**HOLLINS GRUNDY PRIMARY SCHOOL**

Happiness, Health and Respect for Confident, Creative Learners

Progression in Science

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| **NC**  **Animals including human**  **Living thigs and their habitats**  **Evolution and inheritance** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Classification**  **(not plants)** | Making observations and drawing pictures of animals | **Could you become an animal expert?**  -Name and group common vertebrates including pets using vertebrate groups.  -Name and describe birds in the locality  -Describe bodies of common vertebrates  including pets.  -Name, draw and label simple body parts of a human.  -Know body parts associated with senses  -Compare and contrast mini beasts using hand lenses |  | **How can Usain Bolt move so quickly?**  -Identify animals with and without skeletons and observe and compare how they move differently | **Which wild animals and plants thrive in your locality?**  -Classify and group vertebrates and some invertebrates: molluscs, worms, arachnids, insects.  -Make simple classification keys |  | **Could a spiderman exist?**  -Classify animals in the nature reserve and other animals including invertebrates :arthropod, insect, annelid, arachnid, myriapoda, crustacean, mollusc.  -Use classification systems and keys to classify local animals and plants  -Know what a micro organism is : virus, fungi, bacteria.  -Describe decomposition.  -Plan an investigation to see what speed up decomposition.  -Know how to identify vertebrates and invertebrates by observable characteristics and give reasons. |
| **food chains** |  | **Could you become an animal expert?**  -Group carnivores, herbivores and omnivores | **Why can’t a woodlouse live on the sea shore?**  -Make simple food chains from animals from habitats and micro habitats observed | **How can Usain Bolt move so quickly?**  -Compare, contrast and group animals by their diet including pets | **What happens to the food we eat?**  -Look at the difference between teeth of herbivores and carnivores  -Construct and interpret food chains with producer, predators, prey. |  |  |
| **habitats** | Begin to understand the need to respect and care for the natural environment and all living things.  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; | **Could you become an animal expert?**  -What mini beasts live in our school habitat? | **Why can’t a wood louse live on the sea shore?**  -Identify animals in local habitats and micro habitats  -Compare familiar and unfamiliar habitats and why animals live there. |  | **Which wild animals and plants thrive in your locality**?  -Know why wild animals such as the tiger are endangered.  -Know why nature reserves are good for the environment  -Recognise why it is dangerous to animals and their habitats if we drop litter. |  |  |
| **Life cycles and growth** | Understand the key features of the life cycle of a an animal.  (butterflies) |  | **What happens as animals grow?**  -Make a life cycle of a human.  -Create life cycles for animals: chicken, butterfly, frog, sheep  -Observe how an animals grows and record observations.  -Why can’t a woodlouse live by the seashore?  -Can you sort and compare images into living, dead and never alive? |  |  | **How different will you be when you are as old as your grandparent?**  -Explore how humans develop (baby, child, teenager, adult, grandparent) and record changes.  -What do we understand by puberty.  -Can you research and compare the gestation a human baby and another animal?  -Make a scattergraph to compare mass and length of a baby as it grows.  **Do all animals start life as an egg?**  -What is reproduction?  -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? (could include rainforest, ocean, desert or pre-historic animal or plant |  |
| **Human body** | Talk about what they see, using a wide vocabulary  Describe what they see, hear and feel whilst outside.  Make healthy choices about food, drink, activity and toothbrushing.  Know and talk about the different factors that support their overall health and wellbeing:  -Regular physical activity  - healthy eating  -tooth brushing  -sensible amounts of ‘screen time’  -having a good sleep routine  -being a safe pedestrian  -Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. | **Could you become an animal expert?**  -Name, draw and label simple body parts of a human.  -Know body parts associated with senses | **How could you be the next sporting superstar?**  -What do humans need to survive?  -What do humans need to do to keep healthy (food, drink, exercise, hygiene)  -Can you find out what fruits and vegetables your classmates eat?  -Plan a healthy menu and exercise and hygiene routine.  -Know the importance of exercise, eating right amounts of different foods (fruit, vegetables, meat/fish, sugar, dairy, carbohydrates) and hygiene. | **How can Usain Bolt move so quickly?**  -Know main bones in the body and their function.  -Know why we have muscles.  -Where are our muscles, how do they work? How do they help us move  -Know what food and drink is needed to keep us healthy. (food groups, protein, fats, fibre, vitamins, nutrients, energy)  -Plan a healthy meal for an athlete.  -Compare, contrast and group animals by their diet including pets. | What happens to the food we eat?  What happens to that piece of chocolate once you swallow it?  What is the digestive system and why is it so important? (function of mouth, tongue, teeth, oesophagus, stomach and small and large intestine)  How can you make a simple model, using junk material, to show how the digestive system works?  What types of teeth do humans have and why do we have different types of teeth?  What damages our teeth and how should we look after them? Children could ask questions and suggest liquids to investigate what damages our teeth the most? |  | **What would a journey through your body be like?**  -What is pulse and why do we have one?  -What are the parts of the circulatory system and how does the circulatory system work?  -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?  -Describe the ways in which nutrients and water are transported within animals, including humans.  -What are drugs and why is it dangerous to our body to take some drugs?  -What do we need to do to keep our heart healthy? |
