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| **Pendeen SCIENCE SCOPE, CONTENT and SEQUENCING Year B UPPER KEY STAGE 2** |
| Year Group: 5 | Half term: Aut 1 | SCOPE: Force | CONTENT / INTENT: [LINK TO NC Learning OBJECTIVES](https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#upper-key-stage-2--years-5-and-6)I know how to compare how things move on different surfacesI know how to notice that some forces need contact between two objects, but magnetic forces can act at a distanceI know how to compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materialsI know how to describe magnets as having two polesI know how to predict whether two magnets will attract or repel each other, depending on which poles are facing |
| Prior Learning | Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 | Lesson 6 | Future Learning |
| **Yr. 3 – Forces and Magnets -** Notice that some forces need contact between two objects, but magnetic forces can act at a distance. **-** compare how things move on different surfaces.- Identify the effects of air resistance, **water resistance and friction**, that act between moving surfaces**-** Notice that some forces need contact between two objects, but magnetic forces can act at a distance. | 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. | Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. | 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. | To build upon previous learning through the KS3 NC subject content – physics. |
| Can I describe gravity as a pull, or attractive force?Can I explain that gravity pulls objects towards the centre of the Earth, and if they are in the air, it would make object fall?Can I calculate weight? | Can I say that friction occurs when two surfaces slide against each other?Can I identify that friction slows objects down?Can I describe the relationship between the amount of friction and the rate of deceleration? | Can I explain that air resistance is a type of friction and what happens to produce air resistance?Can I describe the effects of air resistance?Can I suggest ways of increasing or decreasing air resistance? | Can I say what water resistance is?Can I say what water resistance does to objects travelling through water?Can I make some suggestions of how to reduce water resistance? | Can I state that machines can make mechanical work easier?Can I explain that the longer the lever, the less effort needed to lift a load?Can I explain that adding pulleys reduces the effort required to lift a load?Can I describe the effect of a larger cog on a smaller cog? |
| See previous year groups vocabulary box in this document. | **Vocabulary:** Gravity, Descend, Newton, Air-Resistance, Mass, Weight, Friction, Decelerate, Smooth, Rough, Surface, Air Resistance, Surface Area, Decelerate, Air Particles, Drag, Direction, Water particles, Float, Sink, Effort, Load, Energy, Fulcrum, Pivot, Lever, Mechanical, Pulley, Gears, Cog, Rotate |

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| **Pendeen SCIENCE SCOPE, CONTENT and SEQUENCING Year B UPPER KEY STAGE 2** |
| Year Group: 5 | Half term: Aut 2 | SCOPE: Earth and Space | CONTENT / INTENT: [LINK TO NC Learning OBJECTIVES](https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#upper-key-stage-2--years-5-and-6)I know how to describe the movement of the Earth, and other planets, relative to the Sun in the solar systemI know how to describe the movement of the Moon relative to the EarthI know how to describe the Sun, Earth and Moon as approximately spherical bodiesI know how to use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the skyI know that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a ‘dwarf planet’ in 2006). I know that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). |
| Prior Learning | Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 | Lesson 6 | Future Learning |
| **Yr. 3 – Light -** Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. - Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.**Yr. 3 – Forces -** Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. | Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. | 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. | Describe the movement of the Moon relative to the Earth. | Describe the Sun, Earth and Moon as approximately spherical bodies. |  | **Yr. 6 – Light -** Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. |
| Can I sort the planets in order of distance from the Sun?Can I classify planets as either rocky or gas giant?Can I describe the orbits of the planets as elliptical? | Can I sort the planets in order of distance from the Sun?Can I classify planets as either rocky or gas giant?Can I describe the orbits of the planets as elliptical? | Can I explain why we have day and night on Earth and why this is cyclical?Can I describe the Moon’s orbit around the Earth as elliptical?Can I explain why the Sun, Moon and Earth are only roughly spherical? | Can I explain why we have day and night on Earth and why this is cyclical?Can I describe the Moon’s orbit around the Earth as elliptical?Can I explain why the Sun, Moon and Earth are only roughly spherical? | Can I explain why we have day and night on Earth and why this is cyclical?Can I describe the Moon’s orbit around the Earth as elliptical?Can I explain why the Sun, Moon and Earth are only roughly spherical? |  |
| See previous year groups vocabulary box in this document. | **Vocabulary:** Earth, Sun, Moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Planets, Solar System, Orbit, Geocentric, Heliocentric, Anticlockwise, Clockwise, Phase, Axis, Cyclical |

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| **Pendeen SCIENCE SCOPE, CONTENT and SEQUENCING Year B UPPER KEY STAGE 2** |
| Year Group: 5 | Half term: Spr 1 | SCOPE: States of Matter | CONTENT / INTENT: [LINK TO NC Learning OBJECTIVES](https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#upper-key-stage-2--years-5-and-6)I know how to compare and group materials together, according to whether they are solids, liquids or gasesI know how to observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)I know how to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature |
