

Working Scientifically Planning and Formative Assessment Tool | Primary Science



	PLANNING	OBTAINING EVIDENCE	ANALYSING EVIDENCE	EVALUATING	IMPLICATIONS	COLLABORATION	COMMUNICATION	SCIENTIFIC UNDERSTANDING			
	What questions do I want to answer? How could I answer it? What do I predict will happen?	How will I plan to answer the question or test my hypothesis?	How will I make valid observations?	How do I make sure my investigation is safe?	How will I record and process my observations?	What does my evidence mean?	How confident am I about my results? How could I improve my investigation?	What are the implications of scientific developments?	How and why do scientists collaborate?	How will I communicate my findings?	
KS 3 Expected	<p>I can use sources of information and my knowledge and understanding of science to ask question and develop a line of enquiry. (5/6)</p> <p>I can use a range of scientific knowledge and understand to make relevant predictions. (5/6)</p>	<p>I can justify my data collection methods. (6)</p> <p>I can identify the significant factors which have to be controlled in a fair test and identify independent and dependent variables. (6)</p>	<p>I can make choices about the resolution of the equipment I use for the change I am measuring. (6)</p>	<p>I can independently identify risks to myself and others and act on them to learn safely. (6)</p>	<p>I can choose forms to communicate qualitative and quantitative data, that is appropriate for the data and purpose of the communication, including scatter graphs to show correlation, between two data sets (6)</p> <p>I consistently record measurements using SI units and IUPAC chemical nomenclature. (5/6)</p>	<p>I can select and manipulate numerical data in order to draw conclusions. (6)</p> <p>I can explain my conclusions using more abstract scientific knowledge and understanding. (6)</p>	<p>I can comment on the repeatability, reproducibility and how representative my results are for my methods and suggest possible improvements. (6)</p> <p>I can identify strengths and weaknesses in the quality of data or information indicating possible sources of random and systematic error or bias (e.g. in information sources) (5/6)</p>	<p>I can identify ethical, moral economic issues linked with scientific developments (5)</p> <p>I can explain everyday uses and technological applications of science and their benefits. (5)</p>	<p>I can explain how new scientific evidence is published, tested and reproduced by the scientific community and how this may lead to changes in scientific ideas.(6)</p>	<ul style="list-style-type: none"> Apply and use scientific ideas and models to explain Represent using quantitative models Describe and compare impact and effect of scientific processes Explain complex, multistage processes using scientific ideas Describe similarities and differences using scientific models Describe patterns using abstract scientific ideas Apply / use scientific ideas to describe Describe more complex processes Compare process and systems Apply scientific ideas to identify changes Use more complex scientific techniques Describe impact of scientific processes and ideas on society 	
Upper Key Stage 2	<p>I can use more abstract scientific knowledge and understanding to explain my prediction. (5)</p> <p>I can ask scientific questions and decide the type of enquiry needed to answer it. (5)</p> <p>I can make predictions and give reasons for this based on my scientific knowledge and understanding. (4/5)</p> <p>I can use test results to make further predictions (4/5)</p>	<p>I can identify the most suitable factors variables/factors to control/ keep the same (5)</p> <p>I can select and identify the number and appropriate intervals for measurements / observations (4/5)</p> <p>I can select and suggest values for what I am keeping the same (5)</p> <p>I can select values for what I am changing (4)</p> <p>I can select or suggest values for what I am keeping the same (4/5)</p>	<p>I can decide when to take repeat readings and suggest reasons for differences(5)</p> <p>I can choose equipment with suitable resolution for the measurement I am making (5)</p>	<p>I can identify hazards and the risk to myself and others and make suggestions on what to do to control and reduce the risk to learn more safely (4/5)</p>	<p>I can choose the appropriate graph to present my results (4/5)</p> <p>I can make and use tables with repeat readings (4/5)</p> <p>I can present my data in a variety of ways including line graphs, scatter graphs, models and scientific diagrams (4/5)</p>	<p>I can use a variety of evidence (including secondary sources) to draw conclusions and to develop models (5)</p> <p>I can model more abstract scientific ideas (5)</p> <p>I know that different people may interpret evidence in different ways (5)</p>	<p>I can suggest how to:</p> <ul style="list-style-type: none"> make my results more reliable (5) make my results more reliable (4/5) evaluate how well keys work (4/5) identify variables that are difficult to measure (4/5) make more systematic observations over time (4/5) use better criteria to sort (4) make my measurements more precise (4) <p>I can distinguish between fact and opinion and appreciate the information can be biased (5)</p>	<p>I