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| Barnston Primary School F2 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Working scientifically | | | | | | |
| Can I explore the natural world?  Can I talk about similarities and differences between the natural world and contrasting environments around us?  Can I draw on my own experiences based on what has been read in class?  ***Challenge***  Can I ask simple questions and recognise that they can be answered in different ways?  Can I perform simple tests? | Can I talk about what they see, touch, smell, hear or taste?  Can I use simple equipment to help make simple  observations?  Challenge  Can I find out by watching, listening, tasting, smelling and touching?  Can I perform a simple test?  Can I tell other people about what I have done?  Challenge  Can I give a simple reason for their answers? | Can I talk about what I can see, touch, smell, hear or taste?  Can I use simple equipment to help make observations?  Challenge  Can I find out by watching, listening, tasting, smelling and touching?  Can I carry out a simple fair test?  Can I explain why it might not be fair to compare two things?  Can I say whether things happened as they expected?  Can I suggest how to find things out?  Can I use prompts to find things out?  Challenge  Can I say whether things happened as they expected and if not why not? | Can I use different ideas and suggest how to find something out?  Can I make and record a prediction before testing?  Can I plan a fair test and explain why it was fair?  Can I set up a simple fair test to make comparisons?  Can I explain why I need to collect information to answer a question?  Challenge  Can I record and present what I have found using scientific language, drawings, labelled diagrams, bar charts and tables? | Can I set up a simple fair test and make comparisons?  Can I plan a fair test and isolate variables, explaining why it was fair and which variables have been isolated?  Can I suggest improvements and make predictions?  Can I decide which information needs to be collected and decide the best way to collect it is?  Can I use my findings to draw a simple conclusion?  Challenge  Can I plan and carry out an investigation by controlling variables fairly and accurately?  Can I use test results to make further predictions and set up further comparative tests? | Can I plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary?  Can I make a prediction with reasons?  Can I use test results to make predictions to set up comparative and fair tests?  Can I present a report of my findings through writing, display and presentation?  Challenge  Can I explore different ways to test an idea, choose the best way and give reasons?  Can I vary one factor whilst keeping the others the same in an experiment?  Can I use information to help make a prediction?  Can I explain, in simple terms, a scientific idea and what evidence supports it? | Can I explore different ways to test an idea, choose the best way, and give reasons?  Can I vary one factor whilst keeping the others the same in an experiment?  Can I explain why?  Can I plan and carry out an investigation by controlling variables fairly and accurately?  Can I make a prediction with reasons?  Can I use information to help make a prediction?  Can I use test results to make further predictions and set up further comparative tests?  Can I explain, in simple terms, a scientific idea and what evidence supports it?  Can I present a report of their findings through writing, display and presentation?  Challenge  Can I choose the best way to answer a question?  Can I use information from different sources to answer a question and plan an investigation?  Can I make a prediction which links with other scientific knowledge?  Can I identify the key factors when planning a fair test?  Can I explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough? |
| Identifying and classifying | | | | | | |
| Can I gather and record data to help answer questions?  ***Challenge***  Can I observe closely, using simple equipment?  Can I Identify and classify things that I have observed?  Can I use my observations and ideas to suggest answers to questions? | Can I identify and classify things I observe?  Can I think of some questions to ask?  Can I answer some scientific questions?  Can I give a simple reason for my answers?  Can I explain what I have found out?  Challenge  Can I talk about similarities and differences?  Can I explain what I have found out using scientific vocabulary? | Can I organise things into groups?  Can I find simple patterns (or associations)?  Can I identify animals and plants by a specific criteria, e.g. lay eggs or not/have feathers or not?  Challenge  Can I suggest more than one way of grouping animals and plants and explain their reasons? | Can I measure using different equipment and units of measure?  Can I record my observations in different ways? Labelled diagrams, charts etc.  Can I describe what they have found using scientific language?  Can I make accurate measurements using standard units?  Challenge  Can I explain my findings in different ways? E.g. display, presentation or writing?  Can I use my findings to draw a simple conclusion?  Can I suggest improvements and predictions for further tests? | Can I take measurements using different equipment and units of measure and record what I have found in a range of ways?  Can I make accurate measurements using standard units?  Can I explain my findings in different ways through display, presentation and writing?  Challenge  Can I record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? | Can I take measurements using a range of scientific equipment with increasing accuracy and precision?  