

	Progression of skills and techniques in science						
By the end of Year 6 what does a typical scientist look like?	<p>Will understand: scientists often don't get it right and you have to keep going with the same experiment and change aspects to improve the outcomes</p> <p>Will be able to: plan, carry out and carefully record, using a variety of different skills, the outcomes of a scientific investigation</p> <p>Know: where science fits into the world including how science has developed over time (famous scientists)</p>						
Teacher expectations	<p>Make sure there is enough time to develop scientific thinking, knowledge and skills</p> <p>Have high expectations for the quality of experiments and that results are recorded neatly and carefully</p> <p>Make sure pupils can always explain what they have found and why they think this is the case</p>						
Attitudes and behaviour for learning	<p>In all year groups we will enable pupils to develop positive attitudes to their science work. We will support pupils in how to manage when things go wrong and how to adapt and change experiments. We will encourage pupils to work in a careful way with growing confidence and concentration. Encourage pupils to change, adapt and solve problems in their work.</p> <p>We will teach the vocabulary of science and encourage pupils to use this vocabulary when talking about their own, their peers' and the work of other artists.</p>						
Curriculum organisation	<p>Each big science theme has a section for key vocabulary to be introduced during the theme. Often key vocabulary will be repeated across all year groups so pupils can talk about their work in science using the correct terminology.</p> <p>Working scientifically is the golden thread that works across every aspect of science. Under each topic key concepts and approaches will be given. Resources required for each theme are noted.</p>						
	EYs	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Animals including humans (Biology)</p> <p>Yellow areas planned by staff</p> <p>Blue- new details</p>	<ul style="list-style-type: none"> - Understand that each child is a unique individual with similar characteristics e.g. eyes nose, mouth - Identify and label external parts of the body - Begin to talk about their growth and development from a baby to now - Observe the development of a chick from the egg (Valley) <p>Topic link: All about me</p>	<ul style="list-style-type: none"> - Understand human development from baby (revisit from R) to adult. - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. - Begin to understand groupings for animals e.g. carnivores, 	<ul style="list-style-type: none"> - Understand basic needs of humans and other mammals - Recognise that animals, including humans, have offspring which grow into adults. - Understand the basic needs of animals, including humans, for survival (water, food and air) - Identify the importance for humans of exercise, eating the right amounts of different 	<ul style="list-style-type: none"> - Understand that the human body has a skeletal structure, muscles and vital organs. - Understand the importance of exercise and diet for healthy growth and development in humans. - Identify the main bones in the skeleton that enable movement – ribs, skull, leg bone, arm bones, shoulder blades, knee and elbow joints 	<ul style="list-style-type: none"> - Understand and explore the function of teeth and how the digestive system works - Recognise how to maintain healthy teeth - Recognise the importance of a healthy diet for maintaining healthy growth and development: nutrition from what you eat: protein, carbohydrate - sugar, fats. Link PSHE 	<ul style="list-style-type: none"> - MUST BE TAUGHT IN SUMMER 2. - Understand changes in the body through puberty and implications for personal hygiene and health. - Understand the impact of hormones on the human body. - the process of menstruation and key physical changes in both genders. 	<ul style="list-style-type: none"> - Understand and talk about the circulatory system - Identify the main structures of the heart - Understand the function of the circulatory system and be able to describe how it works - Identify the impact of diet and drugs e.g. smoking on the heart and circulation link to PSHE

		herbivores, omnivores.	types of food, and hygiene.	<ul style="list-style-type: none"> - Identify the main internal organs – heart, stomach, liver, kidneys, lungs - Topic link-stone age bone age. Exploring remains, diet of humans at this time. 	<ul style="list-style-type: none"> - Topic link- Friend or Foe diet/health WW2 	<ul style="list-style-type: none"> - Possible topic link- Ancient Egypt mummification and exploring remains. Diet and health in ancient times. - RSE LINK WITH NEW 2019 CURRICULUM GUIDANCE. 	<ul style="list-style-type: none"> - MUST BE TAUGHT IN SUMMER 2. - To understand evolution and inheritance from parents to offspring. - Understand the relevance of Darwin's theory of evolution - To understand and revisit knowledge on puberty from year 5 with key vocabulary. - To understand the process of sexual reproduction in humans resulting in pregnancy and birth. - To recognize the stages of foetal development linked to gestation throughout a human pregnancy resulting in a live birth. - Topic link- monsters- drugs, smoking, illness, death. - RSE LINK.
