Year 4 Science Summer 1 Plan - Animals, including humans	
Unit Rationale	**Common misconceptions:**
In Reception, children will have had the chance to plant and grow seeds, e.g. runner beans or sunflowers. In Year 1, they have learned to label the basic structure of a plant and to identify some common plants and trees. This unit continues the learning journey to focus on how seeds and bulbs grow into mature plants and what they need to thrive. Spring 2 was chosen as it is a time where new growth is evident in our outdoor environment and there is increased daylight to encourage growth in the classroom.	Some children may think: • plants are not alive as they cannot be seen to move • seeds are not alive • all plants start out as seeds • seeds and bulbs need sunlight to germinate.
National Curriculum Objectives	**Cross Curricular Links:**
• Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Explorify activities e.g.: Three Weeds Odd one out - https://explorify.uk/en/activities/odd-one-out/three-weeds Plant Take-Away What's going on? https://explorify.uk/en/activities/odd-one-out/three-weeds How does your garden grow? Mission SUrvive: https://explorify.uk/en/activities/mission-survive/how-does-your-garden-grow Super Seeds What's going on? https://explorify.uk/en/activities/whats-going-on/super-seeds LYFTA: 360 video of planting trees in the desert https://teacher.lyfta.com/search/360/preview/1726
Disciplinary Knowledge: Working Scientifically	**Substantive knowledge:**
	• The four stages of a bulb growing:

	○ the roots growing, the shoot appearing, the shoot growing up into a stem with leaves that form around it • That the inside of a bulb and seed are different • That seeds need water and warmth to germinate but NOT light or soil. • That plants need light to grow healthily. • Plants need water to grow and survive. • Plants need warmth to grow healthily.
Trips and Visits	**Modern Day Links: STEM**
Scadbury Woods Park Coolings Garden Centre Visit to allotments Local florist	STEM careers in horticulture, e.g.: Landscape Scientist Environmental Scientist Plant Breeder Soil Scientist. Garden Centre plant manager Florist Environmentalist School groundskeeper team
Prior learning:	**What next?**
• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)	• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants) • 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. (Y3 - Plants) • Investigate the way in which water is transported within plants. (Y3 - Plants) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)

Lesson	WALT	What should the children remember?	Lesson plan and outcome	Key Vocabulary	Key Questions
Lesson 1	**WALT: Observe and describe how seeds and bulb grow into mature plants** **Resources:** Sunflower seeds (avoid beans as these are used in year 1) Pots/yoghurt pots etc for planting in Soil **Enquiry skills/Working scientifically** Observing over time	The four stages of a bulb growing: the roots growing, the shoot appearing, the shoot growing up into a stem with leaves that form around it	**Organisation:** For this lesson each child will need a pot of some sort, soil and a sunflower seed. You will need to find a space to grow them in the classroom throughout the half term. You may wish to plant some extra seeds in case any seeds do not germinate to avoid disappointment! Alternatively, you may wish to just plant one seed as a class plant if space may be difficult. **Retrieval:** (SLIDE 3 and 4) **Main part:** (SLIDE 6) Explain that we will watch seeds grow over the course of the half term. Explain that we also need to observe and describe how bulbs grow but that this is not the best time of year for that. (SLIDE 7-11) watch the video links below. After watching them through once, ask the children to describe how the bulbs grew. It may be necessary to watch it again and pause at points to discuss with children what they can see happening. https://www.youtube.com/watch?v=M9mnMxTOZXU https://www.youtube.com/watch?v=W2Yrj7LNTtY (good to show initial and later stages and how the leaves 'peel back' as flower comes through)	**seeds** **bulbs** **shoot** **stem** **leaves** **flower** **growth**	**Which words do you already know?**

			The main stages of a bulb growing are: the roots growing, the shoot appearing, the shoot growing up into a stem with leaves that form around it (on bulbs the leaves come from the base, not at points along the stem) and the flower growing from the top of the stem as the leaves fall outwards. Elicit this from the children's observations. **Task:** (SLIDE 12) Children draw the 4 stages of a bulb growing into a mature plant with descriptions of what happens at each stage. **Adaptations:** To support children, keep the video playing on loop. They may be expected to just draw the stages and to label with some key words rather than write sentences about what is happening. To challenge children, they may be expected to write a more detailed description of what they can see happening. **Task 2:** (SLIDE 13 and 14) Explain that you are now going to plant a seed which you will watch grow over the course of the half term. We will keep a plant diary to record its growth each week. This will be returned to at the start of each lesson for the rest of the half term. **Quiz:** (15 and 16) Quick quiz to recap learning.		

