Ryders Hayes School

A Primary Learning Academy

Science Guidance

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Mission: At Ryders Hayes School, children and staff will strive to:

Vision: ***To nurture and facilitate the growth of our pupils and their learning; equipping them with the skills and attributes to embrace the challenges of a rapidly changing world. To enjoy success for today and be prepared for tomorrow, by instilling the values of:***

Character*: qualities of the individual essential for being personally effective in a complex world including: grit, tenacity, perseverance, resilience, independence, reliability and honesty.*

Citizenship: *upholding British Values, thinking like global citizens, considering global issues based on deep understanding of diverse values with genuine interest in engaging with others to solve complex problems that impact human and environmental sustainability*

Collaboration: *the capacity to work interdependently and synergistically in teams with strong interpersonal and team-related skills including effective management of team dynamics, making substantive decisions together, and learning from and contributing to the learning of others.*

Communication: *entailing mastery of three fluencies: digital, writing and speaking tailored for a range of audiences, through early, high-quality back and forth interaction.*

Creativity: *having an 'entrepreneurial eye' for economic and social opportunities, asking the right questions to generate novel ideas and explore possibilities, demonstrating leadership to pursue those ideas into practice.*

Critical Thinking: *critically evaluating information and arguments, reflecting upon them, seeing patterns and connections, constructing meaningful knowledge and applying it in the real world.*

Ryders Hayes is a Gold Rights Respecting School and as such strongly believes in and promotes the United Nations Convention on the Rights of the Child. All our policies exemplify these rights and our practise aims to ensure that the following rights are adhered to.

Article 3: The best interests of the child must be a top priority in all things that affect children.

Article 12: Every child has the right to have a say in all matters affecting them, and to have their views taken seriously.

Article 13: Every child must be free to say what they think and seek and receive all kinds of information, as long as it is within the law.

Article 14: Every child has the right to think and believe what they want and to practice their religion, as long as they are not stopping other people from enjoying their rights. Governments must respect the rights of parents to give their children information about this right.

Article 19: Governments must do all they can to ensure that children are protected from all forms of violence, abuse, neglect and bad treatment by their parents or anyone else who looks after them.

Article 28: Every child has the right to an education. Primary education must be free. Secondary education must be available for every child. Discipline in schools must respect children's dignity. Richer countries must help poorer countries achieve this.

Article 29: Education must develop every child's personality, talents and abilities to the full. It must encourage the child's respect for human rights, as well as respect for their parents, their own and other cultures, and their environment.

Article 30: Every child has the right to learn and use the language, customs and religion of their family, regardless of whether these are shared by the majority of the people in the country where they live.

Article 36: Governments must protect children from all other forms of bad treatment.

1. INTRODUCTION

1.1 The School seeks to promote behaviour based on mutual respect between all members of the School community. Ryders Hayes aims to:

….nurture and facilitate the growth of our pupils and their learning; equipping them with the skills and attributes to embrace the challenges of a rapidly changing world. To enjoy success for today and be prepared for tomorrow, by instilling the values of: enquiry; adaptability; resilience; morality; effective communication; thoughtfulness; collaboration; respect; international /open mindedness and a growth mind-set.

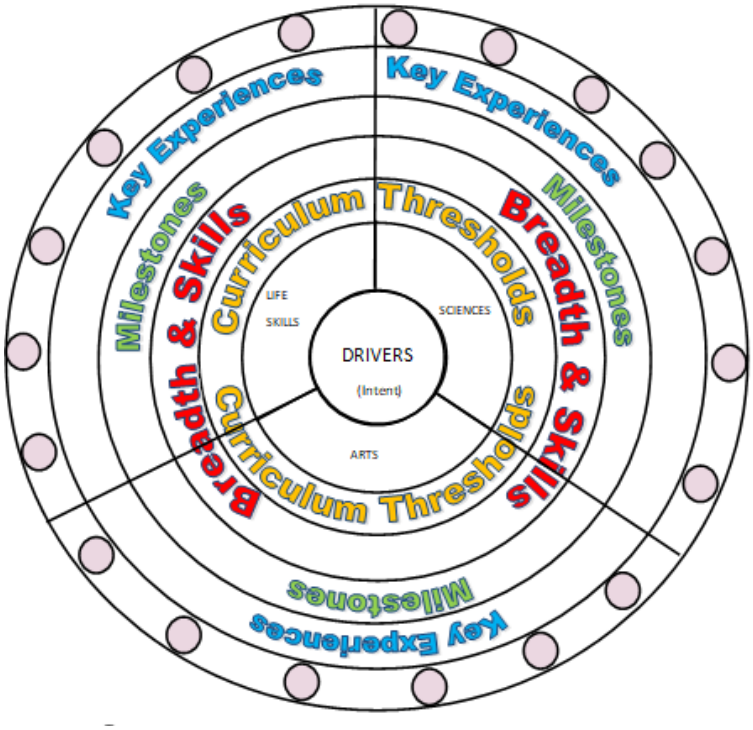
1.2 This guidance outlines the learning, teaching, organisation and management of Science at Ryders Hayes School.

