

Year 5 Science Curriculum Overview

Where we use our enquiry skills to explore, question and talk about ourselves and the world around us.

During year 5, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Identifying scientific evidence that has been used to support or refute ideas or arguments.
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- Using test results to make predictions to set up further comparative and fair tests.

Autumn One

Forces - Physics

What are forces?

How do different machines work?

Lesson 1: I can understand Isaac Newton's theory of Gravity and identify and explain that unsupported objects fall towards Earth because of the force of gravity acting between Earth and the falling object.

Gravity carousel Nicky Waller- focus on observing and interpreting.

Enquiry skill: observe, interpret

Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: *Is gravity the same on all areas of the Earth?/*

Does an objects weight affect the gravitational pull?

Lesson 2: I can understand the work of Stephen Hawkins surrounding black holes and gravity.



Enquiry type:

Enquiry skill: ask questions, interpret

Working scientifically: Identifying scientific evidence that has been used to support or refute ideas or arguments.

Autumn Two

Animals including Humans - Biology

How do humans change as they get older?

Lesson 1: I can understand and research gestation periods for humans and other mammals.



Enquiry type:

Enquiry skill: ask questions, record

Working scientifically: Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: *Think like a Scientist concept cartoon*

Lesson 2: I can identify physical and developmental similarities and differences in babies and toddlers.

Deepening Understanding: *Talk like a Scientist to answer the statement 'All humans develop at the same rate.'*

Lesson 3: I can identify and investigate physical and developmental changes during childhood.

Deepening Understanding: How has and does his work impact on life today?

Lesson 3: I can identify air resistance and investigate the effects of air resistance.



Enquiry type: *Identify the forces in pictures then Nicky Waller investigating air resistance.*

Enquiry skill: observe/measure, record

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests.

Deepening Understanding: Using your findings what size parachute is best?

Lesson 4: I can identify water resistance and investigate the effects of water resistance.



Enquiry type: *Identify the force in pictures then Nicky Waller investigating water resistance*

Enquiry skill: observe/measure, record

Working scientifically: Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests.

Deepening Understanding: Using your findings what shape would be best for a ship?



Enquiry type: *'investigate patterns between age and height recording using graphs'.*

Enquiry skill: measure, record

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. **Deepening Understanding:** Think like a Scientist Do all children grow to the same height? Will all adults grow to the same height?

Lesson 4: I can identify and compare the changes in puberty for males and females.



Enquiry type:

Enquiry skill: observe, record

Working scientifically: Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Deepening Understanding: Talk like a Scientist and respond to this puberty problem 'My voice has been making strange noises when I talk. It is high-pitched or really deep. How can I stop this? Should I be worried?'

Lesson 5: I can identify and investigate physical and developmental changes during late adulthood.



Enquiry type: *use straws and a toilet roll to demonstrate and investigate the effects of osteoporosis.*

Enquiry skill: set up, observe/measure

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Lesson 5: I can identify friction and investigate the effects on two moving objects.



Enquiry type: *Nicky Waller zipewire investigation*

Enquiry skill set up, observe/measure, record.

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Think like a Scientist concept cartoon.

Lesson 6: I can recognise that a pulley mechanism allows a smaller force to have a greater effect.

Investigating pulleys Nicky Waller - link to history Victorians need to use a pulley to help lift the tracks when building the railways.

Enquiry skill: observe, interpret

Working scientifically: Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Think like a Scientist to agree or disagree with the statement bigger pulleys need smaller force/ find examples of pulleys being used everyday.

Lesson 7: I can recognise that a lever mechanism allows a smaller force to have a greater effect.

Investigating levers Nicky Waller- try lifting the weight without a lever measuring the force needed then with a lever measuring the force-link to history Victorians need to use a lever to help lift the tracks when building the railways.

Enquiry skill: observe, interpret

Working scientifically: Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from

Deepening Understanding: Think Scientifically and order pictures of hands, hair, bones at different stages of the human lifecycle. Talk like a Scientist use an ageing app to age yourself and add commentary.

Lesson 6: I can understand the work of Robert Winston



Enquiry type:

Enquiry skill: ask questions, record

Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Cause and effect because of Robert Winstonhas happened today.

