

| SCIENCE                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| EYFS : Understanding the World: The Natural World                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| EYFS Development Matters Statements for Reception Children...                                                                                                                                                                                                                                                                                                                                                                                                | Examples of how we might support this...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Enabling Environments                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Specific Longman's Hill examples...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  <p>Explore the (natural) world around them.</p><br> <p>Describe what they see, hear and feel whilst outside.</p><br> <p>Understand the effect of changing seasons on the natural world around them.</p> | <ul style="list-style-type: none"> <li>• Provide children with frequent opportunities for outdoor play and exploration.</li> <li>• Encourage interactions with the outdoors to foster curiosity and give children freedom to touch, smell and hear the natural world around them during hands-on experiences.</li> <li>• Create opportunities to discuss how we care for the natural world around us.</li> <li>• Offer opportunities to sing songs and join in with rhymes and poems about the natural world.</li> <li>• After close observation, draw pictures of the natural world, including animals and plants.</li> <li>• Observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water</li> <li>• Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs.</li> <li>• Encourage focused observation of the natural world.</li> <li>• Listen to children describing and commenting on things they have seen whilst outside, including plants and animals.</li> <li>• Encourage positive interaction with the outside world, offering children a chance to take supported risks, appropriate to themselves and the environment within which they are in.</li> <li>• Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside</li> <li>• Guide children's understanding by draw children's attention to the weather and seasonal features.</li> <li>• Provide opportunities for children to note and record the weather. Select texts to share with the children about the changing seasons.</li> <li>• Throughout the year, take children outside to observe the natural world and encourage children to observe how animals behave differently as the seasons change.</li> <li>• Look for children incorporating their understanding of the seasons and weather in their play</li> </ul> | <ul style="list-style-type: none"> <li>• Provide stories that help children to make sense of different environments.</li> </ul> <p>Use the local area for exploring both the built and the natural environment.</p> <ul style="list-style-type: none"> <li>• Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs.</li> <li>• Provide play maps and small world equipment for children to create their own environments.</li> </ul> | <ul style="list-style-type: none"> <li>• Provide opportunities for children to use a microscope and other science equipment.</li> <li>• Visit the school pond, wildlife area and allotments.</li> <li>• Have a chance to grow their own plants from seed and give them a chance to grow their own food.</li> <li>• Ensure that all the children have the opportunity to look at, hold and study live animals or insects.</li> <li>• Observe and take part in plan science experiments and investigative, open ended experiences.</li> <li>• Have an opportunity to join in forest school activities outside. EG: Bug Hunt.</li> <li>• Join in with whole school science and STEM days.</li> <li>• Visit or meet a farmer to learn about food and animals.</li> <li>• Study and experience the seasons and all weathers.</li> </ul> |

ELG: The Natural World (Understanding the

World) Children at the expected level of

development will:

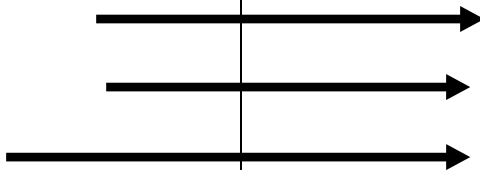
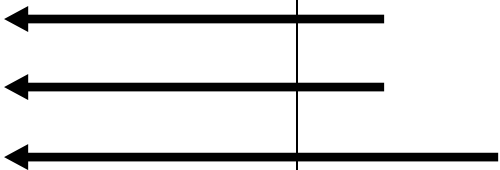
- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

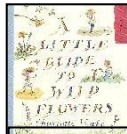
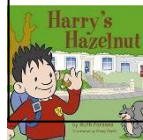
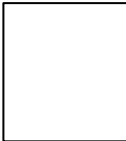
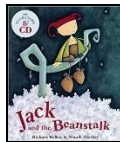
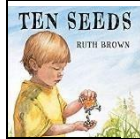
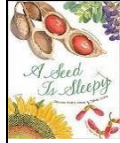
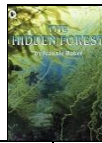
| SCIENCE                              | YEAR 1                                                                                                     | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | YEAR 6 |
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| THRESHOLD<br>CONCEPTS<br>FOR SCIENCE | Understanding the Natural World                                                                            |        |        |        |        |        |
|                                      | Understanding the Physical world                                                                           |        |        |        |        |        |
|                                      | Working Scientifically  |        |        |        |        |        |