Key vocabulary	<ul style="list-style-type: none"> - Eyes, nose, mouth, legs, arms, head, hair, colours to describe features, - Chicks: eggs, shell, hatch, feathers, beak, claws, eyes, wings, mammals and birds 	<ul style="list-style-type: none"> - Animals, growth, groups, carnivores, herbivores, omnivores - Amphibian, Reptile, Mammal, wild/tame, conservation 	<ul style="list-style-type: none"> - growth, exercise, diet, vegetarian, vegan, gluten free survival, adult, offspring, exercise, hygiene, diet, communication, research 	<ul style="list-style-type: none"> - ribs, skull, bones, shoulder blades, knee joint, elbow joints , internal organs - ,heart, stomach, liver, kidneys, lungs, movement, nutrition skeleton, protection 	<ul style="list-style-type: none"> - names of different teeth and their function – canines, molars, pre-molars, incisors. Digestive system, organs, intestines, stomach, diet, healthy, protein, carbohydrate, fats, vitamins 	<ul style="list-style-type: none"> - Related to puberty, hormones, revisit previous vocab including growth and change, toddler, gestation, development - Vulva, pubic hair, vagina, penis, odour, 	<ul style="list-style-type: none"> - Heart, circulation, valve, artery, vein, oxygenated, de-oxygenated, blood, blood vessels, red and white blood cells, pulse, pump, travel, transport. - Vulva, vagina, penis, erection,

						menstruation, period, breasts, scrotum, reproduction, offspring	ejaculation, fetus, contractions. Respiration, Oxygenated, Deoxygenated.
Working scientifically	<ul style="list-style-type: none"> - Asking simple questions and recognising that they can be answered in different ways - Suggested activities - Opportunities for children to compare and contrast key features in given species. - Opportunities for children to observe carefully and grasp name labels - Opportunities to use their senses and explore smell, touch, vision, hearing, taste (e.g. use chicken eggs for cooking) - Opportunities to compare and contrast human characteristics to chicks - 	<ul style="list-style-type: none"> - Observing closely when taking part in experiments - Using simple equipment - Performing simple tests - Able to group (classification) using common features e.g. lives in water, lives on land, has wings, is scaly 	<ul style="list-style-type: none"> - Identifying and classifying using their observations and ideas to suggest answers to questions - Gathering and recording data to help in answering questions. - To make simple predictions - Opportunities for pupils to compare and contrast giving reasons for their answers. 	<ul style="list-style-type: none"> - Asking relevant questions and using different types of scientific enquiries to answer them - Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - Reporting on findings from enquiries, including oral and written explanations - Using results to draw simple conclusions and make appropriate predictions - Suggested activities - Using elastic bands to create a model of joint and muscles – relax and contract - Opportunity to carefully observe and use models of bones and vital organs - Talk about the muscles they use during PE to illustrate contraction and relaxation. Link PE. 	<ul style="list-style-type: none"> - Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - Reporting on findings from enquiries, including written presentations of results and conclusions - Suggest improvements for experiments and raise further questions - Using straightforward scientific evidence to answer questions or to support their findings. - Suggested activities - Opportunity to compare and contrast human teeth to those of animals including 	<ul style="list-style-type: none"> - Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - 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 - Suggested activities - Opportunities to talk about how they feel about the changes they are/ will experience - Fully label the stages of a menstrual cycle with key vocabulary. 	<ul style="list-style-type: none"> - Using test results to make predictions to set up further comparative and fair tests - Setting up experiments independently, taking measurements, using a range of scientific equipment and offering improvements as part of a conclusion - Identifying scientific evidence that has been used to support or refute ideas or arguments. - Suggested activities - Opportunities for detailed observation and drawings of the heart from internal organ models- Art project link - Design an experiment to measure changes in heart rate using pulse (repetitive exercise) - Explore the formation of fossils and what they tell us in regards to

					<p>carnivores, herbivores and omnivores (revisit initial understanding from Y1)</p> <ul style="list-style-type: none"> - Opportunity to talk about special diets – vegan, vegetarian, link to RE, impact of allergies e.g. peanuts – depending on characteristics of pupils in the class - Design an experiment to compare different toothpastes using eggshells. 	<ul style="list-style-type: none"> - Label a simple diagram of both male and female bodies showing the changes expected in puberty. - Label / draw simple anatomically correct diagrams of female and male genitalia. 	<p>evolution. Link-school trip</p> <ul style="list-style-type: none"> - Create an information file on Charles Darwin with a chosen focus from his numerous specialties (finches) - Fully label an anatomically correct diagram of both male and female adult genitalia. - Create a flow diagram showing the process of sexual reproduction resulting in pregnancy in humans. - Be able to label the different gestation stages in human pregnancy with key features of the fetus at each stage - RSE LINK
Resources	<ul style="list-style-type: none"> - Chickens are at Valley - Variety of objects linked to 5 senses 	-	-	- Skeleton and models of vital organs	<ul style="list-style-type: none"> - Different toothpastes, X-ray pictures, internal organ models for digestive system - Visitor linked to teeth- Vet or Dentist, 	- Photographs	<ul style="list-style-type: none"> - Explore a model of the heart. - Stop watches - Accurate heart diagrams- scientific quality - PE equipment linked to experiment. - Detailed anatomically correct male and female genitalia diagrams. - Ultra sound scan pictures of fetal development. - Possible visit from midwife/health professional linked

							to pregnancy and birth.