1.3 The implementation of this guidance is the responsibility of all teaching staff. The responsibility for monitoring and review rests with the Science Leader- Claire Raxworthy-Cooper.

1.4 The curriculum is designed to build a schema by developing knowledge and vocabulary through a range of topics and deliberate practice.

2. Our Intent

2.1 Ryders Hayes Curriculum Model



2.2 At Ryders Hayes each subject holds threshold concepts; the key disciplinary mastery aspects of each subject. They are chosen to build conceptual understanding within subjects and are repeated many times in a variety of experiences.

2.3 The threshold concepts in Science are:

- Scientific knowledge and conceptual understanding
- Scientific understanding of nature, processes and methods of science
- Uses and implications of science, today and for the future

2.4 The threshold concepts are divided into three milestones. We expect pupils in year 1 of the milestone to develop a secure understanding of the concepts and a deeper understanding in year 2 of the milestone. Phase one (Yr1, Yr3, Yr5) in a Milestone is the knowledge building phase that provides the fundamental foundations for later application. Learning at this stage must not be rushed and will involve a high degree of repetition so that knowledge enters pupils' long-term memory. If all the core knowledge is acquired quickly, teachers create extended knowledge.

2.5 The curriculum at Ryders Hayes has three drivers chosen specifically to permeate the curriculum to meet the needs of our children and their local context.

2.6 The Curriculum Drivers for Ryders Hayes School are to:

- Explore possibilities
- Create independence
- Build resilience

2.7 Through our teaching of Science, we intend to:

- Stimulate pupils' enthusiasm for, and curiosity about, their surroundings and the wider world
- Increase pupils' knowledge and understanding of the changing world, through enquiry-based learning
- Encourage pupils to ask questions and propose solutions to environmental problems within Ryders Hayes School and the wider world
- Increase their knowledge and understanding of the many scientific concepts including Plants, Animals (including humans), Living Things and their Habitats, Seasonal Changes, Forces, Light and Shadows, Earth and Space, Solids, Liquids and Gases and Electricity.
- Develop pupils' competence in Working Scientifically skills (such as asking questions, observing and measuring, planning and setting up different types of enquiries, identifying and classifying, performing tests, gathering and recording data, using equipment, reporting, presenting and communicating data/finding).
- Foster a sense of responsibility and respect for our school grounds, its people and its resources

2.8 Through Science we can also:

- Improve pupils' skills in English, Maths and ICT
- Develop pupils' thinking skills
- Promote pupils' awareness and understanding of gender, cultural, spiritual and moral issues
- Develop pupils as active citizens
- Promote awareness of Science related careers

2.9 Entitlement and Equal Opportunities

We are committed to providing a teaching environment conducive to learning.
All pupils are entitled to access the Science curriculum at a level appropriate to their needs arising from race, gender, ability or disability, religion, social background and culture. Fieldwork may have to be adapted to take into account individual requirements. We work to ensure that each child

- Achieves the best possible academic standards in Science regardless of starting point or ability
- Experiences and explores Science concepts in a real-life context
- Understands their role in the sustainability of the world and global citizenship
- Develops an awareness of scientific concepts and have the skills they need to succeed in Science subjects in further and higher education; develop important life-skills in relation to the world they live; and have high aspirations for their future lives.

2.10 Organisation of Science within the Curriculum

Science is linked to all subjects including History, RE and Geography, Me and My World, ICT, Maths and English through the use of cross curricula Writing.
Additionally, Science is part of the Sciences Focus for learning. This enables Science, Maths, Design and Technology and Computing to work together sharing best practice, modelling and support excellence and holding each other to account of our Subject Lead responsibilities.

3. Our Implementation

3.1 We have developed and reviewed the national scheme of guidelines for science as the basis for our curriculum planning. We have adapted the national scheme to the local circumstances of our school, i.e. we make use of the local environment in our investigations, we endeavour to harness enthusiasm and empower our young scientists to ask questions, notice and appreciate and draw conclusions from their findings. A child-led approach allows our children to make decisions and mistakes; learn from the; improve their skills of planning, measurement and conclusion. We review our long-term plan on an annual basis.

3.2 Supporting our Curriculum Drivers, we have our knowledge categories which provide the key knowledge within subjects and help us to grow our cultural capital; making links where appropriate to our children and their learning.

3.3 The Knowledge Categories for Ryders Hayes School are:

- Location
- Settlement
- Culture and pastimes
- Significant events
- Food and farming
- Number
- Self-expression
- Career related
- Beliefs
- Innovation
- Language and oracy
- Peace and war

3.4 Key concepts are taught at stages throughout the school years. These again focus on the need, and importance, of repetition in our curriculum.

