



Arnside National C of E School
Aspire Believe Achieve

Science Staff Meeting Spring 2022



There is much evidence showing that children's interest in science is shaped before they leave primary school. So there is a very pressing need to ensure that primary-aged children do not lose that latent interest and enthusiasm for the world around them, and the science that underpins this.

While not all children will follow a career in science or related disciplines when they leave the school system, science literacy will influence their lives daily: for example, managing their health and understanding issues such as climate change. This means that science taught in primary schools is of vital importance to individuals and the nation's well-being.



Intent, Implementation and Impact-What do we do and why?

[Science | Arnside National Primary School](#)

Intent

At Arnside National C of E school, science teaching aims to increase pupils' understanding of the natural and physical world around them. It also enables them to develop subject specific vocabulary, skills and knowledge to help them think scientifically. Our curriculum ensures that pupils gain an understanding of science processes, its uses, and its implications for today and for the future.

The science National Curriculum identifies three key areas in which the children should be taught: knowledge and understanding; working scientifically and the application of science.

Our school has a carefully mapped science curriculum that ensures children, from nursery to year 6, cover these three aims in an accessible, creative and engaging way. We believe that children learn science best by doing and seeing; by providing the children with a range of opportunities to actively carry out different types of scientific enquiries, we ensure that working scientifically and application of knowledge is embedded into the heart of our science curriculum.

Our school endeavours to ensure that every child is given the opportunity to enjoy and make progress in science. In addition, the wider curriculum provides many opportunities to apply and deepen children's understanding of science. We aim for all pupils to become, 'scientifically literate' citizens and to inspire future scientists.



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Year A



	EYFS + KS1	Nursery	Reception/Y1	Y1/Y2	Y3/4	Y4/5	Y6
AT 1	Seasons, Plants and Weather	Understanding the World Me and my body	Animals (including Humans) My Body, my senses How do our senses help us to understand the world?	Animals (including Humans) My Body, my senses How do our senses help us to understand the world?	Forces/Magnets	Forces/Magnets	Light
AT 2		Understanding the World The Three Little Pigs	Properties of Materials Let's build	Properties of Materials Let's build	Animals (incl humans) diet, skeletons and muscles/movement	Animals (incl humans) diet, skeletons and muscles/movement	Electricity
Spr 1		Understanding the World Baby Animals	Animals (including humans) Animals around us	Animals (including humans) Animals around us			Animals incl humans
Spr 2		Understanding the World African Animals	Animals (including humans) Amazing African Animals	Animals (including humans) Amazing African Animals	Rocks	Rocks	
Sum 1		Understanding the World The Tiny Seed	Plants How does your garden grow?	Plants How does your garden grow?	Plants	Plants	Evolution and inheritance
Sum 2		Understanding the World Minibeasts	Living things and their Habitats – Let's investigate a microhabitat	Living things and their Habitats Let's investigate a microhabitat	Light/Shadow	Light/Shadow	Living things/Habitats

Year B



	EYFS + KS1	Nursery	Reception/Y1	Y1/Y2	Y3/4	Y4/5
AT 1	Seasons, Plants and Weather	Understanding the World Healthy Me	Animals, including Humans What keeps me healthy?	Animals, including Humans What keeps me healthy?	Living things and their habitats	Living things and their habitats
AT 2		Understanding the World We're going on a bear hunt	Seasonal Changes What changes take place across seasons?	Seasonal Changes What changes take place across seasons?	Animal incl humans (digestive system, teeth and food chains)	Animal incl humans (digestive system, teeth and food chains)
Spr 1		Understanding the World Winter Birds	Living things and their habitats The Big Garden Bird Watch	Living things and their habitats The Big Garden Bird Watch	States of matter	States of matter
Spr 2		Understanding the World Our World	Materials Protect our planet	Materials Protect our planet	Sound	Sound
Sum 1		Understanding the World Plants all around us	Plants Wonderful, wild Plants	Plants Wonderful, wild Plants	Electricity	Electricity
Sum 2		Understanding the World Water habitats and life-cycles	Living Things and their Habitats (water) What lies beneath?	Living Things and their Habitats (water) What lies beneath?	Plants	Plants






