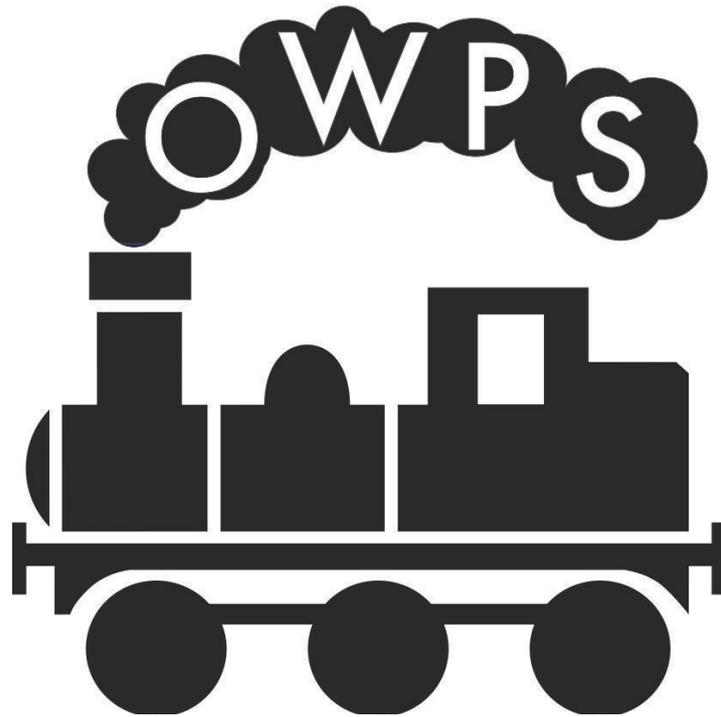


Orton Wistow Primary School



What does Science look like?

At Orton Wistow Primary School, we endeavour to deliver a rich and varied Science Curriculum, in line with national expectations.

This document will outline how science is taught across our school.

T. Newton
January 2023

Contents

Science Curriculum Overview	Page 3
How We Teach Science	Page 4
A Typical Science Unit	Page 5
Investigation Planning Tools We Use	Page 7
Other useful resources	Page 8

Science Curriculum Overview

At OWPS we follow the Science units covered in the National Curriculum. The National Curriculum also outlines Working Scientifically objectives and we cover these throughout the year with a focus on two or three per science topic. More detail on the objectives covered within each unit can be found in our Curriculum 2.0 documents. In Foundation Stage science fits within the 'Understanding of the World' part of their curriculum.

	Autumn	Spring	Summer
FS	Understanding of the world <ul style="list-style-type: none"> Free flow play activities to tinker and explore, magnets, outside area. Guided activities as part of FS curriculum, floating and sinking. Keeping healthy, sleep and teeth. 	Understanding of the world <ul style="list-style-type: none"> Frosty and Frozen topic, melting process. Keeping healthy, big walk and wheel. Keeping healthy exercise and teeth revisited. 	Understanding of the world <ul style="list-style-type: none"> How to care for plants and animals, taking care of our environment. Live eggs in the classroom, how chicks grow. Keeping healthy, healthy picnic, teeth revisited.
Year 1	Everyday Materials Seasonal Changes (taught throughout the year)	Plants	Animals including Humans
Year 2	Plants	Uses of Everyday Material	Animals inc Humans
Year 3	Rocks Light	Forces and Magnets Animals including Humans	Plants
Year 4	Sound Electricity	Animals including Humans States of Matter	Living Things and Their Habitats
Year 5	Animals including Humans Properties and Changes to their Materials	Forces	Space

Year 6	Electricity Evolution and Inheritance	Living Things and Their Habitats	Animals including Humans Light
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How We Teach Science

Here at Orton Wistow, we aim for our Science curriculum to develop children's long term substantive e.g. (to know the opposite poles on a magnet will attract each other or that shadows are formed when light is blocked) and disciplinary knowledge of the subject (e.g. how to plan a fair and reliable investigation or how to analyse data or just apparatus accurately). We try to make meaningful links between our science learning and how it impacts the world around us to develop children's 'Science Capital' (see <https://www.youtube.com/watch?v=A0t70bwPD6Y> for more information on Science Capital).

An Ofsted review into Science teaching and learning identified some helpful key principles of good quality science teaching that we try to incorporate into our teaching.

