

Unit 3B: HELPING PLANTS GROW WELL – MEDIUM TERM PLANNING

Class: **Term: Summer 1** **Subject: Science** **Unit: Helping plants grow**

<p>Differentiation and support (Detailed differentiation in weekly plans.)</p> <p>SEN: write up investigations on writing frames. Support from more able partners in mixed ability work. Additional adult support.</p> <p>GT: provide headings for experiment sections. Send off to experiment sooner than rest of group. Provide with equipment, but provide less scaffolding on how to conduct the experiment. Encourage conclusions that draw on scientific knowledge and enquiry skills.</p>	<p>ICT: children will be using laptops to research information</p> <p>Numeracy: Children will be measuring length and volume and drawing results tables and bar charts</p> <p>Literacy: children will be writing up experiments in sequence using technical language.</p> <p>Geography: children will be thinking about how environment affects plants and sustainability</p> <p>PSHE: children will be thinking about healthy eating</p>
<p>Vocabulary: grow, light, water, warmth, leaves, roots, stem, fruit, flower, herbivore, omnivore, carnivore, producer, consumer, photosynthesis</p>	

The schools that I have worked at in London have access to Collins Virtual Experiments through the London Grid for Learning (LGFL). If you are in London, and google LGFL virtual experiments, from your school you should be able to automatically access them. From home you need your frontier log-in and password.

W	Learning Objective	Skills/knowledge/activities	Resources	Assessment: Success criteria	Evaluation
1	<p>Self-assess knowledge of plants</p> <p>(15 mins)</p> <p>Explain that plants need light, water and warmth</p> <p>(45 mins)</p>	<p>Children complete a mind map on what they know already about plants</p> <p>Model: Model how to do a virtual experiment on the BBC website (this asks you to give a plant the right amount of heat, water and sunlight). Model how to use http://www.mbgnet.net/bioplants/adapt.html to find out how different plants are adapted to their environment Model independent work (10 mins)</p> <p>Main: Children complete missing words in sentence based on what they learn from the BBC website e.g. When I give the plant too much (blank) it dies. Children draw lines between four pictures of plants and four descriptions of them from BBC website e.g. yellow, spindly plant because it is in the dark (15 mins) For several different biomes children give the name of the biome and one adaptation a plant might have to survive there e.g. Desert – some plants have spines instead of leaves to discourage animals from eating them for water (15 mins)</p> <p>Plenary: Revise how plants need warmth, water and sunlight to grow. Ask children for some of the adaptations they found (10 mins)</p>	<p>Mind map frames</p> <p>Worksheets</p> <p>Laptops</p>	<p>Formative assessment exercise</p> <p>MUST: know that plants need the right amount of water, warmth and sunlight</p> <p>SHOULD: know what happens to plants that do not get the right amount of either water, warmth or sunlight</p> <p>COULD: know what an adaptation is and give an example</p>	