Lesson 2	**WALT: investigate what is inside a seed and bulb.** **Resources:** Soaked bean seeds (1 per pair) Bulb (one per table) Knife Hand lenses **Enquiry skills/Working scientifically** Making observations, making predictions,	That the inside of a seed and bulb are different	**Organisation:** Broad bean per pair, bulb per table. The broad beans MUST be soaked for a few hours before cutting otherwise it is very difficult. This will need to be done with a knife prior to the start of the lesson for them. Hand lenses for looking closely at the seeds Begin lesson by looking back at the sunflower seed that was planted last week and complete seed diary. **Retrieval:** (SLIDE 3 and 4) **Odd one out**: (SLIDE 7) Children to discuss in pairs what they think before writing in their book which one they think is the odd one out and why. This will be revisited at the end of the lesson. Children will do this in trios - 2 discuss the odd one out and 1 will report back - summarise what was said. Which one do you think is the odd one out? Explain your thinking.  **Main part:** (SLIDE 8) Give children seeds and bulbs to observe. Discuss what they think is inside each of them (SLIDE 9) Children draw what they think the inside of each will look like in their books. This will be their prediction. (SLIDE 10)Now give children soaked broad bean seeds split in half. Discuss what they can see and what they think each	water, space, grow, healthy, bulb, germinate, shoot, seedling,	**What are seeds and bulbs?** **What do you think is inside a bulb/seed?** **Do you think the inside will be similar or different?**

			part is. (SLIDE 11) Share the seed diagram with them and discuss the function of each part. Children do not need to know the scientific names of these parts. Seed coat, food store and embryo/baby plant will do for Year 2. (SLIDE 12) Ask the children to label the inside of the seed they cut open. (SLIDE 13) Now give children the bulb split in half. Discuss what they can see and what they think each part is. (SLIDE 14) Share the bulb diagram with them and discuss the function of each part. Children do not need to know the scientific names of these parts. (SLIDE 15) children label the inside of the bulb they have cut open. (SLIDE 16) Explain how scientific diagrams differ to drawings in that they are simplified and clearly show each part. Model drawing your own diagram of a seed and bulb with labels. **Task:** (SLIDE 17) Children to draw their own scientific diagrams with labels. (SLIDE 18 and 19) Quick Oracy session to recap key point about the difference between seed and bulb)		

			Task 2: (SLIDE 20) Return to the odd one out from the start of the lesson and discuss it as a class. Give children time to review their first answer and to green pen it to make changes/add detail. **Quiz:** (SLIDE 21 and 22)		
Lesson 3	**WALT: investigate what seeds need to germinate** **Resources:** Bean seeds (1 per pair) Pots Soil Tissue/cotton wool Hand lenses **Enquiry skills/Working scientifically** Making observations, making predictions, comparative and fair testing	That seeds need water and warmth to germinate but NOT light or soil.	**Organisation:** bean seeds (they're large so you can see the shoot easier), soil, cotton wool/tissue, small plastic pots/cups. This lesson will need to be taught near the beginning of the week and the seeds revisited at the end of the week. **Retrieval:** (SLIDE 3 and 4) (SLIDE 5) complete seed diary from first week. **Vocabulary:** (SLIDE 7 and 8) introduce and explain germination and shoot **Main part: Oracy** (SLIDE 9) children to discuss what they think seeds need to germinate. Make sure children know we are focusing on germination, NOT growing into a healthy adult plant. Children talk in groups. Give each child 2 talk tokens. Each time they speak, they put the talk token into the middle of the table. (SLIDE 10) Feedback ideas and record on flip chart. (SLIDE 11) Children to then write a short prediction in their books about what things they think a seed will need to germinate. Model doing this with the children first. (SLIDE 12) Explain investigation to children. See if they can come up with the 5 different growing conditions that they		

			will need to set up before showing them the next slide. (SLIDE 13) The growing conditions: 1. Soil, light, water and warmth 2. Cotton wool, light, water and warmth 3. Soil, dark, water and warmth 4. Soil, light, NO water and warmth 5. Soil, light, water and cold Children to then use this screen to help them set up the growing conditions. **Quiz:** (SLIDE 14 and 15) **Part 2 of lesson:** To be completed at some point after the first part of the lesson, when the seeds have begun to germinate. (SLIDE 16) Remind children what you did a few days prior. Get them to look at the seeds and talk about what they can observe. As a class, elicit what it is that seeds need to germinate and what doesn't seem to affect germination. You could take a picture of the seeds that could be stuck in their books as part of their results. You would need to do this prior to the lesson so that it is ready to stick in. (SLIDE 17) Children to then write a short explanation of their results in their book. Teacher to model writing this first.		
Lesson 4	**WALT: investigate how**	That seeds need light to grow	**Organisation:** cress seeds, soil, small plastic pots/cups. This lesson will need to be taught near the beginning of the		

