

Draft Schemes of Work – Edexcel Primary Curriculum

May 2011

Dear Centre,

The Schemes of Work in this booklet have been prepared to provide teachers with an overview of the coverage provided by the Edexcel Primary Curriculum for Science. Centres which register for the Edexcel Primary Curriculum will receive the final version of this document.

In addition to these Schemes of Work centres which register for the Edexcel Primary Curriculum will receive six completed units, including unit tests and mark schemes, for English and Mathematics for Years 3-6 and three completed units, including unit tests and mark schemes, for Science for Years 3-6. They will also have the opportunity to purchase Achievement Tests for English, Mathematics and Science for Year 6 and Progress Tests for each of Years 3-6 for English, Mathematics and Science. The Achievement Tests will be externally marked by Edexcel. The Progress Tests will be internally assessed by centres. Further information about the availability of Achievement Tests and Progress Tests will be provided to centres as soon as it is available.

Draft sample units for Science for Year 6 and draft sample units for Science for Year 9 are available on the Edexcel web site for the Edexcel Primary Curriculum and the Edexcel Lower Secondary Curriculum.

Further information about the Edexcel Primary Curriculum and the Edexcel Lower Secondary Curriculum is available from the Edexcel Regional Development Manager for your region. Details of international Regional Development Managers are available on the Edexcel web site: www.edexcel.com



Science Scheme of Work – Year 3 Overview

Term One	Objectives
Unit 1 (Teeth and eating)	<ul style="list-style-type: none"> ● Know that all animals, including humans, need to feed ● Know that animals need to feed to grow and to be active ● Know that foods can be sorted into different groups ● Know that different food groups provide the body with the different things it needs ● Know that an adequate and varied diet is needed to keep healthy ● Know that different animals have different diets ● Raise questions about the diet of different pets ● Turn ideas about the diet of animals into a form that can be investigated ● Decide how many animals should be investigated and the range of foods to be considered ● Present evidence about the foods eaten by animals in a suitable bar chart or pictogram ● Decide whether the evidence is sufficient to draw conclusions ● Know that humans have teeth - molars for chewing, canines for tearing, incisors for cutting - and that teeth help us to eat ● Understand that the shape of the teeth makes them useful for different purposes ● Know that teeth are held in place by roots and gums ● Make observations and comparisons of different teeth, identify important features ● Know that we have two sets of teeth and adult teeth have to last ● Understand that healthy teeth need healthy gums ● Know that some foods can be damaging to our teeth ● Know what tooth decay is and how to prevent it
Unit 2 (Characteristics of materials)	<ul style="list-style-type: none"> ● Identify a range of common materials and that the same material is used to make different objects ● Recognise properties, eg hard, soft, strong, flexible and compare materials using the properties of material ● Know that materials are suitable for making a particular object because of their properties and that some properties are more important than others when deciding what to use ● Know how to obtain evidence to test scientific ideas ● Plan and carry out a test safely ● Decide whether the test was fair ● Plan a test to compare the absorbency of different papers,



Term One	Objectives
Unit 2 (Characteristics of materials) <i>continued</i>	decide what evidence to collect, consider what to change, what to keep the same and what to measure <ul style="list-style-type: none"> ● Make comparisons and draw conclusions ● Plan how to find out which pair of tights is the most stretchy, make a fair comparison ● Decide what to change, what to keep the same and what to measure ● Make careful measurements of length, present measurements as a bar chart and draw conclusions

