Stage 1 Physics

Investigations Folio Task: Science as a Human Endeavour

Nuclear Medicine - Radiotracers

Radiotracers can be used to probe underlying physiological, biochemical and molecular processes. The development of nuclear medicine is rich with contributions from gifted scientists across different disciplines in physics, biology, chemistry, engineering, and medicine. Nuclear Medicine teams include nuclear medicine physicists, technologists, radiologists, and nurses.

Choose one radiotracer and examine its contemporary uses, development, application, benefits, and limitations from the perspective of science as a human endeavour.

Examples of radiotracers used in medicine include:

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| --- | --- |
| * Technetium-99m | * Fluorine-18 |
| * Iodine-123 and 131 | * Indium-111 |
| * Thallium-201 | * Xenon-133 |
| * Gallium-67 | * Krypton-81m. |

Construct a one page outline for feedback to help shape your final submission. Due date: \_\_\_\_\_\_\_\_\_\_

The final submission can be presented as a poster, essay, or similar format. Final Submission has a word limit of 1000 words. Due date: \_\_\_\_\_\_\_\_\_\_

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| **Aspect of SHE** | **Possible exploration** |
| Communication and Collaboration  Development  Influence | This may include   * A discuss the contribution of any individuals, teams or organisations that were involved in the development of the radionuclide in medicine.   ***OR***   * The roles of individuals that collaborate to produce the radiotracer and implement the procedure.   ***OR***   * The multidisciplinary contributions that helped make the technology possible. |
| Science behind the application | This may include (but not limited to)   * Describe the process of producing the radionuclide * Explain the procedure for which the radionuclide is used * Decay path * Half Life |
| Application and Limitation | Discuss   * the impact on the individual and society * risks and safety measures |

Stage 1 Physics Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Where Assessed** | **SF** | **A** | **B** | **C** | **D** | **E** |  |
| Explanation of the science behind the application. | **KA1** | Demonstrates deep and broad knowledge and understanding of a range of physics concepts. | Demonstrates some depth and breadth of knowledge and understanding of a range of physics concepts. | Demonstrates knowledge and understanding of a general range of physics concepts. | Demonstrates some basic knowledge and partial understanding of physics concepts. | Demonstrates limited recognition and awareness of physics concepts. | I |
| Discussion of collaborations and contributions made by individuals, teams and organisations. The impact on the individual and society. | **KA3** | Critically explores and understands in depth the interaction between science and society. | Logically explores and understands in some depth the interaction between science and society. | Explores and understands aspects of the interaction between science and society. | Partially explores and recognises aspects of the interaction between science and society. | Attempts to explore and identify an aspect of the interaction between science and society. | I |
| Appropriate communication and reference list. | **KA4** | Communicates knowledge and understanding of physics coherently with highly effective use of appropriate terms, conventions, and representations. | Communicates knowledge and understanding of physics mostly coherently with effective use of appropriate terms, conventions, and representations. | Communicates knowledge and understanding of physics generally effectively, using some appropriate terms, conventions, and representations. | Communicates basic physics information, using some appropriate terms, conventions, and/or representations. | Attempts to communicate information about physics. | I |