**HOLLINS GRUNDY PRIMARY SCHOOL**

Happiness, Health and Respect for Confident, Creative Learners

Progression Working Scientifically

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| **Testing** | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
|  | **Perform simple tests** | **Set up simple practical enquiries, comparative and fair tests** | **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**  **Use test results to make predictions to set up further comparative and fair tests** |
| **-Use all their senses in hands-on exploration of natural materials.**  **-Explore collections of materials with similar and/or different properties.**  **-Explore how things work**  **-Explore and talk about different forces they can feel**  **-Explore different materials freely, to develop their ideas about how to use them and what to make.**  **explore different textures.**  **-Explore the natural world around them.**  **-Explore the natural world around them,**  **explore a variety of materials** | **Year 1**  **Unit-Which materials should the 3 little pigs have used to build their house?**  **-Can you explore and test materials to answer and explain some of the following and your own questions?**   * **Which material should the pigs have used to build their house?** * **Which material is best for an umbrella?** * **Which material is best for a book shelf?** * **Which material is best for a gymnast’s leotard?** * **Which material is best for lining a dog basket?** * **Which material is best for curtains?** * **Which material is best for a window?**   **-Which bridge will be best to hold a kg weight?**  **Year 2**  **Unit-How can we grow our own plants?**  **-Can you set up a fair investigation to compare what happens if plants have different levels of light and amounts of water?**  **Unit-Why can’t a woodlouse live by the seashore?**  **-Can you predict which animals and plants we might find in given local micro habitats and explain why?**  Units What materials are in our school?  What material can a spoon be made out of and why? | **Year 3**  **Unit-Why can Usain Bolt move so fast?**  ***Check to see how far each child can run in the 9.68 secs Compare with Usain Bolt. Make graphs of their groups results***  **Unit-What can you find out about pushes, pulls and magnets?**  **-What surface do you think will make a car travel faster?**  **-Can you predict and investigate whether two magnets will attract or repel each other, depending on which poles are facing?**  **-Can you create a fair test to test magnets of different strengths and record your predictions and findings?**  **Unit-What can you find out about pushes, pull and magnets?**  **-Can you investigate what happens when different rock are rubbed together?**  **OR**  **-What happens when you put different rocks in water?**  **Unit-How did that Blossom become an apple?**  **-Can you investigate how water and nutrients travels up the roots and stem of a plant and record your findings?**  **Unit-What can you find out about shadows?**  **-Can you investigate what happens to shadows when the light source moves or the distance between the light source and the object changes? OR Can you investigate how your shadow changes length and direction throughout the day?**  **Year 4**  **Unit-What happens to the food we eat?**  **-Ask questions and suggest liquids to investigate what damages our teeth the most?**  **Unit-What is sound and how do we make different sounds?**  **-Does sound have the same intensity the further away you go from the source?**  **-Does the thickness of a rubber band affect its pitch?**  **-Finding patterns in the sounds that are made by different objects such elastic bands of different thicknesses.**  **-Which materials produce the best ear muffs?**  **Unit-How could we cope without electricity for a day?**  **-Can you create electrical circuits with switches, bulbs and buzzers?**  **-Can you predict if a bulb will work or not in a given circuit and explain why/why not?**  **- Can you create an experiment to test if materials are conductors or insulators and record your findings?**  **Unit-What are solids, liquids and gases**  **-Can you investigate the temperatures at intervals from ice cube to water?**  **-Can you investigate what temperature different solids melt (i.e iron, ice, chocolate, butter, ice-cream children could come up with suggestions)**  **-Can you investigate how long a puddle takes to evaporate and measure how it changes over time?** | **Year 5**  **Unit-Could you be the next CSI investigator?**  **-What materials can dissolve and how can we recover a substance from a solution?**  **-Can you plan a fair investigation to separate a number of given materials? (include things which could be separated by sieving, filtering, evaporating) (children can be involved in deciding questions to investigate and how to do this)**  **-What is bicarbonate of soda and what impact does it have on different materials?**  **Unit-Can you feel the force?**  **-Can you design and make a parachute to help you understand more about air resistance?**  **-Can you investigate which shaped boats travel faster in water?**  **-Explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel.**  **-Explore the effects of levers, pulleys and simple machines on movement.**  **Year 6**  **Unit-Can a spiderman exist?**  **-Can you plan an experiment to show what speeds up decomposition?**  **Unit-What would a journey through your body look like?**  **-Can you carry out an investigation to show the impact of different exercises on the body?**  **Eg What exercise has the most effect on your pulse rate?**  **Unit-Why is an electrical power source so important?**  **-Can you make circuits which work and don't work and explain why?**  **-Can you plan an investigation to find out what makes a motor go faster or slower including prediction, method, diagrams, results and conclusion?**  **-Explain what makes a bulb brighter, what makes a buzzer louder, what happens if a switch is on or off in a circuit.**  **Unit-Why is light so important?**  **-How can you set up an experiment to show that light travels in straight lines?**  **talk about what happens and make predictions.**  **-Why do shadows have the same shape as objects that cast them?**  **-How can you use mirrors to see around blind corners? Where is the best place to put a mirror on a car and why?**  **-What do you notice when you look at a straw in water?**  **-What do prisms tell us about light?** |