<p>Living things and their habitats (Classification)</p> <p>Blue highlighted area added at EYFS suggestions.</p>	<ul style="list-style-type: none"> - Observe growth from a seed to seedling. - Link to Jack and the Giant beanstalk. - Explore the characteristics of common British mini beasts. - Topic link- minibeasts - Topic link- Seasons 	<ul style="list-style-type: none"> - 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. - Recognise different plants- flowers, grass and trees and start to group them into common features. 	<ul style="list-style-type: none"> - Identify and label a variety of different plants to include plants that we eat. - 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 - Understand what a simple food chain is- soil, plant, snail, bird, fox. 	<ul style="list-style-type: none"> - Understand a plants basic requirement to grow and thrive. - Understand that different animals and plants can be separated into groups that show similar features. - Understand the life cycle of a flowering plant. - Understand how the plant transports the water from the ground up the stem/main plant. 	<ul style="list-style-type: none"> - Understand that living things can be grouped and classified in a particular way. - Understand how seeds are dispersed from the parent plant. - Identify a habitat under threat- link to stranded topic, rainforests. - Understand what a producer and consumer is and how they fit into food chains. - Topic link- Stranded 	<ul style="list-style-type: none"> - Compare the life cycle of a mammal, an amphibian, an insect and a bird. - Understand reproduction and seed formation in plants. - Describe how living things are classified into broad groups according to common observable features. 	<ul style="list-style-type: none"> - Understand the six different Kingdoms of life. - To understand how you can classify a species based on its observable features. - Focus on a famous naturalist- David Attenborough- and what he has shown us in regards to the natural world.
Key vocabulary	<ul style="list-style-type: none"> - Seed, stem, leaf, grow 	<ul style="list-style-type: none"> - Flower, seed, tree, grow, Humid - Thermometer - Deciduous - Evergreen - Harvest - Variety - Blossom - Equipment 	<ul style="list-style-type: none"> - Food chain, plant, flower, seed, stem, bulb, leaf, trunk, roots, predator, prey, habitat, micro habitat, desert, woodland 	<ul style="list-style-type: none"> - Life cycle, plant, pollination, seed formation, growth, dispersal, reproduction, pollen, transportation 	<ul style="list-style-type: none"> - Food chain, habitat, threat, rainforest, producer, consumer, seed dispersal, travel, parent plant, eco system, rainforest, classification, vertebrates, mammals, amphibians, invertebrates, environment, Revisit Yr2 vocab 	<ul style="list-style-type: none"> - Food chain, habitat, threat, rainforest, producer, consumer, classification, group 	<ul style="list-style-type: none"> - Kingdom, classification, species, fungi, cells, naturalist
Working scientifically	<ul style="list-style-type: none"> - Asking simple questions and recognising that they can be answered in different ways <p>Suggested Activities</p>	<ul style="list-style-type: none"> - Observing closely when taking part in experiments - Using simple equipment - Performing simple tests - Use simple classification skills to group organisms 	<ul style="list-style-type: none"> - Understand how to draw a simple food chain. - Identifying and classifying using their observations and ideas to suggest answers to questions - Gathering and recording data to 	<ul style="list-style-type: none"> - Asking relevant questions and using different types of scientific enquiries to answer them - Setting up simple practical enquiries, comparative and fair tests - Gathering, recording, classifying and 	<ul style="list-style-type: none"> - Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including microscopes - Recording findings using simple scientific 	<ul style="list-style-type: none"> - Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Recording data and results of increasing 	<ul style="list-style-type: none"> - Using test results to make predictions to set up further comparative and fair tests - Setting up experiments independently, taking measurements, using a range of scientific

	<ul style="list-style-type: none"> - Be able to label the leaf, stem and seed in a picture/photo. - Is a sunflower taller than me? Grow sunflower seeds and see if they grow as tall (or taller) than each child. (jack and the beanstalk link). Q- Why are sunflowers so tall? - Be able to observe seeds growing and understanding it needs water and sunlight to grow. - Be able to classify common mini beasts with the statement 'this is a mini beast because..' - Using a simple Venn diagram (hoola hoops) classify and group different mini-beasts - Design and draw a mini beast. Art link - 	<ul style="list-style-type: none"> - Be able to draw a basic seedling labelling the leaf, stem and seed. <p>Suggested activities</p> <ul style="list-style-type: none"> - Be responsible for the care of the different seedlings in class, measuring water to give using a jug. - Measure how much a seedling grows in a week using a ruler. - Understand the difference in appearance of the grass and cress seedling - why they are different? Did they grow at the same time as each other? 	<p>help in answering questions.</p> <ul style="list-style-type: none"> - To make simple predictions - Opportunities for pupils to compare and contrast giving reasons for their answers. <p>Suggested activities</p> <ul style="list-style-type: none"> - Understand how to grow a variety of different seeds that can be eaten- link to diet/healthy eating. - Be able to group different animals and plants into the habitat that best suits their needs- Woodland, Coastal, Rural. - Experiment- Do plants need light to survive? Once the seed has grown, keep one in light and one in the dark. Give same amount of water. Observe the outcome. - Encourage children to make a prediction and record results in a class chart to observe the results. 	<p>presenting data in a variety of ways</p> <ul style="list-style-type: none"> - Draw simple scientific diagrams - Reporting on findings from enquiries, including oral and written explanations - Using results to draw simple conclusions and make appropriate predictions - Using simple equipment to include magnifying glasses - Draw and label a life cycle of a flowering plant <p>Suggested activities</p> <ul style="list-style-type: none"> - Create a practical that explores the basic need of a plant to survive. This needs to include the aim, prediction, method, results and conclusion. - Create a suitable chart to present the results gained from the experiment. - Demonstrate celery in coloured water so children can observe how water is transported up the stem. - Use magnifying glasses to observe parts of the plants. Q How do magnifying glasses help us see?. Draw and label a life cycle of a flowering plant 	<p>language, drawings, labelled diagrams, keys, bar charts, and tables</p> <ul style="list-style-type: none"> - Reporting on findings from enquiries, including written presentations of results and conclusions - Suggest improvements for experiments and raise further questions - Using straightforward scientific evidence to answer questions or to support their findings. <p>Suggested activities</p> <ul style="list-style-type: none"> - Experiment- Make different sized paper seeds and observe the speed in which they fall to the ground.. - Draw and label a food chain highlighting the producer and consumer - Create a poster about a habitat under threat- rainforest- and what humans can do to help. (stranded topic) - Use microscopes to view different plants and be able to label some of the basic parts of the microscope. 	