

Medium Term Plan: Light Cycle B Y3/4			
Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
<ul style="list-style-type: none"> <li>comparative / fair testing.</li> <li>observation over time.</li> <li>pattern seeking.</li> <li>research</li> </ul>	<ul style="list-style-type: none"> <li>Making observations and measuring them</li> <li>Engaging in practical enquiry</li> <li>Answering questions and concluding</li> <li>Communicating findings.</li> </ul>	<ul style="list-style-type: none"> <li>transparent</li> <li>opaque</li> <li>dull</li> <li>shiny</li> <li>prediction</li> <li>sun</li> <li>eye</li> <li>sight</li> </ul>	<ul style="list-style-type: none"> <li>translucent</li> <li>reflection</li> <li>UV light</li> <li>shadow</li> <li>pupil</li> <li>darkness</li> </ul>
Previous Learning End Point Assessment in this concept:		Previous Learning End Point Assessment in working scientifically concepts:	
I can identify which part of the body is associated with each sense.		I can use my experiences of the world to suggest appropriate answers to questions. With help, I can relate these to my evidence e.g. observations I have made, measurements I have taken or information I have gained from secondary sources. I can ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). I can sometimes answer these questions. I can answer questions when my teacher explains it through a scenario.	
End Point Assessment Statements (conceptual knowledge):		End Point Assessment Statements (working scientifically knowledge):	
1. I can recognise that we need light in order to see things and that dark is the absence of light. 2. I can notice that light is reflected from surfaces. 3. I can describe the process of reflection using scientific vocabulary. 4. I can recognise that light from the sun can be dangerous and that there are ways to protect your eyes (e.g. sun-glasses, avoid looking at the sun, sun-cream) 5. I can recognise that shadows are formed when the light (from a light source) is blocked by a solid (opaque) object. 6. I can explore and find patterns in the way that the size of shadows can change. I can predict and explain why these changes occur, using what I already know.		I can identify ways in which I would do it differently if I repeated the enquiry. I can follow my plan to carry out: tests to pattern seek. I can recognise when secondary sources can be used to answer questions that cannot be answered through practical work. I can answer my own and others' questions based on information I have gained from secondary sources. I can follow my plan to carry out: observations and tests to classify; comparative and simple fair tests I can draw conclusions based on my evidence and current subject knowledge.	

		Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6
Learning Question	What do I already know about light?	Do we need light to see?	Do all surfaces reflect light?	What is reflection?	Is the sun dangerous?	Do all objects create shadows?	Can I change the size of a shadow?
Enquiry Type		Observing	Comparative/fair testing	Research	Research	Pattern seeking	Pattern seeking
Conceptual Knowledge	Previous unit assessment end points.	I can recognise that we need light in order to see things and that dark is the absence of light	I can notice that light is reflected from surfaces.	I can describe the process of reflection using scientific vocabulary.	I can recognise that light from the sun can be dangerous and that there are ways to protect your eyes	I can recognise that shadows are formed when the light is blocked by a solid (opaque) object.	I can explore and find patterns in the way that the size of shadows can change. I can predict and explain why these changes occur, using what I already know.
Working Scientifically		I can draw conclusions based on my evidence and current subject knowledge.	I can follow my plan to carry out: observations and tests to classify; comparative and simple fair tests;	I can answer my own and others' questions based on information I have gained from secondary sources.	I can recognise when secondary sources can be used to answer questions that cannot be answered through practical work.	I can follow my plan to carry out: tests to pattern seek.	I can identify ways in which I would do it differently if I repeated the enquiry.
Review/ Revisit		Light source quiz: <a href="https://wordwall.net/resource/2898124/science/light-sources-year-3">https://wordwall.net/resource/2898124/science/light-sources-year-3</a>	Quiz: <a href="https://www.bbc.co.uk/bitesize/topics/zbssgk7/articles/z2s4xfr">https://www.bbc.co.uk/bitesize/topics/zbssgk7/articles/z2s4xfr</a>	Flashback – plants: <a href="https://wordwall.net/resource/30575337/science/plants">https://wordwall.net/resource/30575337/science/plants</a>	Flashback – living things: <a href="https://wordwall.net/resource/3061515/science/animals-including-humans-quiz-year-2">https://wordwall.net/resource/3061515/science/animals-including-humans-quiz-year-2</a> <a href="https://wordwall.net/resource/3062303/science/healthy-living-quiz-year-2">https://wordwall.net/resource/3062303/science/healthy-living-quiz-year-2</a>	Quiz: <a href="https://wordwall.net/resource/3069115/science/the-sun-year-3">https://wordwall.net/resource/3069115/science/the-sun-year-3</a>	Quiz: <a href="https://wordwall.net/resource/43360/science/light-and-shadow-quiz">https://wordwall.net/resource/43360/science/light-and-shadow-quiz</a>
Read		Science The Study Book p 80 - 83	Collins Study Book p 65 'Light Reflects'	Collins Study Book p66 & 67	Collins Study Book p 65 'The Sun'	Collins Study Book p68	Collins Study Book p69