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| H<br>R<br>E<br>S<br>H<br>O<br>L<br>D<br>C<br>O<br>N<br>C<br>E<br>P<br>T<br>:<br>U<br>N<br>D<br>E<br>R | <b>BIOLOGY</b><br><br><b>PLANTS</b><br><br>Knowledge | <p><b>Plants</b><br/>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> | <p><b>Plants</b><br/>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> | <p><b>Plants</b><br/>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p><b>Possible AC Passport link:</b><br/>Grow something to eat. Which part of the plant do you eat? Is that the same for all plants? E.g. grow potatoes, herbs (mint?), borage, courgettes and strawberries- great time-lapse videos available for watching the flower turn into the fruit.</p> |  |  |  |
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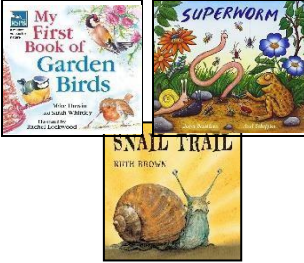
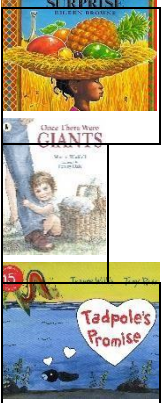
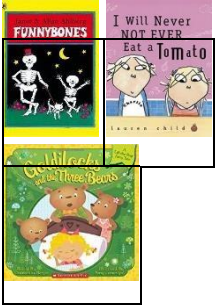
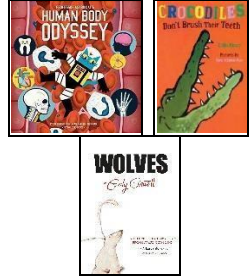
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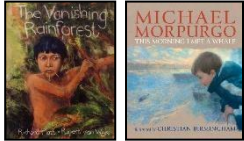
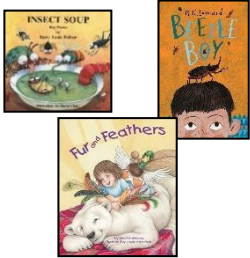
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| <div>SUBJECT</div> <div>SP<br/>EC<br/>IFI<br/>C<br/>VO<br/>CA<br/>BU<br/>LA<br/>RY<br/>PL<br/>AN<br/>TS</div> | <div>Identify<br/>Name<br/>Wild plants<br/>Garden plants<br/>Deciduous<br/>Flowering plants<br/>Trees<br/>Leaves<br/>Flowers<br/>Blossom<br/>Petals<br/>Fruit<br/>Roots<br/>Bud<br/>Seed<br/>Trunk<br/>bark<br/>stalk<br/>Branche<br/>s Stem</div>                                                                                                                                                                                                                                                         | <div>Observe<br/>Describe<br/>Seeds<br/>Bulbs<br/>Mature plants<br/>Plants<br/>Water<br/>Light<br/>Suitable temperature<br/>Healthy<br/>Germination<br/>Growth<br/>Survival<br/>Reproduction<br/>Shade<br/>Sun<br/>Warm cool</div>                                                                                                                                                                                                                                 | <div>Identify<br/>Describe<br/>Function<br/>Flowering<br/>plants<br/>Roots<br/>Stem<br/>Trunk<br/>Leaves<br/>Flower<br/>s Air<br/>Light<br/>Water<br/>Nutrients<br/>Transported<br/>Life cycle<br/>Pollination<br/>Seed formation<br/>Seed dispersal<br/>Structure<br/>Pollen<br/>support<br/>Photosynthesis<br/>Nutrition<br/>Reproduction</div>                                                                                                                                                                |  |  |  |
| <div>SUGGESTED<br/>LINKED<br/>TEXTS<br/>(READING<br/>ACROSS THE<br/>CURRICULU<br/>M)</div>                    | <div><div><i>A Little Guide to Wild Flowers</i><br/>(Charlotte Voake)</div><div><i>The Things That I LOVE about TREES</i><br/>(Chris Butterworth)</div><div><i>Harry's Hazelnut</i><br/>(Ruth Parsons)</div><div></div><div></div><div></div></div> | <div><div><i>Jack and the Beanstalk</i><br/>(Richard Walker)</div><div><i>Ten Seeds</i><br/>(Ruth Brown)</div><div><i>A Seed Is Sleepy</i><br/>(Dianna Aston)</div><div></div><div></div><div></div></div> | <div><div><i>The Story of Frog Belly Rat Bone</i><br/>(Timothy Basil Ering)</div><div><i>The Hidden Forest</i><br/>(Jeannie Baker)</div><div><i>George and Flora's Secret Garden</i><br/>(Jo Elworthy)</div><div></div><div></div><div></div></div> |  |  |  |

