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| **Session 3: Hydroponics in the classroom** |
| Science curriculum area **(2P):** | **Plants (2P)**i. observe and describe how seeds and bulbs grow into mature plantsii. find out and describe how plants need water, light and a suitable temperature to grow and stay healthy |
| Working Scientifically (**KS1 WS**) | **Working Scientifically (KS1 WS)** i) asking simple questions and recognising that they can be answered in different waysii) observing closely, using simple equipmentiii) performing simple testsiv) identifying and classifyingv) using their observations and ideas to suggest answers to questionsvi) gathering and recording data to help in answering questions |
| Teaching Objectives | * To share information about the needs of bulbs.
* To discuss hydroponics and the concept of growing bulbs in water.
* To plant a bean in a bag and record its growth.
* To discuss what might happen to the bean and its growth.
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| Key Vocabulary: seed, bulb, hydroponics, water, warmth, nutrients |
| ResourcesImages of hydroponically grown plants, How to grow a bean in a bag**,** real plant bulbs to show chn, beans, paper towel [school ones are ideal] stapler, plastic bag [the A4 sized kind which seals at the top works best], ruler.  | Weblinks<http://www.hydroponics-simplified.com/what-is-hydroponics.html> - *Information for teachers on hydroponics;* <https://www.youtube.com/watch?v=EKx4ZwoJqXY> – *Time lapse of a sprouting bean seed (3 min 26 secs).* |
| Before the session: Collect real plant bulbs and have in a bag.Whole class: Ask the chn to sit down and show them the various bulbs from the bag. Do not let them touch them (in case they cause skin reactions) but show them to the whole class, asking them to look carefully and to guess what the bulb will grow into. Tell them the answers and wonder at how a little bulb can grow into something larger and so different. Ask the chn: *What does this bulb need to start growing? How could we care for this bulb? (Give it water, warmth, nutrients.)* Tell the chn: *We often think that bulbs need soil, because in this country we usually see plants growing in soil. But plants can grow just in water, so long as the water has the right food in it to keep the plants healthy.* Write the word 'hydroponics' on the board, explain that it means 'growing plants in water' and ask the class to repeat the word to themselves, each other and back to you. Ask: *Can you imagine where it would be really useful to be able to grow plants without soil? Especially edible plants? (Cold places with no soil - Iceland, Antarctica -, hot places with no soil - Sahara, Mars.)* Tell the chn that they will be setting up a hydroponics farm in the classroom. Maybe they can imagine they are preparing for life on Mars, in the Sahara or Antarctica. Show them the materials, equipment and resource sheet.  |
| Activities: Model to the class how to make a bean in a bag. Follow the instructions in the resource sheet. Then ask the chn to work in teams to make their own bean in a bag. When they have finished, they may tape the bean onto a window or peg onto a washing line. Ask each child to predict what they think will happen to the bean. Give them the 'My Bean in a Bag Diary' sheets and ask them to fill in the first week. Make a large copy of the 'Bean in a Bag (in a Cupboard) Diary’. Place one bagged bean in a cupboard, talk about what might happen to the bean and its growth. Use the word 'predict' when discussing this. |
| Plenary | Say to the chn: *What have you noticed about our beans? Do you think the beans will grow? What do we predict will happen to the bean in the cupboard?* Watch this time lapse of a [sprouting bean seed](https://www.youtube.com/watch?v=EKx4ZwoJqXY).  |
| Outcomes | Children will* Understand what beans need to grow and discuss the concept of hydroponics
* Set up and plant a bean in a bag, including a system to record its growth
* Predict what might happen to the bean growing in a dark cupboard
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