<p>complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Suggested activities</p> <ul style="list-style-type: none"> - Draw detailed life cycle diagrams for the different species being explored. - Tadpoles? Pond dipping trip through the Norfolk Broads would be excellent. - Use microscopes to observe and draw sections of plants under different magnification. - Be able to label the main parts of a microscope. - Dissect a flower (suggest Daffodils) head and explore the different parts and their function. 	<p>equipment and offering improvements as part of a conclusion</p> <ul style="list-style-type: none"> - Identifying scientific evidence that has been used to support or refute ideas or arguments. - Create flow charts to classify a given species into its Kingdom. <p>Suggested activities</p> <ul style="list-style-type: none"> - How do scientists categorise and identify different species and plants? - Create fact files on the different Kingdoms and the species contained within them. - Pond dipping observing the micro organisms within the water using a magnifying glass. - Go on a local bug hunt and classify the different species the children find. - Create a detailed labelled diagram of the species found using the correct terminology ie mandible, invertebrate. - Topic link- Survival
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Resources	- Seeds soil pots	- Seeds soil pots	- Seeds, soil, pots	- Magnifying glass	- Microscopes, stop watches	- microscopes	- magnifying glass - bug pots - classification guides - magnifying glasses - Trip?
Electricity	- Linked to seasons and the items powered by electricity we use in winter that are different to spring/summer. - Topic link- seasons	- Understand how to be safe when using electricity. - Recognise the dangers of using electricity	- Understand that some items we use need electricity to work. - Understand how to group/classify items that need electricity from those that do not. - Topic- one giant leap and inventions	- Understand the history behind electricity with a focus on light. - Understand how a basic circuit works. - Understand the symbols that are given to items used in an electrical circuit.	- Understand how to light a bulb in a series circuit. - Identify the difference between conductors and insulators. - Identify given parts of the circuit using their symbols. - Understand that a switch opens and closes a circuit.	- Be able to build a working series circuit independently. - Understand what can interrupt the flow of electricity- conductors/non conductors. - Recognise the different forms of energy – non-renewable and renewable.	- Understand how to create a complex working circuit adding more than one bulb, switch and/or a buzzer. - Understand that the brightness of a lamp or volume of a buzzer is linked with the number and voltage of cells (batteries) used in the circuit. - Recognise the changes in technology with a particular focus- (could be electric cars and the demise of petrol.)
Key vocabulary	- Power, light switch, all items powered by electricity	- Safe, electric shock, dangerous, wires	- Power source, plug, electricity	- Circuit, bulb, wires, clips, battery, symbol, electricity, light, electrical	- Circuit, parallel, bulb, wires, clips, conductor, insulator, symbol, cell, wire, conductor, insulator, switch	- Renewable, non-renewable, power, conductor, parallel, amp, volt, insulator, flow, energy	- Revise vocab from previous years by displaying on science working wall
Working scientifically	- Talk about the seasons and why things change. - When using water tray look at power of water to turn a wheel to develop concept of power and powerful	- Draw simple scientific diagrams - Observing closely when taking part in experiments - Using simple equipment Suggested activities - Ask pupils to create posters that	- Observing closely when taking part in experiments - Opportunities for pupils to compare and contrast giving reasons for their answers. Suggested activities - Talk about how electricity travels	- Draw simple scientific diagrams - Asking relevant questions and using different types of scientific enquiries to answer them - Using simple scientific equipment safely Suggested activities	- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including circuit components recording findings using simple scientific language and drawings	- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - recording data and results of increasing complexity using	- Using test results to make predictions to set up further comparative and fair tests - Setting up experiments independently, taking measurements, using a range of scientific equipment and offering

		<p>warn about the dangers= of electricity. Discuss and share ideas for what should be included on the poster and why.</p> <ul style="list-style-type: none"> - Use pupil's first draft to discuss how to improve the poster and make as simple as possible. 	<p>from a power source to a device</p> <ul style="list-style-type: none"> - Talk about battery powered devices and toys. - Identify and group objects based on their need for electricity 	<ul style="list-style-type: none"> - Making a simple series circuit and recording what they have created using symbols - Drawing and labelling the main components of a circuit 	<ul style="list-style-type: none"> - reporting on findings from enquiries, including written presentations of results and conclusions - Using straightforward scientific evidence to answer questions or to support their findings. <p>Suggested activities</p> <ul style="list-style-type: none"> - Revise creating a series circuit to light a bulb. - Ask pupils to add more bulbs into the circuit and talk about what happens to the quality of the light. - Add different devices into the circuit e.g. switch, buzzer. Ask pupils to accurately draw their circuit using symbols - Design a simple experiment to show that some materials conduct electricity and others do not. 	<p>scientific diagrams and labels</p> <ul style="list-style-type: none"> - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate <p>Suggested activities</p> <ul style="list-style-type: none"> - Create some simple windmills and check which design works most effectively. - Link to D&T 	<p>improvements as part of a conclusion</p> <ul style="list-style-type: none"> - Drawing and labelling the main components of a series and parallel circuit <p>Suggested activities</p> <ul style="list-style-type: none"> - Building circuits using electric motors to power different devices. - Link to D&T - Explore what happens to the brightness of a lamp when more cells (batteries) are added into a circuit. Explain and record findings clearly and accurately in their own words.