Ofsted Research Review Science 2021

- *Planning the science curriculum so that pupils build knowledge of key concepts and the relationships between them over many years; this prevents pupils from seeing science as a list of isolated facts*
- *Pupils remembering long-term the content that has been taught; this is because building domain-specific knowledge leads to expertise*
- *Explicitly teaching pupils the concepts and procedures needed to work scientifically*
- *Starting curriculum planning right from the early years by introducing pupils to wide-ranging vocabulary to describe the natural world (these words should not be overly technical)*
- *Teachers giving clear explanations that build on what pupils already know and explicitly focus pupils' attention on the content being learned*
- *Making sure practical work has a clear purpose, forms part of a wider teaching sequence and takes place only when pupils have enough prior knowledge to learn from the activity*
- *Science teachers and technicians having access to regular, high-quality subject-specific continuous professional development (CPD); this is especially important given that many science teachers are teaching outside of their subject specialism*

SEN Provision

Provision for children with SEND.

In Science, provision for children with SEND will be in accordance with the school SEND Policy and SEND Information Report. For example, in Science, children might use a writing scaffold to explain their findings from an investigation, or access information appropriate to their reading ability.

A Typical Science Unit

We follow the units of learning set out by National Curriculum at Orton Wistow, aiming to teach children the key objectives as laid out in our curriculum documents. Throughout a unit of work lessons will take a number of different focuses. How many different lessons of each focus are required will vary from unit to unit and will be impacted by the needs of the children in each class.

Pre-Assessment

- At the beginning of a unit of work teachers will need to complete activities that allow them to gauge children's prior understanding of a topic, what they have retained from previous linked topics and where they have any gaps or misconceptions. Examples of activities that teachers might use include concept cartoons, out one out questions, short low stakes quizzes or completing KWL grids.

Explicit teaching

- In all units there is some key substantive or disciplinary knowledge that will need to be explicitly taught to children. Lessons with this focus will aim to give children the knowledge they need to carry out their own enquiries later in the unit.

Investigations

- In these lessons children add to their knowledge of a topic using their enquiry skills. This maybe carrying out a fair test but can also involve the other types of enquiry (observing over time; pattern seeking; identifying, classifying and grouping; and using secondary sources.)

Applying

- These lessons give children the chance to apply their knowledge to problem solving in a range of real-world contexts. e.g. After a unit on Rocks children may design a skate park and use their knowledge of different properties of rocks to choose the material they think are best suited to the job.

Revisiting

- Teachers also plan in opportunities in the weeks and months after a unit of work for children to revisit their learning from a unit. This might involve a written piece of work, a chance to apply what they learnt to a practical problem or a low stakes quiz.

Our Science planning format then gives teacher the space to plan for each of these elements through the unit.

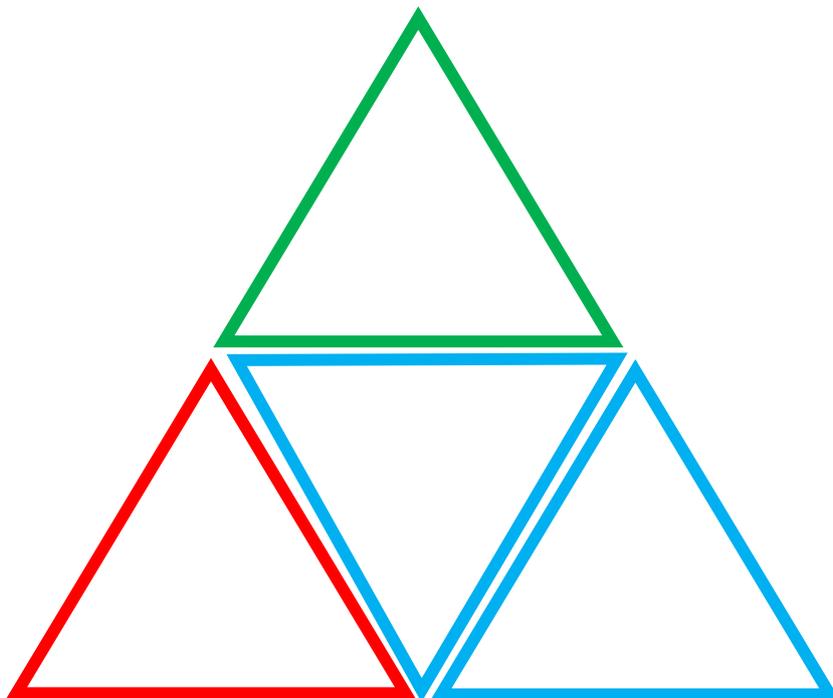
L e a r n i n g f o c u s	Pre-assessment What do they already know? Are there any misconceptions?	Teaching Explicitly teaching key knowledge & vocabulary – What key vocabulary and understanding will need to be taught to help children access the unit?	Investigation 1 What are children going to learn by carrying out their own investigations? I.e. fair test, observing over time, looking for a pattern, using secondary sources, identifying and classifying. Which working scientifically skill are you going to focus on?	Investigation 2 What are children going to learn by carrying out their own investigations? I.e. fair test, observing over time, looking for a pattern, using secondary sources, identifying and classifying. Which working scientifically skill are you going to focus on?	Applying What can the children do to apply what they have learnt in this unit to a different context?	Re-visit Have children retained what they have learnt in the unit?
	<ul style="list-style-type: none"> Clare Godby – 'Perfect Assessment for Learning.' Explority Pid – probing questions, diagnostic tasks, big questions, quick fire recall cards. 	<ul style="list-style-type: none"> Reachoutcpd.com Twinkl 	<ul style="list-style-type: none"> Reachoutcpd.com – practical ideas. https://www.stem.org.uk/practical-ideas Twinkl Explority 	<ul style="list-style-type: none"> Reachoutcpd.com – practical ideas. https://www.stem.org.uk/practical-ideas Twinkl Explority 	<ul style="list-style-type: none"> Practicalaction.org Reachoutcpd.com – practical ideas. https://www.stem.org.uk/practical-ideas Outside the Box books 	<ul style="list-style-type: none"> Pid - big questions, quick fire recall cards, assessments. TestBase Clare Godby – 'Perfect Assessment for Learning.'
	WALT – show understanding of rocks and soil.	WALT – use classification keys to identify different rocks. .	WALT – classify rocks we have found in our school. Rock walk	WALT – compare different types of soil. Water permeability of soil	WALT – apply knowledge of rocks and soils.	WALT recap our learning from rocks and soils.