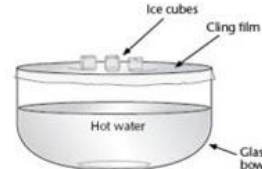
Medium Term Plan: Sound Cycle B Y3/4			
Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
<ul style="list-style-type: none"> <li>comparative / fair testing.</li> <li>observation over time.</li> <li>pattern seeking.</li> <li>identifying, grouping and classifying.</li> </ul>	<ul style="list-style-type: none"> <li>Making observations and measuring them</li> <li>Engaging in practical enquiry</li> <li>Answering questions and concluding</li> <li>Communicating findings.</li> </ul>	Ears Hearing	<ul style="list-style-type: none"> <li>Pitch</li> <li>Volume</li> <li>Sound wave</li> <li>Vibrations</li> </ul>
Previous Learning End Point Assessment in this concept:		Previous Learning End Point Assessment in working scientifically concepts:	
I can identify which part of the body is associated with each sense.		I can record my observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. I can recognise ‘biggest and smallest’, ‘best and worst’ etc. from my data. I can use practical resources provided to gather evidence to answer questions created by myself or my teacher. I can carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. I can ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen).	
End Point Assessment Statements (conceptual knowledge):		End Point Assessment Statements (working scientifically knowledge):	
1. I can identify how sounds are made and associate some with vibrations. 2. I can recognise that vibrations from sounds travel through a medium to the ear. 3. I can explore (and find patterns) between volume and strength of vibrations 4. I can explore how different materials produce different pitch sounds. 5. I can find patterns (similarities and differences) between pitch and features of the object producing the sound. 6. I can recognise that sound gets fainters as the distance from the source increases.		I can record my observation e.g. using photographs, videos, pictures, labelled diagrams or writing. I can communicate my findings to an audience both orally and in writing, using appropriate scientific vocabulary. I can follow my plan to carry out: comparative and simple fair tests; and pattern seeking. I can answer my own and others’ questions based on observations I have made and measurements I have taken Following a scientific experience, I can ask further questions which can be answered by extending the same enquiry. I can interpret the data to generate simple comparative statements based on my evidence.	

	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6
Learning Question	What do I already know about sound?	How are sounds made?	How do we hear?	What makes sounds louder or quieter?	What happens to volume if I move away from a sound source?	What is pitch?	Can I make sounds lower or higher in pitch?
Enquiry Type		Observation over time	Observation over time	Comparative/fair testing	Pattern seeking	Identifying, grouping & classifying	Pattern seeking
Conceptual Knowledge	Previous unit assessment end points	I can identify how sounds are made and associate some with vibrations.	I can recognise that vibrations from sounds travel through a medium to the ear.	I can explore (and find patterns) between volume and strength of vibrations	I can recognise that sound gets fainter as the distance from the source increases.	I can explore how different materials produce different pitch sounds.	I can find patterns between pitch and features of the object producing the sound.
Working Scientifically		I can record my observation e.g. using photographs, videos, pictures, labelled diagrams or writing.	I can communicate my findings to an audience both orally and in writing, using appropriate scientific vocabulary.	I can follow my plan to carry out: comparative and simple fair tests; and pattern seeking.	I can answer my own and others’ questions based on observations I have made and measurements I have taken	Following a scientific experience, I can ask further questions which can be answered by extending the same enquiry.	I can interpret the data to generate simple comparative statements based on my evidence.
Review/ Revisit	Revisit learning from Music & Y1/2 Senses Ears Hearing	Flashback – reading a thermometer <a href="https://wordwall.net/resource/7381875/science/y4-can-you-read-a-thermometer">https://wordwall.net/resource/7381875/science/y4-can-you-read-a-thermometer</a>	Flashback – Light: <a href="https://wordwall.net/resource/3069384/science/light-quiz-year-3">https://wordwall.net/resource/3069384/science/light-quiz-year-3</a>	Flashback – reading scales: <a href="https://wordwall.net/resource/8994298/science/y4-measuring-cylinder">https://wordwall.net/resource/8994298/science/y4-measuring-cylinder</a>	Quiz: <a href="https://wordwall.net/resource/2902066/science/sound-quiz-year-4">https://wordwall.net/resource/2902066/science/sound-quiz-year-4</a>	Vocab match: <a href="https://wordwall.net/resource/12574968/science/sound-vocabulary">https://wordwall.net/resource/12574968/science/sound-vocabulary</a>	Return to the pitch investigation. What ideas did we have for why the instruments produced sounds of different pitch?
Read	Pitch volume	Collins Study Book p 80	How we hear Things - Outstanding Science.	Science The Study Book p 86	Science The Study Book p 87	Collins Study Book p82 & 83	Science The Study Book p88
Teach		<a href="https://www.bbc.co.uk/bitesize/topics/zgffr82">https://www.bbc.co.uk/bitesize/topics/zgffr82</a> Discuss the clip. If we can’t see the vibrations, how can we prove that sounds travel in vibrations? Show the children a drum. Hit it with a stick. How is the sound made? How can we prove the skin is vibrating? Add pompoms and repeat.	<a href="https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zx9hcg6">https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zx9hcg6</a> Discuss the clip. How can we prove that vibrations travel through a medium to the ear?	<a href="https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zqtdpbk">https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zqtdpbk</a> Show the children a variety of instruments and ask them to predict which is the loudest. Demonstrate how they can all make louder and quieter sounds. Why?(depends how hard you hit the drum – stronger vibrations) How could we prove this through a fair test?	Introduce the learning question. In pairs ask the children to predict what will happen. Explain that the children will work in pairs to plan an investigation to prove or disprove their prediction. Remind: Fair test Accurate measurements Recording results.	<a href="https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/z3j3ity">https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/z3j3ity</a> Discuss why it is important to have instruments with differing pitch. What would happen if they all had the same pitch?	Recorders: Ask the childrne to make the recorder produce sounds of different pitch. What did they do? How does this change the way that the sound is produced? (They use their fingers to make a smaller or larger volume of air vibrate). Ask the children to produce a note with two fingers covering the holes and then five. What happens to the pitch? How could we prove this through a fair test?

