

New Curriculum Holy Trinity CE Primary Academy – 2013-14

Subject: Science

Aims:

The national curriculum for science aims to ensure that all pupils:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop understanding of the nature processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Skills:

	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
1. Ideas and evidence in science	<ul style="list-style-type: none"> • to collect evidence to try to answer a 	<ul style="list-style-type: none"> • to collect evidence to try to answer a question 	<ul style="list-style-type: none"> • to collect evidence in a variety of contexts to answer a question or test an idea 	<ul style="list-style-type: none"> • to collect evidence in a variety of contexts to test an idea or prediction based on their scientific knowledge and understanding 	<ul style="list-style-type: none"> • to consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena 	<ul style="list-style-type: none"> • to consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena
2. Investigative skills - Planning	<ul style="list-style-type: none"> • to test ideas suggested to them and say what they think will happen 	<ul style="list-style-type: none"> • to suggest some ideas and questions based on simple knowledge and say how they might find out about them; • to say what they think might 	<ul style="list-style-type: none"> • in a variety of contexts, to suggest questions and ideas and how to test them; • to make predictions about what will happen; • to think about how to collect 	<ul style="list-style-type: none"> • to suggest questions that can be tested and make predictions about what will happen, some of which are based on scientific knowledge; to design a fair test or plan how to collect sufficient evidence; 	<ul style="list-style-type: none"> • to make predictions of what will happen based on scientific knowledge and understanding, and suggest how to test these; • to use knowledge and understanding to plan how to carry out a fair test or how to collect 	<ul style="list-style-type: none"> • to decide how to turn ideas into a form that can be tested and, where appropriate, to make predictions using scientific knowledge and understanding; • to identify factors that are relevant to a particular situation;

		<p>happen</p> <ul style="list-style-type: none"> to think about and discuss whether comparisons and tests are fair or unfair 	<p>sufficient evidence in some contexts;</p> <ul style="list-style-type: none"> to consider what makes a test unfair or evidence sufficient and, with help, plan fair tests 	<ul style="list-style-type: none"> in some contexts, to choose what apparatus to use and what to measure 	<p>sufficient evidence to test an idea;</p> <ul style="list-style-type: none"> to identify factors that need to be taken into consideration in different contexts 	<ul style="list-style-type: none"> recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. to choose what evidence to collect to investigate a question, ensuring the evidence is sufficient; to choose what equipment to use
- Obtaining and presenting evidence	<ul style="list-style-type: none"> to make observations using appropriate senses; to make some measurements of length using standard and non-standard measures; to present some findings in simple tables and block graphs 	<ul style="list-style-type: none"> to make observations; to make measurements of length in standard and non-standard measures; to make records of observations; and to present results in tables, drawings and block graphs 	<ul style="list-style-type: none"> to make careful and systematic observations and comparisons; to measure length, volume of liquid and time in standard measures using simple measuring equipment effectively to present results in labelled drawings, keys, bar charts and tables reporting on findings including oral and written, in displays or presentations of results or conclusions 	<ul style="list-style-type: none"> to make observations and comparisons of relevant features in a variety of contexts; to make measurements of temperature, time and force as well as measurements of length; data loggers may be used to begin to think about why measurements of length should be repeated to present results in labelled drawings, keys, bar charts and tables reporting on findings including oral and written, in displays or presentations of results or conclusions 	<ul style="list-style-type: none"> to make relevant observations; to consolidate measurement of volume, temperature, time and length; to measure pulse rate; to think about why observations and measurements should be repeated; to present results in scientific diagrams and labels, classification keys, tables, bar charts and line graphs 	<ul style="list-style-type: none"> to make a variety of relevant observations and measurements using simple apparatus correctly and accurately; to decide when observations and measurements need to be checked, by repeating, to give more reliable data; to present results in scientific diagrams and labels, classification keys, tables, bar charts and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in oral and written forms such as displays and presentations.
- Considering evidence and evaluating	<ul style="list-style-type: none"> to make simple comparisons and groupings that relate to differences and similarities 	<ul style="list-style-type: none"> to make simple comparisons, identifying similarities and differences between living 	<ul style="list-style-type: none"> to draw conclusions from results and begin to use scientific knowledge to suggest 	<ul style="list-style-type: none"> to identify simple trends and patterns in results presented in tables, charts and graphs and to suggest explanations for some 	<ul style="list-style-type: none"> to decide whether results support any prediction; to begin to evaluate repeated results; to recognise and make 	<ul style="list-style-type: none"> to make comparisons; to evaluate repeated results; to identify patterns in results and results that do not appear to fit the pattern;