Term Two	Objectives
Unit 3 (Magnets and springs)	<ul style="list-style-type: none"> ● Know that there are forces between magnets and that magnets can attract (pull towards) and repel (push away from) each other ● Make and record careful observations of magnets ● Make generalisations about what happens when magnets are put together ● Make and test predictions about whether materials are magnetic or not ● Make careful observations ● Know that magnets attract some metals, but not others, and that other materials are not attracted to magnets ● Use results to draw conclusions, indicating whether they were right in their prediction about which materials were magnetic ● Know that magnets have a variety of uses ● Investigate an aspect of the behaviour of magnets ● Plan a fair test and decide what to measure and what equipment to use ● Make and record measurements ● Draw conclusions ● Know that springs are used in a variety of ways ● Know that when a spring is stretched or compressed upward, it exerts a downward force on whatever is compressing or stretching it, and that when an elastic band is stretched downward, it exerts an upward force on whatever is stretching it ● Know that forces act in particular directions ● Make predictions of the effect of stretching elastic bands by different amounts ● Make comparisons and identify patterns in results ● Draw conclusions and indicate whether the prediction is supported ● Explain the conclusions in terms of the size of the force



Term Two	Objectives
Unit 4 (Helping plants grow well)	<ul style="list-style-type: none"> ● Know that plants can provide food for us, and that some plants are grown for this reason ● Know that plants have roots, stems and leaves ● Make careful observations and measurements of plants growing ● Use simple apparatus to measure the height of plants using standard measures ● Use results to draw conclusions ● Know that plants need leaves in order to grow well ● Know that leaves make food for the plant ● Know that water is taken in through the roots ● Know that water is transported through the stem to other parts of the plant ● Make careful observations and present these observations using drawings ● Be able to explain observations ● Know that plants need healthy roots, leaves and stems to grow well ● Know that plants need water, but not unlimited water, for healthy growth ● Use simple apparatus to measure a volume of water correctly ● Use simple apparatus to measure the height of the plant ● Decide how much evidence is needed about the growth of seedlings ● Know that plants need light for healthy growth ● Ask questions about the growth of plants ● Know that plant growth is affected by temperature ● Recognise when a comparison of plant growth is unfair ● Suggest how a fair test could be carried out ● Make a prediction about the outcome of a test ● Understand that in experiments and investigations involving living things, using just one plant in each set of conditions does not give sufficient evidence



Term Three	Objectives
Unit 5 (Rocks and soils)	<ul style="list-style-type: none"> ● Know that rocks are natural materials ● Know that rocks can be used for a variety of purposes ● Know that rocks can be grouped according to observable characteristics ● Observe and compare rocks ● Know that differences between rocks can be identified by testing ● Know that rocks are chosen for particular purposes because of their characteristics ● Know that there is rock underneath all surfaces ● Understand that there are different kinds of soil and this depends on the rock they come from ● Observe differences and make comparisons ● Know that particles of different sizes can be separated by using a sieve ● Use simple apparatus to measure volumes of liquids and to measure time ● Recognise when a test is unfair ● Plan a fair test ● Make and record measurements of time and volume of water ● Use their results to make comparisons, and to draw and to explain conclusions
Unit 6 (Light and shadows)	<ul style="list-style-type: none"> ● Know that we need light to see things ● Know that shadows are formed when light travelling from a source is blocked ● Make and record observations and present information using drawing and writing ● Know that shadows are formed when objects block light from the Sun ● Know that shadows are similar in shape to the objects that form them ● Recognise that over the course of the day, shadows of objects in sunlight will change ● Use knowledge about light to make and record observations of shadows and attempt to explain observations ● Know that shadows change in length and position throughout the day ● Measure the length of the shadow using standard measures ● Make a table and bar chart to show how the length of the shadows changes during the day ● Record and identify a pattern in the observations of the Sun



Term Three	Objectives
<p>Unit 6 (Light and shadows) <i>continued</i></p>	<ul style="list-style-type: none"> ● Understand that the Sun appears to move across the sky during the day ● Know that when the Sun is behind them, their shadow is in front of them ● Know that the Sun appears to move across the sky in a regular way every day ● Know that the Sun appears highest in the sky at midday ● Know that the higher the Sun appears in the sky, the shorter the shadows ● Understand that the Sun does not move, but that its apparent movement is caused by the Earth spinning on its axis ● Know that shadows can be used to tell the approximate time of the day ● Know that opaque objects/materials do not let light through them and that transparent objects/materials let a lot of light through them ● Use their knowledge about light and shadows to predict which materials will form a shadow, and plan how to test this idea ● Compare the shadows formed by different materials and draw conclusions from their results ● Decide whether the results support their predictions and use knowledge about shadow formation to explain their conclusions



