

# Wensum Science Curriculum



## The Wensum Science Curriculum

### Intent

At Wensum we believe that **our curriculum should raise aspirations, develop independence and offer all children real-life experiences.** These are central in the development and delivery of the curriculum across all subject areas.

Science at Wensum is very much a practical part of the curriculum that enables our children to be 'Scientists': make sense of the world around them through exploration, investigation and discovery. Through practical and meaningful experiences, we seek to develop the key scientific knowledge and the skills of observation, questioning, exploration and investigation to prepare our children for life in an increasingly scientific and technological world. Scientific enquiry skills are embedded in each topic the children study and these topics are revisited and developed throughout their time at school.

Our curriculum documents are designed to ensure that the knowledge, skills and vocabulary are mapped out and children's understanding and learning is built on each year. The aim is for our children to leave KS2 ready to take on the challenge of a subject-based timetable at secondary level and with a passion for learning and knowledge.

### Implementation

We teach the National Curriculum and ensure that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children. Each year group has a long term plan which allows meaningful links to be made across subjects during a half term. This provides children with the opportunity to apply their knowledge in different contexts which will help them to remember more. Skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children.

Successful timetabling is key to the success of the curriculum delivery. We have divided each week into discrete lessons of at least 90 minutes. Medium Term Plans are written by year groups with the support of the Subject Leads to ensure the necessary coverage and progression as set out in the Curriculum documents. For Science, planning from The Association for Science Education (ASE) has been used to create a curriculum that is broad, balanced and deep. The Ogden Trust resources, Wensum being the hub school for Central Norfolk, is used to plan and teach effective physics lessons. The Science Subject Lead has created a LTP for each year group which maps skills, knowledge and vocabulary. This is carefully mapped out to ensure that learning is progressive, also allowing the teacher to link scientific knowledge with other curriculum areas, which allows retrieval of information over an academic year, with connections made across a variety of subjects. As well as weekly lessons each year group will have a Science Week focus during the National British Science week in March. The class teacher, supported by the science subject lead, will also organise trips and visits, throughout the year, from experts who will enhance the learning experience, inspire children and open up the world of work and future careers.

The daily visual timetable in all classes from Y1 to Y6 informs children of what subjects will be studied when. Our aim is for children to be taught in a range of ways and for these to be recorded in their science books. In Year 1 curriculum books are used, in EYFS floor books and Seesaw are used to record learning.

Sessions begin with retrieval opportunities which will be recorded in Science books in KS2. These are to allow children to recall previous knowledge to help them learn more and remember more. For discussion or practical based sessions, the record in books may be photographic, showing the practical activity in progress or an image of the class flipchart / screen to which ideas have been contributed. In this way, children will be reminded of the work they have undertaken and be able to discuss and explain their learning.

AFL and the regular revision of activities and resources is an integral part of our teaching offer. 'Remember More' sessions are conducted approximately twice per unit. Where children show that key concepts have not yet been embedded, further activities will be taught.

Medium Term Plans will be reviewed at the end of each term with a view to making any adjustments as necessary before the next cycle. Even where all sessions have been deemed successful, subject leaders will still review plans in the light of the next cohort, taking into account any specific needs or challenges presented by that particular year group.

Monitoring through book looks, lesson visits and pupil voice, led by the Subject Lead and SLT will focus on the children and their learning journey. This will provide support where necessary, assessing the appropriate level of challenge and adapting where necessary. Teachers will identify those children who would benefit from an additional level of challenge with support from the Subject Lead.

## **Impact**

As our curriculum is a progression model, children who are succeeding with the challenges provided in each year group can be deemed to have made progress from the previous year.

Teachers will be aware of the learning journeys that their children are on and be able to provide examples of where they have adapted or deviated from plans to meet needs, evidencing that adaptation with learning in books. Learning in books will show that children take pride in their work. Activities will be able to be tracked through a coherent sequence of lessons and misconceptions will be addressed with further activities. Subject specific vocabulary will be evident in children's work.

Where children find it difficult to record their thoughts in written format, alternative recording methods (e.g. video / voice recordings on Seesaw; use of an adult as a scribe) will capture their progress in a subject.

Pupil voice interviews will reveal children who are able to talk confidently about what they have learned. They will be able to talk about the specific features of different subjects and demonstrate an understanding of how what they are studying now builds upon what they have studied previously, as well as where their studies will take them next.