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| <p><b>THRESHOLD CONCEPT :</b></p> <p><b>UNDERSTANDING THE NATURAL WORLD</b></p> | <p><b>BIOLOGY</b></p> <p><b>ANIMALS INCLUDING HUMANS</b></p> | <p><b>Animals including humans</b><br/>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p><b>Possible AC Passport Link:</b><br/>Hold a live animal. Label a photograph of the animal that they held and compare to a different one e.g. this one has fur, this one has feathers.</p> <p><b>Possible AC Passport Link:</b><br/>Hunt for bugs- where do they live? Why do they live there?</p> | <p><b>Animals including humans</b><br/>notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><b>Possible AC Passport Link:</b><br/>Hold a live animal. Research the animal and find out what it needs to survive. Is that what we need?</p> | <p><b>Animals including humans</b><br/>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> | <p><b>Animals including humans</b><br/>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> | <p><b>Animals including humans</b><br/>Describe the changes as humans develop to old age.</p> | <p><b>Animals including humans</b><br/>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p><b>Suggested scientists:</b><br/><b>Justus von Liebig</b><br/>(Theories of Nutrition and Metabolism)</p> <p><b>Sir Richard Doll</b><br/>(Linking Smoking and Health Problems)</p> <p><b>Leonardo Da Vinci</b><br/>(Anatomy)</p> |
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| <p>SUBJECT SPECIFIC VOCABULARY</p> <p>ANIMALS INCLUDING HUMANS</p> | <p>Animals<br/>Fish<br/>Amphibians<br/>Reptiles<br/>Birds<br/>Mammals<br/>Pets<br/>Human body<br/>Sense<br/>Habitat<br/>Local environment<br/>Head Neck<br/>Arms Elbow<br/>Legs Knees<br/>Ears Face<br/>Eyes Hair<br/>Mouth Teeth<br/>Feathers Fur<br/>Beak Paws<br/>Hooves Wing<br/>Fin Scales<br/><b>Carnivore</b> <b>Herbivore</b><br/><b>Omnivore</b><br/>Children do not need to use these words, they just need to know that some animals eat meat, some eat plants and some eat both.</p> | <p>Humans<br/>Offspring<br/>Grow<br/>Adults<br/>Animals<br/>Survival<br/>Water<br/>Food<br/>Air<br/>Exercise<br/>Hygiene<br/>Reproduction<br/>Growth<br/>Egg /chick/ chicken<br/>egg/caterpillar/pupa/butterfly<br/>Spawn/tadpole/frog<br/>Lamb/sheep<br/>Baby<br/>Toddler<br/>child<br/>Teenager<br/>Adult</p> | <p>Identify<br/>Humans<br/>Animals<br/>Nutrition<br/>Food<br/>Skeleton<br/>Muscles<br/>Support<br/>Protection<br/>Movement<br/>Diet<br/>Nutrients<br/>Carbohydrate<br/>Sugars<br/>Protein<br/>Vitamins<br/>Minerals<br/>Fibre<br/>Fat<br/>Water<br/>Food groups<br/>Function<br/>Skeletal system<br/>Bones<br/>Ribs<br/>Skull<br/>Spine<br/>Joints<br/>Muscular system.</p> | <p>Describe<br/>Function<br/>Digestive system<br/>Construct<br/>Interpret<br/>Food chains<br/>Producers<br/>Predators<br/>Prey<br/>Mouth<br/>Tongue<br/>Teeth<br/>Oesophagus<br/>Stomach<br/>Small intestine<br/>Large intestine<br/>Herbivores<br/>Carnivores<br/>Digestion<br/>saliva,<br/>Nutrients<br/>Rectum<br/>Anus<br/>incisor<br/>canine<br/>molar</p> | <p>Describe<br/>Changes<br/>Humans<br/>Old age<br/>Develop<br/>Timeline<br/>Stages<br/>Growth<br/>Puberty<br/>Gestation period</p>                                                                                                   | <p>Identify<br/>Name<br/>Circulatory system<br/>Functions<br/>Heart<br/>Blood vessels<br/>Blood<br/>Impact<br/>Diet<br/>Exercise<br/>Drugs<br/>Lifestyle<br/>Function<br/>Nutrients<br/>Transported<br/>Skeletal system<br/>Muscular system<br/>Digestive system<br/>Healthy<br/>Substances<br/>harmful</p> |
| <p>SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM)</p>      | <p><b>RSPB: My First Book of Garden Birds</b><br/>(Mike Unwin and Sarah Whittle)</p> <p><b>Snail Trail</b><br/>(Ruth Brown)</p> <p><b>Superworm</b><br/>(Julia Donaldson &amp; Axel Scheffler)</p>                                                                                                                                                                                                            | <p><b>Handa's Surprise</b><br/>(Eileen Brown)</p> <p><b>Once There Were Giants</b><br/>(Martin Waddell and Penny Dale)</p> <p><b>Tadpole's Promise</b><br/>(Jeanne Willis and Tony Ross)</p>                                 | <p><b>Funnybones</b><br/>(Janet and Allan Ahlberg)</p> <p><b>I Will Never Not Ever Eat a Tomato</b><br/>(Lauren Child)</p> <p><b>Goldilocks and the Three Bears</b><br/>(Samantha Berger)</p>                                                                                          | <p><b>Human Body Odyssey</b><br/>(Werner Holzwarth)</p> <p><b>Crocodiles Don't Brush Their Teeth</b><br/>(Colin Fanc)</p> <p><b>Wolves</b><br/>(Emily Gravett)</p>                                                                                                         | <p><b>Hair in Funny Places</b><br/>(Babette Cole)</p> <p><b>Giant</b><br/>(Kate Scott)</p> <p><b>You're Only Old Once!</b><br/>(Dr. Seuss)</p>  | <p><b>Pig-Heart Boy</b><br/>(Malorie Blackman)</p> <p><b>Skellig</b><br/>(David Almond)</p> <p><b>A Heart Pumping Adventure</b><br/>(Heather Manley)</p>                                                               |

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| <p>THRESH<br/>OLD<br/>CONCEPT:<br/>UNDERSTANDING<br/>THE<br/>NATURAL<br/>WORLD</p> | <p><b>BIOL<br/>OGY</b><br/><b>LIVIN<br/>G</b><br/><b>THIN<br/>GS</b><br/><b>AND</b><br/><b>THEIR</b><br/><b>HABI<br/>TATS</b><br/>Know<br/>ledge</p> |  | <p><b>Living things and their habitats</b><br/>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>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.</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats.</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p> <p><b>Possible AC Passport Link:</b><br/><a href="#">Hunt for bugs.</a></p> |  | <p><b>Living things and their habitats</b><br/>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p><b>Possible AC Passport Link:</b><br/><a href="#">Discover what lives in a pond.</a><br/><a href="#">Pong dipping- use a classification key.</a></p> | <p><b>All living things and their habitats</b><br/>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p> <p><b>Possible AC Passport Link:</b><br/><a href="#">Make a nature film in the style of David Attenborough.</a></p> <p><b>Suggested scientists:</b><br/><b>David Attenborough</b> (Naturalist and Nature Documentary Broadcaster)</p> <p><b>James Brodie of Brodie</b> (Reproduction of Plants by Spores)</p> | <p><b>Living things and their habitats</b><br/>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro- organisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p><b>Possible AC Passport Link:</b><br/><a href="#">Discover what lives in a pond. Pong dipping – classify discoveries; make a classification key.</a></p> <p><a href="#">Go rock pooling.</a></p> <p><b>Suggested scientists:</b><br/><b>Carl Linnaeus</b> (Identifying, Naming and Classifying Organisms)</p> |
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***The Vanishing  
Rainforest***  
*(Richard Platt)*  
  