<b>Practice</b>		Show the children the resources – a container, cling film, pompoms/rice and tuning forks. Explain what tuning forks are and how they are used. In groups children plan an investigation to prove that sound travels in vibrations. Complete investigation	Show the children the resources – string and plastic cups. Ask them to devise an experiment to see if they can use the resources to show that sound vibrations travel through a medium to the ear. Make and use string telephones.	Show the children the equipment. A drum a (small) weight (test before to make sure no damage to the drum!). Ask them to devise an investigation to prove that the stronger the vibrations the louder the volume of the sound produced. (Drop the weight from different heights and observe the volume of the sound produced). Decide how to record results. Carry out investigation and record results	In pairs choose resources and plan a fair test. Decide how to record results. Carry out investigation and record results.	Give each table a set of instruments and explain that they are going to order them from the highest to lowest pitch.	Show the children the resources (glass/metal beakers), water, ruler, beater). Ask them to work in groups of four to plan a fair test. What is the question that they are investigating? What will change? What will stay the same? What results will they record? How will they record their results? Carry out investigation and record results
<b>Apply</b>		Draw and write an explanation of what happened.	Draw and write an explanation of how the sound I produced and reaches the ear.	Analyse the results – did we prove that the stronger the vibration the louder the sound?	Analyse the results – did they prove or disprove their prediction?	Analyse the results. Discuss what makes the instruments produce sounds with a different pitch	Analyse the results. Did they find a pattern in their results? Can they use the pattern to draw a conclusion?
<b>Reflect</b>		Could we use the same method to prove other sound is produced by vibrations?	Concept cartoon	Share results as a class. Were they all the same? What made this investigation difficult? (Measuring volume) How could we improve this if we did it again?	Was their test successful? How could they improve on this if they were to complete the investigation again?	One stray: Move to other tables and look at their order. Is it the same as your tables? Why might we have slightly different results?	Was their test successful? How could they improve on this if they were to complete the investigation again?
<b>End of unit</b>	Design and make a musical instrument that can produce sounds of different volume and pitch						

Medium Term Plan: States of Matter Cycle B Y3/4			
Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
<ul style="list-style-type: none"> <li>comparative / fair testing.</li> <li>observation over time.</li> <li>pattern seeking.</li> <li>identifying, grouping and classifying.</li> </ul>	<ul style="list-style-type: none"> <li>Making observations and measuring them</li> <li>Engaging in practical enquiry</li> <li>Answering questions and concluding</li> <li>Communicating findings.</li> </ul>	<ul style="list-style-type: none"> <li>classify</li> <li>properties</li> <li>flexible</li> <li>stiff</li> <li>tough</li> <li>brittle</li> <li>transparent</li> <li>opaque</li> <li>waterproof</li> <li>dull</li> </ul>	<ul style="list-style-type: none"> <li>Solid</li> <li>Liquid</li> <li>Gas</li> <li>Vapour</li> <li>Evaporation</li> <li>Condensation</li> <li>Water cycle</li> <li>Particles</li> <li>Energy</li> </ul>
Previous Learning End Point Assessment in this concept:		Previous Learning End Point Assessment in working scientifically concepts:	
1. I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. 2. I can explore how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 3. I can describe the simple properties of a variety of everyday materials. 4. I can distinguish between an object and the material from which it is made		1. I can carry out: tests to classify 2. I can use my observations and testing to compare objects, & materials. 3. I can sort and group these things, identifying my own criteria for sorting. 4. I can make careful observations of the things around me to support comparison. 5. I can use practical resources provided to gather evidence to answer questions created by my teacher	
End Point Assessment Statements (conceptual knowledge):		End Point Assessment Statements (working scientifically knowledge):	
1. I can identify whether a material is a solid. liquid or a gas 2. I can compare and group materials together, according to whether they are solids, liquids or gases, giving scientific reasons for my choices. 3. I can 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) 4. I can identify the role of evaporation and condensation in the water cycle 5. I can find a relationship between the rate of evaporation and temperature and suggest how the rate could be altered.		1. I can make systematic and careful observations. 2. I can follow my plan to carry out: observations and tests to classify. 3. I can use a range of equipment for measuring temperature. 4. I can use standard units for my measurements. 5. I can sometimes decide how to record and present evidence. 6. I can record my measurements e.g. using tables, tally charts and bar charts 7. I can draw conclusions based on my evidence and current subject knowledge.	






	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6
Learning Question	What do I know about materials?	What is a gas?	Can I identify different states of matter?	Does chocolate melt at the same temperature?	What is evaporation?	Can I change how quickly water evaporates?	What is condensation?
Enquiry Type		Identifying, grouping and classifying.	Identifying, grouping and classifying.	Comparative / fair testing.	Observation over time.	Pattern seeking.	Comparative / fair testing.
Conceptual Knowledge	Previous unit assessment end points.	I can identify whether a material is a solid. liquid or a gas	I can compare and group materials together, according to whether they are solids, liquids or gases, giving scientific reasons for my choices.	I can 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)	I can identify the role of evaporation in the water cycle	I can find a relationship between the rate of evaporation and temperature and suggest how the rate could be altered.	I can identify the role of condensation in the water cycle
Working Scientifically		I can make systematic and careful observations.	I can follow my plan to carry out: observations and tests to classify.	I can use a range of equipment for measuring temperature. I can use standard units for my measurements.	I can sometimes decide how to record and present evidence.	I can record my measurements e.g. using tables, tally charts and bar charts	I can draw conclusions based on my evidence and current subject knowledge.
Review/ Revisit	Revisit learning from Y1/2  Show the children a selection of materials. Ask them to group them into materials that can be bent, twisted, squashed and stretched.	Flashback - teeth: <a href="https://wordwall.net/resource/25722421/science/types-of-teeth">https://wordwall.net/resource/25722421/science/types-of-teeth</a> <a href="https://wordwall.net/resource/2916595/science/types-of-teeth-year-4">https://wordwall.net/resource/2916595/science/types-of-teeth-year-4</a>	Quiz: <a href="https://www.tinytap.com/activities/gygw/play/solid-liquid-gas-quiz">https://www.tinytap.com/activities/gygw/play/solid-liquid-gas-quiz</a>	Flashback – light: <a href="https://wordwall.net/resource/2898124/science/light-sources-year-3">https://wordwall.net/resource/2898124/science/light-sources-year-3</a> <a href="https://wordwall.net/resource/2898124/science/light-sources-year-3">https://wordwall.net/resource/2898124/science/light-sources-year-3</a>	Flashback – digestive system: <a href="https://wordwall.net/resource/2862736/science/labeling-the-digestive-system-year-4">https://wordwall.net/resource/2862736/science/labeling-the-digestive-system-year-4</a> <a href="https://wordwall.net/resource/11288156/science/digestive-system-quiz">https://wordwall.net/resource/11288156/science/digestive-system-quiz</a>	Flashback – food chains: <a href="https://wordwall.net/resource/2898284/science/food-chain-vocabulary-year-3">https://wordwall.net/resource/2898284/science/food-chain-vocabulary-year-3</a>	Quiz : <a href="https://www.educationquizzes.com/ks2/science/the-water-cycle/">https://www.educationquizzes.com/ks2/science/the-water-cycle/</a>
Read		Key Stage 2 The Study Book p 45	Key Stage 2 The Study Book p 46	Key Stage 2 The Study Book p 47 & 48	Key Stage 2 The Study Book p 50	Key Stage 2 The Study Book p 49	Collins KS2 Science Study Book p 44 & 45
Teach		<a href="https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zsgwwxs">https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zsgwwxs</a> Look at the page from the ‘read’ section. What is similar about the materials in each group?	Explain that today they will be identifying whether materials are solids, liquids and gases using this knowledge.	<a href="https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z9ck9qt">https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z9ck9qt</a> Model using a thermometer to take temperature. Introduce the question: Does chocolate melt at the same temperature?	<a href="https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zydxmnb">https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zydxmnb</a> Explain that the children are going to complete an investigation to prove that evaporation takes place. How could we do it? Discuss ideas. (video of investigation for teachers only: <a href="https://www.youtube.com/watch?v=kmmEV4ohSDA">https://www.youtube.com/watch?v=kmmEV4ohSDA</a> )	What is happening to our clothes when they are put on a washing line? Would they dry quicker on a sunny day or a cloudy day? Why? (Lead to the water evaporated quicker on a sunny day). How could we test this?	<a href="https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zydxmnb">https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zydxmnb</a> Explain that the children are going to complete an investigation to prove that condensation takes place. How could we do it? Discuss ideas.