Can I take repeat readings when appropriate?  Can I record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs?  Challenge  Can I decide which units of measurement I need to use?  Can I explain why a measurement needs to be repeated? | Can I explain why I have chosen specific equipment? (including ICT based equipment)  Can I decide which units of measurement I need to use?  Can I explain why a measurement needs to be repeated?  Can I record my measurements in different ways? (including bar charts, tables and line graphs)  Can I take measurements using a range of scientific equipment with increasing accuracy and precision?  Challenge  Can I plan in advance which equipment I will need and use it well?  Can I make precise measurements?  Can I collect information in different ways?  Can I record measurements and observations systematically? Can I explain qualitative and quantitative data? |
| Recording findings | | | | | | |
| Can I make observations/draw pictures of animals and plants?  Can I label my observational drawings?  Can I record my findings using some non-standard measures? | Can I show my work using pictures, labels and captions?  Can I record my findings using standard units?  Can I put some information in a chart or table?  Challenge  Can I use ICT to represent my work?  Can I make accurate measurements? | Can I use text, diagrams, pictures, charts, tables to record my observations?  Can I measure using simple equipment?  Challenge  Can I use information from books and online information to find things out? | Can I explain what I have found out?  Can I use measurements to say whether it helps to answer the question?  Can I use a range of equipment (including data logger) in a simple test?  Challenge  Can I suggest how to improve my work if did it again? | Can I find any patterns in my evidence or measurements?  Can I make a prediction based on something I have found out?  Can I evaluate what I have found using scientific language, drawings, labelled diagrams, bar charts and tables?  Can I use straightforward scientific evidence to answer questions or to support my findings?  Can I identify differences, similarities or changes related to simple scientific ideas or processes?  Challenge  Can I report findings from investigations through written explanations and conclusions?  Can I use a graph or diagram to answer scientific questions? | Can I report and present findings from enquiries through written explanations and conclusions?  Can I use a graph to answer scientific questions?  Challenge  Can I find a pattern from the data and explain what it shows?  Can I link what I have found out to other science?  Can I suggest how to improve my work and say why? | Can I find a pattern from my data and explain what it shows?  Can I use a graph to answer scientific questions?  Can I link what I have found out to other science?  Can I suggest how to improve my work and say why?  Can I record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?  Can I report findings from investigations through written explanations and conclusions?  Can I report findings from investigations through written explanations and conclusions?  Can I identify scientific evidence that has been used to support to refute ideas or arguments?  Can I report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations?  Challenge  Can I draw conclusions from my work?  Can I link my conclusions to other scientific knowledge?  Can I explain how I could improve ways of working? |



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| F2 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Plants | | | | | | |
| Can I identify features of plants and begin to name some parts? Flower, stem, leaf, roots.  Can I talk about changes as a seed grows?  Can I talk about what a plant needs to grow?  Can I care for plants? | Can I name the petals, stem, leaf, bulb, flower, seed, stem and root of a plant?  Can I identify and name a range of common plants and trees?  Can I recognise deciduous and evergreen trees?  Can I name the trunk, branches and root of a tree? Can I describe the parts of a plant (roots, stem, leaves, and flowers)?  Can I name the main parts of a flowering plant? | Can I describe what plants need to survive?  Can I observe and describe how seeds and bulbs grow into mature plants?  Can I find out and describe how plants need water, light and a suitable temperature to grow and stay healthy?  Challenge  Can I describe what plants need to survive and link it to where they are found?  Can I explain that plants grow and reproduce in different ways? | Can I identify and describe the functions of different parts of flowering plants? (Roots, stem/trunk, leaves and flowers)  Can I explore the requirement of plants for life and growth?  (air, light, water, nutrients from soil, and room to grow)  Can I explain how they vary from plant to plant?  Can I investigate the way in which water is transported within plants?  Can I explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?  Challenge  Can I classify a range of common plants?  (environment found, size,  climate required) |  |  |  |
| All living things | | | | | | |