| **Measuring and Observing** | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
|  | **Observe closely using simple equipment**  **Observe changes over time**  **Use simple measurements and equipment** | **Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment** | **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** |
| **-Use all their senses in hands-on exploration of natural materials.**  **-Explore collections of materials with similar and/or different properties.**  **-Explore how things work**  **-Explore and talk about different forces they can feel**  **-Explore different materials freely, to develop their ideas about how to use them and what to make.**  **explore different textures.**  **-Explore the natural world around them.**  **-Explore the natural world around them,**  **explore a variety of materials**  **-Plant seeds and care for growing plants.**  **Talk about what they see, using a wide vocabulary**  **Explore and talk about different forces they can feel**  **Describe what they see, hear and feel whilst outside.**  **Making observations and drawing pictures of animals and plants;** | **Year 1**  **Unit-How could you become an animal expert**  **-What mini-beasts live in our school habitat?**  **-Can you look closely at them and/or other minibeasts and describe them? (hand lenses)**  **-Compare and contrast animals first hand using lenses or through pictures and videos.**  **Unit-Which material should the 3 little pigs have used to build their house?**  **-Can you explore and test materials to answer and explain some of the following and your own questions?**   * **Which material should the pigs have used to build their house?** * **Which material is best for an umbrella?** * **Which material is best for a book shelf?** * **Which material is best for a gymnast’s leotard?** * **Which material is best for lining a dog basket?** * **Which material is best for curtains?** * **Which material is best for a window?**   **-Which bridge will be best to hold a kg weight?**    **Unit- Which plants grow in our nature reserve**  **-Can you plant some plants and keep an observation log of its growth?**  **-Can you describe and compare common plants or parts of plants from our nature walk using magnifying glasses to help you?**  **Year 2**  **What happens as animals grow?**  **-Can you observe an animal growing over a period of time and record your observations (If possible make measurements of length, height, mass or use pictures and videos to compare these)**  **Unit-How can we grow our own plants?**  **-Look at different types of seeds and bulbs and predict and discuss the plants they grow into and where you find the seeds in the plant.**  **-Can you keep an observational diary describing and comparing the growth of different and similar plants from seeds and bulbs?(measure length, height)**  **-Can you set up a fair investigation to compare what happens if plants have different levels of light and amounts of water? (measure length, height, capacity of water)**  **Units What materials are in our school?**  **What material can a spoon be made out of and why?** | **Year 3**  **Unit-Why can Usain Bolt move so fast?**  ***-Check to see how far each child can run in the 9.68 secs Compare with Usain Bolt. Make graphs of their groups results. (measure length)***  **Unit-What can you find out about pushes, pulls and magnets?**  **-What surface do you think will make a car travel faster?**  **(measure stop watch)**  **-Can you predict and investigate whether two magnets will attract or repel each other, depending on which poles are facing?**  **-Explore the behaviour and everyday uses of different magnets**  **-Can you create a fair test to test magnets of different strengths and record your predictions and findings?**  **(measure how quickly magnets attract or how far away an object is before it attracts)**  **Unit-What can you find out about pushes, pull and magnets?**  **-Can you investigate what happens when different rock are rubbed together?**  **OR**  **-What happens when you put different rocks in water?**  **(observe)**    **Unit-How did that Blossom become an apple?**  **-Can you investigate how water and nutrients travels up the roots and stem of a plant and record your findings?**  **(measure dye travelling up carnation or celery)**  **Unit-What can you find out about shadows?**  **-What happens when light is reflected off a mirror and other shiny surfaces?**  **(observe)**  **Unit-What can you find out about shadows?**  **-Can you investigate what happens to shadows when the light source moves or the distance between the light source and the object changes? OR Can you investigate how your shadow changes length and direction?**  **(measure shadows)**  **Year 4**  **Unit-What happens to the food we eat?**  **-Ask questions and suggest liquids to investigate what damages our teeth the most?**  **(measure liquids, observe decay)**  **Unit-What is sound and how do we make different sounds?**  **-Does sound have the same intensity the further away you go from the source?**  **(measure distance from sound, compare intensity of sound)**  **-Does the thickness of a rubber band affect its pitch?**  **Finding patterns in the sounds that are made by different objects such elastic bands of different thicknesses.**  **(measure thickness, compare pitch)**  **-Which materials produce the best ear muffs?**  **Unit-How could you cope without electricity for a day?**  **-Can you predict if a bulb will work or not in a given circuit and explain why/why not?**  **-Can you create an experiment to test if materials are conductors or insulators and record your findings?**  **Work scientifically by: observing patterns, for example, , that metals tend to be conductors of electricity**  **Unit-What are solids, liquids and gases**  **Can you investigate the temperatures at intervals from ice cube to water?**  **(measure temperature)**  **Where do puddles on the playground disappear to?**  **Can you investigate how long a puddle takes to evaporate and measure how it changes over time?