Science Scheme of Work – Year 4 Overview

Term One	Objectives
Unit 1 (Moving and growing)	<ul style="list-style-type: none"> • Know that humans (and some other animals) have bony skeletons inside their bodies, and raise questions about different bony skeletons • Make and record relevant observations of bones and skeletons • Make observations and comparisons of relevant features • Know that human skeletons are internal and grow as humans grow • Identify a question to make a prediction that can be tested • Decide precisely what body measurement to make, and make these measurements • Use bar charts or pictograms to present measurements • Say what the evidence shows and whether it supports the prediction • Know that the skeleton supports the body • Know that animals with skeletons have muscles attached to the bones • Know that a muscle has to contract (shorten) to make a bone move • Know that muscles act in pairs • Know that when someone is exercising or moving fast, the muscles work hard • Make observations and comparisons relating to exercise and rest
Unit 2 (Keeping warm)	<ul style="list-style-type: none"> • Know that the sense of touch is not an accurate way of judging temperature • Know how to use a thermometer to make careful measurements of temperature using standard measures • Know that temperature is a measure of how hot or how cold things are, and that something hot will cool down and that something cold will warm up until it is the same temperature as its surroundings • Explain temperature and temperature changes using scientific knowledge and understanding • Use IT to collect, store and retrieve temperatures and to explain trends and patterns in results in terms of scientific knowledge and understanding • Turn an idea about how to keep things cold into a form that can be investigated • Decide what evidence to collect • Make a table and record results in it • Draw conclusions from their results • Conduct a fair test • Collect relevant evidence and use it appropriately when drawing a conclusion • Begin to turn ideas into a form that can be investigated • Use thermometers to make careful measurements of temperature



Term One	Objectives
Unit 2 (Keeping warm) <i>continued</i>	<ul style="list-style-type: none"> • Identify and suggest explanations for patterns and trends in results and use these results to draw conclusions • Know that metals are not good thermal insulators but that wood and plastics are good thermal insulators • Know that materials such as metals, which are good electrical conductors, are often good thermal conductors • Recognise a range of uses of thermal insulators

Term Two	Objectives
Unit 3 (Friction)	<ul style="list-style-type: none"> • Use a forcemeter carefully to measure forces • Know that 'newton' is the unit of force • Know that there is a force between an object and a surface which may prevent the object moving • Decide what evidence to collect • Predict what will happen and plan a fair test • Make and record careful measurements and present them in a bar chart • Relate the results to the prediction • Explain conclusions in terms of the roughness or smoothness of the surfaces • Plan a fair test as independently as possible • Try and explain the results in terms of friction • Know that when two moving surfaces are in contact, the force between them is called friction • Know that friction can be useful • Know that water resistance slows down an object moving through water • Explain what evidence needs to be collected and decide whether the test is fair • Identify trends in results and draw conclusions explaining these in terms of the force between the object and the water • Know that air resistance is a force that slows down objects moving through air
Unit 4 (Solids, liquids and how they can be separated)	<ul style="list-style-type: none"> • Identify solids and liquids • Know that there are liquids other than water • Make careful observations and measurements of volume, recording them in tables and using them to draw conclusions • Know that liquids do not change in volume when they are poured into a different container • Know that solids consisting of very small pieces behave like liquids in some ways • Know that solids can be mixed together and it is often possible to get the original materials back • Choose appropriate apparatus for separating a mixture of solids • Know that changes occur when some solids are added to water • Make careful observations and record results in tables and then make comparisons



Term Two	Objectives
Unit 4 (Solids, liquids and how they can be separated) <i>continued</i>	<ul style="list-style-type: none"> • Know that the same material can exist as both solid and liquid • Know that liquids can be changed to a solid by cooling, and this is known as freezing or solidifying • Know that a solid can be changed to a liquid by heating, and this is known as melting • Know that different solids melt at different temperatures • Know that melting and solidifying or freezing are changes that can be reversed and that they are the reverse of each other