Children will be able to explain how they receive feedback from their teachers and how this supports their next steps learning.

By the time children at Wensum Primary School and Nursery leave our school, they will have developed: An enjoyment of scientific learning and a love of science. Have an understanding and knowledge of scientific processes and developed the skills of investigation - including planning, observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating, with the use of scientific language. They will have developed the skills of working cooperatively with others and be able to tackle problems confidently and resiliently.

They will have developed a respect for living and non-living things, building upon their own natural curiosity of the world around them and ask questions. They will have developed the use of computing in investigating and recording and become effective communicators of scientific ideas, facts and data.

Most importantly they will have high aspirations, which will see them through to further study, work and a successful adult life.

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3					
Forces: Earth and Space	Animals (including humans, muscles and skeletons)	Materials	Energy: Light and Sound	Plants	Making Connections
Year 4 and Year 3					
Forces: Earth and Space	Animals (including humans, muscles and skeletons)	Materials	Energy: Light and Sound	Plants	Making Connections
Year 4					
Digestion and Food	Electricity: circuits	States of matter	Sounds and vibrations	Classification and habitats	TBC
Year 5					
Mixtures and separation	Physics: Earth and Space	Properties and Change	Life Cycles of animals and plants	Imbalanced Forces	Human timeline
Year 6					
Biology: Classification	Light and reflection	Evolution and inheritance	Circuits: batteries and switches	Circulation and exercise	TBC

Year 3			
<b>Autumn 1</b>	<p><b>Forces, Earth and space</b></p> <p><b>Forces and magnets (6 lessons)</b> Investigating the movement of vehicles on different surfaces, children learn about the impact of friction and compare uses and drawbacks. They broaden their experience in writing scientific conclusions and recording data as they investigate contact and non-contact forces. Pupils explore the properties of different magnets and use this to understand their uses.</p>	<b>Autumn 2</b>	<p><b>Animals, including humans</b></p> <p><b>Movement and nutrition (6 lessons)</b> Studying the human skeleton, children identify key bones and compare them to other animals explaining the role within the body. Pupils explore how changes in muscles result in movement and the implications these discoveries have in the scientific development of prosthetic limbs. They study how energy is used by the body, what constitutes a balanced diet in humans and how research contributes to nutritionist expertise.</p>
	<p><b>Materials</b></p> <p><b>Rocks and soil (6 lessons)</b> Studying rocks and their properties, children learn that rock properties support classification and tell us about how rocks were formed. Pupils look at the work of paleontologists to learn about how fossils form and use models to explain the rock cycle. They plan an investigation to test rocks for particular uses and form conclusions about which soil type is most suitable for UK farmers.</p>		<p><b>Energy</b></p> <p><b>Light and shadows (6 lessons)</b> Identifying examples of luminous objects, children learn about how light travels around us and how that enables us to see. Children investigate reflection and shadow formation, creating their own shadow puppets and exploring how shadows can be used to entertain in the arts. They look at examples of pivotal scientific discoveries and the scientific methods that led to those successes.</p>
<b>Spring 1</b>	<p><b>Plants</b></p> <p><b>Plant reproduction (6 lessons)</b> Building on their prior knowledge of plant structures, children describe the functions of named parts and use evidence to explain their significance in plant development. Pupils investigate further factors that may affect the growth of plants and compete with their peers to disperse seeds in a variety of ways. They explore how seeds vary and define the type of plant they are studying, as well as looking at how seed shapes have inspired modern technologies.</p>	<b>Spring 2</b>	<p><b>Making connections</b></p> <p><b>Title TBC</b> This unit aims to bring together pupils' science learning from the other units and help them to see connections between the key areas.</p>
<b>Summer 1</b>		<b>Summer 2</b>	