**  **(measure size of puddles)**  **Can you investigate what temperature different solids melt (i.e iron, ice, chocolate, butter, ice-cream children could come up with suggestions)**  **(measure temperature)** | **Year 5**  **Unit-Could you be the next CSI investigator?**  **-What materials can dissolve and how can we recover a substance from a solution?**  **-Can you plan a fair investigation to separate a number of given materials? (include things which could be separated by sieving, filtering, evaporating)**  **-What is bicarbonate of soda and what impact does it have on different materials?**  **Unit-Can you feel the force?**  **-Can you design and make a parachute to help you understand more about air resistance? (measure time)**  **-Can you investigate which shaped boats travel faster in water?**  **(measure time)**  **Unit- do all animals and plants start off life as an egg?**  **-Can you observe and record life cycle changes over time (i.e plant and grow a vegetable or flowering plant, watch chicks hatch and grow)**  **-Can you compare the life cycle of a local plant or animal with those from another environment?**  **Year 6**  **Unit-Can a spiderman exist?**  **-Can you plan an experiment to show what speeds up decomposition?**  **Unit-What would a journey through your body look like?**  **-Can you carry out an investigation to show the impact of different exercises on the body?**  **Eg What exercise has the most effect on your pulse rate?**  **(measure pulse, measure time)**  **Unit-Why is an electrical power source so important?**  **-Can you make circuits which work and don't work and explain why?**  **-Can you plan an investigation to find out what makes a motor go faster or slower including prediction, method, diagrams, results and conclusion?**  **-Explain what makes a bulb brighter, what makes a buzzer louder, what happens if a switch is on or off in a circuit.**  **Unit-Why is light so important?**  **-How can you set up an experiment to show that light travels in straight lines?**  **talk about what happens and make predictions.**  **-Why do shadows have the same shape as objects that cast them?**  **-How can you use mirrors to see around blind corners? Where is the best place to put a mirror on a car and why?**  **-What do you notice when you look at a straw in water?**  **-What do prisms tell us about light?** |
| **Gathering,**  **Recording,**  **Communicating findings** | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
|  | **Gather and record data to help answer questions**  **Record and communicate findings in a range of ways** | **Gather, record, classify and present data in a variety of ways to help in answering questions.**  **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables** | **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** |
| **-Talk about what they see, using a wide vocabulary**  **-Explore and talk about different forces they can feel**  **-Describe what they see, hear and feel whilst outside.**  **-Recognise some environments that are different from the one in which they live.**  **-Understand the effect of changing seasons on the natural world around them.**  **-Know and talk about the different factors that support their overall health and wellbeing:**  **-Making observations and drawing pictures of animals and plants;** | **Year 1**  **Unit-How could you become an animal expert**  **-What birds live in our schools grounds/nature reserve?**  **(tally, table)**  **Unit-Which material should the 3 little pigs have used to build their house?**  **-Can you explore and test materials to answer and explain some of the following and your own questions?**   * **Which material should the pigs have used to build their house?** * **Which material is best for an umbrella?** * **Which material is best for a book shelf?** * **Which material is best for a gymnast’s leotard?** * **Which material is best for lining a dog basket?** * **Which material is best for curtains?** * **Which material is best for a window?**   **-Which bridge will be best to hold a kg weight?**  **Unit-How can we grow our own plants?**  **-Can you keep an observational diary describing and comparing the growth of different and similar plants from seeds and bulbs?**  **(diary, diagrams)**  **Unit How could you be a weather reporter?**  **Can you make a weather chart?**  **Year 1**  **Unit-Which plants grow in our nature reserve?**  **-Can you identify and keep a tally of the different plants and trees we see during our nature walk?**  **Year2**  **Unit-How could you be the next sporting superstar?**  **-What fruits and vegetables do your classmates eat every day? How could you find this out?**  **(tally, block graph)**  **-Create a survey to collect data about fruit and vegetables.**  **(tally, block graph)**  **Unit-How can we grow our own plants?**  **-Can you keep an observational diary describing and comparing the growth of different and similar plants from seeds and bulbs?**  **(diary, diagrams, chart/table)**  **Year 2**  **Unit -Why can’t a woodlouse live by the seashore?**  **-Can you identify and record using charts/ images animals and plants in different local habitats and micro habits?**  **Pick 2 animals from very different habitats and explain why they live where they do and why they couldn’t swap habitats.**  Units What materials are in our school?  What material can a spoon be made out of and why? | **Year 3**  **Unit-Why can Usain Bolt move so fast?**  ***-Check to see how far each child can run in the 9.68 secs Compare with Usain Bolt. Make graphs of their groups results.***  **Unit-What can you find out about pushes, pulls and magnets?**  **-What surface do you think will make a car travel faster?**  **(tables charts)**  **-Can you predict and investigate whether two magnets will attract or repel each other, depending on which poles are facing?**  **-Can you create a fair test to test magnets of different strengths and record your predictions and findings?**  **Unit-How did that Blossom become an apple?**  **-Can you investigate how water and nutrients travels up the roots and stem of a plant and record your findings?**  **(tables charts, photos, diagrams)**  **Unit-What can you find out about shadows?**  **-What happens when light is reflected off a mirror and other shiny surfaces?