

Janaki Ammal: pioneering R and R for the environment (Plants) **BIOLOGY**

SCIENCE LEARNING STATEMENTS

Skills and Knowledge

| Area of Learning | Skills and Knowledge |
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| Scientific Enquiry and applying knowledge in context | I can raise my own relevant questions about the world around me. |
| | I can be given a range of scientific experiences including different types of scientific enquiry. |
| | I can start to make my own decisions about the most appropriate type of scientific enquiry I might use to answer questions. |
| | I can set up simple practical enquiries, comparative and fair tests. I can recognise when a simple fair test is necessary and help decide how to set it up. |
| | I can talk about criteria for grouping, sorting and classifying; use simple keys, with some help. |
| | I can recognise when and how secondary sources might help me to answer questions that cannot be answered through practical investigations. |
| | I can make systematic and careful observations. I can help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. |
| | I can begin to look for naturally occurring patterns and relationships; begin to decide what data to collect to identify them. |
| | With help, I can take accurate measurements using standard units, learn how to use a range of equipment, such as data loggers and thermometers, appropriately. |
| | I can collect and record data from my own observations and measurements in a variety of ways: notes, bar charts, tables. I can use standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse the data. |
| | With help, I can look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. |
| | I can use relevant scientific language to discuss my ideas and communicate my findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions. |
| With support, I can identify new questions arising from their data, making predictions for new values within or beyond the data they have already collected and finding ways of improving what I have already done. | |

NATIONAL CURRICULUM OBJECTIVES

1. identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
2. 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
3. investigate the way in which water is transported within plants
4. explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

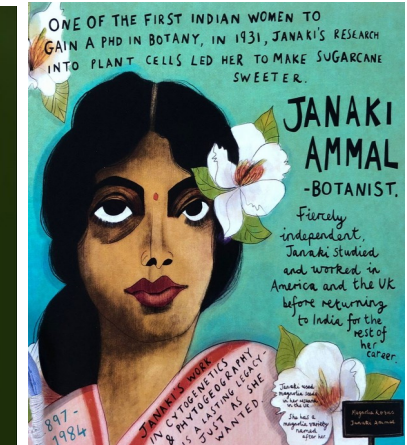
MATHS AND SCIENCE ACROSS THE CURRICULUM – Data Handling and Statistics

Science NC: recording findings using simple scientific language – scientific diagrams and labels; classification keys

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| Possible Enrichment activities | Visit to RHS |
| | Bridgewater |
| | Bee-keeper visit |

KEY VOCABULARY

photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal, germination, seedling, sapling, blossom, Janaki Ammal, botanist



Overview and rationale:

It is in this wonderful science topic that our children get their first in-depth look at life cycles, enhancing the knowledge that they developed in KS1 on plants and growth. Through all of our science learning, our main objective is to develop a sense of awe and wonder for the natural and physical world and again, scientific enquiry is at the fore of this topic, with the children taking a hands-on approach to grasping a deeper and investigative understanding of the life cycle of plants and their incredible ingenuity in maintaining their species. Being three of our most important school values, we again nurture the children's understanding of the importance of **respecting** and taking **responsibility** for looking after our environment, drawing on the inspiring botanist, Janaki Ammal as well as the support for the WWF that the school gives. Year 3 also look at the amazing **resilience** of various species in the UK and across the world and how they survive and pro-create, an attribute which is revisited in Y4, Y5 and then in Y6, where the children delve much deeper into evolution and inheritance.

KNOWLEDGE (substantive)

| 'Core' | 'Additional' |
|---|--|
| 1) I can describe the function of the different parts of a flowering plant. | a) I know that the roots anchor the plant in the ground and absorb water/nutrients from the soil. I know that the stem/trunk holds the plant up and transports the water/nutrients to the leaves. b) I know that the leaves make food for the plant using sunlight and carbon dioxide. c) I know that flowers are brightly coloured to attract insects and birds. |
| 2) I know the requirements needed for a plant to live and grow. | a) I know that plants need air, light, water, nutrients from the soil, and room to grow in order to live and grow. b) I can set up an investigation that shows the requirements needed for a plant to live and grow. I can make systematic and careful observations about the plant. c) I know that the requirements for life and growth vary from plant to plant. |
| 3) I can investigate the way in which water is transported within plants. | a) I can make systematic and careful observations over time when placing celery/carnation into coloured food dye. b) I know that the function of the stem is to transport water within the plant. |
| 4) I know that the flower has an important part to play in the life cycle of a flowering plant. | a) I can explain the lifecycle of an apple tree – from seed germination, to seedling, to sapling, to tree, to blossom, to apple! b) I can explain that pollination is where insects carry pollen from one flower to another. The transfer of pollen makes a new seed. c) I know that seed dispersal can occur in a variety of ways: wind, water, bursting, shaking, animal droppings, travelling on animal fur, drop and roll. |
| 5) I know that Janaki Ammal was a famous botanist. | a) I know that Janaki Ammal was born in India in 1897. b) I know that a botanist is a scientist that studies plants. c) Janaki's work developing sugar cane was important because the sugar cane that grew in India wasn't as sweet as ones from other countries. Janaki helped to develop a sweet sugarcane that would grow in India so that they wouldn't need to buy it from other countries. d) I know how important it is to care for and be responsible for our environment so as not to damage it...and how doing this might impact on our future. |

