Science Long Term Plan

Curricular Goal:

To have a well-developed understanding and knowledge of the world through the specific disciplines of chemistry, biology and physics whilst being excited and curious about natural phenomena with the skills required to work, reason and evaluate scientifically.

Autumn Term 1

		Component: Physics					
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
1 Know and name body parts Know where each body part is Sing Heads, shoulders, knees and toes Know we have two hands, two arms, two legs, two eyes and two ears 2. Know in Autumn the leaves change colours	1.Use all their senses in hands-on exploration of natural materials. 2.Explore collections of materials with similar and/or different properties. 3.Talk about what they see, using a wide vocabulary. 4.Understand the key features of the life cycle of a plant and an animal. 5.Talk about the differences between materials and changes they notice. 6.Understand the effect of changing seasons on the natural world around them.	**Seasonal changes Autumn** 1. Understand there are four seasons 2. Understand the changes that take place in autumn 3. Understand the changes that take place in winter 4. Understand the changes that take place in spring 5. Understand the changes that take place in summer 6. Investigate how you can measure rainfall	**Introduction to living things and their habitats** 1. Compare the differences between things that are living, dead, and things which have never been alive Careers connected to habitats: ecologist, environmentalist, naturalist 2. Identify and name a variety of plants and animals in a microhabitat 3. Design a suitable microhabitat where living things could survive 4. Find out what animals eat to survive in their habitat 5. Understand food chains 6. Understand the journey food makes from the farm to the supermarke	Light 1. What are light and non light sources? 2. How can the sun be harmful and how can we protect ourselves from the sun? 3. Which materials are most reflective? 4. Can you describe how a shadow is formed? 5. How do shadows change throughout the day? · 6. How can you change the size of a shadow? · 7. What knowledge do we know about light?	**Electricity** 1. Understand electrical appliances and safety Careers connected to electricity: electrician, electrical engineer 2. Learn about electrical compounds in a series circuit 3. Investigate electrical circuits 4. Explore conductors and insulators 5. Learn about electrical switches 6. Investigate how electrical components can change within a circuit	**Forces** 1. Explore gravity and the life and work of Isaac Newton Careers connected to Forces: Aerodynamics engineer, forensic investigator 2. Examine the connection between air resistance and parachutes 3. Explore factors which affect an object's ability to resist water 4. Investigate the effects of friction on different surfaces 5. Investigate mechanism – levers and pulleys 6. Investigate mechanisms - gears	**Light** 1. How does light travel? 2. What is reflection? 3. How does reflection help us see? 4. How can shadows change size? 5. What is refraction? 6. How do we see colours?

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Autumn Term 2							
Component: Physics							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
1. Know the 5 senses and what they are used for 2. Know and name some animals which come out at night 5. Know and repeat the word nocturnal 3. Know at night time the moon and stars come out and the sky is black Know that ice melts and make observations of this over time.	1. Use all their senses in hands-on exploration of natural materials. 2. Explore collections of materials with similar and/or different properties. 3. Talk about what they see, using a wide vocabulary 4. Understand the key features of the life cycle of a plant and an animal. 5. Talk about the differences between materials and changes they notice. 6. Understand the effect of changing seasons on the natural world around them.	Humans 1. Discover the basic parts of the human body Careers connected to the human body: doctor, nurse, massage therapist, personal trainer, theatre technician 2. Learn about your eyes and sight 3. Learn about your ears and hearing 4. Explore the tongue and taste 5. Explore your sense of touch 6. Discover how your nose smells	Uses of Everyday Materials 1. Identify different materials and their uses Careers connected to materials: materials engineer, road designer, road engineer 2. Understand how to select the right materials to build a bridge 3. Explore and test the stretchiness of materials 4. Understand materials can change their shape by twisting, bending, squashing or stretching 5. Learn about Charles Macintosh and explore how materials are suitable for different purposes 6. Discover which materials change shape when making a road with John McAdam	Forces 1. Explore contact and non-contact forces? 2. How do things move on different surfaces? 3. What are the different types of magnets? 4. What are the properties of magnets and everyday objects that are magnetic? 5. How can magnetic forces can act at a distance? 6. What are the everyday uses of magnets? 7. What knowledge can we recall?	Animals including Humans Teeth and the digestive system 1. Can you sequence the main parts of the digestive system? 2.What are the simple functions of the basic parts of the digestive system in humans? 3. What are the types of human teeth and what are their functions? 4. Investigate the effects of different liquids on the teeth. 5. Why do different animals have different types of teeth? 6. What are the key features of a food chain? 7. Can you construct a simple food chain to identify the producers, predators and prey? 8. What knowledge about animals including humans can you recall?	Life cycles and reproduction Links with PSHE unit 1. Identify the key stages of a mammal's life cycle Careers connected to Animals Including Humans: field biologist, wildlife biologist, zoologist, midwife, research biologist. 2. Explore the gestation periods of mammals 3. Learn about foetal development 4. Investigate the hand span of different aged children 5. Learn about the changes experienced in puberty 6. Describe the changes humans may experience during old age	**Electricity** 1. Describe the parts of an electric circuit Careers connected to electricity: mechanical engineering technician, electricity distribution worker, electrical engineer, energy engineer 2. Explore voltage and its effect on an electrical circuit 3. Apply knowledge to identify and correct problems in a circuit 4. Investigate what affects the output of a circuit 5. Build a set of traffic lights 6. Apply knowledge of conductors and insulators

