**2019 Year 11 Physics**

**Task 3: Investigation – Energy Efficient Home**

Designing an energy efficient home

Name:

**Background: Humans have ideal operating conditions, and as we spend large amounts of time in our home it is unsurprising that we are spending more and more time ensuring that the temperature within the home is well within our operating temperatures.**

**Task:-**

How does the design of a house affect the temperature inside for the occupants? Create a report indicating the physics concepts or principals involved and discuss their significance and impact on the occupants.

There are numerous heating and cooling systems inside houses some examples can involve different types of air conditioners, heaters, insulators, passive cooling systems and using natural cooling systems. Explain how each component helps to maintain the temperature of the house at a relatively constant temperature.

A large amount of energy is converted to unwanted thermal energy during the day that can shift the temperature away from the target temperature. Identify the places where there are unwanted heat sources and then indicate in what form the energy was before it was converted into thermal energy and how it was converted to thermal energy.

**Further information to consider:**

* Include an introduction to your report and a summary of your findings indicating the effectiveness of each different cooling system.
* Cover at least 8 different heating / cooling techniques and how they keep houses within a target temperature range.
* Include **your own** diagrams where appropriate to demonstrate the concepts
* Ensure you **reference** your work correctly and do not copy your information word for word from another source. For full marks for referencing use an APA reference list and use in-line referencing in your report.

**Factsheet Marking rubric:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Excellent (4)** | **High (3)** | **Satisfactory (2)** | **Limited (1)** |
| **Scientific Content** | All focus questions answered fully and in detail. | Most focus questions answered fully and in detail. | Some focus questions answered. Little detail or explanation. | Little focus questions answered. No or little detail and explanation. |
| **Communication** | Provides clear and detailed explanations of complex scientific models, using appropriate scientific terminology. | Provides clear and detailed explanations of scientific models, using appropriate scientific terminology. | Provides clear explanations of simple scientific models, using scientific terminology. | Provides simple descriptions of events, using some scientific terminology. |
| Supports explanations with the use of relevant examples and clear and detailed labelled diagrams. | Supports explanations with the use of examples and clear, labelled diagrams. | Supports explanations with the use of everyday examples and labelled diagrams. | Includes sketchy diagrams but does not refer to them. Examples are often incorrectly linked to explanations. |
| **Science Inquiry** | Provides a detailed and well-organised reference list, consistently adhering to given referencing conventions. | Provides a relevant reference list, adhering to given referencing conventions. | Provides evidence of background research in the form of a reference list. | Provides evidence of background research. |
| **Presentation** | A maximum of 4 marks will be awarded for general presentation of the report, including use of headings, diagrams and referencing outside the resources provided | | | |
|  | Total: 20 | | | |

# Research segment Due: Your assignment must be submitted via Connect

Note: on this date students will sit a validation quiz that contributes 65% of the overall mark of this assessment.