Practice		Show the children a group of objects and photos, in groups, ask them to sort the materials into 3 sorting rings labelled solids, liquids and gases. Ask the children to write a description of what a solid, liquid and gas is thinking about their shape. Share a scientific description of a solid liquid and gas. Compare to those written by the children and ask them to check their groupings using the new definitions.	In pairs plan a test to find out if the material flows, changes its shape, and changes its volume. Show them the materials to be tested: water, air, and paper. Predict how each will behave. Decide how to record results, and carry out the test in pairs.	Practice using thermometers to take temperature. In pairs children plan a fair test to find out what temperature white, dark and milk chocolate melt at different temperatures. Decide how to record the results and how to present them (graph)	In pairs children plan an investigation and set it up. Children need to decide on how to keep the text fair, what to measure and when, how to record results and how to present results (graph).	In pairs plan an investigation to find out if temperature effects evaporation. (same as last lesson but jars could be placed in different places eg sunny window sill, shade etc. Practice using thermometers to check the temperature. Children decide what to record. How long to leave the investigation etc	Children decide how to record results On each table set up the investigation as in the diagram. Make sure the children are a safe distance from the hot water and know not to touch. Also set up one with cold water  Observe the experiment and record results
Apply		Show the children a particle diagram of a water, ice and steam. Ask them to choose a solid, liquid and gas I and draw a particles diagram for each.	Did the materials behave as we expected?	Which chocolate would you take on holiday to a hot country? What happens to the chocolate when it cools down?	**** AFTER the investigation has completed Watch <a href="https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z3wpp39">https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z3wpp39</a> Identify when evaporation takes place	**** AFTER the investigation has completed  Do your results prove your prediction?	**** AFTER the investigation has completed  Watch <a href="https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z3wpp39">https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z3wpp39</a> Identify when condensation takes place
Reflect		Inside, outside circle. Share a diagram and ask: Is the substance a solid, liquid or gas? Should the particles touch? Should the particles be ordered? Should the particles be moving fast?	Was their test successful? How could they improve on this if they were to complete the investigation again?	Was their test successful? How could they improve on this if they were to complete the investigation again?	**** AFTER the investigation has completed Was their test successful? How could they improve on this if they were to complete the investigation again?	**** AFTER the investigation has completed Was their test successful? How could they improve on this if they were to complete the investigation again?	**** AFTER the investigation has completed Was their test successful? How could they improve on this if they were to complete the investigation again?
End of unit		Magna has been in touch and they need a new display to show how the water cycle works. In groups plan the display.					



Medium Term Plan: Living things Y3/4			
Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
<ul style="list-style-type: none"> <li>Pattern seeking</li> <li>Research using secondary sources</li> <li>Identifying, classifying and grouping</li> <li>Observing over time.</li> </ul>	<ul style="list-style-type: none"> <li>Asking questions</li> <li>Making observations and measuring them</li> <li>Engaging in practical enquiry</li> <li>Recording and presenting evidence</li> <li>Answering questions and concluding</li> <li>Evaluating and predicting</li> <li>Communicating findings.</li> </ul>	<ul style="list-style-type: none"> <li>food chain</li> <li>basic need</li> <li>habitat</li> <li>species</li> <li>sources</li> </ul>	<ul style="list-style-type: none"> <li>threat</li> <li>classification</li> <li>environment</li> <li>danger</li> <li>adaptation</li> <li>defences</li> </ul>
Previous Learning End Point Assessment in this concept:	Previous Learning End Point Assessment in working scientifically concepts:		End Point Assessment Statements:
<b>Living things</b> 1. I can identify and name a variety of plants and animals in their habitats, including microhabitats 2. I can identify and name a variety of common animals that are carnivores, herbivores and omnivores. 3. I can explore and compare differences between things that are living, dead and things that have never been alive 4. I can describe how animals obtain their food using the idea of a simple food chain	I can ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). I can sometimes answer these questions. I can answer questions when my teacher explains it through a scenario. I can take measurements by drawing comparisons. I can record my observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. I can record my measurements e.g. using prepared tables, pictograms, tally charts and block graphs. I can classify using simple prepared tables and sorting rings. I can use my experiences of the world to suggest appropriate answers to questions. With help, I can relate these to my evidence e.g. observations I have made, measurements I have taken or information I have gained from secondary sources.		<b>Classification:</b> 1. I can recognise that living things can be grouped in a variety of ways 2. I can use classification keys to help group, identify and name a variety of living things in my local and wider environment (particularly tress and invertebrates) 3.I can recognise that environments can change and that this can sometimes pose dangers to living things (i.e. cutting down trees)