S y n o p s i s	Explority – mysterious material – zoom in and out – what do you think this is? How do you know?	Share powerpoint-introducing where different rocks come from - (children don't need to know sedimentary, metamorphic etc vocab - but do need to know difference between man made and natural.	Complete Last Man standing quiz on gpt weeks learning (see ppt) - children to sit down if they get a question wrong - last one still standing wins.)	See how the permeability of different soils varies by filling funnels with different soil samples. Pour brightly coloured water into the funnels and time how long it takes for the water to pass through. (You could use pure sand, soil from the school grounds, and soil from the local area.)	Explority – Which rock would be the best for a skate ramp?	Explority – why don't all rocks look the same? Class discussion.
	<p>Give children pictures of different rocks (see twinkl lesson 1 resources – what categories could you sort these into? How many other ways could you do it? Compare way with other groups.</p> <p>Odd one out – show children 3 pictures – one cliff, one object made from a rock, one from a man-made 'rock' – which is the odd one out? Why? How many ways can you think up</p>	Then share different tests we can do to check the properties of different rocks - hardness test, water test, acid test. Get children to carry out the different tests - can they identify their different	Take the children on a walk around the school and the local area. Ask the children to describe the appearance and properties of various rocks that you find on your rock walk. Use survey questions to identify the properties of rocks they find. Can they identify different types of rock using a classification key? Use digital cameras to photograph different rocks, digital microscopes to study their rocks more closely..		Children to design their own skate parks. Label their choices of material including justifications for their choices.	

Investigation Planning Tools We Use

- Triangle Planning

This method of investigation planning was introduced to streamline the process involved where children plan their own scientific investigations. This helps them to focus on the most important variables and frees up more time in the lesson so children are able to spend more time investigating and less time recording. In the Green Triangle children record what they will measure, in the red they record the one variable that will change and in the blue they record the main variable that they will need to ensure always stays the same.