**  **(diagrams)**  **Unit-What can you find out about shadows?**  **-Can you investigate what happens to shadows when the light source moves or the distance between the light source and the object changes? OR Can you investigate how your shadow changes length and direction**  **(diagrams, charts)**  -**Can you make a sundial and explain how it works?**  **OR Can you make a periscope and explain how it works**?  **Year 4**  **Unit-What happens to the food we eat?**  **-Ask questions and suggest liquids to investigate what damages our teeth the most?**  **(photos, labels, diagrams)**  **Unit-What is sound and how do we make different sounds?**  **-Does sound have the same intensity the further away you go from the source?**  **(tables, labels, diagrams)**  **-Does the thickness of a rubber band affect its pitch?**  **-Finding patterns in the sounds that are made by different objects such elastic bands of different thicknesses.**  **tables, labels, diagrams)**  **-Which materials produce the best ear muffs?**  **(photos, labels, diagrams)**  **-Can you make a musical instrument and explain how it produces sound?**  **Year 4**  **Unit-How could we cope for a day without electricity?**  -**Can you predict if a bulb will work or not in a given circuit and explain why/why not?**  **(pictoral diagrams)**  **- Can you create an experiment to test if materials are conductors or insulators and record your findings?**  **(tables)**  **Year 4**  **Unit-What are solids, liquids and gases**  **-Can you investigate the temperatures at intervals from ice cube to water?**  **(tables, charts)**  **-Can you investigate what temperature different solids melt (i.e iron, ice, chocolate, butter, ice-cream children could come up with suggestions)**  **(tables charts)**  **-Can you investigate how long a puddle takes to evaporate and measure how it changes over time?**  **(tables, charts)**  **Unit-Which animals thrive in our locality?**  **Can you make a simple key to classify some animals and plants from the local area?** | **Year 5**  **Unit-How different will you be when you are as old as your grandparents?**  **Can you make a line and scattergraphs to compare mass and length of a baby as it grows?**  **Unit-Could you be the next CSI investigator?**  **-What materials can dissolve and how can we recover a substance from a solution?**  **(diagrams, tables)**  **-Can you plan a fair investigation to separate a number of given materials? (include things which could be separated by sieving, filtering, evaporating)**  **(diagrams, tables)**  **-What is bicarbonate of soda and what impact does it have on different materials?**  **Unit-We will ever send another human to the moon?**  **-Could you create a model on the solar system and use it to explain what you have learnt about the Earth, Sun, Moon and planets?**  **Unit-Can you feel the force?**  **-Can you design and make a parachute to help you understand more about air resistance?**  **(tables, charts)**  **-Can you investigate which shaped boats travel faster in water?**  **(tables, charts)**  **-Explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel.**  **(diagrams)**  **-Explore the effects of levers, pulleys and simple machines on movement.**  **(diagrams)**  **Unit- Do all animals and plants start off life as an egg?**  **-Can you observe and record life cycle changes over time (i.e plant and grow a vegetable or flowering plant, watch chicks hatch and grow)**  **-Can you compare the life cycle of a local plant or animal with those from another environment?**  **(diagrams, charts, graphs)**  **Year 6**  **Unit-Can a spiderman exist?**  **-Can you plan an experiment to show what speeds up decomposition?**  **(photos, explanations)**  **Unit – Can a spiderman exist?**  **-Can you create your own classification system that will take account some plants and animals within the nature reserve?**  **-Can you classify some of the invertebrates from our nature reserve and some other invertebrates (insects, molluscs, annelids, arthropods, arachnids, crustaceans, myriapoda)**  **-Can you make a key to classify plants and animals from our nature reserve?**  **(classification keys)**  **Unit-What would a journey through your body look like?**  **-Can you carry out an investigation to show the impact of different exercises on the body?**  **Eg What exercise has the most effect on your pulse rate?**  **(charts)**  **Unit-Why is an electrical power source so important?**  **-Can you make circuits which work and don't work and explain why?**  **(diagrams)**  **-Can you plan an investigation to find out what makes a motor go faster or slower including prediction, method, diagrams, results and conclusion?**  **(diagrams)**  **-Explain what makes a bulb brighter, what makes a buzzer louder, what happens if a switch is on or off in a circuit.**  **(diagrams)**  **Unit-Why is light so important?**  **-How can you set up an experiment to show that light travels in straight lines?**  **(diagrams)**  **talk about what happens and make predictions.**  **-Why do shadows have the same shape as objects that cast them?**  **(diagrams)**  **-How can you use mirrors to see around blind corners? Where is the best place to put a mirror on a car and why?**  **(diagrams)**  **-What do you notice when you look at a straw in water?**  **(diagrams)**  **-What do prisms tell us about light?**  **(diagrams)**  **-** |
| **Concluding,**  **evaluating,**  **analysing** | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
| **Talk about what they see, using a wide vocabulary** | **Record and communicate findings in a range of ways** | **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**  **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**  **Look for naturally occurring patterns and relationships** | **Report 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** |