***The Morning I  
Met a Whale***  
*(Michael  
Morpurgo)*

Describe Differences Life cycle Mammal  
Amphibian Insect  
Bird  
Life processes Plants Animals  
Local environment Naturalists  
Animal behaviourists Jane Goodall Reproduction  
Sexual reproduction Asexual reproduction sperm  
metamorphosis  
live young fertilise gametes Parent plant  
identical Seeds  
Stem  
Root cuttings Tubers runners Bulbs

***Charlotte's Web***  
(E.B. White)

***The Land of Neverbelieve*** (Norman Messenger)

***Mummy Laid an Egg***  
(Babette Cole)

Describe Living things Classified  
Classifying Groups Common  
Observable features Characteristics  
Similarities Differences  
Micro-organisms Plants  
Animals Classification system  
Invertebrates Insects  
Spiders Snails Worms  
Vertebrates Fish Amphibians  
Reptiles Mammals Birds  
Keys  
Unfamiliar environment Habitats

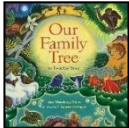
***Beetle Boy***  
(M G Leonard)

***Insect Soup***  
(Barry Louis Polisar)

***Fur and Feathers***  
(Janet Halfmann)

| THRESHOLD | SUBJECT                                    | TEDE                                                                                                                                                                                                                                                                                                                                                                                                                                  | OLD                                                                                          | NEW                                                                                                                                       | NEW             | NEW | NEW | NEW |  |
|-----------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----|-----|-----|--|
|           | <p>SPECIFIC VOCABULARY</p> <p>SEASONAL</p> | <p>LINKED TEXTS (READING ACROSS THE</p> <p>Autumn<br/>Winter<br/><b><i>Tree: Seasons Come, Seasons Go</i></b><br/><i>(Patricia Hegarty and Britta Teckentrup)</i></p> <p><b><i>One Year with Kipper</i></b><br/><i>(Mick Inkpen)</i></p> <p><b><i>After the Storm</i></b><br/><i>(Nick Bunnorth)</i></p> <p><b><i>The Storm</i></b><br/><i>(Nick Bunnorth)</i></p> <p><b><i>One year with Kipper</i></b><br/><i>(Mick Inkpen)</i></p> | <p>CONCEPT:</p> <p><b>BIOLOGICAL</b></p> <p>ANDY</p> <p>SEASONAL CHANGE</p> <p>Knowledge</p> | <p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p> | Seasonal change |     |     |     |  |
|           |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                              |                                                                                                                                           |                 |     |     |     |  |
|           |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                              |                                                                                                                                           |                 |     |     |     |  |
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| <div>T<br/>H<br/>R<br/>E<br/>S<br/>H<br/>O<br/>L<br/>D<br/>C<br/>O<br/>N<br/>C<br/>E<br/>P<br/>T<br/>:<br/>U<br/>N<br/>D<br/>E<br/>R<br/>S<br/>T<br/>A<br/>N<br/>D<br/>I<br/>N<br/>G</div> | <div><div>BIOLOGY</div><div>EVOLUTION</div><div>Knowledge</div></div> |  |  |  |  | <div><div>Evolution</div><div>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</div><div>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</div><div>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</div><div><div>Suggested scientists:</div><div>Charles Darwin and Alfred Russel Wallace</div><div>(Theory of Evolution by Natural Selection)</div><div>Jane Goodall</div><div>(Chimpanzees)</div></div></div> |
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|                                                        |  |  |  |  |  |                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                      |
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| THE NATURAL WORLD                                      |  |  |  |  |  |                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                      |
| SUBJECT SPECIFIC VOCABULARY<br>EVOLUTION               |  |  |  |  |  |                                                                                                                                                       | Recognise<br>Changed<br>Inhabited<br>Offspring<br>Not identical<br>Sexual reproduction<br>Adapted<br>Living things<br>Fossils<br>Produce<br>Vary<br>Parents<br>Environment<br>Adaptation<br>Characteristics<br>Suited<br>Breeds<br>Evolution<br>Inherited<br>Species<br>Variation<br>More able to survive<br>Less able to survive<br>Palaeontologists<br>Advantages<br>Disadvantages |
| SUGGESTED LINKED TEXTS (READING ACROSS THE CURRICULUM) |  |  |  |  |  | <b>One Smart Fish</b><br>(Christopher Wormell)<br><br><b>The Molliebird</b><br>(Jules Pottle)<br><br><b>Our Family Tree</b><br>(Lisa Westberg Peters) |                                                                                                                       |

# TH RES HO LD CO NC EPT : UND ERST AND ING THE PHYS ICAL WO RLD

## CHEMISTRY

### MATERIALS

#### Knowledge

##### Everyday Materials

Distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.

Describe the simple physical properties of a variety of everyday materials.