	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Learning Question	What can I remember about living things?	What is a living thing?	What living things are there in my local area?	Why do scientists create and use branching databases?	How could you group these animals and plants?	How do environmental changes impact on living things?
Enquiry Type		Identifying, classifying and grouping.	Identifying, classifying and grouping. Research using secondary sources.	Identifying, classifying and grouping. Pattern seeking	Identifying, classifying and grouping.	Research using secondary sources Observing over time - <i>deforestation</i>
Conceptual Knowledge	Prior units end point assessment	I can recognise that living things can be grouped in a variety of ways.	I can use classification keys to help group, identify and name a variety of living things in my local and wider environment (particularly tress and invertebrates).	I can use classification keys to help group, identify and name a variety of living things in my local and wider environment (particularly tress and invertebrates).	I can use classification keys to help group, identify and name a variety of living things in my local and wider environment (particularly tress and invertebrates).	I can recognise that environments can change and that this can sometimes pose dangers to living things (i.e. cutting down trees)
Working Scientifically		I can identify differences, similarities or changes related to simple scientific ideas and processes.	Following a scientific experience, I can ask further questions which can be answered by extending the same enquiry. I can make systematic and careful observations.	I can draw on prior knowledge to help answer a question. I can answer questions that my teacher asks by thinking about what I already know. I can answer my own and others' questions based on observations I have made.	I can communicate my findings to an audience both orally and in writing, using appropriate scientific vocabulary. I can identify ways in which I adapted my method as I progressed or how I would do it differently if I repeated the enquiry.	I can communicate my findings to an audience both orally and in writing, using appropriate scientific vocabulary. I can begin to identify naturally occurring patterns and causal relationships.
Concept flashback (previous phase or earlier in the year)		Living things Y1/2: Living or non-living <a href="https://wordwall.net/resource/7300135/science/y2-living-or-non-living">https://wordwall.net/resource/7300135/science/y2-living-or-non-living</a>	Forces and Magnets Y3/4 <a href="https://wordwall.net/resource/3064460/science/magnets-quiz-year-3">https://wordwall.net/resource/3064460/science/magnets-quiz-year-3</a> If it's a new concept for Y3's – what do they already know?	Plants Y1/2: <a href="https://wordwall.net/resource/3062462/what-do-plants-need-to-grow-year-2">https://wordwall.net/resource/3062462/what-do-plants-need-to-grow-year-2</a>	Light Y3/4: <a href="https://wordwall.net/resource/2898124/science/light-sources-year-3">https://wordwall.net/resource/2898124/science/light-sources-year-3</a>	ound Y3/4: <a href="https://wordwall.net/resource/7804340/y4-changing-volume">https://wordwall.net/resource/7804340/y4-changing-volume</a>
Review/ Revisit	Range of activities to test children's prior learning: - name plants and animals in their habitats	Gaps from previous end point assessment. Throughout – reinforcing what they should know from Y2 but ensuring complete understanding of what classifies a living thing.	Gaps from previous end point assessment. MRS NERG – what does each letter stand for? Can you summarise one of the characteristics in a sentence?	Gaps from previous end point assessment. MRS NERG – what does each letter stand for? Can you summarise one of the characteristics in a sentence?	Gaps from previous end point assessment. MRS NERG – what does each letter stand for? Can you summarise one of the characteristics in a sentence? Branching database – get children to fill one in with sweets (practice of the skill)	Gaps from previous end point assessment. MRS NERG – what does each letter stand for? Can you summarise one of the characteristics in a sentence? Branching database – use one from the previous lesson.


