



Medium Term Unit Planning

Topic Name: Science Roots and Shoots / Artful Flowers, Fruits and Seeds

Learning outcome:

Brief description of key takeaways:

Hook: *Zinnia the alien wants to open a human hotel on her planet. She needs to know what plants to eat, how they grow and what parts can be eaten.*

Topic Showcase: Presentation of Space Farm.

Oracy:
Children will have a chance to present their final farm designs in front of the class, explaining their choices and reasoning as they go.

Key Vocabulary: Plants, investigate, seedlings, research, height, root, stem, leaves, flowers, petals growth, light, warmth, air, soil, water, shoots, buds, fruits, seeds, classify, Data logger, light level, temperature, wilting, yellowing, requirement, measure, record, table, line graph, bar graph, transported, results. Reproduction, male, female, stigma, style, ovary, carpel, stamens, pollination, fertilisation, waggle dance, ovules, fruit, pod, seeds, parent plant, dispersal, germination,

Key Texts (whole class reading/end of the day book/Talk for Writing Texts etc.):

WCR books: Du Iz Tak? - Carson Ellis, A seed is sleepy – Dianna Hutts Aston, Why are tomatoes a fruit? – non fiction text.



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Citizenship/Community Opportunities:

Understand how growing plants for food is important for survival. Discuss the benefits of having an allotment or area of their garden dedicated to food. How would this help?

Experiences/Visits/Visitors: N/A

Main Subjects covered: Science – Biology and Maths (data)

Subject 1 Threshold concepts

- Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.
- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
- Investigate the way in which water is transported within plants.
- Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Subject 2 Threshold Concepts

Subject 3 Threshold Concepts



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Notes:			
Lesson title and learning Intention	Threshold concepts (success criteria)	Milestones (success criteria)	Lesson structure/differentiation
<p>1. Space to Grow The children agree to help Zinnia, a friendly alien who wants to farm human food in space. She needs them to find out what plants need to grow strong and healthy. They will need to do some scientific investigation and research over the coming sessions.</p>	<p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p> <p>Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.</p>	<p>Working Scientifically:</p> <ul style="list-style-type: none"> Ask relevant questions. Set up simple, practical enquiries and comparative and fair tests. <p>Understand Plants:</p> <ul style="list-style-type: none"> Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. 	<p>Children will</p> <ul style="list-style-type: none"> Become Planet Earth plant research experts for an alien called Zinnia Discuss and decide all the requirements we think plants need to grow strong and healthy Set up a plant growth investigation to test our theories Begin to take measurements of height and make notes on observations Research some interesting plant facts from books and the Internet <p>Create a display of "Did you know ...?" facts</p>
<p>2. Roots, shoots and so much more Children will check up on their investigation and see</p>	<p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>Working Scientifically:</p> <ul style="list-style-type: none"> Record findings using simple scientific language, drawings, 	<p>Children will</p> <ul style="list-style-type: none"> Play a game to recap on plant knowledge and teach some new concepts



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<p>which seedlings are growing strong and healthy and which are not. They will further broaden their plant knowledge by observing whole plants closely and making detailed, labelled drawings.</p>	<p>Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.</p>	<p>labelled diagrams, bar charts and tables.</p> <ul style="list-style-type: none"> • Make accurate measurements using standard units <p>Understand Plants:</p> <ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers. 	<ul style="list-style-type: none"> • Continue with ongoing investigation of plant needs for growth and health, making comparisons and taking measurements of height • Closely observe whole specimen plants and make detailed, labelled and annotated drawings Play a game to reinforce the various parts of a plant and their functions
<p>3. Fruit, shoot, leaf or root Children will play a game to create a list of top human plant foods Zinnia will need to grow and discover the different parts of plants people eat. They will discover the difference between fruits and vegetables and use their knowledge to classify food plants. Make close observations and create models of sections through different fruits.</p>	<p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p> <p>Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.</p>	<p>Working Scientifically:</p> <ul style="list-style-type: none"> • Make accurate measurements using standard units <p>Investigate Living Things:</p> <ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways. 	<p>Children will</p> <ul style="list-style-type: none"> • Continue with the ongoing investigation of plant needs, making comparisons and taking measurements • Play a team game to discover the huge variety of plants in their diet and create a list of them • Classify different foods as either root, stem/shoot, leaf, flower, fruit or seed • Create detailed models of sections through fruits showing flesh, skin, seeds etc.
<p>4. Water for life Children will do a health check on all the seedlings that are growing without something – light, air,</p>	<p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>Working Scientifically:</p> <ul style="list-style-type: none"> • Make accurate measurements using standard units, using a range of equipment, e.g. 	<p>Children will</p> <ul style="list-style-type: none"> • Continue to take notes and measurements on the bean seedlings in our investigation



