Assessment Schedule – 2020

Biology: Demonstrate understanding of trends in human evolution (91606)

Evidence Statement.

Question One

Evidence	Achievement	Merit	Excellence
Skull trends include: • Increased cranial capacity, e.g. approximately 700 cc difference from the oldest to the most modern 1350cc. • Changes in diet bring about change in teeth, sagittal crest. • Diminished brow ridge possible as less stresses during chewing. • Decreased zygomatic arch, as the selection pressure of having the muscles for chewing are lessening. • Decreased prognathism / muzzle-like. • Increased frontal lobe selected for with increased expression, memory, judgement, which would have made communication clearer and hunts and relationships more successful. Selection pressure could include: loss of forest, ability to catch food, working in teams, communicating, avoiding predators, sexual selection, tool production, use of shelter etc Fossils can be used to infer lifestyle, as lifestyle can be selection agents on the form of the hominin. One aspect is the diet of the hominin – scientists can infer if they are eating a lot of plant or meat matter, due to bone density and the amount of bone for muscle attachment. Communication can be inferred with brain capacity and frontal lobe, as the regions associated with speech are known. Locomotion can be inferred by the position of the foramen magnum for angle that the spinal cord enters the brain. Success to the species could be, for example, the trend may be inferring more meat, less plant, and this gives more energy to the brain – this increases brain capacity and we can think of more solutions for health / survival. If the link is to locomotion, then less energy needed for travelling long distance, so more health / survival, as get to travel to new habitat and have energy for other things, such as mating, hunting. If trend is linked to communication, the bonds and knowledge between members of the group are better, and more support can be offered / taken. • All lead to increased reproductive success and the ability to pass on favourable alleles more often successfully.	Describes a trend seen in the fossils (two max only): • increased cranial capacity • diminished brow ridge • decreased zygomatic arch • decreased prognathism • increased frontal lobe • decreased saggital crest • FM centered • reduction in teeth / molar size. Selection pressures named: • loss of forest • change in diet (tough fibrous to meat / softer foods. • selection for increased communication / teamwork / predator avoidance / shelter sourcing / tools • mate selection. Advantages to lifestyle given: • see further due to height • more teamwork • more meat for energy / iron.	• **Links** change in fossil feature of named hominin to how a named selection pressure / lifestyle resulted in this change. • **Links** change (2nd) in fossil feature of named hominin / group to how a named selection pressure / lifestyle resulted in this change. • Explains how the named trend results in success to the species.	• Discusses how selection pressures have modified skulls in named hominins / image over 4 my, linked to lifestyle of the group, linked to the success of the species. • Discusses how specific selection pressures have modified skulls in specific named features of the skull in named hominins over 4 my, linked to lifestyle of the group, linked to the success of the species. • *(All lead to increased reproductive success and the ability to pass on favourable alleles more often successfully, thus the success of the species)*

Not Achieved			Achievement		Merit		Excellence	
NØ = no response or no relevant evidence.	N1=1A	N2=2A	A3=3A	A4=4A	M5=2M (two trends)	M6=3M (all of the above)	E7=Two trends fully discussed	E8=Two trends fully discussed (includes reproductive success)

