be found on our website, rolling TV's throughout school and take prominent positioning in our science lab. They are a reminder to us daily how we approach teaching and learning in science, a copy can be found below.



The poster is titled "Park Community Academy Science Principles" and features a light blue background with a white central text area. At the top, there are two circular logos for Park Community Academy. The text is as follows:

Science is best when.....  
It is **practical** and **fun** and all pupils are **actively engaged**  
in **educationally relevant** content.

Activities are differentiated to **include everyone** no matter what their ability.

Children have opportunity to **explore** and **natural curiosity** is encouraged.

There is a range of **stimulating** and **high quality resources** for all.

Science is enhanced by embracing **opportunities to learn outside** the classroom, both within the school grounds and beyond.

The whole school participates in science events which foster a **sense of local community** and **GLOBAL CITIZENSHIP**.

At the bottom of the poster, there are five icons: a globe, a horseshoe magnet, a test tube, a stethoscope, and a leaf.

## **Implementation from Teachers Perspective**

We are **enthusiastic about our subject** and want this to be passed on to all of our learners! We endeavour to maintain a high quality and current scientific knowledge by personal pursuit of the latest scientific developments at a local, national and worldwide scale. We are **committed to collaborating** with others to ensure we maintain best practice and undertake **regular reflection** as a department. Work scrutiny, lessons observations and learning walks are regular features of our department; these all inform our professional practice. We seek regular **CPD** opportunities both within the field of science and wider.

In order to provide all of our children with rich and varied learning experiences through which they can reach their full academic and social potential and develop their self-esteem we adopt a **variety of teaching and learning styles**. We are committed to learning in an environment of **total communication** and activities mix kinaesthetic, visual and auditory learning; We also consider individual's **EHCP**, using adapted resources which best support our learners. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry based research activity, within lessons children are encouraged to **work collaboratively and independently**. We encourage the children to **ask as well as answer** scientific questions and **key investigation skills** underpin all topics. Students have the opportunity to engage with a variety of data, such as statistics, graphs, pictures, tables, photographs and aspects of **I.C.T are used** to enhance learning where appropriate. The children engage in a variety of **problem solving activities**, and wherever possible, the **outdoor classroom** is used to create real life situations for the children to research. Field trips are also an important element in developing the child's understanding and we are committed to achieving the Learning outside the classroom whole school objective. As a department, we strive to ensure all pupils have at least one **learning outside the classroom** experience per half term and that LOtC progressively develops knowledge, skills and understanding depending upon a pupil's individual needs.

**All of this combined helps to strengthen our **Implementation**.**

## **Impact**

In the science department, we aim to **assess student retrieval** of knowledge and skills. We do this by revisiting topics and include elements of '**retrieval practice**' throughout. Each lesson begins with a **recap** and we attempt to measure everyone's understanding by use of whiteboards or smiley face fans. We often include Kahoot quizzes for **fun assessment** and throughout the topic have activities which demonstrate their understanding so far. We consistently and constantly are looking to see if **fluency** and **mastery** are **incrementally improving**. **Students are involved** in the process of self-improvement, recognising their achievements and acknowledging where they could improve. We record pupil voice without changing their words so that an accurate picture is reflected in their science work. Whole school assessment opportunities include work scrutiny, use of EVISENSE and biannual 'BSquared' updates and CASPA comparison data.