Compare and group together a variety of everyday materials on the basis of their simple physical properties.

##### Use of Everyday Materials

Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

**Possible AC Passport Link:**  
Follow a recipe to bake something- If making biscuits or something with a dough, children will have the opportunity to use language related to material properties e.g. squashing and stretching.

##### Rocks

Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.

Describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Recognise that soils are made from rocks and organic matter.

##### States of matter

Compare and group materials together, according to whether they are solids, liquids or gases.

Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).

Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

##### Properties and changes of material

Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.

Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.

Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

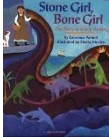
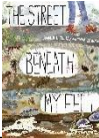
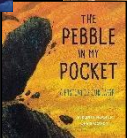
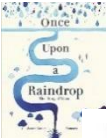
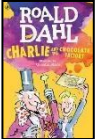
Demonstrate that dissolving, mixing and changes of state are reversible changes.

Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

**Possible AC Passport Link:**  
Fly a kite.

**Suggested scientists:**  
Spencer Silver,  
Arthur Fry and Alan Amron  
(Post-It Notes)

**Ruth Benerito**  
(Wrinkle-Free Cotton)

|                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
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| <div>SUB</div> <div>J<br/>E<br/>C<br/>T<br/>S<br/>P<br/>E<br/>C<br/>I<br/>F<br/>I<br/>C<br/>V<br/>O<br/>C</div> | <div>wood</div> <div>plastic</div> <div>glass</div> <div>metal</div> <div>water</div> <div>rock</div> <div>fabric</div> <div>carboard</div> <div>rubber</div> <div>wool</div> <div>hard</div> <div>soft</div> <div>stretchy</div> <div>stiff</div> <div>shiny</div> <div>dull</div> <div>rough</div> <div>smooth</div> <div>bendy</div> <div>not bendy</div> <div>waterproof</div> <div>not waterproof</div> <div>absorbent</div> <div>not absorbent</div> <div>see through</div> | <div>Wood</div> <div>Plastic</div> <div>Glass</div> <div>Metal</div> <div>water</div> <div>Rock</div> <div>brick</div> <div>paper</div> <div>cardboard</div> <div>squashing</div> <div>Bending</div> <div>twisting</div> <div>Stretching</div> <div>Suitable</div> <div>Unsuitable</div> <div>Properties</div> <div>Absorbent</div> <div>Opaque</div> <div>Strong</div> <div>Weak</div> <div>Optional opportunities:</div> <div>ohn Dunlop – tyres</div> <div>Charles Macintosh</div> | <div>Rocks</div> <div>Stone</div> <div>Pebble</div> <div>Boulder</div> <div>Layers</div> <div>Hard</div> <div>Soft</div> <div>Texture</div> <div>Absorb</div> <div>Marble</div> <div>Chalk</div> <div>Granite</div> <div>Sandstone</div> <div>Slate</div> <div>Peat</div> <div>Appearance</div> <div>Physical properties</div> <div>Fossils</div> <div>Soil</div> <div>Organic matter</div> <div>Grains</div> <div>Crystals</div> | <div>Solids</div> <div>Liquids</div> <div>Gases</div> <div>State</div> <div>changed</div> <div>Heated</div> <div>Cooled</div> <div>Temperature</div> <div>Degrees Celsius (°C)</div> <div>Evaporation</div> <div>Condensation</div> <div>Water cycle</div> <div>Investigate</div> <div>Effect</div> <div>Oxygen condensing</div> <div>Iron melting</div> | <div>hardness</div> <div>solubility</div> <div>transparency</div> <div>Electrical conductivity</div> <div>Thermal conductivity</div> <div>response to magnets</div> <div>Dissolve</div> <div>Solution</div> <div>Recover from solution</div> <div>Soluble</div> <div>Insoluble</div> <div>Solids</div> <div>Liquids</div> <div>Gases</div> <div>Separated</div> <div>Filtering</div> <div>Sieving</div> <div>evaporatin</div> <div>g Metal</div> <div>Wood</div> <div>Plastic</div> <div>mixture</div> <div>changes of state</div> <div>reversible changes</div> <div>Irreversible changes</div> <div>Burning</div> <div>Acid</div> <div>Bicarbonat</div> <div>of soda</div> <div>rusting</div> <div>melting</div> |  |
| <div></div> <div>A<br/>B<br/>U<br/>L<br/>A<br/>R<br/>Y<br/>M<br/>A<br/>T<br/>E<br/>R<br/>I<br/>A</div>          | <div></div> <div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div></div> <div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <div>    </div>                                                                                                                                                    | <div>    </div>                                                                           | <div></div> <div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |

SUGGESTED  
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*The Great Paper Caper*  
(Oliver Jeffers)

*Who Sank the Boat*  
(Pamela Allen)

*The Tin Forest*  
(Helen Ward)

*Traction Man*  
(Mini Grey)

*Three Little Pigs*  
(Lesley Sims)

*The Pebble in My Pocket*  
(Meredith Hooper)

*Stone Girl, Bone Girl*  
(Laurence Anholt)

*The Street Beneath My Feet*  
(Charlotte Guillain & Yuval  
Zommer)

*Charlie and the Chocolate  
Factory*  
(Roald Dahl)

*Once Upon a Raindrop: The  
Story of Water*  
(James Carter)

