



Science Policy

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This policy should be read in conjunction with the following policies and documents:

Whole School Curriculum overview
Science Progression of Skills
Science Ideas for Depth cards
Science Assessment Tracker grids
Science Year 2 bank of outdoor learning activities
SEN policy
Marking policy

Intent

Statement of Intent

At Joydens Wood Infant School we want our children to be confident young scientists, carrying out their own experiments, inferring their own conclusions and having the knowledge and deep understanding of the relevance of their discoveries. Science is an active subject that occurs both indoors and outdoors, the rich learning environments provide valuable learning opportunities and a chance for children to show our school values of resilience, readiness, respect, and responsibility.

Science is taught through a cross-curricular approach, incorporating Outdoor Learning, based on knowledge rich experiences that is unpinned by a varied, progressive, and well-mapped-out Progression of Skills. This allows learning autonomy for all children, whereby the children are confident to apply the skills and vocabulary that is taught and provides the opportunity for progression across the full breadth of the Science National Curriculum. It also gives the children the chance to develop positive attitudes, communicating with others, listening to ideas, and treating these with respect. It encourages them to take responsibility for their own learning and health and safety and enables children to invest in their own success.

Aims of National Curriculum

The National Curriculum for science aims to ensure that all pupils:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics.
- Develop 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.
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

For Key Stage 1, the New Primary Curriculum is organised into the following programmes of study:

- Working Scientifically
- Plants
- Animals including Humans
- Everyday Materials (Year 1 only)
- Uses of Everyday Materials (Year 2 only)
- Seasonal Changes (Year 1 only)
- Living Things and their Habitats (Year 2 only)

In the Early Years, children work to the statutory framework for the Early Years Foundation Stage (EYFS). The areas of learning that can link to our Science Curriculum are: 'Understanding the World' (The World), 'Physical Development' (Health and Self-care) and Expressive Arts and Design (Exploring and using media and materials). These areas of learning involve guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology, and the environment and how to look after themselves and others.

The school builds upon the aims identified in the National Curriculum by ensuring that each aspect is embedded into school life daily. A broad and well thought out curriculum is embedded through our Science Progression of Skills, saved in the school's Targeted Improvement folder under 'Progression of Skills, Science'. This enables skills to be 'layered' in each lesson and allows the skills learnt to be committed to long term memory and the children to become progressive Scientific learners. As children progress through their schooling, they can build upon their skills in Working Scientifically, as well as their Scientific knowledge, enabling them to develop greater independence in planning and carrying out fair

and comparative tests to answer a range of Scientific questions and enquiries. Skill fluency, competency and depth of knowledge occurs during structured Science lessons and unstructured times, such as Child Initiated Play.

Outdoor learning is a central and crucial part of our Science curriculum as it allows the children to become independent explorers, discoverers and develop survival skills. Our Outdoor learning curriculum allows all children to participate in a range of progressive and creative experiences that are providing regular, frequent, enjoyable, and challenging opportunities. Outdoor learning has become a normal part of Joydens Wood school life, as Teachers and staff ensure that it is thoroughly and purposefully embedded into our curriculum and offers the children to deepen and contextualise their understanding of the world around them.