Resources	<ul style="list-style-type: none"> - Pictures of devices that uses electricity 	<ul style="list-style-type: none"> - Materials for making posters 	<ul style="list-style-type: none"> - Pictures for grouping activities, battery powered toys 	<ul style="list-style-type: none"> - bulb, wires, clips, battery, 	<ul style="list-style-type: none"> - Bulbs, wires, crocodile clips, - Circuit kits - Materials – conductors/non conductors 	<ul style="list-style-type: none"> - Visit to a Wind turbine. 	<ul style="list-style-type: none"> - Wires, batteries, bulbs pictures and simple motors - Circuit kits - Torches - Voltmeter
Materials including states of matter (Chemistry)	<ul style="list-style-type: none"> - Group objects in the classroom and outside into what they are made from 	<ul style="list-style-type: none"> - Identify between an object and the material from which it is made - identify and name a variety of 	<ul style="list-style-type: none"> - Recognise the characteristics of key materials used for building. E.g. Recognise why wood 	<ul style="list-style-type: none"> - Understanding that materials can be designed to look different for different purposes (Link to design technology) 	<ul style="list-style-type: none"> - Understand different states of matter: solid, liquid and gas - Understand a Particle model 	<ul style="list-style-type: none"> - Understand the difference between dissolving and mixing of different materials 	<ul style="list-style-type: none"> - Understand a simple filtration system to make dirty water clean. Link to pollution and impact of

	<p>e.g. wood, plastic, fabric</p> <ul style="list-style-type: none"> - Explore using their senses different materials e.g. soil, mud, water, jelly, shaving foam, ice 	<p>everyday materials, including wood, plastic, glass, metal, water, and rock</p> <ul style="list-style-type: none"> - Recognise the simple physical properties of a variety of everyday materials - Identify and group together a variety of everyday materials on the basis of their simple physical properties. 	<p>is not the only material used now to build houses (link to the Great Fire of London)</p> <ul style="list-style-type: none"> - Understand which common materials float and sink and why. - Understand how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<ul style="list-style-type: none"> - Recognise different types of rocks, how they are formed and their appearance in the natural world - Identify in simple terms how fossils are formed when things that have lived are trapped within rock 	<p>theory and what they demonstrate in regards to particles within the different states.</p>	<ul style="list-style-type: none"> - Recognise different separation techniques 	<p>people on the environment (geography)</p> <ul style="list-style-type: none"> - Link with Survival topic. This maybe a one week project.
Key vocabulary	<ul style="list-style-type: none"> - Soft, hard, smooth, rough, squishy, cold, warm, soggy 	<ul style="list-style-type: none"> - Object , Material Experiment, Properties, Waterproof, Absorbent, Hard/soft, Stretchy/stiff, Shiny/dull, Opaque/transparent 	<ul style="list-style-type: none"> - Plastic, metal, brick, clay, mud, wood, Absorbent, Waterproof, Opaque - Transparent, Fabric, Suitability, Solid, Fuel, Oxygen, Combust - 	<ul style="list-style-type: none"> - Transparent, translucent, opaque, thick, thin, fine, Calcification., fossil strong, flexible, weak, sandstone, appearance, igneous, granite, organic, igneous 	<ul style="list-style-type: none"> - Gas, liquid, solid, particle, model, change, Celsius , boiling point, theory, state, energy 	<ul style="list-style-type: none"> - Dissolve, suspension, solution, mixture, substance, soluble, filter, evaporation, vapour, comparative, experiment 	<ul style="list-style-type: none"> - Suspension, filter, filtration, pollution, impact, environment
Working scientifically including recording	<ul style="list-style-type: none"> - Opportunities for adult to talk with children and support their language development when describing how different materials feel – inside and outside the classroom - Talk about why they have grouped materials in the way they have – developing reasoning ‘I have done this because... 	<ul style="list-style-type: none"> - Using simple equipment - Performing simple tests - Use simple classification skills to group objects - Use a Venn diagram <p>Suggested activities</p> <ul style="list-style-type: none"> - Explore the strongest material for making a house (Three Little Pigs). Pupils could have a go at making 	<ul style="list-style-type: none"> - Identifying and classifying using their observations and ideas to suggest answers to questions - Gathering and recording data to help in answering questions. - To make simple predictions - Opportunities for pupils to compare and contrast giving reasons for their answers. <p>Suggested activities</p>	<ul style="list-style-type: none"> - Asking relevant questions and using different types of scientific enquiries to answer them - Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - Reporting