## Year 3 and 4

<b>Autumn 1</b>	<b>Forces, Earth and space</b>	<b>Autumn 2</b>	<b>Animals, including humans</b>
	<p><b>Forces and magnets (6 lessons)</b> Investigating the movement of vehicles on different surfaces, children learn about the impact of friction and compare uses and drawbacks. They broaden their experience in writing scientific conclusions and recording data as they investigate contact and non-contact forces. Pupils explore the properties of different magnets and use this to understand their uses.</p>		<p><b>Movement and nutrition (6 lessons)</b> Studying the human skeleton, children identify key bones and compare them to other animals explaining the role within the body. Pupils explore how changes in muscles result in movement and the implications these discoveries have in the scientific development of prosthetic limbs. They study how energy is used by the body, what constitutes a balanced diet in humans and how research contributes to nutritionist expertise.</p>
<b>Spring 1</b>	<b>Materials</b>	<b>Spring 2</b>	<b>Energy</b>
	<p><b>Rocks and soil (6 lessons)</b> Studying rocks and their properties, children learn that rock properties support classification and tell us about how rocks were formed. Pupils look at the work of paleontologists to learn about how fossils form and use models to explain the rock cycle. They plan an investigation to test rocks for particular uses and form conclusions about which soil type is most suitable for UK farmers.</p>		<p><b>Light and shadows (6 lessons)</b> Identifying examples of luminous objects, children learn about how light travels around us and how that enables us to see. Children investigate reflection and shadow formation, creating their own shadow puppets and exploring how shadows can be used to entertain in the arts. They look at examples of pivotal scientific discoveries and the scientific methods that led to those successes.</p>
<b>Summer 1</b>	<b>Plants</b>	<b>Summer 2</b>	<b>Making connections</b>
	<p><b>Plant reproduction (6 lessons)</b> Building on their prior knowledge of plant structures, children describe the functions of named parts and use evidence to explain their significance in plant development. Pupils investigate further factors that may affect the growth of plants and compete with their peers to disperse seeds in a variety of ways. They explore how seeds vary and define the type of plant they are studying, as well as looking at how seed shapes have inspired modern technologies.</p>		<p><b>Title TBC</b> This unit aims to bring together pupils' science learning from the other units and help them to see connections between the key areas.</p>

<b>Autumn 1</b>	<p style="text-align: center;"><b>Animals, including humans</b></p> <p><b>Digestion and food (6 lessons)</b> Using models, children describe the function of key organs in the digestive system. Pupils identify the types of human teeth to create their own model and investigate factors that impact our dental health. They compare human teeth to other animals' and consider this in the light of prior knowledge about predators, prey and food chains. Children take on the role of a naturalist investigating animal faeces for clues about diet, digestion and dentition.</p>	<b>Autumn 2</b>	<p style="text-align: center;"><b>Energy</b></p> <p><b>Electricity and circuits (6 lessons)</b> Exploring appliances in their setting that use electricity, children learn how to work with electricity safely and build circuits. Pupils investigate electrical conductors and insulators and explore the relationship between the number of cells and bulb brightness. Real scenarios and historical discoveries inform children about scientific progression and home safety.</p>
<b>Spring 1</b>	<p style="text-align: center;"><b>Materials</b></p> <p><b>States of matter (6 lessons)</b> Investigating the properties of solids, liquids and gases, children learn about the different states of matter. They explore changes of state using relatable examples and use this to explain changes to water through the water cycle. Pupils investigate the relationship between temperature and rate of evaporation while broadening their experience of working scientifically.</p>	<b>Spring 2</b>	<p style="text-align: center;"><b>Energy</b></p> <p><b>Sound and vibrations (6 lessons)</b> Exploring different ways of producing sounds, children learn about the relationship between vibrations and what they hear. They use examples of echolocation to develop their understanding of how sound travels between objects and investigate the role of insulation to protect our ears. Pupils explore how pitch and volume can be altered and make their own musical instruments to demonstrate these principles.</p>
<b>Summer 1</b>	<p style="text-align: center;"><b>Animals, including humans</b></p> <p><b>Classification and changing habitats (6 lessons)</b> Identifying different ways living things can be grouped, children make classification keys to explore which grouping methods are most effective. Pupils study ways that habitats may change over time and understand that humans can have both positive and negative effects on their surroundings. They play the role of naturalists and review the impact of conservation programmes.</p>	<b>Summer 2</b>	<p style="text-align: center;"><b>Making connections</b></p> <p><b>Title TBC</b> This unit aims to bring together pupils' science learning from the other units and help them to see connections between the key areas.</p>

**Materials**

**Mixtures and separation (6 lessons)**  
 Pupils explore different types of mixtures and the different methods that can be used to separate them. They dissolve a range of substances, identify different solutions and investigate how temperature affects the time taken to dissolve. They design and create a water filter, sieve soil and evaporate solutions.