Implementation: Teaching and Learning

Curriculum Planning

Science is taught in a cross-curricular way and Teachers are responsible for ensuring that their classes are planned for appropriately. The Progressions of Skills outlines what topics and skills should be taught by the end of Autumn, Spring and Summer for each year group, linking to the Whole School Curriculum plan, located in the document saved in the schools 'JWIS Curriculum 2020' folder. This Progression of Skills have been devised through reading and collaborating different documents, including Twinkl, National Curriculum (2013), Early Years Foundation Stage (EYFS), outdoor learning readings and Kent Scheme of work. This has supported the development and creation of the Progression of Skills that suits the needs, ethos, and curriculum of our school. Teachers are free to plan Science lessons in a creative and active way, ensuring that the Progression of Skills is used, and skills are explicitly taught. Outdoor Learning is embedded into the Science Curriculum through Scientific enquiry and is a non-negotiable part of our Science curriculum. Science Progression should be evident in each year groups Medium Terms plans and then incorporated into weekly planning, highlighting the vocabulary, skills, and SEN/PP support. The acquisition of Key Scientific knowledge is an integral part of our Science planning and ensuring there is progress, enables children to learn and retain the important, useful, and powerful vocabulary and knowledge needed within each area of Science. The added section of Working Scientifically within the Progression of Skills are developed through the year groups and scientific enquiry skills are embedded through this. The Working Scientifically statements link heavily to the Science Ideas for Depth cards, as it ensures depth of knowledge and applying skills independently. It is the Teachers responsibility to inform the Science Leader if they require any additional resources that are not available in the themed curriculum cupboards and Science shed outside. Within each Science lesson, the Science Ideas for depth cards, located in; Targeted Improvement, Science Leader, Assessment, Science Ideas for depth, should be used and considered when planning, to ensure the learning enables the children to design, reason, predict, spot mistakes, analyse, enquire, classify and communicate. Fundamental Outdoor learning skills, within the Progression of Skills, have been included to support teachers and all staff in understanding what all children should know and be able to do in order to access further outdoor learning activities and skills. The outdoor learning skills are separated into different categories, relating to health and safety, survival skills, independent outdoor learners, building and constructing and caring for ourselves, animals, and our environment.

Teaching

At Joydens Wood Infant School, we have an active, cross-curricular, and hands-on approach to Science learning. We encourage children to be inquisitive and to take responsibility for their own learning through the exploration of resources. We ensure that the children are developing the skills to be able to predict, design, test and conclude their own investigations. Our Science Garden, Pond Area and Reception and Year 1's outdoor areas allow outdoor learning to be effective as part of our Science Curriculum and cross-curricular approach. Teachers in Year 2 have a bank of Outdoor Learning activities, located in; Targeted

Improvement, Science Leader, Outdoor Learning, Year 2 Outdoor learning activities, that adopt our cross-curricular approach and should be used, added to and adapted throughout the year. Reception and Year 1 have the addition of challenge cards within their outdoor environment to develop the increasing depth and challenge as children move through our School.

In Year 2, Science should be taught for a minimum of 60 minutes per week. Outdoor Learning sessions have been allocated for each year group and this is monitored by the Science Leader, a timetable as to when each year group will use the Science garden and pond areas has been devised, located in; Targeted Improvement, Science Leader, Outdoor Learning. During CIP and Group times in Reception and Year 1, Science activities and skills should be evident and link to outcomes in the National Curriculum and Development Matters, based in the Progression of Skills.

Science star words should be used in every lesson and should be taken from the words in our Science vocabulary, within the Progression of Skills. Reception's Progression of Skills includes fundamental vocabulary to be learnt by the end of the year, this has not been sectioned into terms as this will narrow down the curriculum for EYFS. Science vocabulary should be evident in all classrooms and children should be able to use and apply the Science vocabulary relevant to the topic they are focusing on. Children should also be encouraged to use full sentences and include the star words within this.

Teachers should use the Science Ideas for depth cards to assess the children learning against the Progression of Skills statements, these are also a tool to challenge and ensure the Science learning is accessible for all learners.

Early Reading will be promoted through Science by the children reading a range of non-fiction texts and being able to form their own predictions, methods, and conclusions. Early Maths will be promoted through Science by the children being able to show their findings on different graphs and linking Science topics to areas of Maths, shape and measure, number, and time. Science and Maths, both use ideas for depth cards to ensure the skills are being taught and used effectively. Science also support Early Maths and Early Reading, alongside other subjects, through our challenge cards within the EYFS and Year 1 provision.