| **Talk about what they see, using a wide vocabulary**  **-Explore and talk about different forces they can feel**  **-Describe what they see, hear and feel whilst outside.**  **-Recognise some environments that are different from the one in which they live.**  **-Understand the effect of changing seasons on the natural world around them.**  **-Know and talk about the different factors that support their overall health and wellbeing:** | **Year 1**  **Unit-How could you become an animal expert**  **-What birds live in our schools grounds/nature reserve?**  **Unit Which material should the 3 little pigs have used to build their house?**  **-Can you explore and test materials to answer and explain some of the following and your own questions?**   * **Which material should the pigs have used to build their house?** * **Which material is best for an umbrella?** * **Which material is best for a book shelf?** * **Which material is best for a gymnast’s leotard?** * **Which material is best for lining a dog basket?** * **Which material is best for curtains?** * **Which material is best for a window?**   **Which bridge will be best to hold a kg weight?**  **Year 2**  **Unit-How can we grow our own plants?**  **-Look at different types of seeds and bulbs and predict and discuss the plants they grow into and where you find the seeds in the plant.**  **-Can you set up a fair investigation to compare what happens if plants have different levels of light and amounts of water?**  **Unit-Why can’t a woodlouse live by the seashore?**  **-Why do animals and plants live in the habitats we explored?**  **-Pick 2 animals from very different habitats and explain why they live where they do and why they couldn’t swap habitats.**  Units What materials are in our school?  What material can a spoon be made out of and why? | **Year 3**  **Unit-What can you find out about pushes, pulls and magnets?**  **-What surface do you think will make a car travel faster?**  **-Can you predict and investigate whether two magnets will attract or repel each other, depending on which poles are facing?**  **Unit-What can you find out about pushes, pull and magnets?**  **-Can you investigate what happens when different rock are rubbed together?**  **OR**  **What happens when you put different rocks in water?**  **Unit-How did that Blossom become an apple?**  **-Can you investigate how water and nutrients travels up the roots and stem of a plant and record your findings?**  **Unit-What can you find out about shadows?**  **-What happens when light is reflected off a mirror and other shiny surfaces?**  **Unit-What can you find out about shadows?**  **-Can you investigate what happens to shadows when the light source moves or the distance between the light source and the object changes? OR Can you investigate how your shadow changes length and direction**  **Year 4**  **Unit-What happens to the food we eat?**  **-Ask questions and suggest liquids to investigate what damages our teeth the most?**  **Unit-What is sound and how do we make different sounds?**  **-Does sound have the same intensity the further away you go from the source?**  **-Does the thickness of a rubber band affect its pitch?**  **-Finding patterns in the sounds that are made by different objects such elastic bands of different thicknesses.**  **-Which materials produce the best ear muffs?**  **Unit-How could you cope without electricity for a day?**  **-Can you predict if a bulb will work or not in a given circuit and explain why/why not?**  **-Can you create an experiment to test if materials are conductors or insulators and record your findings?**  **Unit-What are solids, liquids and gases ?**  **-Can you investigate the temperatures at intervals from ice cube to water?**  **Where do puddles on the playground disappear to?**  **-Can you investigate how long a puddle takes to evaporate and measure how it changes over time?**  **-Can you investigate what temperature different solids melt (i.e iron, ice, chocolate, butter, ice-cream children could come up with suggestions)** | **Year 5**  **Unit-Could you be the next CSI investigator?**  **-What materials can dissolve and how can we recover a substance from a solution?**  **-Can you plan a fair investigation to separate a number of given materials? (include things which could be separated by sieving, filtering, evaporating) (children can be involved in deciding questions to investigate and how to do this)**  **-What is bicarbonate of soda and what impact does it have on different materials?**  **Unit-Can you feel the force?**  **-Can you design and make a parachute to help you understand more about air resistance?**  **Can you investigate which shaped boats travel faster in water?**  **-Explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel.**  **-Explore the effects of levers, pulleys and simple machines on movement.**  **Unit- do all animals and plants start off life as an egg?**  **-Can you observe and record life cycle changes over time (i.e plant and grow a vegetable or flowering plant, watch chicks hatch and grow)**  **-Can you compare the life cycle of a local plant or animal with those from another** environment?  **Year 6**  **Unit-Can a spiderman exist?**  **-Can you plan an experiment to show what speeds up decomposition?**  **Unit-What would a journey through your body look like?**  **-Can you carry out an investigation to show the impact of different exercises on the body?**  **Eg What exercise has the most effect on your pulse rate?**  **Unit-Why is an electrical power source so important?**  **-Can you make circuits which work and don't work and explain why?**  **-Can you plan an investigation to find out what makes a motor go faster or slower including prediction, method, diagrams, results and conclusion?**  **-Explain what makes a bulb brighter, what makes a buzzer louder, what happens if a switch is on or off in a circuit.**  **Unit-Why is light so important?**  **-How can you set up an experiment to show that light travels in straight lines?**  **talk about what happens and make predictions.**  **-Why do shadows have the same shape as objects that cast them?**  **-How can you use mirrors to see around blind corners? Where is the best place to put a mirror on a car and why?**  **-What do you notice when you look at a straw in water?**  **-What do prisms tell us about light?** |
|  | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
| **Scientific questioning**  **Though objectives are presented as learning challenge questions children are given the opportunity to raise and investigate their own scientific questions within the learning challenge** |  | **Ask simple scientific questions and recognise they can be answered in different ways**  **Ask people questions** | **Ask relevant questions and using different types of scientific enquiries to answer them** | **Explore different ideas and raise different kinds of questions?**  **Plan different types of scientific enquiries to answer questions,** |