on findings from enquiries, including oral and written explanations - Using results to draw simple conclusions and make appropriate predictions 	<ul style="list-style-type: none"> - making systematic and careful observations - recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - reporting on findings from enquiries, including written presentations of results and conclusions - suggest improvements for experiments and raise further questions 	<ul style="list-style-type: none"> - making systematic and careful observations - 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 	<ul style="list-style-type: none"> - Using test results to make predictions to set up further comparative and fair tests - Setting up experiments independently, taking measurements, using a range of scientific equipment and offering improvements as part of a conclusion - Using results to draw simple conclusions and

	<ul style="list-style-type: none"> - Use a simple Venn diagram to sort objects according to properties. This can be done outside with hoops. - Topic link- Space/planets? What is the earth and moon made from? 	<ul style="list-style-type: none"> - house from straw and Lego. Design an experiment to test the strength of their house - Be able to classify and group materials according to their perception of what the object is made from and explain their grouping - Sort objects according to their strength- Strong and Weak. Can discuss the cross over sections of the circle but do not label this area. - Once upon a time- Is the castle made from the same material as our houses? 	<ul style="list-style-type: none"> - Opportunities to make simple boats from different materials e.g. card, sugar paper, tinfoil. Predict which will float the longest and explain why. Record result in a chart given by teacher. - Predict which objects are likely to float or sink. Key Questions: Does all metal float? Why and when might a boat sink? Tin foil boats and pennies-how many pennies can your boat hold before sinking. Use a simple Venn diagram classifying objects based on their ability to float or sink? - Topic link- London. Why did London burn down? 	<p>Suggested activities</p> <ul style="list-style-type: none"> - Collect a range of objects made from plastic and discuss differences in appearance of the materials and why this might be the case e.g. plastic wallet for storing paper, pencil cases, chairs, base 10 equipment - Classification and grouping of different fossils e.g. shell types, teeth and bones - Begin to explore fossils of the Norfolk coast e.g. Cromer elephant. Visit to Castle Museum to look at fossils. . - Design a flow chart to define what an object could be made from based on its features. - Topic link- Romans. What were roads made from? Shields? Weapons? 	<ul style="list-style-type: none"> - Using straightforward scientific evidence to answer questions or to support their findings. <p>Suggested activities</p> <ul style="list-style-type: none"> - Make a particle model from a variety of materials chosen by the teacher. - Exploring the differences in the states of water – steam, liquid water and ice. - Design an experiment to change ice into water a rapidly or as slowly as possible. Use hands warmers to place under the beaker and observe how fast the ices melts. - Cooking – exploring how combining liquids and solids and then heating changes how those objects look – Is this change reversible? - Draw a chart to contain the results from the ice practical- this can contain temperatures against time. - Draw a bar chart with the axis time 	<ul style="list-style-type: none"> - 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 - reporting and presenting findings from enquiries, including conclusions <p>Suggested activities</p> <ul style="list-style-type: none"> - Design an experiment to separate a mixture gravel and water using grades of funnels and sieves - Explore how sugar dissolves in water but does not disappear from the water e.g. difference in the weight of the water. - Draw a bar or line graph with appropriate titles and key. Pupils to be aware of the different between bar and line and why they are used. - Use scales and be able to accurately record the amounts. - Topic link- Anglo Saxons and Vikings. 	<ul style="list-style-type: none"> - make appropriate predictions - Identifying scientific evidence that has been used to support or refute ideas or arguments. <p>Suggested activities</p> <ul style="list-style-type: none"> - Design an experiment to separate soil and water so the water appears to be as clean as possible. - Draw an appropriately sized chart to record results with headings. - Draw an appropriate graph - Be able to use a range of equipment safely linked to filtration. - Topic link- survival
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					<p>and temperature to show the temperature change as the ice melts. The bar chart needs to be carefully modelled on the board.</p> <ul style="list-style-type: none"> - Topic link- who let the gods out. What were temples made from? Shields?Weapons. 		