| GEOGRAPHY LEARNING STATEMENTS | | GEOGRAPHICAL VOCABULARY AND CONCEPTS | |
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| Locational and place knowledge | I understand how some aspects have changed over time. | Human Geography | settlement, urban, rural, country, county, river, food and farming |
| Fieldwork | I use fieldwork to observe, measure and record some of the human and physical features of a familiar area using sketch maps and graphs. I can conduct surveys. I am able to use simple equipment to measure and record. | Physical Geography | landscape, biomes, ecosystem, species, habitat, photosynthesis, climate change, natural resources |
| | | Geographical concepts and tier 2 vocabulary | Place: changed, developed Space: weather, climate, biomes, vegetation Scale: connections, impact Environment (physical and human processes: topography, changes over time, natural resources Interconnections: interdependent, ecological, break down Environmental impact and sustainability: interaction – human and natural, responsible, natural resources, modified, damage, Earth, globalisation, future, habitats Cultural awareness, diversity: lives, communities, similarities and differences, environmental resources |

ART AND DESIGN

Exploring and Developing

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| Exploring and developing ideas | Explore ideas for different purposes. Question and make thoughtful observations. Explore the roles and purposes of artists, craftspeople and designers working in different times and cultures. |
| Evaluating and developing work | Adapt their work according to their views and describe how they might develop it further. Annotate work in sketchbook. |

Printing

| National Curriculum | Additional Skills | Knowledge | Key Vocabulary |
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| -To develop techniques, including their control and their use of materials, with creativity, experimentation and an increasing awareness of different kinds of art, craft and design. -To create sketch books to record their observations and use them to review and revisit ideas -To improve their mastery of art and design techniques, including drawing, painting and collage with a range of materials. | -Talk about the processes used to produce a simple print. -To explore patterns and shape, creating designs for printing. -Experiment with mono printing. -Create repeating patterns using impressed print – press print tiles Interpret manmade and environmental patterns. | -Know that materials need to be selected carefully based on their properties for strength and effect. -Know that a sketchbook can be used to collect ideas. -Know that overlapping, tearing, folding and layering creates images and represents textures. | Rubbing, repeated pattern, environment, colour, shape, mono, impressed, interpret. |

Artist/Style/Activities

Clay Perry: still life painting

Possible 'higher order' questioning

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| Remember | Can you name the functions of each part of a flowering plant? |
| Understand | Can you explain the part that water plays in the life cycle of a flowering plant? |
| Apply | How does photosynthesis work and what is needed for it work? |
| Analyse | Use what you know to explain why only very few plants can survive in the desert. What can you infer from the fact that cacti survive in hot, dry environments? |
| Evaluate | How can you discuss global warming in considering what you have learnt about the life cycles of plants? What could the impact of climate change be on plants? |
| Create | Can you plan an investigation that tests the best conditions for a flowering plant to grow? Can you create your own plant with its own method of seed dispersal? Compare it to others...which do you think would be most effective and why? |

School Value Topic relevance: How/when/where/why is it needed?

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| Resilience | - All living organisms show great resilience in their life cycles - many plants manage to grow in the most unbelievable environments and many animals in the most difficult of habitats. |
| Respect | - We must all show tremendous respect for our environment and all living things no matter how big or small. Our school supports the WWF and Y5 supports the Woodland Trust, to help us recognise the importance of looking after our planet. |
| Responsibility | - We all realise that we have a responsibility to look after our world and that is why we do support the WWF. Our UPS Eco Committee illustrates this responsibility and shows how we can all do our part in the fight against global warming. |
| Happiness | - Looking around at our beautiful natural world and the incredible processes that occur, gives us happiness and reminds us of how important it is to look after it. |
| Pride | - We can be proud of the way we look after our environment through being responsible and respectful. |