	Autumn Term	Spring Term	Summer Term
Y1	Seasonal Changes Plants	Seasonal Changes Animals including Humans	Seasonal Changes Animals including Humans Everyday Materials
Y2	Animals including Humans Living things and their habitats	Animals including Humans Plants	Materials: Everyday materials
Y3	Animals including Humans Materials: Rocks	Plants	Forces: Magnets Light
Y4	Electricity	Animals including Humans States of Matter	Living things and their habitats
Y5	Forces: Resistance Materials: changing properties	Living things and their habitats	Animals including Humans
Y6	Animals including Humans	Electricity	Living things and their habitats Light

3.5 Teaching and Learning in Science will be in line with the school's *Behaviours for Learning Policy*, where provision is made for all learning styles.
The Science curriculum at Ryders Hayes School is designed to provide children with learning opportunities that reflect the breadth and balance of contexts outlined in the National Curriculum, as well as well-planned repetition to ensure secure foundation of Working Scientifically skills.

3.6 As an integral part of the teaching and learning of Science children will be given the opportunity to undertake purposeful investigations, communicating their findings in a variety of ways.

3.7 We are very proud of our extensive school grounds and use these in a variety of ways to help children learn geographical skills and to respect the school grounds and wider environment.

3.8 We hold a yearly Outdoor Classroom Day which is an integral part of our Science teaching which contributes to our development of global citizens. Each year group is delegated a specific focus relating to the Sciences where Science, Maths, Computing, and Design and Technology, Art and Music to come together to provide experience for our learners.

3.9 We display and share the characteristics of a Scientist, as well as investigating career opportunities, with children at every available opportunity.

3.10 Key Experiences:

Ryders Hayes Science curriculum is a bespoke model to cater for the needs of the children and key experiences have been carefully selected to ensure that they allow children to explore/create/ build: possibilities, resilience and independence. The Key experiences include:

EYFS	Investigating and exploring the world around us
Year 1	Observe the seasonal changes in our locality and what a plant needs to grow
Year 2	Explore animals and their habitats and investigate plant growth
Year 3	Explore how our bodies work (bones and muscles) and how to keep healthy through diet and water transportation in plants
Year 4	Explore how our bodies work (teeth and digestion) and changing states from solid, liquid

	to gas (water cycle)
Year 5	Explore and compare life cycles of different animals and the human life stages (including puberty).
Year 6	Explore how our bodies work (heart, lungs and circulation) and learn about adaptation.

3.11 The role of the Science Leader is to:

- Support colleagues in teaching the subject content and developing their skills in planning, teaching and assessing Science
- Renew, update and oversee the audit of resources needed to deliver the curriculum
- Monitor and evaluate the learning and teaching of science through learning walks and termly book trawls
- Develop assessment and record keeping ensuring progression and continuity
- Communicate findings, ideas and resources and have an open-door policy for suggestion and questions
- Design the Medium- Term Plans for teachers to use and annotate for weekly lessons

4. Impact

4.1 The curriculum design and planning will lead to outstanding progress for all pupils, regardless of their starting points, over time. Learning is progressive and builds on prior knowledge and understanding and supports children in producing outcomes of the highest quality. Teaching and learning is adapted to cater for the needs of all pupils; providing support for children with special educational needs and enrichment and challenge for more able children.

4.2 Opportunities for assessing the impact will be identified in curriculum overviews for each age group, and these will be based on an assessment of key skills and essential knowledge and understanding within Science.

4.3Methods of assessment will vary as appropriate to the learning. A portfolio of work from Y1 to Y6 will show examples of Scientific work; as well as appropriate evidence from EYFS – understanding the world and will be used to support judgments.

4.4 In Science the use of technology is also used to record and gain evidence of children's Scientific knowledge and skills. Children will be set small tasks in order to demonstrate the knowledge and skills they have learnt during their learning journey and as part of end of Milestones. These tasks will be completed throughout the year to monitor and evidence progression and attainment. Pupil voice will be used to assess the progress in understanding and applying skills needed to become a Scientist.

Resources

4.5 Science resources are stored in the designated area (Science cupboard). Children will have the opportunity to use the following resources: models of human anatomy, magnets, beakers, pipettes, magnifying glasses, tweezers, rocks and fossils, mirrors, torches, electricity circuits, ICT apps, plants, real-live animals (chicks, butterflies, frogspawn), hearts for dissection (Year 6).

4.6 If new or additional resources are required this is the responsibility of the Science Leader to source as well as replenish necessary resources. The Science Leader is the curator of the subject and will update and provide medium term plans to each year group, whilst acting as a curator for the Science.

Health and Safety

4.7 This guidance needs to be read alongside our *Health and Safety Policy*. Consideration needs to be given to conducting appropriate Risk Assessments and ensuring the safeguarding of children and staff when planning and carrying out Science activities.

Monitoring and Evaluation

4.8 The teaching and learning of Science will be monitored through the analysis of medium-term planning, pupil voice interviews, analysis of assessment data, scrutiny of work samples, completion and recording of Science tasks to assess skills and knowledge and learning walks, in line with the School Development Plan.

4.9The Science leader will evaluate progress that has been made and the impact of the curriculum to ensure all pupils have been taught the knowledge and skills they need to deepen their Scientific understanding.