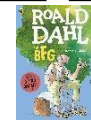
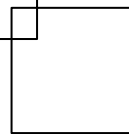
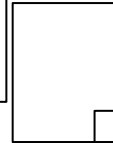
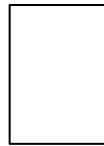
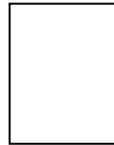
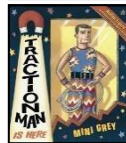
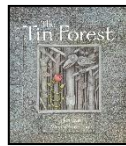
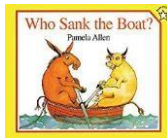
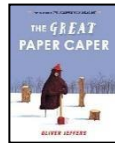
*Sticks*  
(Diane Alber)

*Itch*  
(Simon Mayo)

*Kensuke's Kingdom*  
(Michael Morpurgo)

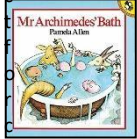
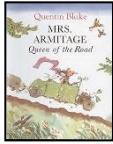
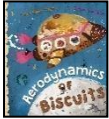
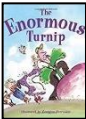
*The BFG*  
(Roald Dahl)

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| THR<br>ESH<br>OL<br>D<br>CO<br>NC<br>EPT<br>:<br>UND<br>ERST<br>ANDI<br>NG<br>THE<br>PHYS<br>ICAL<br>WOR<br>LD | <div>PHYSICS</div> <div>F</div> <div>ORCES</div> <div>Knowledge</div> |  |  | <div>Forces and Magnets</div> <div>Compare how things move on different surfaces.</div> <div>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</div> <div>Observe how magnets attract or repel each other and attract some materials and not others.</div> <div>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</div> <div>Describe magnets as having two poles.</div> <div>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</div> |  | <div>Forces</div> <div>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</div> <div>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</div> <div>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</div> <div>Possible AC Passport Link:<br/><a href="#">Fly a kite.</a></div> <div>Suggested scientists:<br/><b>Galileo Galilei</b><br/>(Gravity and Acceleration)<br/><b>Isaac Newton</b><br/>(Gravitation)<br/><b>Archimedes of Syracuse</b><br/>(Levers)</div> |  |
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| <div>FIC<br/>VOCA<br/>BULA<br/>RY<br/>FORCES</div> |  |  | <div>C<br/>o<br/>m<br/>p<br/>a<br/>r<br/>e<br/>S<br/>u<br/>r<br/>f<br/>a<br/>c<br/>e<br/>F<br/>o<br/>r<br/>c<br/>e<br/>s</div>                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                          | <div>c<br/>e<br/>M<br/>a<br/>g<br/>n<br/>e<br/>t<br/>i<br/>c<br/>A<br/>t<br/>t<br/>r<br/>a<br/>c<br/>t<br/>i<br/>o<br/>n<br/>R<br/>e<br/>p<br/>e<br/>l<br/>l</div>                                                             |
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Force Gravity  
Air resistance Water resistance Friction  
Mechanism Simple machine Levers  
Pulleys Gears Smaller Greater  
Effects

***The Enormous Turnip***  
*(Katie Daynes)*

***Leonardo's Dream***  
*(Hans de Beer)*

***The Aerodynamics of Biscuits***  
*(Clare Helen Welsh)*

|                                                                                                                  |                                                 |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| T<br>H<br>R<br>E<br>S<br>H<br>O<br>L<br>D<br>C<br>O<br>N<br>C<br>E<br>P<br>T:<br>U<br>N<br>D<br>E<br>R<br>S<br>T | <b>PHYSICS</b><br><br><b>LIGHT</b><br>Knowledge |  |  | <b>Light</b><br>Recognise that they need light in order to see things and that dark is the absence of light.<br><br>Notice that light is reflected from surfaces.<br><br>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.<br><br>Recognise that shadows are formed when the light from a light source is blocked by a solid object.<br><br>Find patterns in the way that the size of shadows change. |  |  | <b>Light</b><br>Recognise that light appears to travel in straight lines.<br><br>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.<br><br>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.<br><br>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects cast by them.<br><br><b>Suggested scientists:</b><br><b>Thomas Young</b><br>(Wave Theory of Light)<br><br><b>Ibn al-Haytham (Alhazen)</b><br>(Light and our Eyes) |
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| <div>SUBJECT<br/>SPECIFIC<br/>VOCABU<br/>LARY<br/>LIGHT</div> |  |  | <div>Light<br/>Dark<br/>Surfaces<br/>Sun<br/>Shadows<br/>Light source<br/>Blocked<br/>Change<br/>Mirror<br/>Reflective<br/>Light source<br/>Absence of light<br/>Transparent<br/>Translucent<br/>Opaque<br/>Shiny<br/>Matt<br/>Surface<br/>Dangerous</div> |  |  | <div>Light<br/>Travel<br/>Straight lines<br/>Reflect<br/>Eye<br/>Shadows<br/>Light source<br/>Light rays<br/>Reflection<br/>Periscope<br/>Shadow puppets<br/>Coloured filters</div> |
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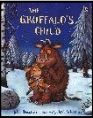
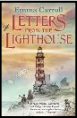
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Letters from the Lighthouse  
(Emma Carroll)

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The Gruffalo's Child  
(Julia Donaldson)

The King Who Banned the Dark  
(Emily Haworth-Booth)



