Stage 1 Physics

Skills and Application Task

Medical Imaging using Waves

Medical imaging is a vital tool that creates a visual representation of organs or tissues to diagnose medical conditions.

This skills and applications task focuses on one of these tools and link it to the *Application and Limitation* aspect of Science as a Human Endeavour as described in the subject outline on pages 12 and 13.

You will make a viewer-friendly, animated video that explains the science behind the technique to a prospective patient.

1. Choose one technique of medical imaging from the list below.

|  |  |  |
| --- | --- | --- |
| ultrasounddopplerechocardiography | thermographyendoscopyMRI | x-rayfluoroscopycomputer aided tomography |

2. Create an animation that:

* explains the physics behind the technique e.g. sound waves, x-rays etc
* contains a description of its application in medicine (what or how it is used in diagnosis)
* incorporates actual images generated from the chosen technique showing a medical condition
* describes the benefits of the procedure and identifies possible limitations to show how the technique is evidence of science as a human endeavour
* has either captions or a voiceover with relevant information
* is a maximum of 6 minutes.

Some techniques you may consider in the creation of your animation are

* a [Minute Physics style](https://www.youtube.com/watch?v=2dRr-fnPCwM) video
* stop motion video [using paper models](https://www.youtube.com/watch?v=oCl1zoxs3Zo) or plasticine
* screencasting a presentation (e.g. google slides or MS PowerPoint that [advances slide by slide](https://youtu.be/MQqMHOgJK30)).

This is then to be uploaded to YouTube and the link emailed by the due date.

Due date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |  |
| **IAE3** | Systematically analyses and interprets data and evidence to formulate logical conclusions with detailed justification. | Logically analyses and interprets data and evidence to formulate suitable conclusions with reasonable justification. | Undertakes some analysis and interpretation of data and evidence to formulate generally appropriate conclusions with some justification. | Describes data and undertakes some basic interpretation to formulate a basic conclusion. | Attempts to describe results and/or interpret data to formulate a basic conclusion. | I |
| **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 |
| **KA2** | Applies physics concepts highly effectively in new and familiar contexts. | Applies physics concepts mostly effectively in new and familiar contexts.  | Applies physics concepts generally effectively in new or familiar contexts.  | Applies some physics concepts in familiar contexts. | Attempts to apply physics concepts in familiar contexts. | I |
| **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 |