Year C

	Y3/4	Y4/5
AT 1	Living things and their habitats	Living things and their habitats
AT 2	Animals incl humans	Animals incl humans
Spr 1	Properties and changes of materials	Properties and changes of materials
Spr 2		
Sum 1	Earth and Space	Earth and Space
Sum 2	Forces	Forces

Year A Y3/4/5

Year B Y3/4/5

Key Skills	Key Skills	Key Skills
Forces and Magnets: I can compare how things move on different surfaces. I can observe that some forces need contact between two objects, but magnetic forces can act at a distance. I can observe how magnets attract or repel each other and attract some materials and not others. I can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. I can describe magnets as having two poles. I can predict whether two magnets will attract or repel each other, depending on which poles are facing.	LOCKDOWN LEARNING: Rocks: I can observe rocks closely. I can explore different soils. I can use a hand lens or microscope. I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. I can classify soils in a range of ways based on their appearance. I can explore how fossils are formed. I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. I can observe rocks, including those used in buildings and gravestones I can identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. I can research and discuss the different kinds of living things whose fossils are found in sedimentary rock. I can investigate what happens when rocks are rubbed together or what changes occur when they are in water. I can raise and answer questions about the way soils are formed by researching, using secondary sources, about how fossils are formed. I can design and perform comparative tests to investigate the hardness of a range of rocks. I can devise a test to investigate how much water different rocks absorb. I can devise a test to investigate the water retention of soils. I can observe how soil can be separated through sedimentation. I can research the work of Mary Anning.	Plants: I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers I can explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow). I can investigate the way in which water is transported within plants I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. I can observe the different stages of plant cycles over a period of time (throughout the year) I can observe how water is transported in plants, for example, by putting cut, white carnations into coloured water. As below (Y4)
Scientist I can research the work of William Gilbert (he produced some of the first work that explained magnetism and electricity.) https://www.techagekids.com/2017/05/william-gilbert-facts-resources-kids.html  https://www.techagekids.com/2017/05/william-gilbert-facts-resources-kids.html Animals including humans: Health and Nutrition, digestive system, teeth and food chains) Big Question: What does our body do with the food that we eat? I can compare and contrast the diets of different animals (including their pets) I can decide ways of grouping them according to what they eat I can research different food groups and how they keep us healthy I can design meals based on what they find out I know that animals, including humans, need the right types and amount of	Scientist I can find out about the work of Mary Anning https://www.natgeokids.com/uk/discover/history/general-history/mary-anning-facts/ 	Light and Shadows: I can look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. I can find patterns in the way that the size of shadows changes.
	Scientist I can find out about the work of Ibn-al-Haytham (reflection and refraction) https://kids.britannica.com/scholars/article/Ibn-al-Haytham/5710 	

- Key questions
- Scientists
- Working scientifically/enquiry skills

YEAR B		Summer 1: Electricity Summer 2: Plants
Spring 1: States of matter Spring 2: Sound		
Links to previous Learning		Links to previous Learning
Materials (Y1/2) I know the difference between an object and the material from which it is made. I know the names of a variety of everyday materials, including wood, plastic, glass, metal, water and rock. I know that some materials are better than others for a purpose. I know that everyday materials are suitable for particular uses. I know that some solid shapes of some materials can be changed by squashing, bending, twisting and stretching.		Electricity Plants I know that plants may grow from either seeds or bulbs. I know that seeds and bulbs germinate and grow into seedlings which then continue to grow into mature plants. I know that these mature plants may have flowers which then develop into seeds, berries, fruits etc. I know that seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. I know that some plants are better suited to growing in full sun and some grow better in partial or full shade. I know that plants also need different amounts of water and space to grow well and stay healthy. I know the lifecycle of a plant. I know what makes a plant, a living thing. I know that Charles Darwin was a famous scientist and that when he was young, he enjoyed collecting plants and set up a science lab in his garden shed!
Sound (Y1/2) Senses activities – hearing and discussing sounds. I know what senses do-that each of our senses sends a message to our brain. I know how to look after our senses, in particular our eyes and ears (e.g. do not look directly at the sun and do not stand close to a very loud speaker). Music – listening and distinguishing between sounds of instruments		
Knowledge		Knowledge
States of matter Big Questions: Where does a puddle go? Is water always wet? I know that materials can be solids, liquids and gases. I know that a solid keeps its shape and has a fixed volume. I know a liquid has a fixed volume but changes in shape to fit the container. I know a liquid can be poured and keeps a level, horizontal surface. I know a gas fills all available space; it has no fixed shape or volume.		Electricity Big Questions: How does electricity work? Can we control electricity? I know common appliances that run on electricity. I know that some plug in to the mains and others run on batteries. I know an electrical circuit consists of a cell or battery connected to a component using wires. I know whether or not a lamp will light in a simple series circuit,

Knowledge

What are we
planning for and
assessing?