Resources	<ul style="list-style-type: none"> - Lots of different materials already available in the EYs classroom and outside 	<ul style="list-style-type: none"> - Lots of objects made from different materials 	<ul style="list-style-type: none"> - A range of different materials 	<ul style="list-style-type: none"> - Castle museum visit as above - Examples of rocks and fossils from Trust science store 	<ul style="list-style-type: none"> - Ingredients for whatever the teacher decides to cook to include a liquid (milk, water, eggs) in some form 	<ul style="list-style-type: none"> - Soil and water. - Funnels - Filter paper - Cotton wool/felt/paper to line funnel - 	
Sound and light (Physics)	<ul style="list-style-type: none"> - Understand how day length varies with the seasons. - Recognise the sounds in the environment – classroom and outside classroom and forest school 	<ul style="list-style-type: none"> - Recognise the different parts of the day regarding natural light linked to Seasons - Identify the different sounds do we hear in Winter (November fireworks)? 	<ul style="list-style-type: none"> - Understand and observe why we have shadows. - Identify and record common sounds. - Understand how sounds are made and how we hear them. 	<ul style="list-style-type: none"> - Recognise that light is needed in order to see things and that dark is the absence of light - Understand 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 an opaque object. 	<ul style="list-style-type: none"> - Identify how sounds are made, associating some with something vibrating. - Identify how sounds are made, associating some of them with something vibrating - Recognise that vibrations from sounds travel through a medium to the ear - Recognise the patterns between the pitch of a sound and features of the object that produced it - Recognise the patterns between the volume of a sound and the 	<ul style="list-style-type: none"> - Understand that because light travels in straight lines, shadows have the same shape as the objects that cast them.. Link to Art and Design - Recognise how sounds travels through a medium to the ears - recognise that sounds get fainter as the distance from the sound source increases - Understand that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye 	<ul style="list-style-type: none"> - Understand how to draw and label a basic diagram of an ear. - Identify the key parts of the ear and their role in hearing sounds. - Understand how to draw and label a basic diagram of an eye. - Identify the key parts of the eye and their role in seeing objects.

					<p>strength of the vibrations that produced it</p> <ul style="list-style-type: none"> - Link to music - Explore patterns and how shadows change size. 		
Key vocabulary	<ul style="list-style-type: none"> - Spring, summer, autumn, winter 	<ul style="list-style-type: none"> - Naming the sounds around us, loud, quiet, names of sound makers 	<ul style="list-style-type: none"> - Shadow, light source, darkness, absence, sound, hear 	<ul style="list-style-type: none"> - Source, cause, effect, reflection, bright, dull, absence, darkness, mirror, power, surface, opaque, reflective, shadow 	<ul style="list-style-type: none"> - Faint, quiet, loud, pattern, volume, noise, pitch, high, features, travelling, waves, low, vibration, tone 	<ul style="list-style-type: none"> - Eye, reflect, pattern, cast, shadow, volume, noise, pitch, high, features, travelling, waves, low, vibration, tone pitch, high, low, vibration, sound proofing, blocking 	<ul style="list-style-type: none"> - eye, pupil, lens, vitreous humor, eyelid, cornea, eyelid, auditory canal, ear lobe, cochlea, ear drum , stapes
Working scientifically	<ul style="list-style-type: none"> - Explore and discuss different ways of listening carefully - Introduce concept of active listening to peers and teacher. Link to PSHE - Practise listening skills in different ways and environments inside and outside the classroom - Explore different sounds made by musical instruments. Link to music 	<ul style="list-style-type: none"> - Observing closely when taking part in experiments - Using simple equipment - Performing simple tests <p><u>Suggested activities</u></p> <ul style="list-style-type: none"> - Why do we need the lights on more in winter? - What light sources do we have at school and home? Short survey. - Explore why the day seems shorter in winter. - Evaluate active listening skills and build on understanding from YR. Make an active listening poster for the 	<ul style="list-style-type: none"> - Observing closely when taking part in experiments - Using simple equipment - Performing simple tests <p><u>Suggested activities</u></p> <ul style="list-style-type: none"> - Explore shadows of different objects and create a shadow picture. Link to Art&Design 	<ul style="list-style-type: none"> - Setting up simple practical enquiries, comparative and fair tests - Observing closely when taking part in experiments. - To make simple predictions - Opportunities for pupils to compare and contrast giving reasons for their answers. <p><u>Suggested activities</u></p> <ul style="list-style-type: none"> - Explore how light is reflected from different surfaces. - Using a torch and a pencil design an experiment to change the size of the shadow the pencil casts. Record your 	<ul style="list-style-type: none"> - Asking relevant questions and using different types of scientific enquiries to answer them - Setting up simple practical enquiries, comparative and fair tests - Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - Reporting on findings from enquiries, including oral and written explanations - Using results to draw simple conclusions and make appropriate predictions <p><u>Suggested activities</u></p>	<ul style="list-style-type: none"> - 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 <p><u>Suggested activities</u></p> <ul style="list-style-type: none"> - Use understanding of tone in Art and Design and the 	<ul style="list-style-type: none"> - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - reporting and presenting findings from enquiries, including conclusions <p><u>Suggested activities</u></p>