Term Three	Objectives
Unit 5 (Habitats)	<ul style="list-style-type: none"> • Identify different types of habitat • Know that different animals are found in different habitats • Make predictions of organisms that will be found in a habitat • Observe the conditions in a local habitat and make a record of the animals found • Know that animals are suited to the environments that they are found in • Group organisms according to observable features • Use keys to identify local plants or animals • Identify the food sources of different animals in different habitats • Pose questions about organisms and their habitats, and make predictions • Decide what evidence to collect and to design a fair test • Make reliable observations of organisms • Indicate whether their prediction is valid and explain findings in scientific terms • Identify the structure of a food chain of a specific habitat • Know that animals are suited to the habitat they are found in • Know that most food chains start with a green plant • Recognise ways in which living things and the environment need protection



Science Scheme of Work – Year 5 Overview

Term One	Objectives
Unit 1 (Keeping healthy)	<ul style="list-style-type: none"> • Know some examples of foods that are needed for energy, that are needed for growth, and that are needed to stay healthy • Know that energy-giving foods contain fat and carbohydrates, sugar and starch, and know the consequences of eating too much energy giving food • Know that fruits and vegetables provide the vitamins and minerals that are needed to stay healthy • Know that food for growth contains protein • Know that exercise is needed to stay healthy, and that muscles work harder when they are being exercised • Know what an organ is, where the lungs and heart are, and that the heart is a pump which pumps blood around the body • Know that blood travels to all parts of the body through blood vessels, that arteries carry blood away from the heart, and that veins carry blood to the heart • Know that lungs use oxygen from the air • Know that the pulse can be used to measure how fast the heart beats and how to measure a pulse rate • Know that pulse rate increases during exercise, and that harder exercise makes the pulse rate increase even more • Know why we breathe and how we breathe • Know that muscles work bones in joints • Know that more blood is needed by the muscles when they work harder, and so the heart beats faster, causing an increase in pulse rate • Explain how muscles work in pairs to operate bones in a joint • Know that drugs are substances that have an effect on the body, and that some of these effects are harmful • Know that medicines are a type of drug and may have side effects, and that they should be used by following the instructions • Explain why alcohol and nicotine are considered to have harmful effects on the body
Unit 2 (Gases around us)	<ul style="list-style-type: none"> • Recognise differences between solids and liquids • Know that gases are different from solids and liquids as they do not maintain their shape and volume • Know that gases flow more easily than liquids, and in all directions • Identify and describe differences in properties of solids, liquids and gases • Know that air has weight and is all around us



Term One	Objectives
Unit 2 (Gases around us) <i>continued</i>	<ul style="list-style-type: none"> • Use scientific knowledge and understanding to explain phenomena related to air • Relate observations and conclusions to scientific knowledge and understanding • Know that powders and sponges are solid materials, with air in the 'gaps' in between particles • Make careful observations of materials, and explain these observations using scientific knowledge and understanding • Understand that observations and measurements may need to be repeated • Know that soils have air trapped within them • Turn ideas into a form that can be investigated, make a prediction and decide what evidence needs to be collected • Construct a fair test • Make careful measurements, record the measurements in tables and graphs • Identify trends in results, and use these trends to draw conclusions, indicate whether the results support the original prediction • Explain conclusions in terms of scientific knowledge and understanding • Measure volumes of water carefully • Recognise when measurements need to be repeated • Use their results to compare the air trapped in different soils • Know that there are many gases and many of these gases are important to us • Know that gases are formed when liquids evaporate • Explain the 'disappearance' of water in a range of situations as evaporation • Know that other liquids can evaporate and form gases which flow easily from place to place • Know and define the three states of matter as solids, liquids and gases