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	Spring Term 1						
	Component: Physics	Component: Biology			Component: Physics	Component: Biology	
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1. Talk about the signs of Spring 2. I begin to notice that toy cars travel at different speeds when I push them using different amounts of strength 3. I can say whether something is floating or sinking 4. I can talk about different temperatures	1. Begin to understand the need to respect and care for the natural environment and all living things. 2. Explore and talk about different forces they can feel. 3. Explore the natural world around them. 4. Understand the effect of changing seasons on the natural world around them.	**Everyday Materials – object and materials** 1. Identify and name a variety of everyday materials 2. Distinguish between an object and the material it is made from 3. Describe the properties of everyday materials 4. Identify objects that are natural and those that are manmade 5. Predict and identify if an object will float or sink 6. Explore which materials are best for different objects	Animals including Humans **Humans grow and stay healthy** 1. Describe the needs of animals for survival Careers connected to the human body: doctor, nurse, massage therapist, personal trainer, theatre technician 2. Describe the needs of humans for survival 3. Explore the importance of eating the right food 4. Describe what a healthy, balanced diet looks like 5. Investigate the impact of exercise on our bodies 6. Investigate hygiene	Skeletons and Muscles 1.What are the different types of skeletons? 2. What can we learn about the human skeleton? 3. What can we learn about animal skeletons? 4. What is the purpose of muscles? 5. Can people with longer legs run faster? Investigation 6. What can we recall?	States of Matter 1. Compare and group the 3 states of matter 2. Explore how particles behave in solids liquids and gases 3. Investigate melting points 4. Explore freezing and boiling points 5. Explore evaporation and condensation 6. Understand the water cycle	Space – Links with Music Unit 1.Explore the solar system and its planets. 2. Understand the heliocentric model of the solar system. 3. Explain Earth's movement in space. 4. Explain the Earth's rotation and night and day. 5. Explain the movement of the Moon. 6. Design a planet using knowledge gained.	Living Things and their Habitats 1. Classify living things 2. Understand the Kingdoms of Life 3. Classify living things using the Linnaean system 4. Identify the characteristics of different types of microorganisms 5. Investigate asexual reproduction through spore dispersal 6. Classify and describe a living organism
Spring Term 2							

Science Long Term Plan

	Component: Physics	Component: Physics	Component: Biology				
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
1. Talk about and name some minibeasts that they might see in their outdoor environment 2. Talk about where they might find different creatures e.g some creatures only live in the sea, some live on land, some can fly etc…	3. Begin to understand the need to respect and care for the natural environment and all living things. 4. Explore and talk about different forces they can feel. 5. Explore the natural world around them. 6. Understand the effect of changing seasons on the natural world around them.	**Animals** 1. Discover animal families 2. Learn about the differences between mammals and birds 3. Learn about the differences between amphibians, reptiles and fish 4. Discover the type of food living things eat 5. Explore the difference between wild animals and pets 6. Explain the characteristics of an animal	**Animals besides humans – survival and offspring, growth and food chains** 1. Learn how to order the stages of the human life cycle 2. Describe the stages of life from adulthood to old age 3. Learn how to match offspring to their parent 4. Explore the life cycle of a chicken 5. Describe the life cycle of a butterfly 6. Explore the life cycle of a frog	**Health & Nutrition** 1. What are the 5 different food groups? · 2. How do different food groups benefit our bodies? 3. What nutrition can we identify in our DT fruit crumble recipes? 3. Are our own food choices healthy and balanced? · 4. What information can we find on food labels? · 5. What can we recall about health and nutrition?	**Living things and their habitats** 1. Explore different habitats Careers connected to Living things and their habitats: Animal Care Practitioner, Biologist, Zoologist 2. Research a habitat 3. Explore how animals can be classified 4. Create a classification key 5. Adaptations and classification within species 6. Explore and classify pond plants	**Properties of materials** 1. Explore properties of materials 2. Explore thermal conductors and thermal insulators 3. Explore hardness of materials 4. Discover materials that are soluble in water 5. Investigate the solubility of materials 6. Explore how mixtures can be separated by filtering, sieving, evaporating or magnets	**Evolution & Inheritance** 1. Understand how offspring vary and are not identical to their parents 2. Learn about animal adaptations 3. Learn about plant adaptations 4. Explore what we can learn from fossils 5. Explore the theory of evolution by natural selection 6. Explore human evolution