| **-Talk about what they see, using a wide vocabulary**  **-Explore and talk about different forces they can feel**  **-Describe what they see, hear and feel whilst outside.**  **Use all their senses in hands-on exploration of natural materials.**  **-Explore collections of materials with similar and/or different properties.**  **-Explore how things work**  **-Explore and talk about different forces they can feel**  **-Explore different materials freely, to develop their ideas about how to use them and what to make.**  **Explore different textures.**  **-Explore the natural world around them.**  **-Explore the natural world around them,**  **explore a variety of materials** | **Year 1**  **Unit-How could you become an animal expert**  **-What mini-beasts live in our school habitat?**  **-What birds live in our schools grounds/nature reserve?**  **-Can you explore and test materials to answer and explain some of the following and your own questions?**   * **Which material should the pigs have used to build their house?** * **Which material is best for an umbrella?** * **Which material is best for a book shelf?** * **Which material is best for a gymnast’s leotard?** * **Which material is best for lining a dog basket?** * **Which material is best for curtains?** * **Which material is best for a window?**   **Unit How could you become a weather reporter**  **-What changes do we see in our country with each season?**  **How do trees change over the seasons?**  **Why are the days longer in the summer?**  **Unit-Which plants grow in our nature reserve?**  **-What different plants and trees grow in our nature reserve?**  **Year 2**  **Unit-Could you be the next sporting superstar?**  **What do humans need to survive?**  **What do we need to do to keep healthy and why?**  **Unit- How can we grow our own plants?**  **What do plants need to grow and be healthy?**  **Unit-Why can’t a woodlouse live by the seashore?**  **What animals live on the sea shore/ ocean/ rainforest and why?**  **Units What materials are in our school?**  **What material can a spoon be made out of and why?** | **Year 3**  **Unit-How can Usain Bolt move so quickly**  **-Why do we have muscles?**  **Unit- what can you find out about pushes, pulls and magnets?**  **-What surface do you think will make a car travel faster?**  **Year 3**  **Unit-What can you find out about pushes, pull and magnets?**  **-Can you investigate what happens when different rock are rubbed together?**  **OR**  **What happens when you put different rocks in water?**    **Unit-How did that Blossom become an apple?**  **-Can you investigate how water and nutrients travels up the roots and stem of a plant and record your findings?**  **Year 4**  **Unit-What is sound and how do we make different sounds?**  **-Can you make a musical instrument and explain how it produces sound?**  **Does sound have the same intensity the further away you go from the source?**  **-Does the thickness of a rubber band affect its pitch?**  **-Finding patterns in the sounds that are made by different objects such elastic bands of different thicknesses.**  **-Which materials produce the best ear muffs?**  **Unit-How could we cope without electricity for a day?**  **-Can you predict if a bulb will work or not in a given circuit and explain why/why not?**  **-Can you create an experiment to test if materials are conductors or insulators and record your findings?**  **Unit-What are solids, liquids and gases?**  **-Can you investigate the temperatures at intervals from ice cube to water?**  **-Where do puddles on the playground disappear to? Can you investigate how long a puddle takes to evaporate and measure how it changes over time?**  **Unit-What happens to the food we eat?**  **-Ask questions and suggest liquids to investigate what damages our teeth the most?** | **Year 5**  **Unit-Could you be the next CSI investigator?**  **-What materials can dissolve and how can we recover a substance from a solution?**  **-Can you plan a fair investigation to separate a number of given materials? (include things which could be separated by sieving, filtering, evaporating) (children can be involved in deciding questions to investigate and how to do this)**  **-What is bicarbonate of soda and what impact does it have on different materials**  **Unit-Can you feel the force?**  **-Can you design and make a parachute to help you understand more about air resistance?**  **-Can you investigate which shaped boats travel faster in water?**  **Unit-Do all animals and plants start off life as an egg?**  **-Who are David Attenborough and Jane Goodall and what would you ask them if you met them?**  **Year 6**  **Unit-Can a spiderman exist?**  **-Can you plan an experiment to show what speeds up decomposition?**  **-Can you make a key to classify plants and animals from our nature reserve?**  **Unit-What would a journey through your body look like?**  **-Can you carry out an investigation to show the impact of different exercises on the body?**  **Eg What exercise has the most effect on your pulse rate?**  **Unit-Why is an electrical power source so important?**  **-Can you make circuits which work and don't work and explain why?**  **-Can you plan an investigation to find out what makes a motor go faster or slower including prediction, method, diagrams, results and conclusion?**  **-Explain what makes a bulb brighter, what makes a buzzer louder, what happens if a switch is on or off in a circuit.**  **-Can you design and make a steady hand game?**  **Unit-Why is light so important?**  **-How can you set up an experiment to show that light travels in straight lines?**  **talk about what happens and make predictions.**  **-Why do shadows have the same shape as objects that cast them?**  **-How can you use mirrors to see around blind corners? Where is the best place to put a mirror on a car and why?**  **-What do you notice when you look at a straw in water?**  **-What do prisms tell us about light?** |
| **Identifying,**  **Classifying, comparing, sorting, grouping** | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