		<p>classroom Link to PSHE</p> <ul style="list-style-type: none"> - Creating a soundscape of firework sounds using what they remember from firework night past and present. Link to music 		<p>result and explain why you think this happens.</p>	<ul style="list-style-type: none"> - Use understanding of tone in Art and Design and the affect of light sources in science to create 3D pictures of objects using pencil. - Experiment with different musical instruments to explore the range of different sounds including making louder and quieter sounds. - Explore and discuss the different sounds made by instruments made from different materials. 	<p>effect of light sources in science to create 3D portraits using pencil and charcoal and chalk.</p> <ul style="list-style-type: none"> - Design experiments to illustrate that instruments made of different materials make different sounds - Explore how different lengths of keys on a xylophone and/or glockenspiel have a different pitch. Explain why this might be the case 	<ul style="list-style-type: none"> - Design an experiment that shows how light travels. - Explore how to create 3D pictures using colour. For example, which colours create the more effective shadows. - Explore different materials that block sounds effectively - soundproofing
Resources	<ul style="list-style-type: none"> - Pictures of different seasons 	<ul style="list-style-type: none"> - Pictures of light sources - 	<ul style="list-style-type: none"> - Tape recorder 	<ul style="list-style-type: none"> - Torches, different surfaces in the classroom, mirrors 	<ul style="list-style-type: none"> - Examples of pencil drawings by famous artists - Different musical instruments 	<ul style="list-style-type: none"> - Examples of pencil and charcoal and chalk drawings by famous artists Art link - Different musical instruments Music link 	<ul style="list-style-type: none"> - Works of artists like Caravaggio that use colour to create light and shadow to make dramatic 3D pictures. Art link - Different materials for sound proofing cotton wool, felt,tin,paper - Torches
The earth, the solar system and forces (Physics)	<ul style="list-style-type: none"> - Understand that we live on a planet called Earth. Link to understanding of local geography and space and planets topic 	<ul style="list-style-type: none"> - Understand there are natural forces in the environment including weather – wind, rain, snow, ice etc. - Identify the changes across the four seasons - Recognise and describe weather associated with the seasons and 	<ul style="list-style-type: none"> - Understand the impact of the force of the weather on where they live (wind). - Recognise the impact of pushing and pulling as a force. - Recognise how somethings move on different surfaces. - Link to PE 	<ul style="list-style-type: none"> - Identify how magnetism is a type of force. - Recognise how magnets attract or repel each other and attract some materials and not other - Identify and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify 	<ul style="list-style-type: none"> - Explore friction as a type of force. - Understand the impact of friction on the movement of objects. - Recognise that different materials produce different amounts of friction depending o - n the surface. 	<ul style="list-style-type: none"> - Know the planets of the solar system and their order from the sun. - Understand gravity as a force and that unsupported objects fall to earth due to the gravity. - Understand the concept between mass and weight. Recognise that some mechanisms- levers and pulleys- 	<ul style="list-style-type: none"> - Identify the effects of air and water resistance that acts between moving objects. -

		how day length varies.		some magnetic materials - Understand that magnets as having two poles		allow a smaller force to have a greater effect. -	
Key vocabulary	- Earth	Weather, force weather, snow, ice, wind, rain, Autumn, Spring, Summer, Winter.	- Movement, friction, force, surface	- Attracting, repelling, magnet, poles, force, contact, friction, magnetic	- Friction, object, movement, force, surface, material, impact	- Gravity, force, pulley, lever, mechanism, Axis, Rotation, Constellation, Orbit, Planet, Heliocentric Geocentric, Eclipse Astronomy, Dwarf, Universe, Celestial, Solar -	- Resistance, force, parachute, objects
Working scientifically	- Star gazing with parents to observe the nights sky. - Create basic constellations using card. Art link. - Topic link- Space/planets.	- Observing closely when taking part in experiments - Using simple equipment - Performing simple tests Suggested activities - Observe and record different weather each day for a week. - Design a way to measure rainfall over a given period. (link to maths) - Topic link- Poles apart.	- Observing closely when taking part in experiments - Using simple equipment - Performing simple tests - To make simple predictions Suggested activities - Explore how much force is needed to move different types of balls e.g. football, sponge ball, netball. - How does a toy car move on different surfaces? Use smooth, rough, fluffy etc. to compare the force needed to move it.	- Asking relevant questions and using different types of scientific enquiries to answer them - Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - Reporting on findings from enquiries, including oral and written explanations - Using results to draw simple conclusions and make appropriate predictions Suggested activities - Design an experiment to show what materials are attracted to magnets. - Use magnetic trains/cars etc. to demonstrate how magnets can attract	- Asking relevant questions and using different types of scientific enquiries to answer them - Setting up simple practical enquiries, comparative and fair tests - Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - Reporting on findings from enquiries, including oral and written explanations - Using results to draw simple conclusions and make appropriate predictions Suggested activities - Design an experiment to show how different materials change the	- Asking relevant questions and using different types of scientific enquiries to answer them - 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, - classifying and presenting data in a variety of ways to help in answering questions Suggested activities - Design an experiment to create a functioning parachute to safely	

				<ul style="list-style-type: none"> - and repel each other and talk about why this might be the case 	<ul style="list-style-type: none"> - speed of an object (cans of beans wrapped in different materials) 	<ul style="list-style-type: none"> - Build a simple model of the solar system (could be homework) - Gravity experiment – Weight and gravity experiment. 5 different objects to be dropped and timed. - Investigate how levers work- practical experiment. Could link to DT. - Topic link- final frontier. 	<ul style="list-style-type: none"> - support a toy soldier. - Observe how objects move in air and water- plasticine experiment. - Does changing an objects shape affect how it moves when dropped in air and water?
Resources	<ul style="list-style-type: none"> - Google Earth 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - Toy cars, variety of surfaces, balls 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - Weights, rulers 	<ul style="list-style-type: none"> - Different materials, plasticine, water cylinders - Parachutes- material - Toy soldiers -