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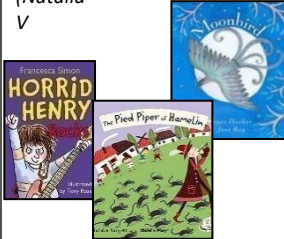
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Circuit Complete circuit Circuit diagram Circuit symbol Brightness  
Lamp Volume Buzzer Voltage Cells Batteries Switch Voltage  
Component Variation Loudness Diagram Systematic Safety Changing

**Good Night Mr Tom**  
(Michelle Magorian)

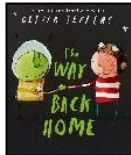
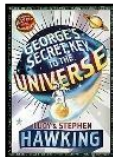
**Horrible Science: Shocking Electricity**  
(Nick Arnold and Tony De Saulles)

|                                                                                                                               |                                  |   |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
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| <div></div> <div>D</div> <div>CONCEPT:</div> | UNDERSTANDING THE PHYSICAL WORLD | D |  |  | <div>Identify how sounds are made, associating some of them with something vibrating.</div> <div>Recognise that vibrations from sounds travel through a medium to the ear.</div> <div>Find patterns between the pitch of a sound and features of the object that produced it.</div> <div>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</div> <div>Recognise that sounds get fainter as the distance from the sound source increases.</div> |  |  |
| SPECIFIC VOCABULARY SOUND                                                                                                     |                                  |   |  |  | <div>Vibrate</div> <div>Ear</div> <div>Pitch</div> <div>Sound</div> <div>Travel</div> <div>Volume</div> <div>Pattern</div> <div>Strength</div> <div>Faint</div> <div>Source</div> <div>Musical instruments</div> <div>Insulation</div>                                                                                                                                                                                                                                                        |  |  |
| LINKED TEXTS (READING ACROSS THE                                                                                              |                                  |   |  |  | <div><div><div>Horrid Henry Rocks</div><div>(Francesca Simon)</div></div><div><div>Moonbird</div><div>(Joyce Dunbar)</div></div><div><div>The Pied Piper of Hamelin</div><div>(Natalia V</div></div></div> <div></div>                                                                                                                                                                                   |  |  |



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| UN<br>DE<br>RS<br>TA<br>ND<br>IN | <b>PHYSICS</b><br><b>EARTH<br/>AND<br/>SPACE</b><br>Knowle<br>dge |  |  |  |  | <b>Earth and Space</b><br>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.<br><br>Describe the movement of the Moon relative to the Earth.<br><br>Describe the Sun, Earth and Moon as approximately spherical bodies.<br><br>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.<br><br><b>Suggested scientists:</b><br><b>Claudius Ptolemy and Nicolaus Copernicus</b><br>(Heliocentric vs Geocentric Universe)<br><br><b>Neil Armstrong</b><br>(First man on the Moon)<br><br><b>Helen Sharman</b><br>(First British astronaut)<br><br><b>Tim Peake</b><br>(First British ESA astronaut) |  |
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| SPECI | FIC<br>VOCA<br>BULA<br>RY<br>EARTH<br>H |  |  |  |  | Solar system<br>Movement<br>Earth<br>Planets<br>Sun<br>Star<br>Moon<br>Spherical<br>Rotation<br>Day<br>Night<br>Mercury<br>Venus<br>Earth<br>Mars<br>Jupiter<br>Saturn<br>Uranus<br>Neptune<br>moons<br>Celestial body<br>Axis<br>Orbit<br>Safety<br>Astronomical clocks<br>Sundials<br>Calibration                                                                                                                                                                                                                        |  |
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| LINKE | D<br>TEXT<br>S<br>(READING<br>ACRO      |  |  |  |  | <p><b>The Skies Above My Eyes</b><br/>(Charlotte Guillain &amp; Yuval Zommer)</p> <p><b>George's Secret Key to the Universe</b><br/>(Lucy and Stephen Hawking with Christophe Galfard)</p> <p><b>The Way Back Home</b><br/>(Oliver Jeffers)</p> <div></div> |  |

