

Meden School Curriculum Planning							
Subject	Biology	Year Group	9	Sequence No.		Topic	

Retrieval	Core Knowledge	Student Thinking
What do teachers need retrieve from students before they start teaching new content ?	What specific ambitious knowledge do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!'
<p>KS1 year 1: Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>KS1 year 2: Observe and describe how seeds and bulbs grow into mature plants</p> <p>KS2 years 3 & 4: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>KS2 years 5 & 6 Describe the life process of reproduction in some plants - pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants,</p>	<p>L1: Be able to identify the anther and filament as male parts of a flower and recall that pollen is the male gamete (sex cell) and is made by the anther. Be able to identify that the stigma, style and ovary are the female parts of a flower and that the female sex cell is the egg/ova, which are produced in the ovary.</p> <p>L2 Know that pollination is the transfer of pollen from the anther of one flower to the stigma of another flower. Know that pollination can be carried out by insects or by wind. Recall some differences in flowers that are wind or insect pollinated. Know that insect pollinated plants contain nectaries which is what attracts insects to them as this is a source of food. Students should know that insects do not deliberately collect pollen.</p> <p>L3: Students to know that fertilisation happens after the pollen has landed on the stigma. A pollination tube forms and grows down the style to the ovary, the pollen grain will move down the tube and meet an egg/ova. Fertilisation happens when the nuclei of the pollen and ova fuse together and an embryo is formed. The embryo is contained within a seed.</p> <p>L4: Students should know the meaning of the term 'seed dispersal' and be able to describe several methods that some plants have adapted to disperse their seeds as far as possible, including; wind, air, water and animals. Students should know the advantage of seed dispersal to a plant species is that it increases the likelihood individuals will survive and reproduce themselves, thus ensuring continuation of the species. This is due to the fact that dispersal can reduce competition for space and resources such as light, nutrients in the soil and water.</p> <p>L5: Students should know the structure of a leaf in cross section, identifying the layers of tissue from the cuticle, upper epidermis, palisade mesophyll, spongy mesophyll, vascular bundle/vein, lower epidermis, cuticle, guard cells and stomata. Students should know the following functions: the cuticle is waxy and waterproof to prevent water loss from inside the plant; the epidermis is thin and contains no chloroplasts, this means it is transparent and will allow all light through to the palisade layer; the palisade cells are adapted for photosynthesis (more on this in lesson 7) by being tightly packed in columns and containing many chloroplasts. Chloroplasts contain a pigment called chlorophyll which absorbs the light needed for photosynthesis; spongy mesophyll contains air</p>	<p>L2: Decline in bee numbers and the effect it could have on the ability of people to feed themselves. This differs in different locations around the world.</p> <p>L10: the importance of plants in food production, in or out of a greenhouse. Links with importation/exportation and ability to provide adequate food for all citizens. Links with food production in hot climates where water is scarce.</p>

<p>KS3 Y7 Reproduction: Sexual reproduction requires cells from 2 parents</p>	<p>spaces which allows the diffusion of carbon dioxide into the leaf and oxygen and water vapour out of the leaf; vascular bundles are specialised cells that allow transport of water & minerals and sugars around the plant; stomata are small pores (holes) that allow gas exchange; guard cells surround the stomata and control whether they are open or closed</p> <p>L6: Students investigate the location of stomata on the upper and lower surface of a leaf. Students compare the number on the top and bottom, there should be a lot more on the bottom; explain why there are less stomata on the top and how that helps to reduce unnecessary water loss.</p> <p>L7: Students to learn the word equation for photosynthesis is carbon dioxide + water – oxygen + glucose. Students should know that the glucose made provides ‘food’ for the plants as they cannot eat. Students should know the carbon dioxide comes from the air and enters into the leaf via stomata; the water comes from the soil and is absorbed by the roots; the process of photosynthesis takes place in the chloroplasts, light and chlorophyll are needed for this to happen; the glucose and oxygen are used in respiration (full details in lesson 9) to release energy for growth; excess oxygen is released into the air through the stomata. Students should recognise that photosynthesis can only happen with light, so does not occur at night unless there is artificial lighting in place. Students should know that any excess glucose, which is soluble, is stored as larger, insoluble starch molecules in the leaves.</p> <p>L8: Students should investigate the production of starch in leaves. Teacher to choose the most appropriate practical for the class. All should be able to carry out the practical to remove chlorophyll from a leaf using ethanol as a solvent and then carry out the iodine test to look for the presence of starch in the leaves. Students should know that iodine changes from an orangey-brown colour to a blue-black in the presence of starch.</p> <p>L9: Students to know that plants also carry out aerobic respiration to release energy for life processes (remind of MRS NERG). Students should know the word equation for aerobic respiration is glucose + oxygen – carbon dioxide + water. This process happens in the mitochondria of plant cells. Students to know that plants may lack oxygen in waterlogged soils, so may be able to respire anaerobically – without oxygen. The word equation for this is glucose- ethanol + carbon dioxide. Most plants can only do this for short periods; plants that permanently live in boggy, wet areas usually have adaptations to increase the amount of oxygen they can get.</p> <p>L10: Students to know that light intensity, temperature and carbon dioxide concentration can all limit the rate of photosynthesis. Students to analyse how an horticulturalist will utilise greenhouses to maximise the rate of photosynthesis and be able to describe how features of a greenhouse help to control the conditions. Windows to release heat energy and allow air flow to provide carbon dioxide; made of glass – transparent to allow in maximum amount of light for photosynthesis; use of a paraffin heater in winter to provide adequate warmth and additional carbon dioxide from combustion; use of artificial lights to extend the growing season.</p> <p>L11: Revision</p> <p>L12: End of Topic Test and GPA.</p>	
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