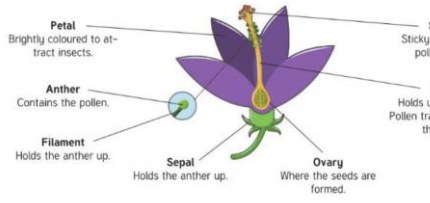
<b>Read</b>	- carnivores, omnivores and herbivores (also re-addressed during plants)	What is a living thing (poem) by Trevor Parsons – end of lesson read for the children. Link to poem of the week.	Classification keys Qualities of a good observer or collector	KS2 study book – page 9 and 13 (page 13 can be used a tool during the apply)	KS2 study book – page 10, 11 and 12	KS2 study book – page 14
<b>Teach</b>	- compare between living, dead and never been alive - simple food chains (inferring and creating from a scenario)	<p>Practice first. Discuss what they have found – look for where one group might have used the correct scientific term whereas another group got the same idea but not the correct scientific word.</p> <p>Teach MRSNERG – go through each letter and what they stand for. As a class, each time summarise each characteristic of a living thing to a partner (keep changing partners) in a sentence (link to practice).</p> <p>Discuss what we mean by local area and not local and what our local environment is like.</p>	<p>Useful links to use:  <a href="http://www.woodlandtrust.org.uk/naturedetectives/activities/2015/09/leaf-id/">http://www.woodlandtrust.org.uk/naturedetectives/activities/2015/09/leaf-id/</a> - Leaf identification PDF;  <a href="http://www.woodlandtrust.org.uk/naturedetectives/schools-and-groups/">http://www.woodlandtrust.org.uk/naturedetectives/schools-and-groups/</a> - Spotter sheet downloads (you may have to copy and paste this link);  <a href="https://www.forestryengland.uk/sites/default/files/documents/MiniBeasts%20in%20a%20Forest_lesson%20plan.pdf">https://www.forestryengland.uk/sites/default/files/documents/MiniBeasts%20in%20a%20Forest_lesson%20plan.pdf</a> - Pg 3 of PDF has easy instructions of safe and considerate collection methods for insects; <a href="http://www.science-resources.co.uk/KS2/Habitat/s/MiniBeast_identification.html">http://www.science-resources.co.uk/KS2/Habitat/s/MiniBeast_identification.html</a> - MiniBeast identification.</p> <p><b>Qualities of a Good Observer or Collector</b></p>  Search carefully, disturbing the surroundings as little as possible.  Handle only a few, but look at many living things.  Replace overturned logs and stones.  Carefully return the living things to their natural habitat after your study.  Do not pick wild flowers; draw them or photograph instead. <p>Discuss what a local habitat is – make sure children know what a habitat is. Ask children to name any habitats in the vicinity of the school (within and outside school grounds and including micro-habitats) and write a list on a flipchart. <i>What questions might they ask about the habitat?</i> Model asking a question about one of the nearby habitats. <i>Has this habitat always looked like this? How does the habitat change during the different seasons?</i> With a partner, chn come up with questions about the different habitats listed. They write the questions on Post-it notes and stick them on the flipchart paper.</p>	<p>Practice 1 first. Discussion – how did they group them? Why? Did you do something different to another group?</p> <p>- use sentence stems to help if needed.</p> <p>Teach why scientists groups things and classify different living things. Explain that careful observations of living things are needed so that scientists know which group they belong to.</p> <p>Using the leaves collected from last lesson, model a branching database. Choose 5 of the leaves and ask the child to choose one (but not tell anyone which one). Model asking yes and no questions to identify which leaf they are thinking of. After the 1<sup>st</sup> or 2<sup>nd</sup> question, ask the other chn for some ideas for questions to ask to help identify which leaf has been chosen. Every time a question is asked, write it on the flipchart paper as a branching database – use blue-tac to model placing/eliminating the leaves.</p>	<p>Teach that they already know that living things are classified into animals, plants or microorganisms but that animals are grouped into vertebrates and invertebrates and that plants are grouped into flowering or non-flowering plants.</p> <p>Teach what a vertebrate and an invertebrate are. Link to prior learning – did we find any of these in our local environment?</p> <p>Teach flowering and non-flowering plants.</p> <p>Before the apply, teach how to change a branched database into a question and answer clue sheet. Explain how scientists use better classification keys, which are a list of clues and answers for identifying an organism, i.e. finding out which species it is. It is a ‘key’ for unlocking the identification of a living thing or other object. Compare this to the use of the word ‘key’ on maps.</p>	<p>Explain that you are going to discuss 5 different changes to environments (<i>deforestation, urbanisation, global warming/climate change, intensive farming and nature reserves</i>) and the impacts of these changes.</p> <p>For each different change, one group will become the class experts on it throughout the lesson.</p> <p>Idea to showcase the impact of deforestation visually: Gather the class around the 2 boards of soil (one should now have some cress on it). Place a few monopoly houses at the edge of the soil on both boards. The houses represent villages and the cress represents the rainforest. Explain that the board without cress was once covered in trees and other living things. They were cut down for the wood and to clear areas to rear livestock. Hold up the watering can. It rains a lot in the rainforest. <i>What do you think will happen when it rains on the trees? What about when it rains on the cleared ground?</i> Allow chn a moment to discuss with a partner. Slowly pour water over the top of the cress mound. There should be some mud trickling out, and the houses may move a little. Do the same over the non-cress mound. This time the ground should become very unstable as there are no roots to strengthen it. It may even cause the houses to be washed away. Deforestation can have far-reaching impacts on many living things, including humans.</p>
<b>Practice</b>		<p>In groups, give children the chance to write on A3 paper their answers to: What makes a living thing? Move between the groups and guide their discussions. Remind them of their learning about things that are alive in Year 2. What can they remember? Bring the class back together and take feedback from each group. Jot down their ideas.</p> <p>On their tables, give children the seven characteristics and a matching explanation and see if they can now successfully match these statements to their characteristic.</p>	<p>Discussion about local habitats and verbalising their understanding.</p> <p>Post-it note questions.</p> <p>Explore the local area: With a partner, chn move carefully around the local habitat. They can use as many sheets as necessary to record the living things they see: encourage them to answer what, where and what does it look like? Move between the groups. Point out if they raise an interesting question, and begin a discussion about how to find the answer. Ensure that care of the habitat and the living things is being taken. Encourage the observation of plants as well as animals.</p> <p>Children to have classifications to help them or ipads to take pictures of things they are unsure about.</p>	<p>Using the resource pdf, in small groups, children need to group the cards into families of four (like the game happy families).</p> <p>Children are to practice using yes/no questions to determine which leaf their partner chose.</p>	<p>Give each group a range of pictures and ask them to organise them under the correct heading: vertebrate, invertebrate, flowering plant and non-flowering plant.</p> <p>Question to consider: Can you divide all the plants in the world into two groups by simply asking, “Does the plant have flowers?”</p>	<p>Discussion during the model and peer discussions during the input.</p> <p>During the input, in tables, children are to define each environmental change and state one way of reducing the impact of this change.</p>