Recording Science

In Year 2, Science learning should be evident within our Writing books and on Children's Dojo portfolios, embedding our cross-curricular approach. In Year 1, Science learning should be evident within our Writing books and on Class Dojo, where a cross-curricular approach has been used. In EYFS, Science should be evident within children's individual learning journals. Graphs and tables should be written and drawn on squared paper, linking to our Mathematics skills.

Within these books, the Science Ideas for depth cards should be evident and used a minimum of twice a week for Year 1 (from the Summer term) and Year 2. In Autumn and Spring terms, Year 1 will use the Science Ideas for depth cards within a more able group and they will be accessible for all children within the provision. Reception should use these within the environment to challenge and assess the children during child-initiated play. Both Reception and Year 1 staff have the Ideas for Depth cards on their lanyards to support interactions and ensure there is challenge. Science vocabulary, through star words should also be used during every lesson and should be evident on planning. This will ensure the children are gaining the skills and depth of knowledge to be able to predict, design, test and conclude.

Resources

Within the school there is a wide range of resources to support the teaching and learning of Science across the school. These are stored in the Curriculum cupboards and garage on the playground and are labelled for easy access (appendix 1). All staff are responsible for keeping the cupboard tidy and ensuring they return resources once they have finished using them. There are also exciting resources for our outside learning environment, which are stored in our shed outside. EYFS and Year 1 provisions have valuable Science resources for the children to choose and explore. These resources should be kept stocked and accessible for all learners.

Every classroom should display Science vocabulary, which will aid learning during lessons. Within EYFS and Year 1, Science displays should be evident in the area which Science is taking place, displaying key vocabulary, questions and children's learning and pupil voice.

Assessment

Science Assessment will be carried out in the following ways:

- Marking children's work and CIP observations
- Verbal feedback
- Use of Science Ideas for depth
- Teacher judgement
- Pupil voice
- Science termly Assessment tracker for Year 1 and 2, located in; Targeted Improvement, Science Leader, Assessment, Assessment tracker grids 2020.

Class Teachers/Science Leader will undertake a pupil voice after each unit in order:

- To ensure consistency of approach across the school.
- To ascertain pupils understanding of Science and the Science lessons they have taken part in.
- To gain an insight into all pupils' thoughts about the nature of Science.

Teachers should use the Progression of Skills for Science, to assess whether a child is emerging, expected, or exceeding and this should take place every half term. The progression of skills, alongside the Science Ideas for depth cards should be used to assess and inform planning, to make sure that our Science learning is relevant and appropriate to each individual child and class.

The Science Assessment Tracker is to be used as part of and to support the teaching, learning and assessment cycle in Key Stage 1 and to support the moderation process and quality of evidence. Teachers are to assess the children at the end of the week and use this to inform their future planning. It is built from the Science Progression of skills, emerging, expected, and exceeding statements. This is to ensure that teachers are differentiating appropriately and gives clarity over what expected look likes. These Assessment Tracker grids have been created to ensure reliability and accuracy in the Science data, as historically most children were given expected. Science Ideas for depth cards should be used to extend learning and provide consistent next steps for all children that can be accessed by all learners.

Vulnerable Learners

The Science curriculum will ensure that all children are able to access the learning. All teachers will teach the skills required to access the curriculum and make sure there is depth of understanding, using the Science Ideas for depth cards. Once these fundamental skills have been taught and understood, the children should be constantly supported and challenged. Careful consideration in the 'barriers to learning' will enable teachers to form a

picture as to how a child's life experiences and opportunities hinder their development in Science.