Misconceptions: (Firmly teach the Science first before discussing any misconceptions unless they arise within children's thinking).

- A baby grows in a mother's tummy.
- A baby is "made".

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| <p>enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Deepening Understanding: Think like a Scientist to agree or disagree with the statement the closer the pivot point is to the load the easier it is to lift/ find examples of levers being used everyday.</p> <p>Misconceptions: (Firmly teach the Science first before discussing any misconceptions unless they arise within children's thinking).</p> <ul style="list-style-type: none"> • The heavier the object the faster it falls, because it has more gravity acting on it. • Forces always act in pairs which are equal and opposite. • Smooth surfaces have no friction. • Objects always travel better on smooth surfaces. • A moving object has a force which is pushing it forwards and it stops when the pushing force wears out. • A non-moving object has no forces acting on it. • Heavy objects sink and light objects float. | |
| <p>Vocabulary: force, gravity, Earth, air resistance, friction, mechanisms, simple machines, levers, pulleys, gears.</p> <p>Resources: paint, pop bottles, balls, IPADS, non-fiction texts, fabric, stop watches, measuring cylinders, play dough, coat hangers with a clip, zipwire material (string, wool, plastic, wire, nylon), rope, sand, newton meters, weights, rulers, pens.</p> <p>Better Reading Better Science texts: The Tin Snail, The Aerodynamics of Biscuits</p> <p>Cross Curricular Links:</p> <p>History/Computing/Literacy: researching the work of Isaac Newton and Stephen Hawkins.</p> <p>History: explore levers and pulleys to help the Victorians make their railway lines.</p> <p>Maths: measuring and calculating the areas of 2D shapes when making</p> | <p>Vocabulary: gestation, puberty, vocabulary to describe sexual characteristics</p> <p>Resources: VR look at gestation and pregnancy, IPADS, photographs of the children as babies, measuring tapes/meter sticks, growth charts, straws, toilet roll.</p> <p>Better Reading Better Science texts: Hair in Funny Places, Giant-Kate Scott</p> <p>Cross Curricular Links:</p> <p>Maths: Reading and recording time periods and weights when comparing gestation periods for mammals. Measuring height to find patterns in age and height-recording and interpreting findings on a graph.</p> <p>Computing/ Literacy: researching gestation periods for mammals. Researching the work of Robert Winston.</p> <p>D & T: Drawing labelled diagrams when labelling changes in puberty for males and females. Creating a model of bones to show the effects of</p> |

parachutes to investigate the effect of air resistance. Making 3D shapes with playdough when investigating water resistance. Reading scales on a newton meter when measuring the effects of pulleys and levers. Reading and measuring time on a stop watch.

D & T: exploring the uses and benefits of levers and pulleys. In D & T they will make a pop up/moveable book using levers.





Science: Earth and Space topic in Science Summer Term- exploring black holes.

Osteoporosis.

RSE: Individuality and personal qualities-puberty.

National Curriculum: By the end of the Autumn Term, pupils should be taught to

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction that act between moving surfaces.
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
- Describe the changes as humans develop to old age.

| Spring One | Spring Two |
|---|--|
| <p align="center">Properties and Changes of Materials- Chemistry</p> <p align="center">What is a mixture?</p> <p align="center">How do I separate mixtures into parts?</p> | <p align="center">Living Things and their Habitats- Biology</p> <p align="center">How do living things make copies of themselves?</p> |
| <p>Lesson 1: I can compare and group together everyday materials on the basis of their properties, including their hardness, transparency, conductivity (electrical and thermal) and response to magnets.</p> <p>Enquiry type: </p> <p>Enquiry skill: observe, record</p> <p>Working scientifically: Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Deepening Understanding: Can the same material belong to more than one group?;Talk like a Scientist to discuss if Ranjit is correct in his statement “Wool and plastic cannot be grouped together.”</p> <p>Lesson 2: I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Enquiry type:  <i>Nicky Waller materials tests-children to be given key property words to choose from and plan and carryout a comparative and fair test.</i></p> <p>Enquiry type: set up, interpret</p> <p>Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests.</p> | <p>Lesson 1: I can describe the life process of asexual reproduction in some plants. (recap previous work in year 3 on sexual reproduction in flowering plants-pollination, seed dispersal, seed formation).</p> <p>Enquiry type:  <i>Nicky Waller-plant reproduction-grow plants from cuttings, seeds,tops, tubers.</i></p> <p>Enquiry skill: observe, record, interpret</p> <p>Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests.</p> <p>Deepening Understanding: Consider the advantages and disadvantages of asexual reproduction.</p> <p>Lesson 2: I can describe the life process of reproduction in some animals.</p> <p>Enquiry type:  <i>Nicky Waller reproduction in animals-research and compare how different animals reproduce by asking and answering questions. Present findings in a presentation.</i></p> <p>Enquiry skill: ask questions, record, interpret</p> <p>Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Recognise which secondary sources will be most useful to</p> |