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	Summer Term 1						
Component: Biology	**Component: Biology**	**Component: Biology and Physics**	**Component: Biology**				
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
1. I can talk about how things change as they grow including humans and plants 2. I can talk about what humans need to live and what plants need to live 3. I can begin to name some parts of a plant	4. Use all their senses in hands-on exploration of natural materials. 5. Explore collections of materials with similar and/or different properties. 6. Talk about what they see, using a wide vocabulary. 7. Explore how things work 8. Plant seeds and care for growing plants. Name some well known plants e.g. daisy 9. Understand the key features of the life cycle of a plant and an animal. 10. Talk about the differences between materials and changes they notice.	**Plants** 1. Understand that seeds grow into plants 2. Identify the basic parts of a plant and tree 3. Understand that different plants can grow in the same environment 4. Know the difference between deciduous and evergreen trees 5. Know that fruit and vegetables are varieties of plants 6. Record the growth of a plants	**Plants** 1. Know the differences between seeds and bulbs Careers connected to plants: horticultural management, plant biologist, plant pathologist 2. Design an experiment to find out what plants need to grow 3. Describe what plants need to grow and stay healthy 4. Describe the life cycle of a plant 5. Observe and record the growth of plants over time 6. Understand that plants adapt to suit their environment	Plants 1. What factors have an effect on plant growth? (Ongoing investigation over time) 2. What are the parts of a flowering plant?- Part of DE Lesson 2 - activity use real flowers. 3. What are the functions of a flowering plant & how are they used in photosynthesis? Lesson 2 from DE continued. 4. How is water is transported within plants? Investigation - DE Lesson 5. What is the life cycle of a flowering plant & pollination? DE Lesson 5 and 6 combined	**Living things and their habitats- conservation** 1.Describe ecosystems and how they are affected by changes in the seasons Careers connected to habitats: 2. Understand human impact on the environment through deforestation 3. Explore air pollution 4. Understand water pollution 5. Explore methods that can be used to conserve water 6. Understand that humans can have a positive impact on nature	**Changes in Materials** 1. Use evaporation to recover the solute from a solution Careers connected to changes of materials: laboratory technicians, technical associates, research analysts, chemistry teachers 2. Recognise and describe reversible changes 3. Observe chemical reactions and describe how we know new materials are made 4. Investigate rusting reactions 5. Investigate burning reactions 6. Investigate chemical reactions - acids and bicarbonate of soda	**Animals including Humans** (Circulation) 1 Understand the function of the heart and its role in the circulatory system 2. Identify and compare blood vessels 3. Explore blood 4. Learn how the body transports water and nutrients 5. Investigate what affects your heart rate 6. Learn about the impact of drugs and alcohol on the body.

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	Summer Term 2						
	Component: Biology	**Component: Biology**	**Component: Biology**	**Component: Physics**	**Component: Biology**	**Component: Physics**	
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
1. I know we wear sun cream so we don't burn 2. I know and can name clothes to wear at the seaside	1. Use all their senses in hands-on exploration of natural materials. 2. Explore collections of materials with similar and/or different properties. 3. Talk about what they see, using a wide vocabulary. 4. Explore how things work 5. Plant seeds and care for growing plants. 6. Understand the key features of the life cycle of a plant and an animal. 7. Talk about the differences between materials and changes they notice.	Exploring everyday materials – Links with DT unit 1. Build a structure strong enough to withstand wind 2. Build a waterproof structure 3. Understand the properties of glass and its uses 4. Understand that materials are used to create a variety of furniture 5. Explore a variety of fabrics and understand their different properties 6. Explain the uses of materials and why they are suitable	**Living Things & Habitats around the world** 1. Learn about habitats 2. Appreciate that environments are constantly changing 3. Explore the rainforest and its problems 4. Describe life in the ocean 5. Discover the Arctic and Antarctic habitat 6. Create a model of a habitat	**Rocks** 1. How are igneous rocks formed? 2. What are the properties of sedimentary and metamorphic rocks? 3. What is weathering & what is the suitability of rocks for different purposes? DE lessons 4 & 5 combined 4. How are fossils formed? - Workshop at Cliffe Castle 5. What are the different types of soil?	**Sound** 1. Identify how sound is made Careers connected to sound: audiologist, sound engineer 2. Explore how vibrations from sounds travel through a medium to the ear 3. Explore sound insulation 4. Explore volume 5. Explore pitch 6. Explore sounds	**Living things and their habitats – life cycles, plants and animals** 1. Understand the life processes of a plant. 2. Understand the life cycles of mammals. 3. Compare the life cycles of insects and amphibians. 4. Understand the life cycle of birds and reptiles. 5. Know about the life and work of Jane Goodall and David Attenborough. 6. Research and present the life cycle of a creature	Science Assessment Consolidate science knowledge including transition work with secondary school. Northern Gas Network workshop.
	Component: Working Scientifically						

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	Foundation Stage	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
	As above	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions.	*During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content*: • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	*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 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 • using test results to make predictions to set up further comparative and fair tests • 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 • identifying scientific evidence that has been used to support or refute ideas or arguments.