

Assessment Schedule – 2024**Biology: Demonstrate understanding of trends in human evolution (91606)****Assessment Criteria**

Achievement	Achievement with Merit	Achievement with Excellence
<p><i>Demonstrate understanding</i> involves:</p> <ul style="list-style-type: none"> • using biological ideas to describe trends in human evolution. 	<p><i>Demonstrate in-depth understanding</i> involves:</p> <ul style="list-style-type: none"> • using biological ideas to explain how or why trends in human evolution occur. 	<p><i>Demonstrate comprehensive understanding</i> involves:</p> <ul style="list-style-type: none"> • linking biological ideas about trends in human evolution; and linking of ideas may involve justifying, relating, evaluating, comparing and contrasting, and analysing using scientific evidence.

Cut Scores

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

Evidence

Question One

Evidence	Achievement	Achievement with Merit	Achievement with Excellence												
<p>[Evidence of bipedalism appears approximately 4–5 mya after the split of a common ancestor from the quadrupedal common ancestor.]</p> <p>Habitually bipedal organisms perform most of their locomotion on their two / hind legs.</p> <p>Arboreal species spend most of their time in trees.</p> <p>Advantages of bipedalism:</p> <p>Bipedalism would have conferred several advantages, including much more efficient walking [not faster] / locomotion over longer distances. The hands were free to carry more; they could see further due to the height change, which was beneficial in the African savanna; they had less midday day beating down on them; and would have been more intimidating.</p> <p>There were disadvantages, such as: much higher risk of back / flat feet pain, pain of childbirth, slipped discs, hernia, spine changes, e.g. scoliosis; and the loss of tree-climbing ability. However, the advantages greatly outweighed the disadvantages overall, which is why habitual bipedalism became fixed for hominins.</p> <p>Difference in forms:</p> <table><tr><th>Feature [must be described]</th><th>Chimpanzee</th><th>Human</th></tr><tr><td>Spine</td><td>C-shaped</td><td>S-shaped</td></tr><tr><td>Pelvis</td><td>Smaller, narrower</td><td>Bowl-shaped, wider</td></tr><tr><td>Valgus</td><td>Legs vertical / much smaller angle</td><td>Greater angle</td></tr></table> <p>The S-shaped spine offers shock absorption for bipedal walking and brings the weight over the midline The pelvis supports / distributes the weight above, provides an area for muscle attachment, and enables balance. The valgus angle is the angle of the femur coming in towards the knee, and the angle becomes greater. It reduces energy loss due to less sway; being balanced on one foot while walking / as each foot is lifted, the weight is supported, and there is no energy required to come back from a tilt / sway position.</p>	Feature [must be described]	Chimpanzee	Human	Spine	C-shaped	S-shaped	Pelvis	Smaller, narrower	Bowl-shaped, wider	Valgus	Legs vertical / much smaller angle	Greater angle	<p>Describes:</p> <ul style="list-style-type: none">• habitually bipedal• arboreal• one skeletal difference between modern humans and chimpanzees• a second skeletal difference• a third skeletal difference• an advantage of bipedalism saving energy• disadvantage of bipedalism.	<p>Explains:</p> <ul style="list-style-type: none">• a reason for skeletal difference between the hominin and hominid: valgus angle, spine, pelvis (large baby head)• a second explained skeletal difference (from the three listed)• despite the disadvantages of bipedalism, the advantages outweigh the disadvantages; supported with a named example, e.g. increased risk of back pain• advantage of bipedalism for modern humans• disadvantage of bipedalism.	<p>Discusses:</p> <ul style="list-style-type: none">• movement in arboreal and terrestrial habitats, supported with links to three changes in the skeleton; also discusses disadvantages• how the advantages outweigh the disadvantages for this mode of locomotion / long distance walking.
Feature [must be described]	Chimpanzee	Human													
Spine	C-shaped	S-shaped													
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Not Achieved		Achievement		Achievement with Merit		Achievement with Excellence	
N1	N2	A3	A4	M5	M6	E7	E8
Discusses ONE evidence point only at Achievement.	Discusses TWO evidence points only at Achievement.	Discusses THREE evidence points at Achievement.	Discusses FOUR evidence points at Achievement.	Explains TWO evidence points at Merit.	Explains THREE evidence points at Merit.	Discusses BOTH evidence points at Excellence, but discussion for one may be weaker.	Discusses BOTH evidence points at Excellence.