| Prior Learning | Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 | Lesson 6 | Future Learning |
| **Yr. 1 – Everyday Materials –** Identify and name a variety of everyday materials including wood, metal, plastic glass, water and rock.**Yr. 2 – Uses of Everyday Materials –** Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.**Yr. 3 – Rocks -** Recognise that soils are made from rocks and organic matter.**Yr. 4 – States of Matter –** Compare and group together materials according to whether they are solids, liquids or gases.**–** Observe that some materials change state when heated or cooled, and measure or research the temperature at which this happens in degrees Celsius.**-** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. | 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. | 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. | - Demonstrate that dissolving, mixing and changes of state are reversible changes. | - 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. | To build upon previous learning through the KS3 NC subject content – chemistry |
| Can I name the 3 things needed to produce fire?Can I name the new substances formed when fire occurs?Do I know what irreversible change means?Can I name some signs of chemical reactions? | Can I describe some of the signs that tell a chemical reaction has occurred?Can I identify some of the products of chemical reactions?Can I classify substances as acids, alkalis or neutral? | Can I identify the parts of a solution?Can I identify a solution as a type of mixture?Can I explain the process of dissolving?Can I describe changes of state as a reversible process? | Can I identify the parts of a solution?Can I identify a solution as a type of mixture?Can I explain the process of dissolving?Can I describe changes of state as a reversible process? | Can I explain how a solution is formed?Can I analyse a solution and decide how best to separate the component parts? | Can I explain how a solution is formed?Can I analyse a solution and decide how best to separate the component parts? |
| See previous year groups vocabulary box in this document. | **Vocabulary:** Fire, burning, combustion, oxygen, carbon dioxide, fuel, mass, Irreversible, Acid, Alkali, pH scale, Neutral, Carbon Dioxide, Neutralisation, Solute, Solvent, Solution, Dissolving, Soluble, Insoluble, Saturated, Mixture, Reversible,  |

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| **Pendeen SCIENCE SCOPE, CONTENT and SEQUENCING Year B UPPER KEY STAGE 2** |
| Year Group: 5 | Half term: Spr 2 | SCOPE: States of Matter | CONTENT / INTENT: [LINK TO NC Learning OBJECTIVES](https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#upper-key-stage-2--years-5-and-6)I know how to compare and group materials together, according to whether they are solids, liquids or gasesI know how to observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)I know how to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature |
| Prior Learning | Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 | Lesson 6 | Future Learning |
| **Yr. 1 – Everyday Materials –** Identify and name a variety of everyday materials including wood, metal, plastic glass, water and rock.**Yr. 2 – Uses of Everyday Materials –** Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.**Yr. 3 – Rocks -** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.**Yr. 3 – Light -** Recognise that shadows are formed when the light from a light source is blocked by an opaque object**Yr. 4 – States of Matter –** Compare and group together materials according to whether they are solids, liquids or gases.**Yr. 4 – States of Matter –** Observe that some materials change state when heated or cooled, and measure or research the temperature at which this happens in degrees Celsius.**Yr. 4 – States of Matter -** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.**Electricity** - Recognise some common conductors and insulators, and associate metals with being good conductors | Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating  | 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. | 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. | 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. | give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic | To build upon previous learning through the KS3 NC subject content – chemistry |
| Can I identify the solute and the solvent in a solution?Can I identify the solute as the substance that is dissolved in the solvent?Can I explain the process of evaporation and how it can be used to separate the solute from the solvent? | Can I produce my own hardness scale?Can I link the hardness of materials to their use?Can I explain how additives change the properties of the main metal? | Can I classify materials as transparent, translucent or opaque?Can I classify materials based on whether they are attracted to magnets? | Can I define the terms conductor and insulator?Can I state which types of material make the best thermal and electrical conductors/insulators?Can I link the properties of materials to their use? | Can I define the terms conductor and insulator?Can I state which types of material make the best thermal and electrical conductors/insulators?Can I link the properties of materials to their use? |
| See previous year groups vocabulary box in this document. | **Vocabulary:** Solute, Solvent, Solution, Dissolving, Soluble, Insoluble, Saturated, Mixture, Reversible, Evaporation, Transparent, Translucent, Opaque, Magnetic, Attract. |
| **Pendeen SCIENCE SCOPE, CONTENT and SEQUENCING Year B UPPER KEY STAGE 2** |
| Year Group: 5 | Half term: Sum 1 | SCOPE: Animals including humansLiving things and their habitats | CONTENT / INTENT: [LINK TO NC Learning OBJECTIVES](https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#upper-key-stage-2--years-5-and-6)I know how to describe the changes as humans develop to old ageI know how to describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird I know how to describe the life process of reproduction in some plants and animals |