Term Two	Objectives
Unit 3 (Earth, Sun and Moon)	<ul style="list-style-type: none"> • Know that the Sun, Earth and Moon are approximately spherical • Understand that it is sometimes difficult to collect evidence to test scientific ideas and that evidence may be indirect • Know about the relative sizes of the Sun, Moon and Earth • Know that the Sun appears to move across the sky over the course of a day • Understand that evidence may be interpreted in more than one way • Know that it is the Earth that moves, not the Sun, and that the Earth spins on its axis once every 24 hours



Term Two	Objectives
<p>Unit 3 (Earth, Sun and Moon) <i>continued</i></p>	<ul style="list-style-type: none"> • Know that it is daytime in the part of the Earth facing towards the Sun, and night-time in the part of the Earth facing away from the Sun • Use scientific knowledge and understanding to make observations and conclusions • Know that the Sun rises in the general direction of the east and sets in the general direction of the west • Make observations of where the Sun will rise and set, and recognise the patterns in these observations • Present times of sunrise and sunset in a graph and to recognise trends and patterns in the data • Know that the Moon takes approximately 28 days to orbit the Earth • Know that the different appearance of the Moon over 28 days provides evidence for a 28-day cycle
<p>Unit 4 (Life cycles)</p>	<ul style="list-style-type: none"> • Know that flowering plants reproduce • Know that seeds can be dispersed in a variety of ways • Make careful observations of fruits and seeds, to compare them • Use results of observations of fruits and seeds to draw conclusions • Know that many fruits and seeds provide food for animals including humans • Draw conclusions and indicate whether the results support the prediction • Know that plants reproduce • Consider conditions that might affect germination and plan how to test them • Understand how to alter one factor at a time in order to carry out a fair test • Know that several seeds should be used in each set of conditions in order to get reliable evidence • Make careful observations and comparisons and use these to draw conclusions • Know that seeds need water and warmth (but not light) for germination • Know that insects pollinate some flowers • Know that plants produce flowers which have male and female organs, and that seeds are formed when pollen from the male organ fertilises the ovum (female) • Know about the life cycle of flowering plants including pollination, fertilisation, seed production, seed dispersal and germination



Term Three	Objectives
Unit 5 (Changing states)	<ul style="list-style-type: none"> • Understand evaporation as a liquid changing to a gas • Know that condensation is when a gas turns to a liquid • Know that condensation is the reverse of evaporation • Make careful observations and draw conclusions, explaining them in terms of scientific knowledge and understanding • Know that air contains water vapour and when air hits a cold surface it may condense • Know that the boiling temperature of water is 100°C • Identify patterns in data and use these patterns to make predictions • Complete a graph by looking at patterns in data • Use scientific knowledge and understanding to decide whether the evidence collected supports the prediction and conclusion • Obtain evidence by making careful observations • Make predictions using scientific knowledge and understanding • Know that melting, freezing, condensing and evaporating are all changes of state which can be reversed • Understand that some changes are reversible and some are not reversible
Unit 6 (Changing sounds)	<ul style="list-style-type: none"> • Know that sounds are made when objects or materials vibrate • Make careful observations • Draw conclusions about sounds using their observations • Know that vibrations from sound sources travel to the ear through different materials • Make careful observations to identify the types of material through which sound travels • Know that some materials are effective in preventing vibrations from sound sources reaching the ear • Use data loggers to monitor sound • Plan a test to measure or observe how well different materials muffle sound • Use a prediction to help decide what evidence to collect • Devise a fair comparison of different materials • Decide how to use a sound source with a range of different materials to collect reliable evidence • Decide whether their results support or do not support the prediction or whether the evidence is not good enough • Know that the term 'pitch' describes how high or low a sound is • Suggest how to change the pitch of a drum, a stringed instrument and a wind instrument, and to carry out simple tests of these instruments • Turn ideas into a form that can be investigated and make predictions