2	<p>Investigate if plants grow better with or without water</p> <p>(1 hour)</p>	<p>Experiment: Children plant seeds in some soil in a plastic cup. Leave cups on a windowsill, watering some a little, watering some a lot and not watering others.</p> <p>Revise how we learnt last week that plants need warmth, water and sunlight to grow. We are going to investigate if this is true. Discuss with the children how they could investigate this.</p> <p>Plan a fair test: conditions the same.</p> <ul style="list-style-type: none"> • Amount of sunlight • Warmth • Type of soil • Depth that seed is planted at <p>Model how changing these things would be unfair and explain why this is the case. (15 mins)</p> <p>Emphasise need to be careful not to get soil in mouths, noses etc. (you might want the children to wear gloves)</p> <p>Children write aim, prediction and method and then plant seeds. Children will need to water them over the next couple of weeks (45 mins)</p>	<p>Seeds e.g. cress</p> <p>Soil in cups</p> <p>Investigation frames</p> <p>Bar graph frame</p>	<p>MUST: plan and carry out an experiment by using an investigation frame, with adult support</p> <p>SHOULD: plan and carry out an experiment by using an investigation frame, without adult support</p> <p>COULD: link predictions and conclusions to scientific knowledge and use scientific language</p>	
3	<p>Investigate if plants grow tallest with or without sunlight</p> <p>(1 hour)</p>	<p>Experiment: Children plant seeds in some soil in a plastic cup. Leave some cups on a windowsill with lots of sunlight, some cups in a cupboard with a light on and some plants in a cupboard with no light.</p> <p>Revise how we have learnt that plants need warmth, water and sunlight to grow. We are going to investigate if this is true. Discuss with the children how they could investigate this.</p> <p>Plan a fair test: conditions the same.</p> <ul style="list-style-type: none"> • Amount of water (use measuring jugs and specify amount) • Warmth • Type of soil • Depth that seed is planted at <p>Model how changing these things would be unfair and explain why this is the case. (15 mins)</p> <p>Emphasise need to be careful not to get soil in mouths, noses etc. (you might want the children to wear gloves)</p> <p>Children write aim, prediction and method and then plant seeds. Children will need to water them over the next couple of weeks (45 mins)</p>	<p>Seeds e.g. cress</p> <p>Soil in cups</p> <p>Investigation frames</p> <p>Bar graph frame</p>	<p>MUST: plan and carry out an experiment by using an investigation frame, with adult support</p> <p>SHOULD: plan and carry out an experiment by using an investigation frame, without adult support</p> <p>COULD: link predictions and conclusions to scientific knowledge and use scientific language</p>	
4	<p>Explain that plants need light, water and warmth and healthy</p>	<p>Model:</p> <p>Show children a real plant and explain the functions of the different parts of the plant: roots, leaves, stem, flower and fruit.</p> <p>Model how to draw and label a diagram. (10 mins)</p>	<p>Plant</p> <p>Laptops</p>	<p>MUST: draw and label a diagram of a plant</p> <p>SHOULD: annotate their</p>	

	<p>leaves, roots and stems in order to grow well</p> <p>Explain why healthy roots and a healthy stem are needed for plants to grow</p> <p>Recognise that the leaves of a plant are associated with healthy growth</p> <p>(1 hour)</p>	<p>Main: Children draw a diagram of a plant and label its parts (10 mins) Once drawn diagram add information on each part of the plant by researching on a carousel of:</p> <ul style="list-style-type: none"> • Books (15 mins) • Internet (15 mins) <p>http://www.naturegrid.org.uk/plant/parts.html http://www.bbc.co.uk/schools/ks2bitesize/science/living_things/help_plants_grow/read3.shtml</p> <p>Collins virtual experiments Will display words such as photosynthesis, chlorophyll, transpiration, osmosis, xylem, phloem and respiration on the board for G + T to find out the meaning of, and then use to label diagram</p> <p>Which parts could a plant survive without? Why? (5 mins)</p> <p>Plenary: Complete LGFL activity on labelling parts of a plant as a class. What information could we add that we learnt from other sources? (10 mins)</p>	Books	<p>diagram with extra information</p> <p>COULD: use find out the meaning of technical words e.g. chlorophyll, and use them to annotate their diagrams</p>	
5	<p>Recognise that plants provide food for humans and other animals</p> <p>(1 hour)</p>	<p>Intro: As a class make a list of plants we eat (5 mins) Explain food chains and the terms:</p> <ul style="list-style-type: none"> • Producer and primary / secondary / tertiary consumer • Herbivore / omnivore / carnivore (5 mins) <p>Play food chain game: each child is given a card with a plant or an animal. The card tells them what they eat and / or what they are eaten by. They need to find the other people with the cards. (10 mins) Once children have found their partners I will go around asking who is the producer, primary consumer etc and who is a herbivore, omnivore or carnivore. (10 mins)</p> <p>Main: Children draw their food chain in their books. Each plant / animal must be labelled as:</p> <ul style="list-style-type: none"> • Producer and / or primary / secondary / tertiary consumer • Herbivore / omnivore / carnivore <p>Children can create their own food chains once they have finished this and label each plant / animal similarly (15 mins)</p> <p>What would happen to an animal further up the chain if something lower down was taken away? Why?</p> <p>Plenary: Revise meaning of terms by going through an example. Discuss what would happen to an animal further up the chain if something lower down was taken away? Why? (10 mins)</p>	Food chain game cards	<p>MUST: know what a food chain is</p> <p>SHOULD: correctly arrange given animals / plants into a food chain and label them e.g. caterpillar: primary consumer and herbivore</p> <p>COULD: create their own food chain and label the constituents</p>	