N0 = No response; no relevant evidence.

Question Two

Evidence	Achievement	Achievement with Merit	Achievement with Excellence
<p>‘Levallois technique’ refers to a strategy of stone-tool production, specifically a means of taking a block of stone (core) and producing sharp-edged flake tools through percussive application of a stone hammer.</p> <p>There is a positive feedback loop between tools, food, and brain development. Brain development would have enabled greater use of fibre technology to make new tools, e.g. hunting snares. The use of twisted fibres is evidence of mathematical ability. Neanderthal needed to be able to count the number of strands and to be able to make a repeating pattern when they tied the cord.</p> <p>The area of the brain developed is possibly the parietal lobe, motor cortex, and temporal lobe (multiple areas are responsible for mathematics); the frontal lobe for counting and the left brain also for mathematics.</p> <p>The use of twisted fibres would have enabled the Neanderthals to make a far wider range of tools than previously. For example, fibre would have allowed axes to be attached to handles, increasing their usefulness and allowing a much stronger blow than could be achieved with a hand axe alone. This wider range of tools would have enabled more efficient food gathering, increasing chances of survival.</p> <p>Tool use for health could be making clothes to stay warm, freeing up more energy for immunity as opposed to thermoregulation; being able to cut food / pummel food for the sick; cauterise a wound; provide more protein; enable shelter to be built for the cold.</p> <p>Food gathering would be enhanced by the making of items like bags and rope, lasso, e.g. bags to carry more back for the clan / family, and rope to possibly tow carcasses of larger animals.</p> <p>The manufacture of fibre is evidence of a sophisticated understanding of trees and seasons. Neanderthals could access fibre only if the trees they used were present. However, with the occurrence of climate change, the trees would have been lost. The Ice Age meant living was harder.</p>	<p>Describes:</p> <ul style="list-style-type: none"> • the Levallois technique • a brain region • the health benefit of tools • a second health benefit of tools • twisted fibre for food / in cold climate. 	<p>Explains:</p> <ul style="list-style-type: none"> • links named brain region to the maths needed for making ropes • a link between the making of tools to health • a second idea linking the making of tools to health • that twisted fibres can be used to influence success in a cold environment [ice age] • second idea about twisted fibres being used to influence success in a cold environment [ice age]. 	<p>Discusses:</p> <ul style="list-style-type: none"> • how and why twisted fibres / rope, and tools gave Neanderthal advantages during the Ice Age, making links between food gathering and health • link between the use of fibre technology and brain development; and demonstrates knowledge of how this supported Neanderthal in the Ice Age.

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Question Three

Evidence	Achievement	Achievement with Merit	Achievement with Excellence
<p><i>Homo floresiensis</i> ' small size meant they needed less energy for the day and could hide more easily in small places from the dragon or in order to ambush, meaning the island could sustain a larger population.</p> <p>Large teeth are an indication they ate raw food / plant matter / did not cook; however, they still got enough nutrition to supply the energy needs of a small brain and body because, being on an island, fish would be a food source, and fish takes little / no energy to chew.</p> <p>Flores is near the equator, with long days throughout the year, so there was no need to rely on fire to extend light hours for activities; a warmer climate so no need for heating / warmth for survival. They may have used wildfires on the island. They didn't migrate so didn't need to cook to preserve food. They had a range of foods so ate proteins that could be eaten immediately.</p> <p>Early hominins would also benefit from substantial brain development, for example the speech centre, memory to be used for food sources, avoidance strategies regarding predators, and building shelter.</p>	<p>Describes:</p> <ul style="list-style-type: none"> • a named advantage of being small-bodied • a second named advantage of being small-bodied • why there was no need for controlled use of fire • why they were successful, despite no controlled use of fire • one benefit of brain development for early hominins • a second benefit of brain development for early hominins. 	<p>Explains:</p> <ul style="list-style-type: none"> • advantage of being small-bodied, linked to population success • a second advantage of being small-bodied, linked to population success • a success despite no controlled use of fire • a second success despite no controlled use of fire • one reason why brain development is a selective advantage • second reason why brain development is a selective advantage. 	<p>Provides detailed discussion of:</p> <ul style="list-style-type: none"> • success indicators of being small on an island AND being successful, whilst not having controlled use of fire • justification of two advantages to early hominins with specifics of what advanced and how this influenced success / TWO examples of brain development that would have led to success for early hominins.

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