Deepening Understanding: Use results to explain why particular materials are chosen and used for different purposes.

Lesson 3: I can understand that some materials dissolve in a liquid to form a solution (soluble).



Enquiry type: *Nicky Waller-which materials in my kitchen cupboards dissolve?*

Enquiry skill: observe, record

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests.

Deepening Understanding: Think like a Scientist concept cartoon. Extend enquiry- does the size of material affect the rate of dissolving, does the temperature of the water affect the rate of dissolving, does stirring affect the rate of dissolving?

Lesson 4: I can describe how to recover a substance from a solution. (evaporation).



Enquiry type: *Nicky Waller Finding a solution- trial filtering and sieving to identify that these methods of separation will not work. Then use evaporation (recap year 4 learning)-take photographs and make notes.*

Enquiry skill: observe, record, interpret

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research their ideas and begin to separate opinion from fact.
Deepening Understanding: Discuss similarities and differences.

Lesson 3: I can describe the lifecycle of an insect.



Enquiry type: *research two lifecycles. The life cycle of an insect that goes through complete metamorphosis and an insect that goes through incomplete metamorphosis-present this using drawing or drama.*

Enquiry skill: ask questions, record, interpret

Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

Deepening Understanding: Recognise similarities and differences between the lifecycles. Care for and observe the hatching of butterflies using scientific vocabulary to describe what is happening at each stage-(Butterfly collecting was a popular pastime for Victorians and Margaret Fountaine became an expert in their lifecycles.

Lesson 4: I can understand the work of Eva Crane.



Enquiry type: *Twinkl- complete a timeline for her life and play the bee lifecycle board game.*

Enquiry skill: ask questions, record

Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

Deepening Understanding: Cause and effect because of Eva Cranehas happened today.

Lesson 5: I can describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird.



Enquiry type: *Research the lifecycle of a mammal of their choice. Compare this lifecycle to the lifecycle of a duck, frog and butterfly/bee. Identify the differences and similarities.*

Enquiry skill: ask questions, record, interpret

Deepening Understanding: Thinking back to year 4 how can we separate the mixture more quickly when evaporating? Apply into a context- How could fishermen lost at sea make the salty sea water safe to drink?

Lesson 5: I can demonstrate that changes of state are reversible changes.



Enquiry type: *Recap year 4 changes of state. Nicky Waller fruity ice cubes- freezing and melting processes.*

Enquiry skill: observe, record

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests.

Deepening Understanding: Identify other everyday examples of changes of state and explain how the process is reversible.

Lesson 6: I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.



Enquiry type: *Discuss irreversible changes that the Victorians completed burning coal and wood in their fire places and baking cakes with afternoon tea becoming popular and other everyday irreversible changes used today. Nicky Waller new materials- burning money and mixing bicarbonate of soda.*

Enquiry skill: observe, interpret

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and

Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

Deepening Understanding: Think like a Scientist concept cartoon.

Lesson 6: I can use test results to make predictions and set up further fair



tests. Enquiry type: *Based on their findings from lesson one now investigate what other plants can grow in this way. Focus on making predictions and recording findings including measuring differences in growth rate.*

Enquiry skill: set up, observe, record

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests.

Deepening Understanding: Think scientifically to answer the statement 'A parent plant can only produce one new plant'.

Misconceptions: (Firmly teach the Science first before discussing any misconceptions unless they arise within children's thinking).