Types of
Enquiry

Working
Scientifically
Skills

- Knowledge
- Working Scientifically Skills
- Types of Enquiry

• Knowledge

These are the curriculum aims that we are all familiar with from the National Curriculum. They relate to the knowledge that we want the children to come out with at the end of the topic.

Forces and magnets

Statutory requirements

Pupils should be taught to:

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

Working Scientifically Skills:

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions.

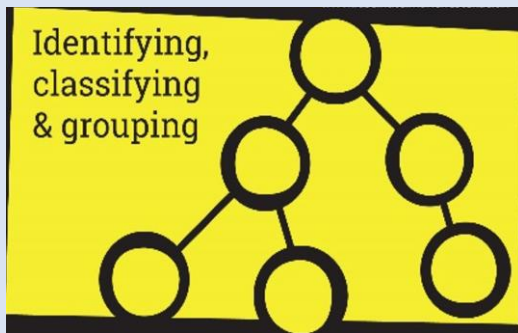
These are the skills that we want children to gain and apply whilst gaining the knowledge.

We have to achieve these objectives a few times over the entire year. You do not have to fit every objective in in every topic but make we need to make sure we cover each one a few times per year.

- Working Scientifically Skills

Scientific Enquiry:

The practical element of science when they are working scientifically can be categorised into at least one of the five different Scientific Enquiry types.



- Types of Enquiry

Which enquiry type?

Larger hands can pick up more sweets



What and how will we assess?

- Prior Knowledge: Thought showers at the beginning of each unit.
- Progress: Diagrams, low stakes quiz
- Working Scientifically: Observations during experiments, scientific write ups



What and how will we assess?



Assessment for Learning and Misconceptions

- Concept cartoons
- Cold tasks

Concept cartoons feature cartoon-style drawings showing different characters arguing about everyday situations. They are designed to intrigue, to provoke discussion and to stimulate scientific thinking.



As the plant grows its extra weight comes from the soil



Its extra weight comes from the water it takes in through the roots



Its extra weight comes from the air



I think it gets bigger but not heavier



?



How Do We Hear?

I think sound travels into our ears through the air.

I think we hear sound because it travels through our skull and reaches our brains.

Sound bounces off things and into our ears.

The ears catch sounds as they go past.



Exploring ideas about gravity

Gravity pulls things to the centre of the Earth.



Gravity only pulls on things that are falling.



Gravity pulls on things on Earth but not in space, astronauts float.



Gravity pulls things and makes them fall down.



Cold task:

Draw the rest of this diagram.



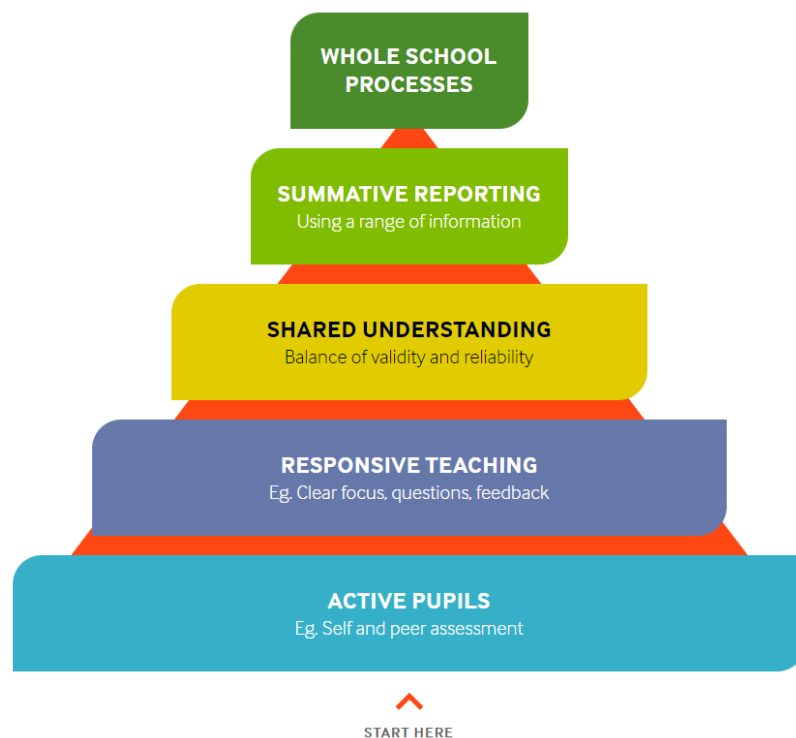
What and how will we assess?