	lights affects how healthily a plant grows **Resources:** cress seeds pots soil **Enquiry skills/Working scientifically** Comparative test making observations, making predictions, comparative and fair testing	healthily. That plants can grow without light but they won't be healthy and likely won't survive.	week and the seeds revisited at the end of the week or at the start of the next lesson. **Retrieval:** (SLIDE 3 and 4) **Main part:** (SLIDE 6) Explain that we will be investigating what plants need to grow healthily over the next few weeks and that this week will be focussing on light. (SLIDE 7) **ORACY** CHildren to discuss what they think plants will look like if grown in the dark vs in the sunlight. Discuss in trios - two discuss, one listens and summarises what the other two have said. (SLIDE 8) Use the discussion ideas to model writing a prediction using the sentence stems. Children to then write what they think the plants will look like after being kept in the light or dark. (SLIDE 9) Children to plant cress seeds. Ensure that they only sprinkle the cress seeds on top of the soil and do not bury it beneath the soil. (SLIDE 10) Vocabulary cards - play matching pairs to test children's vocabulary. You could also play taboo depending on how much time you have. This part of the lesson is to be completed later in the week, when the seeds have started to grow. (SLIDE 11) Revisiting the seeds later in the week to see what has happened. Look at the plants and discuss what has happened as a class. Were the children surprised by anything? Children to then write down what has happened and to draw an observational drawing of both plants.		

			The cress in the dark are likely to be paler in colour or more yellow and will be much taller/longer but with smaller leaves. This is because the plant believes it is still under the soil and is trying to grow tall to reach the sunlight so it uses all the energy it has on growing taller rather than its leaves.		
Lesson 5	**WALT: investigate how plants need water to grow healthily** **Resources:** **Enquiry skills/Working scientifically** Comparative test making observations, making predictions,	Plants need water to grow and survive.	**Organisation:** cress seeds, soil, small plastic pots/cups. This lesson will need to be taught near the beginning of the week and the seeds revisited at the end of the week or at the start of the next lesson. **Retrieval:** (SLIDE 3 and 4) **Main part:** (SLIDE 6) Explain that we will be investigating what plants need to grow healthily over the next few weeks and that this week will be focussing on water. (SLIDE 7) **ORACY** Children to discuss what they think plants will look like if they are not watered. Discuss in trios - two discuss, one listens and summarises what the other two have said. (SLIDE 8) Use the discussion ideas to model writing a prediction. Children to then write what they think the plants will look like after either being given water or no water. (SLIDE 9) Children to plant cress seeds. Ensure that they only sprinkle the cress seeds on top of the soil and do not bury it beneath the soil. Discuss how you need to give both sets of seeds water to start of with so that they germinate but that once it's started growing, you will not water one of them. (SLIDE 10) Vocabulary cards - play matching pairs to test		

			children's vocabulary. You could also play taboo depending on how much time you have. (SLIDE 11) Revisiting the seeds later in the week to see what has happened. Look at the plants and discuss what has happened as a class. Were the children surprised by anything? Children to then write down what has happened and to draw an observational drawing of both plants. **Adaptations:** Continue to give sentence stems to BAR children. Extend more able children to explain their predictions using their current knowledge.		

Lesson 6	**WALT: investigate the best temperature for a plant to grow healthily** **Resources:** **Enquiry skills/Working scientifically** Comparative test making observations, making predictions,	Plants need warmth to grow healthily.	**Organisation:** cress seeds, soil, small plastic pots/cups. This lesson will need to be taught near the beginning of the week and the seeds revisited at the end of the week or at the start of the next lesson. **Retrieval:** (SLIDE 3 and 4) **Main part:** (SLIDE 6) Remind children that we have been investigating what plants need to grow healthily and that this week will be focussing on temperature (SLIDE 7) ORACY Children to discuss what they think plants will look like if they are kept in different temperatures. Discuss in trios - two discuss, one listens and summarises what the other two have said. (SLIDE 8 and 9) Use the discussion ideas to model writing a prediction. Children to then write what they think the plants will look like in a cool, warm and hot position. (SLIDE 10) Children to plant cress seeds. Ensure that they only sprinkle the cress seeds on top of the soil and do not bury it beneath the soil. Discuss how you need to give both sets of seeds water to start of with so that they germinate but that once it's started growing, you will not water one of them. (SLIDE 11) Vocabulary cards - play matching pairs to test children's vocabulary. You could also play taboo depending on how much time you have. (SLIDE 12) Revisiting the seeds later in the week to see what has happened. Look at the plants and discuss what has happened as a class. Were the children surprised by anything? Children to then write down what has happened **Ambition Collaboration Fairness Respect**		

			and to draw an observational drawing of both plants. **Adaptations:** Continue to give sentence stems to BAR children. Extend more able children to explain their predictions using their current knowledge.		