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Learning Scientific Skills Outside the Classroom

Scientific Skills

Observing	Identifying and Classifying Specific skill – comparing flowers	Recording
Country of Origin	Suggested Age Range	Suggested Theme
UK	9 – 10	Plants

Location outside the classroom	Benefits of using this location
An area where there are flowering plants in the school grounds	There are flowers for the children to observe

Learning Objectives – Scientific Skills	Learning Objectives – Knowledge
To make careful observations of flowering plants To compare the reproductive organs of flowering plants To record their observations	To know that some plants reproduce by sexual reproduction To know that there are male and female reproductive organs in a flowering plant To locate and name the reproductive organs in a flowering plant To develop an understanding of sexual reproduction in plants

Key Vocabulary

Scientific skills vocabulary – observe, observing, compare, comparing, similar, different, record, recording
Knowledge vocabulary – flower, life cycle, reproduction, sexual, germination, pollination, fertilisation, offspring, male, female, stem, receptacle, petal, sepal, stem, pollen tube, anther, filament, ovule, ovary, style, stigma, carpel, nectar, gametes, fusion

Resources / Equipment

- Equipment to observe flowers – magnifying glasses, flowering plants
- Resources for scavenger hunt - envelopes containing information on: stem, receptacle, petals, sepal, stamen, anther, filament, pollen, carpel, stigma, style, ovary and ovule.
- Equipment to record observations – flowers to dissect (for example tulip and lily), tweezers, white paper, pencil, glue or sticky tape

Teaching activities including differentiation

Children will have previous knowledge of the life cycle of plants including germination and pollination.

Explain - Plants are essential to every living thing and are all around us.

Discuss – How do plants continue to live and grow? They need to reproduce or they will become extinct but how do they do this? What is the life cycle of a plant?

Explain – The life cycle of a plant is: Germination – Plant Growth – Pollination – Fertilisation – Seed formation - Seed dispersal – Germination. To complete the life cycle, a plant must reproduce and produce offspring. Plants can do this in two different ways:

- Asexually – requires 1 parent which produces an exact copy of the parent plant.
- Sexually – requires 2 parents and the fusing of male and female sex cells (gametes) and produces offspring which are not identical to the parent.

Explain – They are going to explore sexual reproduction in plants and observe the features of a plant involved in sexual reproduction.

Discuss – Show children a diagram of a plant. What parts of the plant can they label? What is the function of this part?

Activity – In pairs, children look at the plant diagram and discuss what different parts they can name and their function.

Discuss – What parts of the plant do you know? *(This provides an opportunity to assess their current knowledge and correct any misconceptions the children have before you continue the lesson).*

Explain – A flowering plant has many different parts which are involved in sexual reproduction, each of these parts has a specific function.

- Watch a video which clearly shows the process of sexual reproduction in plants.

Discuss – What do you know about sexual reproduction in plants? What is the process of sexual reproduction?

Explain – They are going to do a scavenger hunt in the school grounds in small groups. They will look for envelopes which contain the parts of a flowering plant and their correct definition. They will use this information to help them label an enlarged diagram of a flowering plant. (Each group will need to have a complete set of plants parts and a diagram of a plant.) The envelopes will contain information about: the stem, receptacle, petals, sepal, stamen, filament, anther, pollen, carpel, stigma, style, ovary and ovule.

Activity – Children complete their scavenger hunt and use the information found to label a plant diagram.

Discuss – The different parts of the flowering plant and their function.

Explain – They are now going to closely observe real flowering plants to look for evidence of the different parts discussed today.

Activity - Children use magnifying glasses to carefully observe flowering plants in the outside area and think about the similarities and differences between these parts in the flowers they observe.

Compare – Do the parts look the same in every plant? What is the same? What is different?

Explain – They are going to dissect two different flowers, a tulip and a lily, and identify the different parts in these plants.

Demonstrate - Show them how to start at the base of the flower and remove the sepals first using tweezers or their fingers and then carefully pull apart the remaining parts.

Record – Pupils record their observations by sticking each part of their plant onto a piece of paper and correctly labelling each part.

Compare – Do the parts look the same in the lily and the tulip? How are they different? Was one flower easier to dissect than the other? Were some parts easier to identify in one flower than the other?

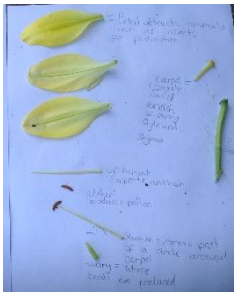
Discuss – Why do the parts of a flower vary in appearance amongst different flowers?

Examples of children's work and teacher comments from country of origin

Pupils enjoyed the practical aspect of the lesson. They found that on some flowers it was easy to recognise the reproductive parts whereas on others they were much harder to identify. This observation enabled pupils to understand that although flowers have the same parts, there is still great diversity amongst them.

An extension to this lesson would be to identify whether there are the same number of petals/sepals/stamens/carpels on each flower? Is there a pattern based on the flower's location or pollination method?

Using resources they find outside, can they create their own flower using different materials to represent the parts of the flower.



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