|  |  |                    |                                                                                                                                                       |                                                                                                                                                                      |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |
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|  |  | QUESTIONING        | With help and encouragement I ask simple questions that begin with why, what if, how or when.                                                         | I ask simple questions and recognise these questions can be answered in different ways.                                                                              | I can ask questions and I recognise that there are different types of enquiry                                                                                                                                                                                                        | I ask relevant questions and use different types of scientific enquiries to answer them.                                                                                                                                                                                                                                    | I ask relevant questions (containing scientific knowledge and understanding) and with help I recognise which type of enquiry is best to answer a question.                                                                                                                                                                                                                          | I ask relevant questions (containing scientific knowledge and understanding).                                                                                                                                                                                                                                                                                                                                          |
|  |  | INVESTIGATING      | I make suggestions about how to do things when we plan a simple test.<br>With help, I use simple equipment and non-standard units to find things out. | I decide with help, what to find out, observe or measure.                                                                                                            | I can set up a simple practical enquiry and I am beginning to understand how to make a test fair.                                                                                                                                                                                    | I can set up simple practical enquiries, comparative or fair tests.                                                                                                                                                                                                                                                         | I use a range of equipment independently.                                                                                                                                                                                                                                                                                                                                           | I recognise which type of enquiry is best to answer a question.<br>I can plan different types of science enquiries to answer questions. I recognise and control variables where necessary.                                                                                                                                                                                                                             |
|  |  |                    | I observe using my senses                                                                                                                             | I observe closely, using simple equipment and non-standard units.<br><br>I can identify and classify.<br><br>I can perform a simple test.                            | I make suggestions about what observations and measurements to make and what equipment I need.<br><br>I am beginning to make systematic and careful observations.<br><br>I sometimes use standard units.<br><br>With help I can use information sources provided to find things out. | I decide what observations and measurements to make and what equipment to use.<br><br>I use a range of equipment (including thermometers and dataloggers).<br><br>I make systematic and careful observations and take accurate measurements using standard units.<br>I use information sources provided to find things out. | I decide what observations and measurements to make (controlling variables with help where necessary) and what equipment to use to make my measurements and observations.<br><br>The series of observations and measurements I take are adequate for the task.<br><br>I use information sources provided to find things out.<br><br>I identify possible risks to myself and others. | I decide what observations and measurements to make and what equipment to use (giving reasons) to make my measurements and observations.<br><br>I take measurements, using a range of scientific equipment with increasing accuracy and precision.<br><br>I take repeat readings when appropriate.<br><br>I use relevant information sources to find things out<br><br>I identify possible risks to myself and others. |
|  |  | RECORDING FINDINGS | With help, I can gather and record data to help me answer my questions.                                                                               | I gather data and record data to help me answer my questions.<br><br>I record what I have found out using e.g. words or pictures, tables or simple prepared formats. | I gather data and using a pre-prepared table I can record data.<br><br>I record my findings using a drawing and/or words.<br><br>With help, I can present my data.                                                                                                                   | I gather, record and classify data in a variety of ways to help me answer my questions.<br><br>I record my findings using simple scientific language, tables, drawings and labelled diagrams.<br><br>I present my data in a variety of ways using e.g. Venn diagrams, bar charts, simple scatter graphs and keys.           | I gather and record non-complex results (data and observations) using e.g. tables and scientific diagrams.<br><br>I present the results (data and observations) in a range of formats e.g. bar and line graphs, simple scatter graphs, keys and frequency charts.                                                                                                                   | I record data and results of increasing complexity using e.g. scientific diagrams and labels and tables<br><br>I choose a method to suit the results, e.g. a two column table<br><br>I present the data and results in suitable formats using e.g. line graphs, bar graphs, scatter graphs and classification keys.                                                                                                    |

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| <p>WORKING<br/>SCIENTIFICALLY<br/>VOCABULARY</p>                                                                                                                                                                                             |                                                               |                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                              |                                                               |                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                              | FURTHER INVESTIGATIONS                                        | CONCLUSIONS AND REFLECTIONS                                                                                                                                                                                                                                                                                                                              |
| <p>Identify Name Questions<br/>Suggestions Test<br/>Equipment Observe<br/>Identify Compare Enquiry<br/>Observing Patterns,<br/>Groups classifying<br/>Comparative<br/>Secondary source</p>                                                   |                                                               | <p>I talk about what happened and/or what I saw</p> <p>I talk about what I did.</p>                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                              |                                                               |                                                                                                                                                                                                                                                                                                                                                          |
| <p>Observe Describe Group<br/>Record Data Contrast<br/>Diagram Chart Map</p>                                                                                                                                                                 |                                                               | <p>I use my observations and ideas to suggest answers to my questions.</p> <p>I talk about how I found out what I found out.</p>                                                                                                                                                                                                                         |
| <p>Research Enquiry Measurement<br/>Systematic<br/>Data – gather, record, present<br/>Results Table</p>                                                                                                                                      | <p>I have ideas about what else I would like to find out.</p> | <p>I can use my results when I talk about what happened.</p> <p>I can talk about what went wrong!</p>                                                                                                                                                                                                                                                    |
| <p>Predictions Evidence Improve<br/>Conclusion Comparative Venn diagram Bar chart Scatter graph<br/>Interpret Differences<br/>Similarities Changes<br/>Thermometers Dataloggers<br/>Systematic Standard units<br/>Further investigations</p> | <p>I suggest further questions to investigate.</p>            | <p>I use my results to draw simple conclusions and I make predictions for new values.</p> <p>I communicate what I have found out using straightforward scientific ideas and I report my findings using oral and written explanations and displays.</p> <p>I suggest improvements to the way I carried out the enquiry.</p>                               |
| <p>Plan Variables<br/>Repeat readings report Scientific diagrams, Labels,<br/>Classification keys, Line graphs<br/>Further comparative and fair test<br/>Report and present – conclusions<br/>Improvements<br/>Risks<br/>Non-complex</p>     | <p>I can set up further questions to investigate.</p>         | <p>I draw conclusions from my data and observations.</p> <p>I begin to use basic scientific evidence to support or refute the ideas or arguments for my conclusion.</p> <p>I look at my results and decide if any observations or measurements are unsuitable.</p> <p>I use what I have found out to suggest improvements to my work giving reasons.</p> |

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| <p>Causal relationship Explanations</p> <p>Degree of trust,</p> <p>Evidence - support, refute ideas or arguments Accuracy</p> <p>Precision Complex</p> <p>Systematic Quantitative</p> | <p>I use my test results to make predictions to set up further enquiries e.g. comparative and fair tests and suggest how my working methods could be improved, with reasons.</p> | <p>From my data and observations I draw valid conclusions (i.e. consistent with the evidence) including causal relationships.</p> <p>I identify scientific evidence to support or refute the ideas or arguments for my conclusion.</p> <p>I look at my results and decide if any observations or measurements are unsuitable and need to be carried out again.</p> <p>I offer simple explanations for differences in results.</p> |
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