**Autumn 2**

**Earth and space (6 lessons)**  
 Exploring some of the key celestial bodies in our solar system, children learn the names and compare their movements.  
 Pupils discover the relationship between the Earth's rotation and day and night, making models to represent their knowledge. They make their own sundials and consider how and why our ideas about the universe have changed so much over history.

**Materials**

**Properties and changes (6 lessons)**  
 Broadening their experience of the properties of materials, children investigate hardness, transparency and conductivity and consider how these properties influence the uses of materials. They explore reversible changes, including dissolving and changes of state. Children compare these to irreversible changes, including rusting, burning and mixing vinegar and bicarbonate of soda.

**Spring 1**

**Spring 2**

**Living things and their habitats**

**Life cycles and reproduction (6 lessons)**  
 Studying different animals' life cycles, children learn about the significance of reproduction for a species' survival. Pupils calculate the probability of male and female turtles hatching and grow plants to compare asexual and sexual reproduction. Pupils compare fertilisation across different animals and explore the needs of a fetus. Children narrate their own documentary in the style of an inspirational naturalist.

**Forces, Earth and space**

**Imbalanced forces (6 lessons)**  
 Building on their knowledge of contact forces, children explore gravity, air resistance and water resistance in more depth and consider the effect of these forces being imbalanced. They demonstrate key principles in the classroom and plan investigations to further their understanding of the effects of these forces. Pupils test their ideas using models and compete to build the most effective pulley system.

**Summer 1**

**Summer 2**

**Animals, including humans**

**Human timeline (3 lessons)**  
 Studying human development and changes, children identify key stages and consider what data may help determine if a child is growing normally. They describe how puberty affects girls and boys and produce graphs to record how gestation periods vary across different animals.

**Making connections**

**Title TBC**  
 This unit aims to bring together pupils' science learning from the other units and help them to see connections between the key areas.



Year 6

Year 6			
<b>Autumn 1</b>	<p><b>Living things and their habitats</b></p> <p><b>Classifying big and small (6 lessons)</b> Children broaden their knowledge of how vertebrates, invertebrates, plants and micro-organisms are grouped using shared characteristics. They discover how Carl Linnaeus developed the Linnaean and binomial systems for classifying and naming living things. Pupils use and produce classification keys to sort and identify organisms.</p>	<b>Autumn 2</b>	<p><b>Energy</b></p> <p><b>Light and reflection (6 lessons)</b> Using their prior knowledge of light, children study unusual luminous objects and investigate the properties of light transfer. They explore how our eyes allow us to see and how mirrors can be used in a variety of ways. Pupils investigate the laws of reflection and build their own periscope testing its effectiveness by completing a series of challenges.</p>
	<p><b>Living things and their habitats</b></p> <p><b>Evolution and inheritance (6 lessons)</b> Studying patterns through families, children learn about features that are inherited from parents and those that are environmental. Through the eyes of Darwin and Wallace, pupils understand how observations lead to theories and explore the survival of the fittest. They model the variation and natural selection of Darwin's finches and use this information to begin to explain how species evolve over time and how human input may affect the process.</p>		<p><b>Energy</b></p> <p><b>Circuits, batteries and switches (6 lessons)</b> Using their prior knowledge of electrical circuits, children learn to draw conventional circuit diagrams and use models to explain current and voltage. They make their own batteries, relate this to their knowledge of voltage and explore how battery research has impacted other scientific progress. Pupils investigate the use of switches and fuses and apply their electrical knowledge to design and produce their own electrical device.</p>
<b>Spring 1</b>	<p><b>Animals, including humans</b></p> <p><b>Circulation and exercise (6 lessons)</b> Studying the human circulatory system, children learn about the role of the heart, blood and blood vessels and use models to demonstrate their function. They play the role of healthcare professionals to diagnose patients and play games to explore how lifestyle choices affect our health. Pupils devise their own investigation to look at the relationship between exercise and heart and breathing rates, applying their knowledge of variables.</p>	<b>Spring 2</b>	<p><b>Making connections</b></p> <p><b>Title TBC</b> This unit aims to bring together pupils' science learning from the other units and help them to see connections between the key areas.</p>
<b>Summer 1</b>		<b>Summer 2</b>	