Apply		<p>Draw a table in their books and name some living things we will find living in the wild in our local environment. List some living things we will definitely not find locally. Remember to think of some plants and animals.</p> <p>Differentiate: give some children pictures to stick in, give others a resource word bank.</p> <p>Challenge: Why wouldn't you find a _____ locally?</p>	<p>Children are to fill in the table above about what they have found about three things, condensing their group findings. Loweres: do it as a group, with adult support.</p> <table><tr><th colspan="4">Local Living Things</th></tr><tr><th>What is it? <small>Do you know what it is? Have a go at writing the name of it.</small></th><th>Where did you find it? <small>Write down where you found it in. Add details about the habitat conditions such as climate, light, ground etc.</small></th><th>What does it look like? <small>Draw a quick sketch, jot down details like how many legs or wings, take a photo and write the photo number.</small></th><th></th></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table> <p>Use the mini-beast worksheet from this website and allow children to create their own branching database in order to identify all of the species. Encourage them to spend time looking at the minibeasts and discussing what they look like – what features do/don't they have? Wings, legs, antennae? Discuss what sorts of questions they might use, e.g. Has it got a shell? Has it got wings? Has it got 6 legs? Has it got more than 8 legs? Is it segmented? Does it have antennae? Is it black/brown/red? Remind children that the questions must always have a yes/no answer. The yes and no then leads to either another question or an insect. There will be one less question than the number of insects.</p> <p>Children could work in pairs and loweres could have the questions already written and they need to stick and glue the questions with the images.</p> <p><a href="https://www.j2e.com/j2data/">https://www.j2e.com/j2data/</a> Use this website to make ones digitally.</p>	Local Living Things				What is it? <small>Do you know what it is? Have a go at writing the name of it.</small>	Where did you find it? <small>Write down where you found it in. Add details about the habitat conditions such as climate, light, ground etc.</small>	What does it look like? <small>Draw a quick sketch, jot down details like how many legs or wings, take a photo and write the photo number.</small>														<p>Children are to create two branched databases (dichotomous key – introduce this alternative term) for classifying a range of animals and then plants.</p> <p>Once complete, children are to then pick one of these and change it into a question-and-answer clue sheet.</p>	<p>In groups, chn will design an information poster to tell people about the change and what they can do to help – hedgehog highways, wildflower planting, litter picking, recycling, helping nature reserves. The poster should include: what change has happened to the environment (good or bad), what impact this has had on the living things within that environment, what we can do to minimise the danger to the living things.</p>
Local Living Things																									
What is it? <small>Do you know what it is? Have a go at writing the name of it.</small>	Where did you find it? <small>Write down where you found it in. Add details about the habitat conditions such as climate, light, ground etc.</small>	What does it look like? <small>Draw a quick sketch, jot down details like how many legs or wings, take a photo and write the photo number.</small>																							
Reflect		<p>Share answers and discuss the challenge – allows children who have excelled to share their understanding but provides the others with a chance to listen to ideas and benefit from discussion.</p>	<p>As a class, collate all of the findings from each group. Create a tally of living things spotted. Were the chn surprised by any of them? If chn were not able to identify a living thing, did they take a photo? Display on the class IWB, does anyone know what it is? Try <a href="http://www.science-resources.co.uk/KS2/Habitats/Minibeast_identification.html">http://www.science-resources.co.uk/KS2/Habitats/Minibeast_identification.html</a></p>	<p>Share branching databases and see if another pair agrees with your branching database. Post-it note feedback on quality of questions, etc.</p>	<p>Go to a partner with a question-and-answer clue sheet and see if they can successfully identify each plant.</p> <p>Discussion: What happens to these keys and classification systems when new species are identified? Look at some recent specie discoveries by scientists .</p>	<p>Present their poster to the class and explain what they have found.</p>																			
<p><b>End of block assessment:</b></p> <ol style="list-style-type: none"><li>Guess who game? Children to be given an incorrectly labelled branching database – can they fix the problems.</li><li>Plan a positive change(s) to a local environment and can explain how this/these change(s) will help living things within the area.</li></ol>																									

Medium Term Plan: Plants Y3/4				
Enquiry Type:		Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
<ul style="list-style-type: none"><li>Comparative and fair testing</li><li>Pattern seeking</li><li>Research using secondary sources</li><li>Identifying, classifying and grouping</li><li>Observing over time.</li></ul>		<ul style="list-style-type: none"><li>Asking questions</li><li>Making observations and measuring them</li><li>Engaging in practical enquiry</li><li>Recording and presenting evidence</li><li>Answering questions and concluding</li><li>Evaluating and predicting</li><li>Communicating findings.</li></ul>	<ul style="list-style-type: none"><li>bulbs</li><li>mature</li><li>temperature</li><li>germinate</li><li>growth</li><li>insects</li><li>pollen</li><li>sun</li></ul>	<ul style="list-style-type: none"><li>veins</li><li>surface</li><li>edge</li><li>nutrients</li><li>seedling</li><li>pollination</li><li>seed formation</li></ul>
Previous Learning End Point Assessment in this concept:		Previous Learning End Point Assessment in working scientifically concepts:		End Point Assessment Statements:
<p><u>Plants</u></p> <p>I can identify and describe the basic structure of common flowering plants, including trees.</p> <p>I can observe and describe how seeds and bulbs grow into mature plants.</p> <p>I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>		<p>I can ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen).</p> <p>I can sometimes answer these questions.</p> <p>I can answer questions when my teacher explains it through a scenario.</p> <p>I can take measurements by drawing comparisons.</p> <p>I can record my observations e.g. using photographs, videos, drawings, labelled diagrams or in writing.</p> <p>I can record my measurements e.g. using prepared tables, pictograms, tally charts and block graphs.</p> <p>I can classify using simple prepared tables and sorting rings. I can use my experiences of the world to suggest appropriate answers to questions.</p> <p>With help, I can relate these to my evidence e.g. observations I have made, measurements I have taken or information I have gained from secondary sources.</p>		<p><u>Plants:</u></p> <p>1. I can identify the different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>2. I can describe the functions of the different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>3. I can describe how some plants have adapted these different parts for their functioning (e.g., ap roots, bulbs, cactus)</p> <p>4. I can explore what a plant needs for life and growth (e.g. air, light, water, nutrients from soil, and room to grow).</p> <p>5. I can explain how this varies from plant to plant</p> <p>6. I can investigate the way in which water is transported within plants (transpiration)</p> <p>7. I can identify the part that flowers play in the life cycle of flowering plants (including pollination, seed formation and seed dispersal).</p> <p>8. I can explain the part that flowers play in the life cycle of flowering plants and understand the importance of this.</p>