Assessment for Learning

Working Scientifically

TAPs - Two thirds into the unit



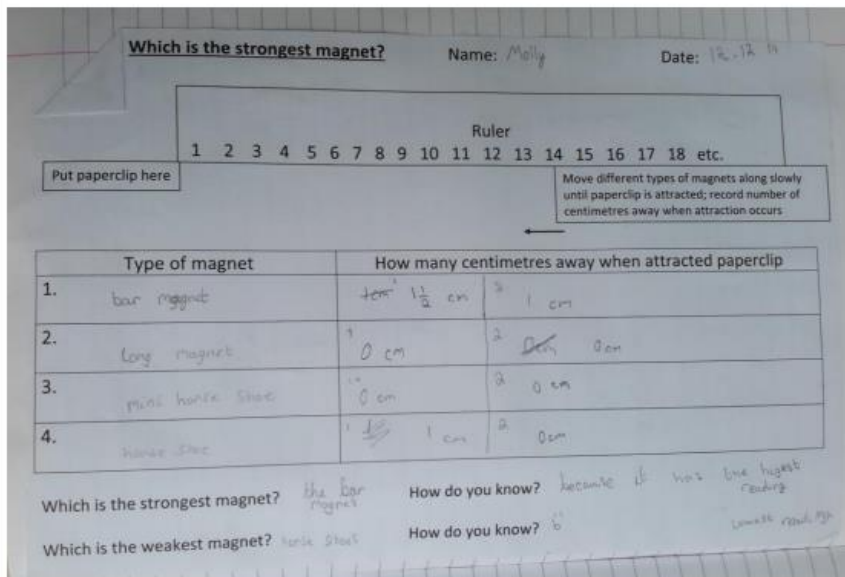
[Assessment \(TAPS\) - Curriculum Materials | Primary Science Teaching Trust \(pstt.org.uk\)](https://pstt.org.uk)

Topic: Forces and magnets	Year 3 Age 7-8	Title: Testing the strength of magnets
Working Scientifically Plan: Set up simple practical enquiries, comparative and fair tests		Concept Context Notice that some forces need contact between two objects, but magnetic objects can act at a distance.
Assessment Focus <ul style="list-style-type: none"> Can children decide on an approach to compare magnet strength? Can children recognise and control variables where necessary? 		
Activity <i>Today we are going to be physicists</i> Provide the children with a collection of magnets and other materials (e.g. card, fabric, tissue, thin wood, aluminium foil, paperclips) to explore. Ask them to find out ways to test whether the magnets are all equally strong e.g. <i>through paper/card or layers of each, how close magnet needs to be before it attracts a paper clip etc.</i> Ask the children to report their findings verbally, e.g. explaining how they carried out their investigation to their peers.  As a class, discuss the different ways of testing magnet strength and talk about the advantages and disadvantages of each approach. Discuss why it is a good idea to try different ways of answering a question (to get a more reliable answer).		
Adapting the activity Support: Ask which magnet is the strongest. Ask, 'How do you know?' and use the response to help the children plan to systematically test each magnet. Extension: Challenge children to order the magnets from strongest to weakest. Challenge the children to find several different ways of comparing the strength of magnets and see if these result with the magnets in the same order of strength.		
Questions to support discussion <ul style="list-style-type: none"> How can we find out which magnet is the strongest? What will you measure? Which materials will you use? Do the magnets need to be touching the objects to find out? Can you now put the magnets in order from strongest to weakest? Can you think of any other ways to test which is the strongest? Which magnet was the strongest? Did you get the same results with every way you tested it? 		
Assessment Indicators Not yet met: With support, can make suggestions about how to find which magnet is the strongest, e.g. <i>see how many paperclips the magnet will pick up.</i> Meeting: Can decide on an approach to answer the question, and what observations/measurements need to be made, e.g. <i>hold each magnet above the paperclips and measure the greatest distance each magnet can still attract them from.</i> Possible ways of going further: Can compare different ways of answering the question and whether they lead to the same sequence of strength of magnets, e.g. <i>The order was different when you measure the distance the paperclips jump because it is not very easy to know when this happened.</i>		