Question Two

Evidence	Achievement	Merit	Excellence
Biological evolution is where the changes passed on through generations are through DNA changes, whereas cultural evolution is where changes are passed on through learning. Stone tools are manipulated stone pieces, used for a purpose. Use began approx. 2.2 mya with the *Homo habilis* using tools that worked only on one side and could serve uses such as bone bashing, digging or scraping for termites. Tools were used to more effectively catch prey and obtain food. The advantages are many, but would involve better protection, use for building shelter, use for getting (killing) and processing food. The advantage is health, increased reproductive success, selection for bigger brains and better communication, as well as the ability to feed a larger group. For example, access to new foods would increase the fat intake, leading to better reproductive success. The hand structure (change in thumb length, smaller straight fingers) gave more of a precision grip than before. Broca's (speech) & Wernickes (comprehension) linked to advanced tool making OR art. Art benefits to society could be bonding / learning / sharing of ideas and tools, which would mean better health (including mental health), protection, habitat changes (i.e. shelter).	• Describes cultural / biological evolution. • Describes stone tools as those tools made for a purpose. • Describes art benefit to *Homo sapiens*. • Describes an advantage of stone tools. • Describes one of Broca's, Wernicke's. • Describes a change in the hand structure, e.g. precision grip, shorter fingers, change in thumb length / full opposability.	• Explains a difference between biological and cultural evolution (both needed). • Explains how the Broca's / Wernicke's area would lead to more advanced tool making OR art. • Explains a clear advantage of stone tools, e.g. getting untapped foods from underground, making clothes, fighting predators. • Explains a clear advantage of art e.g. teaching hunting methods. • Explains the change in hand structure for example mentioning a shorter thumb / more precise grip which gave greater manipulative ability to produce finer tools (named) / art instruments (named).	• Gives a thorough discussion showing understanding of the biological and cultural evolution through understanding of the changes to the hand and brain (both Broca's and Wernicke's) and the impacts this had on tool production, leading to named benefits to society. • Gives a thorough discussion showing understanding of the biological and cultural evolution through understanding of the changes to the hand and brain (both Broca's and Wernicke's) and the impacts this had on art, leading to named benefits to society.

Not Achieved			Achievement		Merit		Excellence	
NØ = no response or no relevant evidence.	N1=1A	N2=2A	A3=3A	A4=4A	M5=2M	M6=3M	E7=1E	E8= 2E

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Question Three

Evidence	Achievement	Merit	Excellence
Domestication of plants and animals began when groups learned how to regulate / know about the seasonal and reproductive cycles. Sheep / goats and cattle were domesticated 11 000 and 10 000 years ago respectively. Sheep / goats provided meat and wool. More meat provides more protein for digestion into amino acids for humans to build their own proteins. Cows would offer milk for young as lactase persistence was selected for. Use of animals reduced the energy and effort for the *H. sapiens* by ploughing etc. Settlements develop when groups stop being nomadic and occupy a more constant dwelling place. Towns begin. There are advantages, such as being able to share workload / job specialisation / security / companionship and less space is required for more nutrient-filled foods that are artificially selected. There are disadvantages however; agricultural / horticultural activities require intensive labour, whereas hunter gatherer lifestyles provide more free time, but require a larger range of area and nomadic lifestyle. But as humans trade labour for food, and commerce establishes, the health of humans decreases. Settlements are at greater risk of infectious disease and famine, as reliance on a smaller pool of less varied resources in a smaller area increases.	Describes use of domestication and settlements through: • first benefit of animal / plant, e.g. goats can be milked for food / regular food supply • second benefit of animal / plant, e.g. cattle can be bred and some eaten / less energy used than hunting • benefit of a settlement, e.g. less energy needed to keep looking for shelter • benefit of a settlement, e.g. people can begin to specialise in their jobs • cost of a settlement, e.g. there is less room between people, more disease sharing / attract pests / increase chance of conflict • cost of a settlement, e.g. food may be less varied due to less hunter-gathering • how health is affected e.g disease / famine etc.	Explains the effect on humans of domestication and settlements through: • the advantage of having domesticated animal / plant due to a constant / ready supply of protein / high nutrient value • another advantage domestication of animal / plant is the increased energy efficiencies of cattle and sheep – wool, meat or milk or use of animal labour e.g to plough etc (must be explained) • benefit of settlement e.g show agriculture advantaged modern humans in settlement due to role specialisation (must be explained) • how health in settlements could be affected due to increased risk of disease transmission due to close proximity of people / animals • Other costs in the establishment of settlements greater risk of famine due to reliance on monoculture / increase in population could lead to increase in conflict due to competition.	Discusses the effect on health of domestication and settlements through: • discussion of **domestication** of named species and settlements with evaluation noting links to both the costs and benefits of agriculture and links to health • development of **settlements** linked to advantages and disadvantages to health but ultimately the benefits outweigh the costs.

Not Achieved			Achievement		Merit		Excellence	
NØ = no response or no relevant evidence.	N1=1A	N2=2A	A3=3A	A4=4A	M5=2M (1 cost + 1 benefit)	M6=3M (2 costs + 1 benefit or vice versa)	E7=1E	E8= 2E

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 7	8-13	14-18	19 – 24