can identify the social and economic impact of scientific developments on different people (5)</p> <p>I can recognise that different people may have different views on scientific developments depending on their circumstances (5)</p>	<p>I can give examples of how sharing and discussion of evidence leads to the development of scientific ideas (5)</p> <p>I can give examples of how scientists develop their ideas from evidence (5)</p>	<p>I can present reasoned explanations in a variety of ways appropriate to audience (5)</p> <p>I can use relevant scientific language in discussing, describing and explaining my ideas (4/5)</p>	<p>DESCRIBING RELATIONSHIPS AND SCIENTIFIC IDEAS (becoming more abstract)</p> <p>Describe systems / Scientific ideas</p> <ul style="list-style-type: none"> classification of living things identify and name the main parts of the human circulatory system describe functions of the heart, blood vessels and blood describe how nutrients and water are transported within animals including humans describe changes in living things over time describe how living things produce offspring of the same kind but that these normally vary and are not identical to adults identify how animals and plants adapt to their environment and that adaptation may lead to evolution describe how light travels <p>Use scientific ideas to explain / model</p> <ul style="list-style-type: none"> that light travels in straight lines to explain how we see objects why shadows have the same shape as the objects that cast them give reasons for variations in how electrical components function <p>Patterns and relationship</p> <ul style="list-style-type: none"> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit <p>Recognise impact of ...</p> <ul style="list-style-type: none"> diet exercise and drugs and lifestyle on the way their bodies function.
Upper Key Stage 2	<p>I can sort questions and suggest ways of collecting evidence to answer them (e.g. fair test comparison, sort, classify and identify, observe over time, use secondary data, pattern seeking and applying scientific understanding to invent or design) (3/4)</p>	<p>I can state why fair tests are needed and can vary one factor while keeping the others the same. (3/4)</p>	<p>I can suggest reasons why a sample might not be representative (4/5)</p> <p>I can collect data from different sources (4)</p> <p>I can choose which information sources might be useful (1/2/3/4/5)</p>	<p><i>I can identify hazards and make suggestions on how to reduce the risk so I can learn more safely (4)</i></p>	<p>I can use line graph and scatter graphs (4)</p> <p>I can systematically record my observations using scientific units e.g. kg, s, cm, m, N (4/5)</p>	<p>My conclusions match my evidence and I can use my scientific understanding to explain them (4)</p> <p>I can use evidence to back up or refute my ideas (4)</p> <p>I can develop identification keys (4)</p>	<p>I can suggest how to make measurements more precise, to make a test more fair, to use better criteria to sort,</p>	<p><i>I can explain the consequences of scientific and technological developments (4)</i></p> <p><i>I can identify aspects of scientific ideas in different jobs (4)</i></p>	<p><i>I can say why it is useful to work with others (3)</i></p>	<p><i>I can use scientific language to discuss, describe and communicate my ideas (4)</i></p> <p><i>I can choose what to present and how to present to communicate to different audiences (4)</i></p>	<p>DESCRIBING PROCESSES</p> <p>Compare and group</p> <ul style="list-style-type: none"> everyday materials based on their properties <p>Describe the process/ phenomenon of</p> <ul style="list-style-type: none"> reproduction in some plants and animals. the movement of the Earth, other planets relative to the Sun in the solar system the movement of the moon relative to the Earth of dissolving materials in a liquid recovering a substance from solution <p>Describe the changes</p> <ul style="list-style-type: none"> as humans develop into old age when substances change state, dissolve or react to form new materials <p>Describe differences in processes</p> <ul style="list-style-type: none"> in the life cycles of a mammal, amphibian, an insect and bird. between reversible and irreversible changes <p>Identify the effects of</p> <ul style="list-style-type: none"> air resistance, water resistance and friction some mechanisms on the force needed to move an object <p>Use ideas to explain</p> <ul style="list-style-type: none"> explain day and night and the apparent movement of the Sun across the sky explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. recover substances from solution decide how materials might be separated