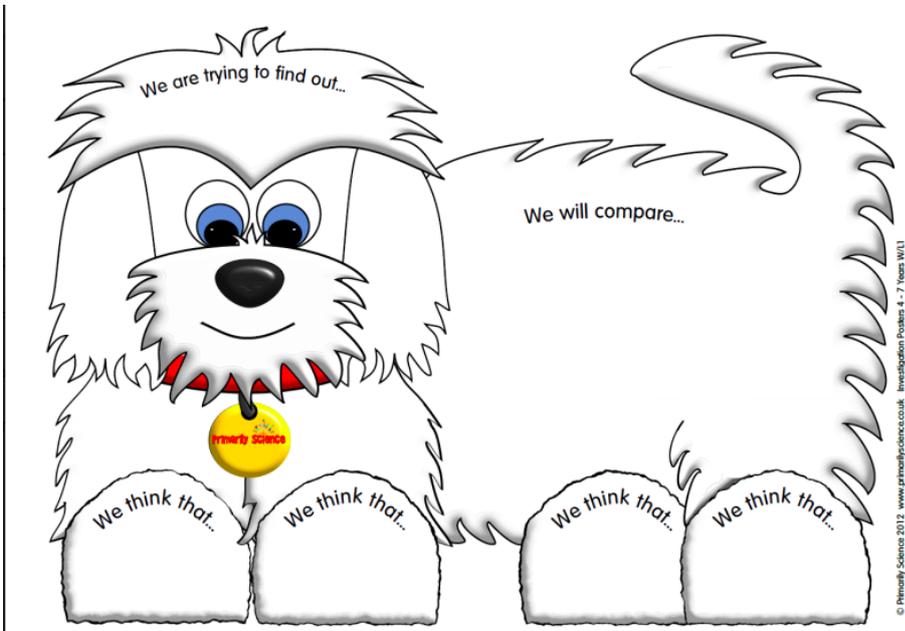


- Discovery Dog and Post-It planning
We also use these formats ('Post it' in KS2 and Discovery Dog) when discussing as a whole class how to plan an investigation.

Post it Planning

We are investigating													
<p>The variables we could change</p> <table border="1"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>							<p>The variables we could measure/observe</p> <table border="1"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>						
<p>We will change</p> <table border="1"> <tr><td> </td></tr> </table>		<p>We will measure/observe</p> <table border="1"> <tr><td> </td></tr> </table>											
<p>Our question is...</p> <p>If we change <table border="1"><tr><td> </td></tr></table> what will happen to <table border="1"><tr><td> </td></tr></table> ?</p>													
<p>To make it a fair test we will keep these factors the same</p> <table border="1"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>							<p>Our predictions are.....</p> <table border="1"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>						

Discovery Dog



Here are some of the many different online resources we use in school to help aide our science teaching.

- Explorify.com - Explorify is a free digital resource for teaching primary science. The website provides A range of activities to develop curiosity, discussion and reasoning skills.

- Knowledge Organisers - Pupils throughout school have access to these and they outline the key knowledge they need from each topic we cover.
- Twig Science Reporter - a weekly free news programme that is aimed at Primary aged children and covers news stories and the latest research breakthroughs from the world of science and technology.

- Reachoutcpd.com - a free resource aimed at improving the subject knowledge of teachers that also includes lots of practical ideas for using in the classroom.

Your current unit



Upper Primary
Forces and Magnets
Unit: 2. Core Learning
What do you need to know
about forces and magnets?

Go to this unit

Courses and Progress



See all primary science courses and and keep track of your progress and certificates.

View courses and progress

Reach Out Reporter



Free topical resources
Get the latest from our free primary science news service!

Learn more

Invite your colleagues

Share this free resource to help your fellow teachers.



Discover award-winning classroom resources for Forces and Magnets.
Browse for free.

- Pixl - this website contains lots of resources that can be useful in teaching and assessing science.

PrimaryWise Resources

← Back to "Year 3"

- Big Question Cards
- Follow me cards and multiple choice questions - Animals, Forces and Magnets, Plants, Rocks
- Know It, Grasp It, Think It Knowledge Mats
- Princes Olivia - Go Green Resources (Year 3)
- Science Experiments - Creating Awe and Wonder in the Primary Science Classroom
- Y3 and 4 Working Scientifically Vocabulary Mat
- Y3 Knowledge Organisers
- Y3 Personalised Learning Checklist (PLC)
- Y3 Teaching and Assessment Resoures - Animals, Forces & Magnets, Light, Plants, Rocks
- Y3 to 4 Transition Therapies - key topics which pupils should be secure in before progressing to Y4

- Chris Quigley - Greater Depth in Science - Lots of practical ideas for how to deepen children's understanding of key scientific concepts.

Milestone 3 – Chemistry

To investigate materials

Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

Basic

Observe and describe how items may be separated through filtering, sieving and evaporation.

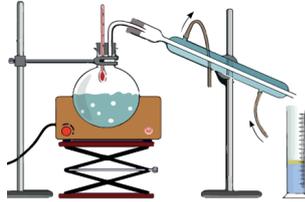
Advancing

Experiment with ways to separate pebbles and silt in a solution of salt.

Explain your methods and summarise your results.

Deep

Is there a way to recover water after recovering a substance from a solution after evaporation? (propose) Prove it.



- Kahoot - full of lots of quizzes that work really well when assessing children's recall of prior knowledge.

Questions (20) Show answers

1 - Quiz

What is the function of the skeleton?

To hold our head ✗

To protect, support and move ✓

To protect our blood ✗

To scare people on halloween ✗

Year 3 End of Year Science Quiz

Kahoot in progress

Kahoot finished View results 27

1 play · 27 players

- Twinkl - a website that contains lots of lesson ideas and resources that can be useful when planning lessons.
- BBC Bitesize - lots of video clips and pages of information that present knowledge to children in an accessible and informative way.