- SEND and EAL pupils: resources and support should be planned for to enable all children to have access to the learning. Suitable aids that are relevant to the child in the 'classroom' context should be reviewed for their suitability and impact when the child is accessing Science in other areas and places. Where necessary a risk assessment should be undertaken. All resources should be clearly labelled to allow all children to access them.
- Disadvantaged pupils: children have external circumstances that affect their ability to access the Science Curriculum and experiences. The school are expected to identify these contributing factors rapidly to ensure every child has the same opportunities to access their learning. This may involve discussing the child's home life with the DSL or FEL.
- In-year admissions and Persistent Absentees: children who have not attended our school previously or have poor attendance are at risk of not being able to access the learning. They may have significant gaps in their skills and knowledge that prevent them from being able to access specific skills/games. All children that are new/returned to school following a period of absence should be carefully monitored to ensure support is implemented without delay. In some cases, it may be necessary to undertake a risk assessment.

Cross Curriculum Links

At Joydens Wood Infant School, we follow a cross-curricular approach to learning, whereby all subjects are intertwined and linked to an overarching theme. The order in which Science topics should be taught are outlined in the Progression of Skills, the topics have been chosen to be taught in this order to link to other books, texts and areas of learning across the school, within the Whole School Curriculum plan. Curriculum days and weeks will be planned for in each term and are shown on the Progressions of Skills and Whole School Curriculum plan, these include: Science week, Eco Warriors week, external visitors, Horticultural show, Multicultural week, and trips. The curriculum days and weeks will be planned for across the school to ensure that there is challenge for all learners and that the learning is age appropriate. These events support the Teaching, Learning and Assessment cycle, by allowing the Teachers to plan exciting opportunities that allows all children to learn and use this as an assessment tool to inform future planning.

Extra-Curricular Activities

All extra-curricular clubs and activities link to our school's teaching and learning. All clubs are available to all children, so that talents and interests are nurtured. Clubs will include a Stem Science Club in the Autumn and Spring term.

Termly activities and events are built into the school's calendar to enable all children to have access to our local area and different experiences and competitions, such as visits to the local farms and Joydens Wood woods.

Science week is planned yearly; a broad range of scientific skills are built into the week to give all children the opportunity to showcase their strengths.

Impact

The Role of Subject Leader

The Science Leader is responsible for providing access to the Science Progression of Skills to every teacher and member of staff and ensure they fully understand what is required. This is distributed to year groups for the pre-planning meetings. The Science Leader also

provides a list of resources that are available in school and regularly monitor whether the resources are being used effectively. The Science Leader will undertake learning walks, book looks and pupil voice termly to ensure and assess how effective the Science Curriculum is and the next steps. Professional conversations will be made with other subject leaders to evaluate the cross-curricular approach and planning for impact. The Science Leader will also make sure they have strong connections to other professionals to develop our Science Curriculum.

The Science Leader will:

- Develop the year 1 outside provision to encourage Science learning outside the classroom, linking to all topics within Science.
- Monitor the standards of teaching and progression of skills.
- Provide support and training to staff (see CPD below)
- Ensure Outdoor Learning is effective throughout the School.

The Science Leader will audit the effectiveness and use of the resources termly, by observing how the children and Teachers use them during lessons, observing whether the children are using them for the right purpose and know why they are using them and whether the resources that are available are suitable for the needs of our children and supporting the teaching of a broad curriculum.

Progression and the impact of the Science Progression of Skills is measured through a child's ability to explain their understanding of key Science matters using Scientific vocabulary. This can be measured in different ways through teacher judgement, pupil voice, Assessment tracker, book looks, planning scrutiny and learning walks.

Attainment and progress can be measured across the school using our SIMS system and this data will be analysed to provide key groups of children to support further and investigate whether our Science Curriculum allows these children to access Science as well as challenge them.

Throughout the year the Science Leader will complete the following monitoring across the school:

- Autumn term- observe Science Learning in the environment and classrooms.
- Spring term- provide CPD and training to all staff about how to deliver a broad and thought out curriculum, using the Progression of Skills, linking Outdoor Learning. Carry out book looks to ensure consistency and effectiveness of Ideas for Depth cards.
- Summer term- reflect on the impact Science has had over the two terms, develop links with a secondary school to be able to visit labs. Implement an extra-curricular club.