|  | Can I match certain living things to the habitats they are found in?  Can I explain the differences between living and non-living things?  Can I describe some of the life processes common to plants and animals, including humans?  Can I decide whether something is living, dead or non-living?  Can I describe how a habitat provides for the basic needs of things living there?  Can I describe a range of different habitats?  Can I describe how plants and animals are suited to their habitat?  Challenge  Can I name some characteristics of an animal that help it to live in a particular habitat?  Can I describe what animals need to survive and link this to their habitats? |  | Can I recognise that living things can be grouped in a variety of ways?  Can I explore and use a classification key to group, identify and name a variety of living things?  (plants, vertebrates, invertebrates)  Can I compare the classification of common plants and animals to living things found in other places?  (under the sea, prehistoric)  Can I recognise that environments can change and this can sometimes pose a danger to living things?  Challenge  Can I give reasons for how I have classified animals and plants, using their characteristics and how they are suited to their environment?  Can I explore the work of pioneers in classification? (e.g. Carl Linnaeus)  Can I name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore) |  | Can I describe the differences in the life cycles of a mammal, amphibians, insects and a bird?  Can I describe the life cycles of common plants?  Can I explore the work of well-known naturalists and animal behaviourists?  (Jane Goodall) | Can I 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 based on specific characteristics?  Challenge  Can I explain why classification is important?  Can I readily group animals into reptiles, fish, amphibians, birds and mammals?  Can I sub divide original groupings and explain their divisions?  Can I group animals into vertebrates and invertebrates?  Can I find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification? |
| Animals including Humans | | | | | | |
| Can I sort and identify and sort different animal  Can I identify and describe parts of an animal?  Can I explain the different features? | Can I point out some of the differences between different animals?  Can I sort photographs of living things and non-living things?  Can I identify and name a variety of common animals? (birds, fish, amphibians, reptiles, mammals, invertebrates)  Can I describe how an animal is suited to its environment?  Can I identify and name a variety of common animals that are carnivores, herbivores and omnivores?  Can I name the parts of the human body that they can see?  Can I draw & label basic parts of the human body?  Can I identify the main parts of the human body and link them to their senses?  Can I name the parts of an animal’s body?  Can I name a range of domestic animals?  Can I classify animals by what they eat? (carnivore, herbivore, omnivore)  Can I compare the bodies of different animals?  Challenge  Can I begin to classify animals according to a number of given criteria?  Can I point out differences between living things and non- living things?  Can I name some parts of the human body that cannot be seen?  Can I say why certain animals have certain characteristics?  Can I name a range of wild animals? | Can I describe what animals need to survive?  Can I explain that animals grow and reproduce?  Can I explain why animals have offspring which grow into adults?  Can I describe the life cycle of some living things?  (e.g. egg, chick, chicken)  Can I explain the basic needs of animals, including humans for survival? (water, food, air)  Can I describe why exercise, balanced diet and hygiene are important for humans?  Challenge  Can I explain that animals reproduce in different ways? | Can I explain the importance of a nutritionally balanced diet?  Can I describe how nutrients, water and oxygen are transported within animals and humans?  Can I identify that animals, including humans, cannot make their own food: they get nutrition from what they eat?  Can I describe and explain the skeletal system of a human?  Can I describe and explain the muscular system of a human?  Challenge  Can I explain how the muscular and skeletal systems work together to create movement?  Can I classify living things and non-living things by a number of characteristics that I have thought of?  Can I explain how people, weather and the environment can affect living things?  Can I explain how certain living things depend on one another to survive? | Can I identify and name the  basic parts of the digestive system in humans?  Can I describe the simple functions of the basic parts of the digestive system in humans?  Can I identify the simple function of different types of teeth in humans?  Can I compare the teeth of herbivores and carnivores?  Can I explain what a simple food chain shows?  Can I construct and interpret a variety of food chains, identifying producers, predators and prey?  Challenge  Can I classify living things and non-living things by a number of characteristics that I have thought of?  Can I explain how people, weather and the environment can affect living things?  Can I explain how certain living things depend on one another to survive? | Can I describe the changes as humans develop to old age?  Can I understand that all living things have lifecycles?  Challenge  Can I create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies?  Can I draw a timeline to indicate stages in the growth and development of humans? | Can I identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood?  Can I recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? Can I describe the ways in which nutrients and water are transported within animals, including humans?  Challenge  Can I make a diagram of the human body and explain how different parts work and depend on one another?  Can I name the major organs in the human body?  Can I locate the major human organs? |
| Materials | | | | | | |
