Science teaching principles at Arley:

* Science is a CORE subject.
* All year groups should be teaching from the 2014 National Curriculum.
* Science must be timetabled and taught for the equivalent of 2 hours per week (approximately 22-24 hours per term).
* Teaching of Science is flexible in timetabling. For example; you may choose to complete 3 hours one week and 1 hour the next week. Or 4 hours one week and then miss it the next week. HOWEVER you should not go more than 2 weeks without teaching science.
* Science must not be blocked (e.g. complete it all in one week of the term and then no Science until the next term).
* Teaching should be pitched appropriately. Take in to consideration the progression of statutory requirements document when planning.
* Children should learn about science through active investigations and enquiry based learning.
* Assessment of science is via target tracker using Teacher Formative and Summative Assessment.

Resources:

* <http://www.nationalstemcentre.org.uk/primaryscience>
* Twinkle site
* Hamilton Site
* The **Science cupboards** are in the centre of the learning street outside Badger room. Please inform M Watts (or document on the list inside of the cupboard door) of any resources that you feel need updating or replenishing. Please also return all items as you would expect to find them. Thanks.

If you feel that you have *‘extra time’* within a term then what should you do? Here are some ideas. Remember the National Curriculum is a ‘minimum entitlement’ for pupils. We have a duty to expand on it!

* **Take longer over each topic**
* **Use the time for revision, consolidation and extension (but be mindful of progression in programme of study objectives for subsequent year groups)?**
* **Independent (pairs or groups) study some of the question that came up during the year?**
* **Create your own topic?**
* **Do something adventurous – class science newspaper/documentary/show**

**Year 1**

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| **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Animals including Humans** | **Light** | **Everyday Materials** | **Plants** | **Earth and Space** |  |
| • identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates  • identify and name a variety of common animals that are carnivores, herbivores and omnivores  • describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, and including pets)  • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. | • Observe and name a variety of sources of light, including electric fires, flames and the Sun  • Associate shadows with a light source being blocked by something | • distinguish between an object and the material from which it is made  • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock  • describe the simple physical properties of a variety of everyday materials  • compare and group together a variety of everyday materials on the basis of their simple physical properties  • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | • identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen  • identify and describe the basic structure of a variety of common flowering plants including roots, stem, leaves and flowers. | • observe changes across the four seasons  • observe and describe weather associated with the seasons and how day length varies |  |

**Year 2**

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| **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **All Living Things** | **Use of Everyday Materials** | **Plants** | **Animals including Humans** | **Sound** |  |
| • explore and compare the differences between things that are living, dead, and things that have never been alive.  • identify that most living things live in habitats to which they are suited and describe how different habitats provide for  the basic needs of different kinds of animals and plants, and how they depend on each other  • identify and name a variety of plants and animals they study in a variety of habitats, including microhabitats  • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. | • identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard.  • Compare how things move on different surfaces | • observe and describe how seeds and bulbs grow into mature plants  • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. | • notice that animals, including humans, have offspring which grow into adults  • find out about and describe the basic needs of animals, including humans, for survival (which are water, food and air)  • describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene. | • observe and name a variety of sources of sound, noticing that we hear with our ears  • Recognise that sounds get fainter as the distance from the sound source increases |  |

**Year 3**

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| --- | --- | --- | --- | --- | --- |
| **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Rocks** | **Light** | **Plants** | **Forces and Magnets** | **Animals including Humans** |  |
| • compare and group together different kinds of rocks on the basis of their simple physical properties  • describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock.  • Recognise that soils are made from rocks and organic matter | • notice that light is reflected from surfaces  • find patterns that determine the size of shadows | • identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers  • explore the requirements of plants for life and growth (air, light, water, nutrients from soil and space) and how they vary from plant to plant  • investigate the way in which water is transported within plants.  • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | • notice that some forces need contact between two objects and some forces 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 | • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition  from what they eat  • identify that humans and some animals have skeletons and muscles for support, protection and movement. |  |

**Year 4**

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| **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Sound** | **Electricity** | **Animals including Humans** | **All living things** | **States of Matter** |  |
| • identify how sounds are made, associating some of them with something vibrating  • find patterns between the pitch of a sound and features of the object that produced it  • find patterns between the volume of a sound and the strength of the vibrations that produced it | • identify common appliances that run on electricity  • construct a simple series electric circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers  • identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery  • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit  • recognise some common conductors and insulators, and associate metals with being good conductors | • describe the simple functions of the basic parts of the digestive system in humans  • identify the different types of teeth in humans and their simple functions.  • Construct and interpret a variety of food chains, • identifying producers, predators and prey. | • identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups  • recognise that environments can change and that that this can sometimes pose dangers to living things | • compare and group materials together, according to whether they are  solids, liquids or gases  • observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C)  • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature |  |

**Year 5**

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| **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Electricity** | **Forces** | **Sound** | **Earth and Space** | **States of Matter and Properties and Changes of Materials.** |  |
| • understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs  • construct a simple series electric circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers  • identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery  • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit  ***Scope to use this learning to make some form of light up circuit Christmas Card.*** | | • identify how sounds are made, associating some of them with something vibrating  • find patterns between the pitch of a sound and features of the object that produced it  • find patterns between the volume of a sound and the strength of the vibrations that produced it | • 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 | Recap Year 4 objectives:  • compare and group materials together, according to whether they are  solids, liquids or gases  • observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C)  • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature  Year 5:  • compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency conductivity (electrical and thermal), and response to magnets  • understand how 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 |  |

**Year 6**

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| --- | --- | --- | --- | --- | --- |
| **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **All Living Things** | **Electricity** | **Properties and Changes of Materials.** | **Light** | **Evolution and Inheritance.** | **Animals Including Humans**  (look briefly at the All living things objectives and link in but have done these before so just recap) |
| • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms  • Give reasons for classifying plants and animals based on specific characteristics | • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit  • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.  • Use recognised symbols when representing a simple circuit in a diagram | • compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency conductivity (electrical and thermal), and response to magnets  • understand how 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 | • understand that light appears to travel in straight lines  • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye  • Explain that we see things because light travels from light sources to objects and then to our eyes  • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes | • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago  • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents  • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution | • Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood  • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function  • Describe the ways in which nutrients and water are transported within animals including humans. |