| **Evolution and inheritance** |  |  |  |  |  |  | **Why do we not look exactly like our parents?**  -Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.    -Understand that characteristics are passed from parents to their offspring.  -Who was Darwin and what was his theory?  -Why have some animals and plants adapted over time?  -Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.  -What do fossils tell us about how animals have adapted over time?  -Could we have evolved from apes, monkeys or primates?  -Appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, |
| **NC**  **Plants** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Classification** |  | **Which 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)  -Identify and name a variety of common wild and garden plants including deciduous and evergreen trees.  -Can you identify and keep a tally of the different plants and trees we see during our nature walk? |  |  | **What wild animals and plants thirive in the locality?**  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? |  | **Could a spiderman exist?**  Can you create your own classification system that will take account some plants and animals within the nature reserve?  Can you make a key to classify plants and animals from our nature reserve?  -Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals  -Give reasons for classifying plants based on characteristics. |
| **Identifying parts of plants and their function** |  | **Which plants grow in our nature reserve?**  -Can you describe and compare common plants or parts of plants from our nature walk using magnifying glasses to help you? (i.e leaves, flowers, roots, whole plants)  -Can you label the parts of plants and trees? (leaves, flowers/blossom, petals, fruit, roots, bulb, seed, trunk, branches, stem). | **Which plants grow in our nature reserve?**  What do plants grow from?(seeds bulbs)  Where do plants keep their seeds? | **How did that blossom become an apple?**  Can you make a labelled diagram of the parts of a flowering plant and their function? (roots, stem/trunk, leaves and flowers)  Why are flowers so important for plants?(look at pollination, seed formation, reproduction and seed dispersal.)  Why are the root and stem important? Can you investigate how water and nutrients travels up the roots and stem of a plant and record your findings?  Can you investigate the structure of different fruits to identify and compare the seeds? Find out how the seeds from each plant will be dispersed. |  | **Do all animals and plants start life as an egg?**  What is reproduction? (sexual and asexual reproduction in plants and reproduction in animals |  |
| **Growth** | Plant seeds and care for growing plants.  Understand the key features of the life cycle of a plant | **Which plants grow in our nature reserve?**  -Can you plant some plants and keep an observation log of its growth? (Encourage use of vocabulary for parts of plants in logs look at vegetables, plants, flowering plants) | **Which plants grow in our nature reserve?**  If possible 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?  What do plants need to grow and be healthy?  Can you set up a fair investigation to compare what happens if plants have different levels of light and amounts of water? | **How did that blossom become an apple?**  What do plants need to grow? How may this vary for different plants? ((air, light, water, nutrients from soil, and room to grow)  Can you make a life cycle of an apple from growing from a seed to seed dispersal? |  | **Do all animals and plants start life as an egg?**  Can you observe and record life cycle changes over time (i.e plant and grow a vegetable or flowering plant) |  |
| **NC**  **Materials**  **Rocks**  **States of matter** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Classification and properties of materials** | Use all their senses in hands-on exploration of natural materials  .  Explore collections of materials with similar and/or different properties.  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.  Join different materials and explore different textures.  Safely use and explore a variety of materials | **Which materials should the 3 little pigs gave used to build their house?**  -Can you identify objects which are made from different materials and group them including wood, plastic, glass, metal, water and rock?  -Can you describe properties of different every day materials?  -Describe simple properties of a variety of everyday materials (hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent, not absorbent, opaque/transparent.  -Can you compare and group every day materials by their properties?  -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? | **What materials are in our school?**  Can you find and group items made of the same material and suggest why they are made of the material?  -Identify and compare the suitability of a variety of every day materials including wood, metal, plastic glass, brick rock, paper and cardboard for particular purposes.  -What material can a spoon be made out of and why? What would not be a suitable material for a spoon?  -What are the advantages and disadvantages of different materials?  Which solid objects can change shape if you squash, bend, stretch or twist them?  -Can you compare how different materials are used in school and in the grounds/local area and record your observations? | **What do rocks tell us about how the Earth was formed?**  Can you group rocks based on their appearance and physical properties? (For example use hand lenses to group considering crystals, grains, fossils)  What can you find out about sedimentary and igneous rocks?  Can you describe in simple terms how fossils are formed when things that have lived are trapped within rock?  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?  What types of soil are there and how are they similar and different?  Can you investigate what happens when different rock are rubbed together?  OR  What happens when you put different rocks in water? | **What are solids liquids and gases?**  What are solids, liquids and gases? (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container).  Can you group materials into solids liquids and gases**?** | **Could you be the next CSI investigator?**  Can you group materials by properties? (hardness, conductivity, solubility, transparency, magnetic)  Can you suggest uses for the materials? |  |