| Prior Learning | Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 | Lesson 6 | Future Learning |
| **EYFS –** pupils should be able to identify different parts of the body and understand growth and change.**Yr. 2 – Animals Including Humans –** know that animals, including humans, have offspring that grow into adults.**Yr. 2 – Animals Including Humans –** know the basic stages in the life cycles of animals including humans.**Yr. 3 – Animals Including Humans** – identify that humans and some other animals have skeletons and muscles for support, protection and movement.**EYFS –** pupils may be able to identify the leaf and flower part of a plant.**Yr. 1 – Plants –** identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.**Yr. 1 – Plants –** identify and describe the basic structure of a variety of common flowering plants.**Yr. 1 – Plants –** identify and name the roots, trunk, branches and leaves of a tree.**Yr. 2 – Plants –** observe and describe how seeds and bulbs grow into mature plants.**Yr. 2 – Plants –** find out and describe how plants need water, light and a suitable temperature to grow and remain healthy.**Yr. 3 – Plants -** explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | Describe the changes as humans develop to old age. | Describe the life process of reproduction in some plants and animals. | 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. | **Yr. 6 – Evolution and Inheritance –** recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.**Yr. 6 – Evolution and Inheritance -** identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.**Yr. 6 – Living Things and their Habitats -** describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.**Yr. 6 – Living Things and their Habitats -** give reasons for classifying plants and animals based on specific characteristics. |
| Can I explain some of the changes that occur in humans from when they are born?Can I describe some of the characteristics that occur as humans get older? | Can I state that animals can only produce offspring via sexual reproduction? Can I compare the life cycles of a mammal, amphibian, insect and a bird? | Can I state that animals can only produce offspring via sexual reproduction? Can I compare the life cycles of a mammal, amphibian, insect and a bird? | Can I state that plants can reproduce either sexually or asexually?Can I describe some methods for asexual reproduction in plants? |
| See previous year groups vocabulary box in this document. | **Vocabulary:** Aging, puberty, elderly, osteoporosis, bone density. Sexual, reproduction, mating, hatch, birth, offspring, Sexual, asexual, reproduction, regeneration, cutting, spores. |
| **Pendeen SCIENCE SCOPE, CONTENT and SEQUENCING Year B UPPER KEY STAGE 2** |
| Year Group: 5 | Half term: Sum 2 | SCOPE: Working Scientifically  | CONTENT / INTENT: [LINK TO NC Learning OBJECTIVES](https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#upper-key-stage-2--years-5-and-6)During years 5 and 6, 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 necessarytaking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriaterecording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphsusing test results to make predictions to set up further comparative and fair testsreporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentationsidentifying scientific evidence that has been used to support or refute ideas or arguments |
| Prior Learning | Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 | Lesson 6 | Future Learning |
| Year 3 and 4 programme of study content (working Scientifically):asking relevant questions and using different types of scientific enquiries to answer themsetting up simple practical enquiries, comparative and fair testsmaking systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggersgathering, recording, classifying and presenting data in a variety of ways to help in answering questionsrecording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tablesreporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusionsusing results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsidentifying differences, similarities or changes related to simple scientific ideas and processes | Child led plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary | Child ledtake measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate | Child ledtake measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate | Child ledrecord data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs | Child ledusing test results to make predictions to set up further comparative and fair tests | Child led reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations | Continue to build upon NC objectives within Working Scientifically for years 5 and 6 (See content/ intent) |
| I know the risks of doing an experimentI can write a methodI can identify the equipment I needI can make and explain predictionsI can write questions from variablesI know variables. | I can carry out an experiment/observationI know what a fair test isI can record with an appropriate methodI can take repeat data when appropriate  | I can carry out an experiment/observationI know what a fair test isI can record with an appropriate methodI can take repeat data when appropriateI know the type of data to gather | I can spot patterns in my resultsI can draw different types of graphsI can draw my own results tableI can record my results in various waysI know the type of data to gather | I can design my own experimentI can ask other questions related to my experimentI can improve methodsI can suggest reasons for anomaliesI can discuss if my results were valid | I can spot patterns in my resultsI can draw different types of graphsI can draw my own results tableI can record my results in various waysI know the type of data to gather |
| See previous year groups vocabulary box in this document. | **Vocabulary:** Data, record, evidence, variable, Independent variable, Dependent variable, Control variable, prediction, Hypothesis, Equipment, Method, Risks, Fair Test, Comparative Test, Observation, Pattern, Conclusion, Anomalies, invalid, valid, results |