Term Three	Objectives
Unit 6 (Changing sounds) continued	<ul style="list-style-type: none">• Decide whether the evidence is sufficient to support the prediction• Relate their understanding of sound using a range of musical instruments• Use scientific knowledge and understanding to explain an application of sound• Suggest how to change the pitch of a wind instrument and to carry out simple tests using these suggestions



Science Scheme of Work – Year 6 Overview

Term One	Objectives
Unit 1 (Interdependence and adaptation)	<ul style="list-style-type: none"> • Understand that plants use air and water to make new materials for growing, and that they need light and leaves to be able to do this • Know that water and nutrients are taken into the plant through the roots • Identify some of the nutrients that plants need • Know that things like flower colour, flower shape and leaf shape are all good ways of telling the differences between plants • Know that things like colour, what its body is covered with and how many legs it has are good ways of telling animals apart • Understand that there are differences between the same types of plants growing in different areas • Know that habitat is the place where a living thing lives • Know that a food chain starts with a producer, and that living things that eat other things are called consumers • Know how some plants and animals are suited to where they live • Know that plants grow well in different conditions • Know how to identify the characteristics of soil suitable for a soil-living animal, and which allow roots to firmly anchor a plant • Understand that animals that eat other animals are predators and animals that are eaten are prey • Know that animals that eat plants are herbivores, and that animals that eat animals are carnivores • Know that different conditions in a pond are suitable for different pond plants
Unit 2 (Micro-organisms)	<ul style="list-style-type: none"> • Know that very small living things, called micro-organisms, can cause disease • Know that microorganisms feed, grow and reproduce like other organisms • Know that micro-organisms cause decay and that they have uses in food production
Unit 3 (More about dissolving)	<ul style="list-style-type: none"> • Understand what dissolving is and know that undissolved solids can be got back from a liquid by filtering • Know what a mixture is • Know that when a liquid evaporates any dissolved solids in the liquid will stay behind • Understand that dissolving can be speeded up by using hotter water, stirring faster or using a fine powder • Know how to investigate factors affecting the speed at which something dissolves



Term One	Objectives
Unit 3 (More about dissolving) <i>continued</i>	<ul style="list-style-type: none"> ● Understand that there is a limit to how much solid will dissolve in a liquid ● Know why there is a limit to how much solid will dissolve ● Know that as you increase the solubility of a liquid, the solubility of solids in the liquid increases ● Understand that different amounts of different solids will dissolve in a given volume of water ● Know about liquids and gases, mixing with liquids and dissolving in liquids

Term Two	Objectives
Unit 4 (Reversible and irreversible changes)	<ul style="list-style-type: none"> ● Identify whether changes are reversible or irreversible ● Recognise that irreversible changes often make new and useful materials ● Know that burning is an irreversible change, and recognise some of the hazards of burning materials
Unit 5 (Balanced and unbalanced forces)	<ul style="list-style-type: none"> ● Identify weight as a force ● Recognise that more than one force can act on an object ● Measure forces using a forcemeter ● Know that water can produce an upwards force on objects ● Know that unbalanced forces can change the way things move



Term Three	Objectives
Unit 6 (How we see things)	<ul style="list-style-type: none"> ● Recognise that shadows are formed when light is blocked ● Know that reflections can be seen in shiny surfaces ● Recognise that light travels from a source ● Know that we see light sources when light enters our eyes ● Know that light is reflected when it hits a shiny surface
Unit 7 (Changing circuits)	<ul style="list-style-type: none"> ● Understand that a circuit needs a power source, and that a complete circuit is needed for a device to work ● Know that metals are electrical conductors and plastics are electrical insulators ● Know how to make bulbs in a circuit brighter ● Know how to use mains electricity safely ● Understand that electrical components can be represented by symbols, and know the symbols for the components they use ● Know how to construct circuits from a circuit diagram ● Understand what a parallel circuit is, and identify some of the differences between series and parallel circuits ● Know how the thickness of a wire in a circuit will reduce the brightness of the bulbs ● Know the effect on brightness of changing the numbers of bulbs and cells in a circuit ● Understand that a flow of electricity is called a current, and how to measure current