| **States of matter**  **Changes in state**  **Chemical changes**  **Reversible and irreversible changes** | Understand some important processes and changes in the natural world around them, including the changing states of matter. |  |  |  | **What are solids, liquids and gases?**  How can water be a solid, liquid and gas?  Can you investigate the temperatures at intervals from ice cube to water?  How can we make water into a gas?  Where do puddles on the playground disappear to?  What is evaporation and condensation in the water cycle?  Can you investigate what temperature different solids melt (i.e iron, ice, chocolate, butter, ice-cream  Can you investigate how long a puddle takes to evaporate and measure how it changes over time?    Explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). | **Could you be the next CSI investigator?**  What materials can dissolve and how can we recover a substance from a solution?  What are reversible and irreversible changes? (evaporation, sieving, melting, dissolving, filtering, burning, rusting)  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? (bicarbonate soda and vinegar) |  |
| **NC**  **Forces**  **Forces and Magnetism** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | Explore and talk about different forces they can feel |  |  | **What can you find out about pushes, pulls and magnets?**  -What is a force?  Can you group activities by push or pull?  -What is friction? What surface do you think will make a car travel faster?  -Can you investigate and record which materials are attracted and repelled by magnets?  -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?  -Observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary a swing).  -Explore the behaviour and everyday uses of different magnets.  -Look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces **another** |  | **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?  -Can you design and make a parachute to help you understand more about air resistance?  -What is water resistance?  -Can you investigate which shaped boats travel faster in water?  -What are pulleys, leavers and gears and why are they useful?  -What helps you to climb hills on your bicycle? |  |
| **NC**  **Electricity** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  |  |  |  |  | **How could we cope without electricity for one day?**  --Can you identify common appliances from home and school which run on electricity?  -How can you create electrical circuits with switches, bulbs and buzzers and draw and label your circuits?  -Can you predict if a bulb will work or not in a given circuit and explain why/why not?  -What are conductors and insulators and how are they associated with electricity?  -Can you create an experiment to test if materials are conductors or insulators and record your findings?  recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit  -Construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. (torches)  -Draw circuits as a pictorial representation, not using conventional circuit symbols at this stage |  | **Why is an electrical power source so important?**  -Can you explain how a circuit works?  -Can you understand what circuit symbols represent and make circuit diagrams?  -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.  -Use circuits to make a steady hand game (DT)  -Associate the brightness of a lamp or the volume of a buzzer or speed of a motor with the number and voltage of cells used in the circuit  -Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches, speed of a motor. |
| **NC**  **Light**  **Sound** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  |  |  |  | **What can you find out about shadows?**  -Why do we need light?  -What is darkness?  -What happens when light is reflected off a mirror and other shiny surfaces?  -How are shadows formed?  -Why should we not look directly at the sun?  -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?  -Find patterns in the way the size of shadows change.  -Explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves.  -Work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. | **How are sounds made?**  -How do your ears work?  -Recognise that vibrations from sounds travel through a medium to the ear  -Find patterns between the volume of a sound and the strength of the vibrations that produced it  -What do we mean by the pitch and volume of the 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?  -Can you explain how different instruments produce sound and how you might change the pitch and volume?  -Which materials produce the best ear muffs?  -Can you make a musical -instrument and explain how it produces sound? |  | **How do your eyes work?**  How can you set up anexperiment to show that light travels in straight lines?  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? |
| **NC**  **Seasonal Changes** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | Describe what they see, hear and feel whilst outside.  Understand the effect of changing seasons on the natural world around them.  Understand some important processes and changes in the natural world around them, including the seasons | **How could you become a weather reporter?**  What types of weather are there in our country?  Can you make a weather chart?  Observe and describe the changes across the four seasons.  Know the 4 seasons in order.  Observe and describe weather associated with the seasons.  What changes do we see in our country with each season? (weather, leaves, day length)  How do trees change over the seasons?  Why are the days longer in the summer?  Why are so many of the things you enjoy doing dependent on the time of year and the weather?  Can you create a typical weather forecast summary |  |  |  |  |  |
| **NC**  **Earth and Space** | **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  |  |  |  |  |  | **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?  -Describe the Sun, Earth and Moon as approximately spherical bodies.  -Can you describe how the Earth and other planets orbit the sun?  -What can we learn about the solar system and the other planets in it?  -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?  -Can you compare the time of day with other countries on Earth?  -Why do some people believe Stonehenge was an astronomical clock?  -Work scientifically by creating simple models of the solar system |  |