|  | **Identify and classify**  **Compare objects**  **Compare living things**  **Sort and group objects** | **Identifying differences, similarities or changes related to simple scientific ideas and processes** | **Develop keys and other information records to identify, classify, and describe living things and materials and identify patterns that might be found in the natural environment** |
| **-Explore collections of materials with similar and/or different properties.**  **-Explore and talk about different forces they can feel**  **-Talk about the differences between materials and changes they notice.**  **-Explore different materials freely, to develop their ideas about how to use them and what to make.**  **-Recognise some environments that are different from the one in which they live.**  **-Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;** | **Year 1**  **Unit-How could you become an animal expert**  **-What are the common animal groups and can you group animals into these groups?**  **- Can you describe and compare the bodies of different animals and group them by common features?**  **Can you group animals by what they eat?**  **-Can you identify objects which are made from different materials and group them including wood, plastic, glass, metal, water and rock?**  **-Can you compare and group every day materials by their properties?**  **Unit-How could you become a weather reporter**  **-What changes do we see in our country with each season?**  **How do trees change over the seasons?**  **Year 1**  **Unit-Which plants grow in our nature reserve?**  **-What different plants and trees grow in our nature reserve?**  **How could we group them?**  **-Can you describe and compare common plants or parts of plants from our nature walk using magnifying glasses to help you**  **Year 2**  **Unit – What happens as animals grow?**  **--Can you make life cycles of different animals and describe the changes?**  **Unit-How can we grow our own plants?**  **-Can you keep an observational diary describing and comparing the growth of different and similar plants from seeds and bulbs?**  **Unit-Why can’t a woodlouse live by the seashore?**  **-Can you set up a fair investigation to compare what happens if plants have different levels of light and amounts of water?** | **Year 3**  **Unit-How can Usain bolt move so quickly?**  **-Can you Identify and group animals with and without skeletons? How do they move differently?**  **Can you compare, contrast and group animals by their diet?**  **Unit-What do rocks tell us about the way the Earth was formed?**  **-Can you group rocks based on their appearance and physical properties?**  **How did that blossom become an apple?**  **-Can you investigate the structure of different fruits to identify and compare the seeds?**  **Year 4**  **Unit-What happens to the food we eat?**  **-What are the difference between the teeth of herbivores and carnivores? Why?**  **Unit-What are solids, liquid and gases?**  **-Can you group materials into solids liquids and gases?**  **Unit-Which animals and plants thrive in our locality?**  **-Can you group vertebrates into fish, mammals, amphibians, reptiles and birds?**  **-Can you group some invertebrates? snails and slugs (molluscs), worms, spiders (arachnids) and insects.**  **-What plants grow in the nature reserve/school grounds? Can you group them (flowering plants including grasses non flowering plants including ferns and mosses)**  **-Can you make a simple key to classify some animals and plants from the local area?** | **Year 5**  **Unit-Could you be the next CS! Investigator?**  **-Can you group materials by properties? (hardness, conductivity, solubility, transparency, magnetic) Can you suggest uses for the materials?**  **Unit-Do all animals and plant start off life as an egg?**  **-How can you create and compare life cycles of a bird, amphibian, insect and mammal?**  **-Can you observe and record life cycle changes over time (i.e plant and grow a vegetable or flowering plant, watch chicks hatch and grow)**  **-Can you compare the life cycle of a local plant or animal with those from another environment?**  **Year 6**  **Unit – Can a spiderman exist?**  **-Can you create your own classification system that will take account some plants and animals within the nature reserve?**  **-Can you classify some of the invertebrates from our nature reserve and some other invertebrates (insects, molluscs, annelids, arthropods, arachnids, crustaceans, myriapods)**  **-Can you make a key to classify plants and animals from our nature reserve?**  **-What are micro-organisms and how would you classify them?**  **Unit- Have we always looked like this?**  **-How have some animals and plants adapted over time and why? Comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels**  **-What do fossils tell us about how animals have adapted over time?** |
| **Scientific Research** | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
|  | **To use secondary sources** | **To use secondary sources.** | **Recognise which secondary sources will be useful to research ideas** |
| **Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;** | **Year 1**  **Unit-How could you become an animal expert?**  **Compare and contrast animals first hand using lenses or through pictures and videos.**  **Unit-What plants grow in our nature reserve?**  **-What different plants and trees grow in our nature reserve?**  **-How could we group them? (children decide different ways to group them from pictures including deciduous and evergreen, trees, plants, flowering plants etc)**  **Year 2**  **Unit-Could you be the next sporting superstar?**  **-What do humans need to survive?**  **-What do we need to do to keep healthy and why?**  **Year 2**  **What happens as animals grow?**  **-Can you make a life cycle of a human?**  **-Can you make life cycles of different animals and describe the changes?**  **Year 2**  **What happens as animals grow?**  **-Can you observe an animal growing over a period of time and record you observations (If possible make measurements of length, height, mass or use pictures and videos to compare.** | **Year 3**  **Unit-How can Usain Bolt move so quickly?**  **-What food and drink do we need to keep our body healthy?