| Can I explore and talk about materials with similar or different properties?  Can I sort collections of materials? | Can I distinguish between an object and the material from which it is made?  Can I describe materials using their senses?  Can I describe materials using their senses, using specific scientific words?  Can I explain what material objects are made from?  Can I explain why a material might be useful for a specific job?  Can I name some different everyday materials? e.g. wood, plastic, metal, water and rock Can I sort materials into groups by a given criteria?  Can I explain how solid shapes can be changed by squashing, bending, twisting and stretching?  Challenge  Can I describe things that are similar and different between materials?  Can I explain what happens to certain materials when they are heated, e.g. bread, ice, chocolate?  Can I explain what happens to certain materials when they are cooled, e.g. jelly, heated chocolate? | Can I describe the simple physical properties of a variety of everyday materials?  Can I compare and group together a variety of materials based on their simple physical properties?  Can I explore how the shapes of solid objects can be changed?  (squashing, bending, twisting, stretching)  Can I say which materials are natural and which are man-made?  Can I find out about people who developed useful new materials? (Charles Macintosh and John McAdam)  Can I identify and compare the suitability of a variety of everyday materials?  (wood, metal, plastic, glass, brick, rock, paper, cardboard)  Can I explain how they are used?  Can I explain how things move on different surfaces?  Challenge  Can I explain how materials are changed by heating and cooling?  Can I tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted?  Can I describe the properties of different materials using words like, transparent or opaque, flexible, etc.? |  |  | Can I compare and group together everyday materials on the basis of their properties including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets?  Can I explain how some materials dissolve in liquid to form a solution?  Can I describe how to recover a substance from a solution?  Can I use my knowledge of solids, liquids and gases to decide how mixtures might be separate including through filtering, sieving, evaporating?  Can I give reasons, based on evidence for comparative and fair tests for the particular uses everyday materials, including metals, wood and plastic?  Can I describe changes using scientific words? (evaporation, condensation)  Can I demonstrate that dissolving, mixing and changes of state are reversible changes?  Can I explain that some changes result in the formation of new materials and that this kind of change us not usually reversible, including changes associated with burning and the action of acid bicarbonate of soda?  Can I use the terms ‘reversible’ and ‘irreversible’?  Challenges  Can I describe methods for separating mixtures? (filtration, distillation)  Can I work out which materials are most effective for keeping us warm or for keeping something cold?  Can I use my knowledge of materials to suggest ways to classify? (solids, liquids, gases) |  |
| States of Matter | | | | | | |
| Can I understand some important processes and changes in the natural world, including changing states of matter?  Can I talk about the differences between the material and changes?  Can I describe the effect of heating/cooling ingredients? |  |  |  | Can I compare and group materials together, according to whether they are solids, liquids or gases?  Can I explain what happens to materials when they are heated or cooled?  Can I measure or research the temperature at which different materials change state in degrees Celsius?  Can I use measurements to explain changes to the state of water?  Can I identify the part that evaporation and condensation has in the water cycle?  Can I associate the rate of evaporation with temperature?  Challenge  Can I group and classify a variety of materials according to the impact of temperature on them?  Can I explain what happens over time to materials such as puddles on the playground or washing hanging on a line?  Can I relate temperature to change of state of materials? |  |  |
| Rocks | | | | | | |
|  |  |  | Can I compare and group together different rocks on the basis of their appearance and simple physical properties?  Can I describe and explain how different rocks can be useful to us?  Can I describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed?  Can I describe in simple terms how fossils are formed when things that have lived are trapped within rock?  Can I recognise that soils are made from rocks and organic matter?  **Challenge**  Can I classify igneous and sedimentary rocks?  Can I begin to relate the properties of rocks with their uses? |  |  |  |
| Forces and Magnets | | | | | | |
| Can I explore objects around the classroom that are magnetic/non-magnetic? |  |  | Can I compare how things move on different surfaces?  Can I observe that magnetic forces can be transmitted without direct contact?  Can I observe how some magnets attract or repel each other?  Can I classify which materials are attracted to magnets and which are not?  Can I notice that some forces need contact between two objects, but magnetic forces can act at a distance?  Can I compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet?  Can I identify some magnetic materials?  Can I describe magnets have having two poles?  (North and South)  Can I predict whether two magnets will attract or repel each other depending on which poles are facing?  Challenge  Can I investigate the strengths of different magnets and find fair ways to compare them? |  | Can I explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object?  Can I identify the effects of air resistance, water resistance and friction that act between moving surfaces?  Can I recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?  Challenge  Can I describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction)  Can I design very effective parachutes?  Can I work out how water can cause resistance to floating objects? |  |