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Lower Key Stage 2	I can ask questions that can be investigated scientifically and I can say whether I need a fair test to answer it (3/4)	I can suggest criteria I will use to sort and classify, how I will make observations over time, how to plan a fair test and why it is fair (3/4) I can use my observations to make and test keys (3/4)	I can choose suitable equipment, including electronic equipment to measure with greater precision and care (4)	<i>I can identify hazards and make suggestions on how to reduce the risk so I can learn more safely (4)</i>	I can present my results in a variety of ways including bar charts, labelled diagrams, annotated drawings, branching databases stick graphs and tables (4)	I can model my scientific ideas (4) I can identify patterns and use these to draw my conclusions (3/4) I can use my evidence to make further predictions/ raise questions/ identify (4) I can use evidence to back up my ideas I can give simple explanations for observations / changes (3) I can draw simple conclusions (3)	I can give reasons why my results might be different than others (4) I can identify ways to improve my key (4) I can suggest how to make a test more fair (3/4)	<i>I can explain the consequences of scientific and technological developments (4)</i> <i>I can identify aspects of scientific ideas in different jobs (4)</i>	<i>I can say why it is useful to work with others (3)</i>	<i>I can use scientific language to discuss, describe and communicate my ideas (4)</i> <i>I can choose what to present and how to present to communicate to different audiences (4)</i>	DESCRIBING PATTERNS SCIENTIFIC VOCABULARY (PROCESSES) Name and describe simple functions of <ul style="list-style-type: none"> the basic parts of the digestive system different types of teeth electrical components Describe how <ul style="list-style-type: none"> sounds are made vibrations travel through a medium to the ear Describe changes <ul style="list-style-type: none"> when materials are heated or cooled Group in a variety of ways <ul style="list-style-type: none"> living things solids liquids and gases Use and interpret keys to <ul style="list-style-type: none"> identify and name a variety of living things Construct... <ul style="list-style-type: none"> a variety of food chains simple series electrical circuits Find patterns between / associate ... <ul style="list-style-type: none"> the effects of changes to the environment and living things. the change in state of materials and heating/ cooling the rate of evaporation and temperature how sounds are made and something vibrating pitch of sounds and features of the objects that produced them volume of sound and the strength of vibration that produced it a complete circuit and a lamp lighting up open and closed switch and a lamp lighting/not lighting in a circuit metals and electrical conductivity Generalise <ul style="list-style-type: none"> Sounds get fainter as the distance from the sound increases
Lower Key Stage 2	I can use patterns within and outside the observations/ data I have collected to make further predictions (3) I can give everyday reasons for my predictions (3) I can predict the order of results (3) I can ask questions and with help suggest what I will do to answer questions. (2/3)	I can use secondary sources of information including other people's data (3/4/5)	I can decide what equipment to use and how to make observations (3) I can measure using cm, m, g or kg (3)	<i>I can identify hazards and make suggestions to learn safely (2)</i>	I can choose to present my results including words, pictures, charts lists, bar charts, Venn diagrams, pictograms, simple tables (3)	I can identify patterns including those between two sets of data and use these to draw my conclusions (4) I can give simple explanations for observations / changes (3) I can draw simple conclusions (3)	I can suggest improvements (3) I suggest ways to improve how I find out and use information (3)	I can give ideas of how scientific ideas are used (3)	<i>I can say why it is useful to work with others (3)</i>	I can choose how to present evidence to communicate to different audiences (3)	DESCRIBING & COMPARING (STRUCTURE, FUNCTION, BEHAVIOURS) Identify <ul style="list-style-type: none"> different parts of flowering plants that darkness is the absence of light ways to protect eyes from the sun. Describe structure and function <ul style="list-style-type: none"> of flowers and seeds the skeleton and muscles of magnets Describe the formation of <ul style="list-style-type: none"> seeds fossils soils shadows Compare and group <ul style="list-style-type: none"> different kinds of rocks a variety of everyday materials according to their magnetic properties Compare requirements... <ul style="list-style-type: none"> of plants for growth types and amount of nutrition light to see Compare how <ul style="list-style-type: none"> light is reflected from surfaces things move on different surfaces some forces need contact between two objects and some act at a distance. magnets behave with each other and with different materials. water is transported in plants the way the size of shadows can be changed

