

(Jackdaws) - (Paper 1 Entry Level Science)

Key Stage/Year	KS4 - Year 10
Approximate Number of Lessons and Term	9 lessons teaching plus two lessons for revision and 1 lesson for the assessment and 1 lesson for feedback. All lessons are on Google Classroom.
Qualification/Exam (if applicable)	Paper 1 Entry Level Certificate

Consideration of prior learning	Some students have gaps in their learning due to lack of engagement in previous school settings and their ability to access the curriculum through reading is also limited. Students have also struggled to engage in the lesson at KS3. Some students have studied this material previously but due to gaps in knowledge I have decided to repeat this course in order to consolidate understanding of the work.
How will learners' knowledge, skills and understanding be checked at the start of the unit?	Class discussion about how we are all made of cells and questioning of what students think the function of the cells are. Question about DNA and why we have it in our cells and what chromosomes are and what they do. This should be memory recall for some students but will be completely new to other students.

How will learners' knowledge, skills and understanding be checked at the end of the unit?	Two options. Students will take the end of topic assessment to assess their understanding and to help with their revision. Students will then sit the assessment for the entry level certificate.
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Learning Outcome	Potential Activities	Behaviour/Safety/Personal Development/SMSC Opportunities
1A.1 Describe the functions of the: (a) nucleus (b) cell membrane (c) cytoplasm in animal cells	Use the models of the animal cells to illustrate the different parts of the animal cell. Encourage students to hold the models and 'test' each other on the names of the different parts of the cell.	
1A.2 Describe the functions of the: (a) nucleus (b) cell membrane (c) cytoplasm (d) chloroplast in plant cells	Use the models of the plant cells to illustrate the different parts of the plant cell. Encourage students to hold the models and 'test' each other on the names of the different parts of the cell. Summarise the key similarities and differences between an animal and a plant cell.	
1A.3 Describe how growth takes place in organisms by: (a) cell division in animals and plants (b) cell elongation in plants	Diagram of each to show different stages of cell division and compare like for like at each stage.	
1A.4 Describe the importance of cell differentiation in the development of specialised cells		
1A.5 Describe how the following specialised cells are adapted to their function: (a) sperm cells (b) egg cells (c)	Use models/diagrams of sperm cells and egg cells and compare features of each cell to its function and how it helps the cell in reproduction. Name the	Cell diagrams powerpoint. Can be a trigger for some students due to its sexualised nature.

nerve cells (d) muscle cells	key features of a nerve cell and a muscle cell and again look at the key features and its function and how this helps the cell.	
1A.6 Recall the function of: (a) embryonic stem cells to differentiate into all cell types (b) adult stem cells to maintain and repair the body	Use powerpoint to explain the key differences.	Ethics of stem cells.
1A.7 Recall the functions of the following nerve cells: (a) sensory neurones (b) relay neurones in the spinal cord (c) motor neurones	Use microscope to show slides of each cell. Compare to a computer as an analogy with an input, a decision and an output.	
1A.8 Describe the role of neurotransmitters in allowing an impulse to cross a synapse	Diagram showing the ions crossing the synapse and explain the stages.	
1A.9 Recall the function of the myelin sheath to insulate neurones		
1A.10 Describe the processes involved in a reflex arc, including: (a) receptor cells detecting a stimulus (b) the path taken by the impulse through sensory, relay and motor neurones (c) the impulse arriving at the effector	Compare to a computer as an analogy with an input, a decision and an output. Practise drawing a simple flow diagram to illustrate the key stages.	
1A.11 Recall the structure of DNA as: (a) two strands (b) coiled to form a double helix	Use straws and marshmallows or DNA kits or origami to build DNA strands and illustrate amino	

	acids.	
1A.12 Recall that: (a) DNA is found in a cell's nucleus, packaged into chromosomes (b) each chromosome contains several genes (c) a gene is a section of a DNA molecule (d) a gene contains the information needed to make a protein	Videos from the Amoeba Sisters on Youtube. Stop at key parts and illustrate in order of magnification.	
1A.13 Define the terms allele, dominant and recessive	Talk about characteristics of dogs, coloured eyes and relate to certain characteristics being dominant over other characteristics.	This could be a trigger for certain students about skin colour et cetera.
1A.14 Use genetic diagrams and Punnett squares to show monohybrid inheritance	Look at a case study such as eye colour or relate it to current events, e.g. pumpkins at Halloween. Encourage students to complete squares on their own.	
1A.15 Recall that a person's sex is determined at fertilisation by the inheritance of an X chromosome from the mother, and either: (a) an X chromosome (in girls) or (b) a Y chromosome (in boys) from the father	String shoelaces (sweets) can be used to illustrate how chromosomes separate if a more able class.	Trigger as some students will identify as different genders and this may create a discussion about how people identify and why.
1A.16 Recall that differences in characteristics within organisms in a species is called variation	Study of dogs and variation of characteristics in breeds.	

<p>1A.17 Describe genetic variation as the variation that arises because organisms inherit different combinations of alleles from their parents</p>		
<p>1A.18 Recall that genetic variation mostly occurs because of small changes to the structure of DNA, known as a mutation</p>	<p>Talk about examples of good and bad mutations.</p>	<p>Beaware that some students will find this a trigger as some mutations can be harmful.</p>
<p>1A.19 Describe environmental variation as the variation that arises because an organism's environment makes it develop different characteristics</p>	<p>Look at case studies such as hawk moths either being mottled brown or a solid colour and how this affected their survival and ability to reproduce.</p>	
<p>1A.20 Explain Darwin's theory of evolution by natural selection</p>	<p>Talk about Darwin and his discoveries and case studies such as bird beak shape and how they accessed food as a result. Encourage students to look at a particular case study and report back to other students.</p>	
<p>1A.21 Describe the process of selective breeding, including: (a) producing wheat that is resistant to disease (b) producing cows with a high yield of milk</p>	<p>Case studies from text book - simple flow charts drawn in books to illustrate process.</p>	
<p>1A.22 Describe genetic engineering as a process that involves modifying the DNA of an organism to introduce</p>	<p>Case studies from text books. Can also look also at recent studies such as 'glow fish' or goats that produce spider proteins in milk.</p>	<p>Ethics - cosmetic, designer babies versus illness eradication.</p>

desirable characteristics		
1A.23 Describe the benefits and risks of genetic engineering	Case studies from text book such as Atlantic Salmon.	Ethics such as having a baby to save another baby.

Possible Adaptations for Higher and Lower Achievers	See challenge for each objective as this will apply to high achievers. Also work from Foundation GCSE courses can be used. Low achievers can use Entry Level Certificate material as well as revise Key Stage 3 work relevant to the topic.
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