	<p>between living things and objects;</p> <ul style="list-style-type: none"> • in some cases to say what their observations show, and whether it was what they expected; • to draw simple conclusions and explain what they did 	<p>things, objects and events;</p> <ul style="list-style-type: none"> • to say what results show; • to say whether their predictions were supported; • in some cases to use knowledge to explain what was found out and to draw conclusions; • to explain what they did 	<p>explanations for them;</p> <ul style="list-style-type: none"> • to make generalisations and begin to identify simple patterns in results presented in tables • to suggest improvements and further questions 	<p>of these;</p> <ul style="list-style-type: none"> • to explain what the evidence shows and whether it supports any prediction made; • to link the evidence to scientific knowledge and understanding in some contexts • to suggest improvements and further questions 	<p>predictions from patterns in data and suggest explanations for these using scientific knowledge and understanding;</p> <ul style="list-style-type: none"> • to interpret data and think about whether it is sufficient to draw conclusions; • to draw conclusions indicating whether these match any prediction made • Use simple models to explain scientific ideas (simple atomic theory in crystal formation) 	<ul style="list-style-type: none"> • to use results to draw conclusions and to make further predictions; • to suggest and evaluate explanations for these predictions using scientific knowledge and understanding; • to say whether the evidence supports any prediction made • to use test results to make predictions to set up further comparative and fair tests •
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Programme of Study:

Stonehenge All Y1 NC		
Biology Plants identify and name a variety of common wild and garden plants, including deciduous and evergreen trees identify and describe the basic structure of a variety of common flowering plants, including trees. Animals identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 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 (fish, amphibians, reptiles, birds and mammals, 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.	Chemistry Everyday Materials 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.	Physics Seasonal Changes observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies. Light & Dark (Not in NC for Y1, now Y3) Identify sources of light, create and describe shadow and reflection.

Whitehorse All Y2 NC

Biology

Living things and their habitats

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 in their habitats, including micro-habitats

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.

Plants

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.

Animals, including humans

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 (water, food and air)

describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Chemistry

Uses of Everyday Materials

identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses

find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Physics

Sound (not in NC for Y2 , now Y4)

Identifying how sound is made.
Identify different pitch and volume.

Biology
Plants
identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) 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.

Animals, including humans
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 other animals have skeletons and muscles for support, protection and movement.
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.

Chemistry
Rocks
Pupils should be taught to:
compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
describe in simple terms how fossils are formed when things that have lived are trapped within rock
recognise that soils are made from rocks and organic matter.

Physics
Light
Pupils should be taught to:
recognise that they need light in order to see things and that dark is the absence of light
notice that light is reflected from surfaces
recognise that light from the sun can be dangerous and that there are ways to protect their eyes
recognise that shadows are formed when the light from a light source is blocked by a solid object
find patterns in the way that the size of shadows change.

Forces and Magnets
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.

<p>Biology</p> <p>Living things and their habitats</p> <p>recognise that living things can be grouped in a variety of ways</p> <p>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>Chemistry</p> <p>States of Matter</p> <p>compare and group materials together, according to whether they are solids, liquids or gases</p> <p>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)</p> <p>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p>	<p>Physics</p> <p>Sounds</p> <p>identify how sounds are made, associating some of them with something vibrating</p> <p>recognise that vibrations from sounds travel through a medium to the ear</p> <p>find patterns between the pitch of a sound and features of the object that produced it</p> <p>find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>recognise that sounds get fainter as the distance from the sound source increases.</p> <p>Electricity</p> <p>Identify common appliances that run on electricity</p> <p>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Earth and Space</p> <p>describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>describe the movement of the Moon relative to the Earth</p> <p>describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>
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Biology

Living things and their habitats
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.

describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals

give reasons for classifying plants and animals based on specific characteristics.

Animals, including humans
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.

identify and name the main parts of the human circulatory system, and describe 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

Chemistry

Properties and changes of materials
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

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.

Physics

Forces
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.

Light
recognise 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 our eyes or 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.

Electricity
associate the brightness of a lamp or the volume of a

<p>humans.</p> <p>Evolution and inheritance</p> <p>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>		<p>buzzer with the number and voltage of cells used in the circuit</p> <p>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</p> <p>use recognised symbols when representing a simple circuit in a diagram.</p>
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Links with other subjects (especially the core subjects and ICT):

Computing – word processing, excel for graphs, presentations

Maths – data handling, graphs, extrapolation of data, units of measure, cumulative totals

English – Non chronological reports, oral presentations and posters, instructions

Opportunities for real life projects, experiences, field trips, final products, links to local area/community/relevant topics or issues/

Planetarium, At Bristol, Field studies, in school grounds and local area, residential trip, pond dipping – Langford lakes, Devizes Museum (fossils), local walks for physical features, woodland, Roundway Hill, Salisbury Plain, river meadows, towns and villages, Salisbury, Devizes, and local villages.

Previous QCA units used

Sarum

- 3a teeth and eating
- 3b helping plants grow well
- 3c characteristics of materials
- 3d rocks and soils
- 3e magnets and springs
- 3f light and shadows

Avebury (previous)

- 4a moving and growing (now Y3)
- 4b habitats x
- 4c keeping warm x
- 4d solids, liquids, separation
- 4e friction x
- 4f circuits and conductors
- 5a keeping healthy
- 5b life cycles
- 5c gases around us

Silbury (previous)

- 5d changing states
- 5e earth sun & moon
- 5f changing sounds
- 6a interdependence & adaptation
- 6b micro-organisms
- 6c more about dissolving
- 6d reversible and irreversible changes (short)
- 6e forces in action
- 6f how we see things (short)
- 6g changing circuits (short)