	Revisit of knowledge short Afl lesson	Lesson 1 and 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
Learning Question	What do I already know about plants?	What is the role of different parts of a plant?	What is needed for a plant to grow?	How have plants adapted to aid their survival?	How does water get from the roots to the leaves?	Why do plants have flowers?	How does a plant disperse seeds?
Enquiry Type		Research using secondary sources	Fair and comparative test	Identify, classify and group Research using secondary sources	Observing over time	Research using secondary sources	Identify, classify and group Research using secondary sources
Conceptual Knowledge	Prior units end point assessment	I can identify the different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can describe the functions of the different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can describe how some plants have adapted these different parts for their functioning (e.g., ap roots, bulbs, cactus)	I can explore what a plant needs for life and growth (e.g. air, light, water, nutrients from soil, and room to grow).	I can explore what a plant needs for life and growth (e.g. air, light, water, nutrients from soil, and room to grow). I can explain how this varies from plant to plant	I can investigate the way in which water is transported within plants (transpiration)	I can identify the part that flowers play in the life cycle of flowering plants (including pollination, seed formation and seed dispersal). I can explain the part that flowers play in the life cycle of flowering plants and understand the importance of this.	I can identify the part that flowers play in the life cycle of flowering plants (including pollination, seed formation and seed dispersal). I can explain the part that flowers play in the life cycle of flowering plants and understand the importance of this.
Working Scientifically		I can use a range of question stems to ask a relevant question. I can use resources to gather evidence for a question. I can recognise when secondary sources can be used to answer questions that cannot be answered through practical work.	I can select from a range of practical resources to gather evidence to answer questions generated by myself or the teacher. I can sometimes decide how to record and present evidence. I can record my observation e.g. using photographs, videos, pictures, labelled diagrams or writing. I can record my measurements e.g. using tables, tally charts and bar charts (given templates when needed).	I can use resources to gather evidence for a question. I can begin to identify naturally occurring patterns and causal relationships. I can follow my plan to carry out: observations and tests to classify	I can make systematic and careful observations. I can use resources to gather evidence for a question. I can answer my own and others' questions based on observations I have made, measurements I have taken or information I have gained from secondary sources.	I can use a range of question stems to ask a relevant question. I can use resources to gather evidence for a question. I can recognise when secondary sources can be used to answer questions that cannot be answered through practical work.	I can use resources to gather evidence for a question. I can sometimes decide how to record and present evidence. I can record my observation e.g. using photographs, videos, pictures, labelled diagrams or writing.

<b>Concept flashback (previous phase or earlier in the year)</b>		Plants Y1/2: 1. Label the plant 2. Explain the role of the roots.	Forces and Magnets Y3/4 <a href="https://wordwall.net/resource/3064460/science/magnets-quiz-year-3">https://wordwall.net/resource/3064460/science/magnets-quiz-year-3</a> If it is a new topic for Y3, treat as a what do you know?	Living things and their habitats Y3/4 <a href="https://wordwall.net/resource/5776745/science/living-things-and-their-habitats">https://wordwall.net/resource/5776745/science/living-things-and-their-habitats</a>	Electricity Y3/4 <a href="https://wordwall.net/resource/2367085/science/year-4-electricity-key-vocabulary">https://wordwall.net/resource/2367085/science/year-4-electricity-key-vocabulary</a> If it is a new topic for Y3, treat as a what do you know?	Materials Y1/2 1. Match the material to its description 2. Define properties	Plants Y1/2: 1. name these wild and garden plants. 2. Explain the role of roots.
<b>Review/ Revisit</b>	Low Stakes Quiz or interactive activity to test their knowledge about:	1. Prior gaps in knowledge 2. what plants need to grow	1. Prior gaps 2. Have pictures of different elements and children group them on whether they are a root, shoot or leaf. How did they group these?	1, Measure their plants and fill in the notes section	1, Measure their plants and fill in the notes section	1, Measure their plants and fill in the notes section	1, Measure their plants and fill in the notes section
<b>Read</b>	- common wild and garden plants	KS2 study book – page 1	KS2 study book – page 2	KS2 study book – page 2 (act as a revisit and recap – children should know this fluently).	KS2 study book – 4 (not necessarily at the start of the lesson)	KS2 study book – page 5 and 6	KS2 study book – page 7
<b>Teach</b>	- name habitats and microhabitats - recall how seeds and bulbs grow - what plants need to grow and why (water, sunlight, temperature, etc)	Practice one (Afl opportunity) before teach. Go through the structure and the different parts. Children to predict what each part might do. Teach what each part of the plant does.	What do plants to grow and how if they need something particular, how could you test for this? Model this for investigating space.	How to classify and group. Using a range of cut up food items (actual food – i.e. celery), children are to group the foods into root, shoots, fruit or leaf. Children practice this and then as a class go through the classification and choices made and teach why these are classified and how different plant-based foods may have differing needs.  After matching in the apply section, make sure all children have matched correctly – teach how we know these plants are in this environment.	  Stimulus – what is happening in this photograph? Use celery to model this process – use scientific terms such as xylem and how it is their job to carry water up to the leaves and flowers	The following website contains many short videos of different ways in which animals pollinate plants: <a href="http://www.bbc.co.uk/nature/adaptations/Pollinator">http://www.bbc.co.uk/nature/adaptations/Pollinator</a>  The following video is good introduction to insect pollination and artificial pollination.  <a href="http://www.bbc.co.uk/learningzone/clips/insect-pollination/119.html">http://www.bbc.co.uk/learningzone/clips/insect-pollination/119.html</a>  Model the dissection of a plant and what the different elements are. Children then practice whilst predicting what they will see and the functions.  Teach each function and ask children to point to that on their real flower.    Teach pollination and fertilisation	The following video clearly shows how the dandelion disperses its seeds. <a href="http://www.bbc.co.uk/learningzone/clips/the-life-cycle-of-a-dandelion/2257.html">http://www.bbc.co.uk/learningzone/clips/the-life-cycle-of-a-dandelion/2257.html</a>  Teach animal dispersal and wind dispersal and other forms.  Look at ways of fertilising plants.