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Key Stage 1	<p>I can ask questions and with help suggest what I will do to answer questions. (2/3)</p> <p>I can with help suggest what might make a difference to how something looks, sounds, feels or behaves (2)</p>	<p>I can suggest how to make a comparative test fair (2/3)</p> <p>I can suggest what to observe / when and how to measure (2/3)</p>	<p>I look closely for patterns (2/3)</p> <p>I can use simple equipment to help me make measurements in non-standard units (2)</p>	<p><i>I can identify hazards and make suggestions to learn safely (2)</i></p>	<p>I can present my results in a variety of ways - words, pictures, two column tables, charts or lists including bar charts, Venn diagrams, pictograms, simple tables (2/3)</p>	<p>With help I can use my observations to answer questions - to say whether something made a difference (2/3) or identify links between two sets of results (2/3) e.g. shoe size and height, to identify how things have changed (2)</p>	<p>I can talk about whether the information source was useful (2/3)</p>	<p>I can identify how science may or may not be useful (2/3)</p>	<p>I can work with others to investigate ideas (2)</p>	<p>I can suggest how to communicate my science (2)</p>	<p>DESCRIBING HOW AND COMPARING (BASIC NEEDS AND SUITABILITY)</p> <p>Identify</p> <ul style="list-style-type: none"> that most living things live in habitats that there are different sources of food <p>Compare groups of</p> <ul style="list-style-type: none"> living and non-living things dead things and things that have never been alive <p>Describe how</p> <ul style="list-style-type: none"> different habitats provide the basic needs of different kinds of animals and plants. animals obtain their food from plants and animals using simple food chains plants need water, light and a suitable temperature to grow and stay healthy. living things are suited to their habitat plants and animals depend on each other. seeds and bulbs grow into mature plants humans have offspring and grow into adults. the shapes of objects made of some materials can be changed by squashing, bending, twisting and stretching. the properties of materials make them suitable for different uses. <p>Describe the importance</p> <ul style="list-style-type: none"> water food and air for survival of animals including humans for humans of exercise, eating right amounts of different types of food and hygiene
Key Stage 1	<p>I can make suggestions on how to answer a question (2)</p> <p>I can make a simple prediction. (2)</p> <p>I have an idea what might happen. (1)</p> <p>I can ask simple questions about things I have explored (1)</p> <p>I am curious and interested (1)</p>	<p>I can use secondary sources to find out things (1/2)</p> <p>I can suggest why a test is obviously not fair (2)</p> <p>I can carry out simple comparative tests (1/2)</p> <p>I can carry out simple tests with help (1/2)</p>	<p>I can use simple equipment to help observe, compare and record (2)</p> <p>I can use things to measure (1)</p> <p>I can use my senses to make close observations, to sort, to match (1)</p>	<p>I can identify hazards and do what we suggest to learn safely (2)</p> <p>I can do what we suggest to learn safely (1)</p>	<p>I can complete simple two column tables and record what I observe (1/2)</p>	<p>I can model my ideas (3)</p> <p>I can say whether what happened or a pattern was what I expected (2/3)</p> <p>I can use evidence to answer questions (2)</p> <p>I can use my record to help sort and identify things (2)</p> <p>I can compare (2)</p> <p>With help I can use my observations to answer questions to identify how things have changed (1/2)</p>	<p>I can accept that I could do things differently (2)</p> <p>I can compare my results with others (2)</p> <p>I can say what I found difficult (2)</p>	<p>I can identify people that use science to help us (2)</p> <p>I can identify things and jobs that use science (1/2)</p>	<p>I can share my ideas and listen to the ideas of others (1)</p>	<p>I can use science words to talk about and describe my observations (2)</p>	<p>IDENTIFY AND NAME FROM EXPERIENCES (BASIC STRUCTURE / PROPERTIES AND VARIETY)</p> <p>Identify and name a variety of...</p> <ul style="list-style-type: none"> common wild and garden plants including deciduous and evergreen trees common animals including fish, amphibians, reptiles, birds and mammals, carnivores, herbivores and omnivores. everyday materials <p>Describe, compare</p> <ul style="list-style-type: none"> the basic structure of a variety of common flowering plants including trees the structure of a variety of animals the structure of the human body and say which part is associated with each sense. the simple physical properties of a variety of everyday materials. weather associated with the seasons how day length varies <p>Describe changes...</p> <ul style="list-style-type: none"> across the four seasons
Early Years Foundation Stage	<p>I question why things happen (CLL)</p> <p>I use my senses to explore objects (Ch E L)</p> <p>I use my senses to explore objects (Ch E L)</p>	<p>I experiment with texture (ELG EAD)</p>	<p>I can compare quantities (ELG M)</p> <p>I am confident to choose the resources(including technology) I need (ELG PSED, U of W)</p> <p>I can handle equipment and tools (ELG PD)</p>	<p>I can talk about ways to keep healthy and to learn safely (ELG PD)</p>	<p>I can draw and talk about what I explore, notice</p>	<p>I can talk about changes (ELG U of W)</p> <p>I can identify similarities and differences between myself and others, materials and living things (ELG U of W)</p> <p>I can answer how and what questions (ELG CLL)</p>	<p>I can review how well my approach worked (C of L)</p>		<p>I take turns, I listen to the ideas of others on how to do things (ELG PSED)</p>	<p>I can draw and talk about what I explore and notice</p>	