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<p>water, soil, warmth and space and begin to think about the differences they are showing and why. Investigate how water is transported in plants and also set up data loggers to record temperature and light over a 24 hour period.</p>	<p>Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.</p>	<p>thermometers and data loggers. Understand Plants:</p> <ul style="list-style-type: none"> Investigate the way in which water is transported within plants. 	<ul style="list-style-type: none"> Report to the class in groups on how their requirement seems to be affecting the health and growth of seedlings Play a team game to recap on knowledge gained so far and introduce a few new concepts Set up an experiment to investigate the way in which water is transported within plants Use data loggers to measure light levels and temperature over a 24 hour period <p>Make a summary of class findings from the seedling investigation with notes and drawings of results</p>
<p>5. Data, data, data!</p> <p>The children will have 3 scientific investigations to review and will need to gather all the data to give to Zinnia next session. It's time to draw graphs, make drawings and write reports.</p>	<p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p> <p>Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.</p>	<p>Understand Plants:</p> <ul style="list-style-type: none"> Investigate the way in which water is transported within plants. <p>Working Scientifically:</p> <ul style="list-style-type: none"> Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. 	<p>Children will</p> <ul style="list-style-type: none"> Review and discuss the data from the data loggers (light and temperature for 24 hrs) and explain patterns you find Look at the results of the food dye experiment and draw conclusions on how water is transported in plants Draw graphs or write reports on findings and seek to explain and interpret results in terms of what you know about plants <p>Begin to learn about the 7 life processes common to all living things and tackle a class challenge to match scientific terms to pictures of each process</p>
<p>6. Space Farm</p> <p>Zinnia is about to make contact one last time so children will need to have</p>	<p>Understand plants This concept involves becoming familiar with different types of</p>	<p>Working Scientifically:</p> <ul style="list-style-type: none"> Report on findings from enquiries, including oral and written explanations, 	<p>Children will</p> <ul style="list-style-type: none"> Review their knowledge and understanding by taking part in a quiz/ assessment task



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<p>all their data, drawings, graphs and findings ready. They will then design a space farm for Dock 5.</p>	<p>plants, their structure and reproduction.</p>	<p>displays or presentations of results and conclusions.</p> <ul style="list-style-type: none"> Use straightforward, scientific evidence to answer questions or to support their findings. 	<ul style="list-style-type: none"> Recap on all the requirements of plants for health and growth Design a space farm for plants with labels and annotations that meets all their requirements for life <p>Receive a final message of thanks from Zinnia for all their help and research</p>
<p>7. More about Flowers Children will learn how insects and other creatures are important in the pollination of flowers. Discover the secrets of how bees communicate using a waggle dance. They will create some stunning bee and flower models.</p>	<p>Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.</p>	<p>Understand Plants: Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Children will</p> <ul style="list-style-type: none"> Discover the role played by insects in pollination Learn to do a bee Waggle Dance and know this is how they communicate with other bees Create 3D models of either flowers or bees <ul style="list-style-type: none"> Play a waggle dance game to communicate the location of a target “flower”
<p>8. Seeds in the Making Children will check out some real plant specimens to discover what happens to flowers after pollination. They will make a beautiful illustrated zigzag book to explain how fruits develop from pollinated flowers.</p>	<p>Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.</p>	<p>Understand Plants: Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Children will</p> <ul style="list-style-type: none"> Consolidate knowledge on pollination by doing a sequencing puzzle in pairs Examine plant specimens that show the development of fruits from pollinated flowers Discuss observations, generate questions and form theories on the process Learn how pollen grains fertilize ovules by watching a film clip and an explanatory PowerPoint Make illustrated zigzag books that explain the development of fruits Play a team game to reinforce the link between flowers and fruits and the huge variety that exists



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<p>9. Exploring Fruits Children will explore the huge variety of different fruits – asking questions and making observational drawings and notes. They will sort fruits according to their own criteria based on their similarities and differences.</p>	<p>Investigate living things This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.</p>	<p>Investigate Living Things:</p> <ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways. 	<p>Children will</p> <ul style="list-style-type: none"> • Consolidate the learning of scientific vocabulary by playing a word matching game in teams • Explore a wide variety of fruits and ask questions about them • Use observation skills to create detailed drawings of fruits with accompanying notes • Suggest criteria for grouping fruits and classify them accordingly
<p>10. Seed Dispersal Children will begin to understand why fruits are so varied – to help with the dispersal of their seeds. They will make their own paper seed and investigate wind dispersal by testing different versions to find the best flier.</p>	<p>Investigate living things This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.</p> <p>Understand evolution and inheritance This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.</p>	<p>Investigate Living Things:</p> <ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways. <p>Understand evolution and inheritance:</p> <ul style="list-style-type: none"> • Identify how plants are suited to and adapt to their environment in different ways. 	<p>Children will</p> <ul style="list-style-type: none"> • Sort a variety of fruits according to observable features • List the different ways seeds are dispersed • Investigate wind dispersal by setting up fair tests to determine the best type of paper spinner • Record and report back on results • Use results to generate further questions and possible enquiries