| Light | | | | | | |
|  |  |  | Can I recognise that they need light in order to see things?  Can I recognise that dark is the absence of light?  Can I notice that light is reflected from surfaces?  Can I recognise that light from the sun can be dangerous and that there are ways to protect their eyes?  Can I recognise that shadows are formed when the light from a light source is blocked by a solid object?  Can I find patterns in the way that the size of shadows change?  Challenge  Can I explain why lights need to be bright or dimmer according to need?  Can I explain the difference between transparent, translucent and opaque?  Can I explain why lights need to be bright or dimmer according to need?  Can I make a bulb go on and off? Can I say what happens to the electricity when more batteries are added?  Can I explain why their shadow changes when the light source is moved closer or further from the object? |  |  | Can I recognise that light appears to travel in straight lines?  Can I 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?  Can I 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?  Can I use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them? |
| Electricity | | | | | | |
|  |  |  | Can I identify common appliances that run on electricity?  Can I construct a simple series electric circuit?  Can I identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers?  Can I identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery?  Can I recognise that a switch opens and closes a circuit?  Can I associate a switch opening with whether or not a lamp lights in a simple series circuit?  Can I recognise some common conductors and insulators?  Can I associate metals with being good conductors?  Challenge  Can I explain how a bulb might get lighter?  Can I recognise if all metals are conductors of electricity?  Can I work out which metals can be used to connect across a gap in a circuit?  Can I explain why cautions are necessary for working safely with electricity? |  |  | Can I identify and name the basic parts of a simple electric circuit?  (Cells, wires, bulbs, switches, buzzers)  Can I compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches?  Can I use recognised symbols when representing a simple circuit in a diagram?  Challenge  Can I explain the effect of changing the voltage of a battery? |
| Sound | | | | | | |
|  |  |  |  | Can I describe a range of sounds and explain how they are made?  Can I associate some sounds with something vibrating?  Can I compare sources of sound and explain how the sounds differ?  Can I explain how to change a sound louder/softer)?  Can I recognise how vibrations from sound travel through a medium to an ear?  Can I find patterns between the pitch of a sound and features of the object that produce it?  Can I find patterns between the volume of the sound and the strength of the vibrations that produced it?  Can I recognise that sounds get fainter as the distance from the sound source increases?  Can I explain how you could change the pitch of a sound?  Can I investigate how different materials can affect the pitch and volume of sounds?  Challenge  Can I explain why sound gets fainter or louder according to the distance?  Can I explain how pitch and volume can be changed in a variety of ways?  Can I work out which materials give the best insulation for sound? |  |  |
| Earth and Space | | | | | | |
|  |  |  |  |  | Can I identify and explain the movement of the Earth and other planets relative to the sun in the solar system?  Can I explain how seasons and the associated weather is created?  Can I describe and explain the movement of the Moon relative to the Earth?  Can I describe the sun, earth and moon as approximately spherical bodies?  Can I use the idea of the earth’s rotation to explain day and night and the apparent movement of the sun across the sky?  Challenge  Can I compare the time of day at different places on the earth? Can I create shadow clocks? |  |
| Seasonal Change | | | | | | |
| Can I understand the effect of changing seasons in the natural world?  Can I describe/talk about the changes in the different seasons? | Can I observe changes across the four seasons?  Can they name the four seasons in order?  Can I observe and describe weather associated with the seasons?  Can I observe and describe how day length varies?  Challenge  Can I observe features in the environment and explain that these are related to a specific season?  Can I observe and talk about changes in the weather?  Can I talk about weather variation in different parts of the world? | Can I observe and talk about changes in the weather?  Can I talk about weather variation in different parts of the world? |  |  |  |  |
| Evolution and Inheritance | | | | | | |
|  |  |  |  |  |  | Can I recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago?  Can I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents?  Can I give reasons why offspring are not identical to each other or to their parents? Can I explain the process of evolution and describe the evidence for this?  Can I identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution?  Challenge  Can I talk about the work of Charles Darwin, Mary Anning and Alfred Wallace?  Can I explain how some living things adapt to survive in extreme conditions?  Can I analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet?  Can I begin to understand what is meant by DNA? |
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