Continued Professional Development

The Science Leader will keep up to date with recent changes to the Science curriculum and will continue to develop their own CPD, by visiting other schools and speaking to other Science Leaders. Following a recent staff questionnaire, the needs of the school are the confidence to take Science outside the classroom. Therefore, training will be delivered to all staff on how to deliver a Science lesson outside.

Appendix 1- Science Resources

Outside Area <ul style="list-style-type: none"> • Fishing nets • Tweezers • Magnifying glasses • Stop watches • Observing pots • Watering cans • Gardening tools • Gardening gloves • Plant markers • Wipe clean wallets • Binoculars 		
Themed corridor cupboards <ul style="list-style-type: none"> • 8 weighing newton scale • Year 1 materials box • Year 2 materials box • 10 torches • 20 Keyring torches • 1 electricity box with bulbs, motors, buzzers, switches etc. • 49 cardboard flowerpots • 181 sunflower seeds • 1 heat science kit • 1 air pressure science kit • 1 sound science kit 		
EYFS provision	Inside <ul style="list-style-type: none"> • Water resources • Measuring cylinders 	Outside <ul style="list-style-type: none"> • 3 wheelbarrows • Plant pots and trays • Water resources
	Inside <ul style="list-style-type: none"> • Measuring cylinders • Pipettes • Lightbox • Human body 	Outside <ul style="list-style-type: none"> • 2 wheelbarrows • Gardening and digging tools • 4 binoculars • 4 magnifying glasses Water shed <ul style="list-style-type: none"> • Measuring cylinders • Plastic bottles • Piping and guttering • Jugs Maths shed <ul style="list-style-type: none"> • Blocks • Number squares • Shells Construction shed <ul style="list-style-type: none"> • Blocks • Helmets
Year 1 provision		





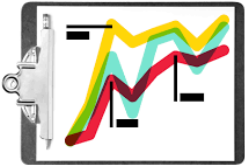



Appendix 2

Example of Assessment tracker grids. Located in; Academic Year 2020-2021- Targeted Improvement- Science Leader- Assessment

How is this going to be used? This is to be used as part of the teaching, learning and assessment cycle.		
Below Expected (To focus on these children the following week to fill gaps and pre-teach)	Expected (Taken from Progression of Skills)	Above Expected (Use ideas for depth cards to deepen their knowledge and challenge them the following week)
	<p style="text-align: center;"><u>Plants</u></p> <p>To name up to 10 common plants and /or trees with little prompting To name most plant/tree plants by selecting correct labels to pictures answering simple questions.</p>	
	<p style="text-align: center;"><u>Seasonal Change</u></p> <p>To relate the weather typically associated with each season across a year.</p>	
	<p style="text-align: center;"><u>Everyday Materials</u></p> <p>To identify up to 6 materials with prompting questions. To describe some physical properties of some materials. To sort a range of materials into groups with prompting questions.</p>	
End point (To use to support data and assessment)		
	<p>To be confident to name and identify plants and trees. To know what the seasons are, and the weathers associated with them. To identify materials and know the properties, using Scientific vocabulary.</p>	

Appendix 3

Science Ideas for Depth. located in; Academic Year 2020-2021- Targeted Improvement- Science Leader- Assessment- Science Ideas for depth

<p>Design</p>  <p>Can you design a new experiment?</p>	<p>Reasoning</p>  <p>Explain how you know using scientific vocabulary.</p>
<p>Predicting</p>  <p>What do you think is going to happen?</p>	<p>What's Wrong?</p>  <p>Can you spot any mistakes?</p>
<p>Analyse</p>  <p>Can you analyse your findings?</p>	<p>Enquiry</p>  <p>What do you want to find out?</p>
<p>Classifying</p>  <p>What is the same? What is different?</p>	<p>Communicating</p>  <p>Can you tell a friend what you have investigated?</p>