- All plants start out as seeds.
- All plants have flowers.
- Plants that grow from bulbs do not have seeds.
- Only birds lay eggs.

degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: sort processes to reversible and irreversible changes explaining reasoning e.g. melting an ice cube, rusting a nail, boiling water, making cement.

Misconceptions: (Firmly teach the Science first before discussing any misconceptions unless they arise within children's thinking).

- Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed.
- Some children may think:
 - Thermal insulators keep cold in or out.
 - Thermal insulators warm things up.
 - Solids dissolved in liquids have vanished and so you cannot get them back.
 - Lit candles only melt, which is a reversible change.
 - When a lit object is burnt parts of it disappear and no longer exist.

Vocabulary: thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non reversible, burning, rusting, new material.

Resources: materials and objects, magnets, pipettes, thermometer, ruler, beakers, solids from kitchen cupboards, sand, paper clips, fruit, ice cube trays, stop watches, freezer, fake money, tea light, bicarbonate soda,

Vocabulary: Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings.

Resources: seeds from vegetables, carrot, potatoes, plant cutting, IPADS, non-fiction texts, butterfly growing kit,

Better Reading Better Science texts: Insect Soup, The Land of Never Believe, Beetle Boy

vinegar, bottle, balloon, sieve, filter paper, filter

Better Reading Better Science texts: George's Marvellous Medicine, Kensuke's Kingdom.

Cross Curricular Links:

Maths: grouping materials based on their properties. Measuring and recording temperature and its impact on dissolving rate. Measuring time when freezing and melting materials to change state.

History: Identifying irreversible changes seen in everyday Victorian life.

Cross Curricular Links:

Art: spring term- Georgia O Keef-painting of large flowers.

Computing: using IPADS to research.

Literacy: Using non-fiction texts to research.

History: Creating a time line for the life of Eva Crane. Observe and explain the lifecycle of butterflies- Victorians were keen collectors of butterflies and Margaret Fountaine was an expert in their lifecycles.

National Curriculum: By the end of the Spring Term, pupils should be taught to

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
- Describe the life process of reproduction in some plants and animals.

Summer One


Summer Two

Earth and Space - Physics

What planets move in our solar system? Why?

Why does the Moon appear to change shape?

Lesson 1: I can identify the eight planets in the solar system.


Enquiry type:  Use models and diagrams to introduce the eight planets. Use/ create poems to help children remember the planets and their order from the Sun. Discuss how the Victorian John Couch Adam was first to identify the planet Neptune.

Enquiry skill: ask questions, observe, record

Working scientifically: Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Identify similarities and differences between the planets.

Lesson 2: I can describe the Sun, Earth and Moon as spherical bodies.

Enquiry type:  Discover Aristotle's ideas for why the Earth was round and act these out practically. Children produce diagrams and explanations to explain why the Sun, Earth and Moon are spherical bodies. Address the common misconception that the Earth is flat and the arguments around this.

Enquiry skill: ask questions, record, interpret

Working scientifically: Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Lesson 1: I can understand that the Moon is not a light source and that it shines because of reflections from the sun.

Nicky Waller- use simple equipment to act out how the moon shines due to reflections from the sun -explain the models created using a diagram and writing or video.


Working scientifically: Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Talk Scientifically to correct the misconception about the moon in the fiction book- The Loon on the Moon.

Lesson 2: I can understand the movement of the moon relative to the Earth. Introduce how the phases of the moon are created because of the moons orbit and the light from the sun-children can draw and label these phases and use jaffa cakes to help.

Deepening Understanding: Talk Scientifically to correct the misconception about the moon in the fiction book- Goodnight Magic Moon.

Lesson 3: I can describe the movement of the moon relative to the Earth.

Enquiry type:  Nicky Waller- modelling the phases of the moon-use simple equipment to model the phases-explain the models created using a diagram and writing or video. Bring back moon diaries-discuss observations made, identify patterns in data and access a lunar calendar online to find out the lunar phases for any month this could check their findings and to look at dates significant to them.

Enquiry skill: Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar

Deepening Understanding: Choose objects to represent the Sun, Moon and Earth and explain their choices. Explore secondary resources to examine real images taken from space that show that these bodies are spherical.

Lesson 3: I can describe the movement of the Earth, and other planets, relative to the sun in the solar system.