6	Write up results from investigation on if plants grow better with a little, a lot or no water (1 hour)	Measure height of different plants and record in a table (15 mins) Model recording of investigation in a bar chart and explain how to use tick list on investigation frame. Write conclusion, encouraging use of scientific words such as tallest / shortest, parched / flooded and because (30 mins) Plenary: which plant grew the most and why? Did different groups get different results? Compare and discuss results. (15 mins)	Bar graph frame Investigations begun in lesson 3		
7	Write up results from investigation on if plants grow better with / without sunlight (1 hour)	Measure height of different plants and record in a table (15 mins) Model recording of investigation in a bar chart and explain how to use tick list on investigation frame. Write conclusion, encouraging use of scientific words such as tallest / shortest, photosynthesis, spindly / strong and because (30 mins) Plenary: which plant grew the most and why? Were the plants the same colour? Did different groups get different results? Compare and discuss results. (15 mins)	Bar graph frame Investigations begun in lesson 4		
8	Make careful measurements of volumes of water and height Explain in simple terms why a number of plants should be used to provide reliable evidence about plant growth (1 hour)	<i>You will need to test this to see how long it takes for the colouring to travel up the celery – too long and it will reach the top of all of them, too short and it will not climb far up any of them</i> Experiment: Put sticks of celery in a container of water with food colouring in, place celery in places of different temperatures and measure how far the food colouring has travelled up the celery after certain time. Use more than one stick in each location. Discuss with the children what investigation they could do with this equipment. Plan a fair test fair: conditions the same. <ul style="list-style-type: none"> • Type of celery • Freshness of celery • Amount of food colouring • Amount of water • Container (cup) • Amount of light Model how changing these things would be unfair and explain why this is the case. (15 mins) Emphasise need to not drink water or taste food colouring. Children write aim, prediction and method, then carry out the investigation (45 mins) 10 minute break Record results in a table and calculate mean averages for children.	Graph frames Celery Measuring jugs Water Food colouring Rulers	MUST: plan and carry out an experiment by using an investigation frame, with adult support SHOULD: plan and carry out an experiment by using an investigation frame, without adult support COULD: link predictions and conclusions to scientific knowledge and use scientific language	

		<p>Discuss how having used more than one plant in each location makes the results more reliable. (10 mins)</p> <p>Model recording of investigation in a bar chart and explain how to use tick list on investigation frame. Write conclusion, encouraging use of scientific words such as most / least, furthest / shortest, transpiration, xylem and because (25 mins)</p> <p>Plenary: which stick did the food colouring climb furthest up and why? Were there any anomalies (odd results)? (10 mins)</p>			
9	<p>Self-assess knowledge of plants</p> <p>(15 mins)</p>	<p>Children return to their mind maps from the first week and add what they have learnt over the past few weeks to them in a different coloured pencil.</p> <p>This will hopefully show me (and them) what they have learnt.</p>	<p>Colouring pencils</p>	<p>Mind maps from first lesson</p>	

An interesting alternative for the investigative lessons is to give the children the opportunity to come up with their own investigations and let them do them, as there are so many possibilities with plants e.g. planting in different soils, planting at different depths, at different temperatures, using a different liquid to water e.g. lemonade etc. Lower ability children will probably struggle with this, but the others should be able to do it.

Another possibility is to do an investigation on planting seeds in different types of soil to see which soil they grow best in.

Some of these can be used in the next unit on 'Light and Shadows' since this can be difficult to do investigations for.

Assessment

<p>some children will not have made so much progress and will:</p>	<p>Most children will</p>	<p>some children will have progressed further and will also:</p>
<ul style="list-style-type: none"> recognise that plants need light, warmth and water to grow make some measurements of the height of plants 	<ul style="list-style-type: none"> recognise that plants provide food for humans and other animals explain that plants need light, water and warmth and healthy leaves, roots and stems in order to grow well make careful measurements of volumes of water and height of plants recognise that in experiments and investigations a number of plants need to be used to provide reliable evidence 	<ul style="list-style-type: none"> explain why healthy roots and a healthy stem are needed for plants to grow; recognise that the leaves of a plant are associated with healthy growth; explain in simple terms why a number of plants should be used to provide reliable evidence about plant growth