

**Year 12 Human Biology**

**Extended Response: Evidence for Evolution**

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| Name: |
| Teacher: |

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|  | Marks Received | Marks Available | Percentage |
| Total |  | 35 |  |

Assessment Time: 50 minutes

Weighting: 5%

You must **answer all questions** on the lined paper provided. Please clearly number questions and use the paper at the back of the booklet if you wish to plan your answer. Clearly label your plan.

Human Biological Sciences Unit 4

Extended Response

1. Radiocarbon dating and potassium-argon dating are two methods scientists use to determine the age of fossils. Compare and contrast these two techniques.

(9 marks)

*Similarities:*

|  |  |
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| *They are both absolute dating methods* | *3* |
| *They both use the decay of radioisotopes* |
| *Based on the half life of the isotope.* |
| *Ratio of isotopes before and after decay.* |

*Differences:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Radiocarbon dating* | | *Potassium-argon dating* | |
| *Isotopes* | *Carbon 14 to Nitrogen* | *1 mark* | *Potassium to Argon* | *1 mark* |
| *Material used* | *Living things which contain carbon* | *1mark* | *Rock samples* | *1mark* |
| *Time frame* | *0 to 50,000 years* | *1mark* | *100,000 to 200,000 years* | *1mark* |

1. Examining fossils and their surroundings is one method by which evolution can be shown to have occurred. However there are also many types of comparative studies that can be used to support the theory of evolution. Two of these involve studies in biochemistry, namely protein sequences and DNA.

a) Describe the comparative study of DNA and explain how it can be used to provide evidence for evolution. (5 marks)

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| *Determine the sequence of bases in genome* |  |
| *Compare genomes of different species* |
| *Form hybrid DNA from different species* |
| *Compare non-coding sequences* |
| *Compare endogenous retroviruses* |
| *Compare mitochondrial DNA* |
| *The more similar the DNA, the more closely related the species* | *Must allow 1 mark for this* |
| *The more different the DNA, the more time has passed since common ancestry.* |  |

b) The table below shows differences in the amino acid sequence of cytochrome C between humans and other species. Use this to construct a phylogenetic tree of these organisms. (4 marks)



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