**  **Unit-What can ricks tell us about the way the Earth was formed?**  **-What can you find out about sedimentary and igneous rocks?**  **Can you explain how rocks change over time?**  **Can you describe in simple terms how fossils are formed when things that have lived are trapped within rock?**  **What is soil and how is it formed?**  **Year 4**  **Unit-What are solids, liquids and gases?**  **-What are solids, liquids and gases?**  **What is evaporation and condensation in the water cycle?**  **Unit-What animals and plants thrive in our locality?**  **-Why are there large wild animals like the tiger in danger of extinction today?** | **Year 5**  **Unit-How different will you be when you are as old as your grandparents?**  **-Can you research and compare the gestation of a human baby and another animal?**  **Unit-Will we ever send another human to the moon?**  **-Find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model**  **-What can we learn about the solar system and the other planets in it?**  **-Why do some people believe Stonehenge was an astronomical clock?**  **Unit—Do all animals and plants start off life as an egg?**  **-Who are David Attenborough and Jane Goodall and what would you ask them if you met them?**  **-Can you compare the life cycle of a local plant or animal with those from another environment?**  **Unit-Can you feel the force?**  **-Explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel.**  **-Explore the effects of levers, pulleys and simple machines on movement.**  **Year 6**  **Unit- Have we always looked like this?**  **Who was Charles Darwin and what was his theory?**  **-How have some animals and plants adapted over time and why? Comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels**  **-Appreciate that variation in offspring over time can make animals more or less able to survive in particular environments,**  **-What do fossils tell us about how animals have adapted over time?**  **-Could we have evolved from apes, monkeys or primates?**  **-Can you explain how humans have adapted over time stemming from a question e.g why do humans walk on two legs?** |
| **Using scientific evidence** | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
|  |  | **Using straightforward scientific evidence to answer questions or to support their findings.** | **Identify scientific evidence that has been used to support or refute ideas or arguments.** |
|  |  | **Year 3**  **Unit-What can you find out about pushes, pulls and magnets?**  **What is friction?**  **What surface do you think will make a car travel faster?**  **What is a force? Can you group activities by push or pull?**  **Can you create a fair test to test magnets of different strengths and record your predictions and findings?**  **Can you predict and investigate whether two magnets will attract or repel each other, depending on which poles are facing?**  **Unit-What can you find out about shadows?**  **How are shadows formed?**  **Year 4**  **Unit-How are sounds made?**  **-Which materials produce the best ear muffs?**  **-Can you explain how different instruments produce sound and how you might change the pitch and volume?**  **Unit-What are solids, liquids and gases?**  **-What are solids, liquids and gases?**  **-w can we make water into a gas?**  **Where do puddles on the playground disappear to?**  **Unit-How could we cope without electricity for one day?**  **-Can you predict if a bulb will work or not in a given circuit and explain why/why not?**  **-Can you create an experiment to test if materials are conductors or insulators and record your findings?** | **Year 5**  **Unit-Could you be the next CSI investigator?**  **What are reversible and irreversible changes? (evaporation, sieving, melting, dissolving, filtering, burning, rusting)**  **Unit-Will we ever send another human to the moon?**  **Can you explain why we have day and night and the apparent movement of the sun across the sky?**  **Why does the moon appear to change shape?**  **Can you describe how the Earth and other planets orbit the sun?**  **Find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model**  **How did the work of work of scientists such as Ptolemy, Alhazen/Ibn al Haytham and Ibn al Shatir and Copernicus. Help us find out about the solar system?**  **Unit – Can you feel the force?**  **What is friction and how does it affect moving objects?**  **What is gravity and why is Isaac Newton/ Galileo Galilei linked to it?**  **Year 6**  **Unit- Have we always looked like this?**  **-Who was Charles Darwin and what was his theory?**  **-How have some animals and plants adapted over time and why? Comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels**  **-Appreciate that variation in offspring over time can make animals more or less able to survive in particular environments,**  **What do fossils tell us about how animals have adapted over time?**  **-Could we have evolved from apes, monkeys or primates?**  **-Can you explain how humans have adapted over time stemming from a question e.g why do humans walk on two legs?**  **Unit-Why is light so important?**  **-How can you set up an experiment to show that light travels in straight lines?**  **talk about what happens and make predictions.**  **-Why do shadows have the same shape as objects that cast them?**  **-How can you use mirrors to see around blind corners? Where is the best place to put a mirror on a car and why?**  **-What do you notice when you look at a straw in water?**  **-What do prisms tell us about light?** |
|  | **Reception** | **KS1** | **Year 3 and 4** | **Year 5 and 6** |
|  |  | **Use relevant scientific language** | **Use relevant scientific language** | **Use relevant scientific language** |
|  | **Talk about what they see, using a wide vocabulary**  **talk about different forces they can feel**  **Describe what they see, hear and feel whilst outside.**  **Know and talk about the different factors that support their overall health and wellbeing:** | All units see vocabulary Appendix in Learning Challenge document for key vocabulary for each unit | All units see vocabulary Appendix in Learning Challenge document for key vocabulary for each unit | All units see vocabulary Appendix in Learning Challenge document for key vocabulary for each unit |