Topic: Forces	Year 3 Age 7-8	Title: Magnet results table
Working Scientifically Focus Do: record findings using simple tables	Conceptual Knowledge Context magnetic forces can act a distance	

Example

Children were asked to explore the strength of magnets by comparing how close a paper clip needed to be before it was attracted to the magnet. A simple table is provided to support children to record their results (just with titles).



Which is the strongest magnet? Name: Molly Date: 12.12.11

Ruler

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 etc.

Put paperclip here

Move different types of magnets along slowly until paperclip is attracted; record number of centimetres away when attraction occurs.

Type of magnet	How many centimetres away when attracted paperclip
1. bar magnet	1 1/2 cm
2. long magnet	0 cm
3. mini horseshoe	0 cm
4. horseshoe	1 cm

Which is the strongest magnet? the bar magnet

Which is the weakest magnet? horseshoe

How do you know? because it was the highest reading

How do you know? 10

lowest reading

Children meeting the objective would be able to use the table to record their results clearly, for example, naming each magnet and recording distances. Some children may test the magnets more than once.

Example from Shaw Primary School, Melksham

Lesson Starters:



- Promote Scientific Thinking and Discussion.
- Get Children thinking deeper.
- Promote reasoning vocabulary.

Further Science support:



[Primary Resources Science | Reach Out CPD](#)



[Science for children 4 to 14 years |
Developing Experts](#)

English National Curriculum Science

Library: English National Curriculum Science - Year 4

Below are different units for **English National Curriculum Science - Year 4**. Click on the tile to view that unit.

Add this year's lessons to your classes
This year has 36 available lessons.

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6

KS3 Biology

KS3 Chemistry & Earth

KS3 Physics

KS4 Biology

KS4 Chemistry

KS4 Physics

Topical Lessons

Classifying Living Things and their Habitats

Electricity

Food and Digestion

Nature and the Environment

Sound

States of Matter

Year 4 documents

Download the documents and resources for this year below:

Curriculum Intent - Developing Experts 2022

Developing Expert's Curriculum Statement of Intent, Implementation and Impact 2020-2021

Developing Experts - Progression of Knowledge Document

Developing Experts - Progression of Skills Document

Hello !

SCHOOL

Dashboard
Units & Lessons
Mark Book
Invite Teachers
Referrals

MY CLASSES

Classes
Pupils
Reports

ADMINISTRATION

All Classes
All Pupils
All Teachers
Import Data
Subscription
Contact us

YOU

Create your careers profile

Back to Sound

Add lesson to class
Example Class - Scheduled: 21/03/22

4. Describe high and low pitched sounds

Start presentation

Mission Objectives

Understand the difference between high and low-pitched sounds

Lesson plan

View and print the lesson plan

back
print

Rockets words quiz
See if you know all the meanings of the rocket words

start

Assessment quiz
Test your knowledge of this lesson

start

Word search game
Find all the rocket words

start

Unit Video

Lessons

Choose your lesson below from the suggested sequence

1. Explain what causes sound

2. Describe how sound travels

3. Compare the speed of sound and the speed of light

4. Describe high and low pitched sounds

5. Explore acoustics and how sound travels through solids, liquids and gases

6. Explain how to protect your ears

Unit Mastery

To master this unit learners should be able to:

- Know how sounds are made through vibration
- Understand how high and low-pitch sounds are made
- Explain how sounds can be damaging and ways to insulate our ears from sounds

Assessment Opportunities

To assess this unit, provide learners opportunities to:

- Set up a simple practical enquiry
- Report on findings of enquiries through presentations and diagrams
- Use key vocabulary

This unit is assessed by a summative test. A unit knowledge organiser is available to support learners.

How we deliver the Gatsby Benchmarks:



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Thank you!