Nicky Waller-use humans to act out the movement of the Earth relative to the sun -explain the models created using a diagram and writing or video. Add other planets thinking about their distance from the Sun.

Working scientifically: Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

Deepening Understanding: Estimate how often you would have a birthday party if you lived on the other planets then research this information.

Lesson 4: I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Nicky Waller- use simple equipment to create a model of the Earth and Sun to represent day and night. Explain the models created using a diagram and writing or video

Working scientifically: Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Use scientific knowledge to address the misconception that the sun travels across the sky during the day.

Lesson 5: I can investigate day and night in different parts of the Earth.



Enquiry type: *Twinkl- time zone investigation.*

Enquiry skill: ask questions, record

Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of

and line graphs. Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Think scientifically concept cartoon.

Lesson 4: I can set up a fair test to investigate variables that affect the dimensions of craters when meteorites hit.



Enquiry type: *Nicky Waller- What can we learn about the surface of the moon. Allow children to choose what enquiry they want to complete.*

Enquiry skill: measure, record

Working scientifically: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Relate your conclusions to the formation of real craters on the moon.

Lesson 5: I can understand the work of Katherine Johnson



Enquiry type:

Enquiry skill: ask questions, record

Working scientifically: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Using test results to make predictions to set up further comparative and fair tests. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

Deepening Understanding: Cause and effect because of Eva Cranehas happened today.

trust in results, in oral and written forms such as displays and other presentations.

Deepening Understanding: Use your findings to explain why night and day occur at different times in different places on Earth.

This week also ask children to create a moon diary at home for the next 28 days to share in lesson 3 next term.

Misconceptions: (Firmly teach the Science first before discussing any misconceptions unless they arise within children's thinking).

- The Earth is flat.
- The Earth is at the centre of the solar system and the sun and other planets orbit around it.
- The Sun is a planet.
- The Sun rotates around the Earth.
- The Sun moves across the sky during the day.
- The Sun rises in the morning and sets in the evening.
- The moon orbits around the Earth.
- Night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.
- Pluto is a planet.
- The Earth, Sun and Moon are about the same size.

Misconceptions: (Firmly teach the Science first before discussing any misconceptions unless they arise within children's thinking).

- The moon is a source of light.
- The moon orbits around the Earth.
- The Moon appears only at night.
- The Earth's shadow causes the different phases of the moon.

Vocabulary: Earth, Sun, Moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, spherical, solar system, rotates, star, orbit, planets, moon phases.

Resources: VR to explore the planets, balls, torches, foil, labels, hats, playdough, lego man, pencil sharpener, chalk, IPADS, time zone map, jaffa cakes, moon diary, desk lamps, polystyrene balls, tray of sand, cocoa powder, marbles, different size spheres.

Better Reading Better Science texts: The Way Back Home, George's secret key to the universe, The skies above my eyes

Cross Curricular Links:

Computing: using IPADS to research and record explanations of findings. Use the lunar calendar.

Literacy: writing an acrostic poem to remember the planets. Using drama to act out scientific models and theories.

History: Exploring Aristotle's arguments and evidence for why the Earth, Sun and Moon are spherical bodies, Victorian John Couch Adams was the first to identify the planet Neptune, Mayans studied astronomy and learnt about the solar system.

Maths: Reading and comparing time. Measuring height, depth and distance.

National Curriculum: By the end of the Summer Term, pupils should be taught to

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
- Describe the movement of the Moon relative to the Earth.
- Describe the Sun, Earth and Moon as approximately spherical bodies.
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Science capital:

Educational visit: National Space Centre, Jodrell Bank, Star dome visit school, Visit a beehive/beekeeper.

School environment: Use the school swimming pool to explore and feel water resistance for themselves using different body shapes when, moving and jumping.

Creative Homework: Create a catapult.

Parent workshops: Separate mixtures using filtering, sieving, evaporating- teach and explore one method in each classroom and parents and child move around to trial each method after lesson 4 spring term 1.

Professional visits: Interview an expert school nurse/parent nurse about changes as humans develop to old age, invite in an engineer to discuss the role of Science in their job. Adopt a Scientist-Aleena-Scientist who specialises in gut bacteria in various species-Cambridge based.

Themed days: Annual science day/science week

