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**Year 12 Human Biology**

**Unit 3: Science Inquiry - Homeostasis (5%)**

**Task 3**

**TYPE:** Science Inquiry

**CONTENT:** Homeostasis

**Homeostasis; Temperature and Body Fluids**

Sir Charles Blagden (1748-1820) was an English doctor and scientist. In a report to the Royal Society in 1775, he was the first person to describe the link between sweating and regulation of body temperature. He carried out many experiments on thermoregulation and in 1775 he published his results in a paper titled ‘Experiments and observations in a heated room’.

In one of Blagden’s experiments, he spent time in a chamber that was heated to more than 120°C. With him in the chamber were some research assistants, a dog and a piece of beef. They all emerged from the chamber unharmed, but the beef was cooked.

**YOUR TASK:**

You will be required to plan and evaluate an investigation based on the Sir Blagden’s early experiment on body temperature. You will write your investigation as a scientific report, following the guidelines on the following page.

**Time allowed for completion of the task:**

• Investigation research and planning – one class period

• Completion of the write up of scientific report – at home

• Validation – one class period under test conditions

**Task weighting**

5% of the school mark for this pair of units

**Due Date:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
 **Complete in Class:**

Your investigation will determine the impact of the external environment temperature on the core body temperature of the test subjects. Please ensure your investigation is ethically suitable to be conducted in the 21st century.

|  |
| --- |
| **Plan your investigation**   * Aim * Devise a hypothesis and choose dependent and independent variables for your investigation * Identify variables to control, including experimental and control groups * Decide upon the appropriate sample size, trials and data collection methods * Describe, in detail, the methodology you will use during your investigation * Features of the investigation to ensure reliability and validity * Ethical issues to be considered |
|  |

**Complete at home:**

Write up your expected results and discussion sections, linking this to the homeostasis of body temperature AND body fluids.

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| --- |
| **Scientific report: write up for your investigation**   * Introduction * Aim * Hypothesis * Variables |
| * Method * Materials * Results * Description of the expected results from your investigation * Discussion * Explanation of your expected results linking to homeostasis of body temperature, metabolism and body fluids * Suggested improvements and possible further investigations * References in APA 6th Edition |

**Complete under test conditions:**

Complete validation under test conditions with second hand data, **no notes** are permitted.

Please ensure you have a thorough understanding of:

* Homeostasis of body temperature and metabolism
* Homeostasis of body fluids
* The entire scientific inquiry process

NOTE: your **completed** **scientific report** is expected to be handed in on the day of the validation.

Teacher Reference: **Scientific Report – Marking Key**

**NOTE: this is not marked** so this marking key can be reviewed as a class before the validation.

* I recommend setting a due date for the introduction, method and referencesand students cross mark each other’s work

Introduction

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Succinctly writes a general introduction that summarises the aim of the investigation  Example: To investigate the impact of the external environment temperature on the core body temperature of individuals/test subjects/rats. | 1 |
| Writes a hypothesis relating dependent and independent variables and stating direction of effect  Example: When placed in a room with an increase in temperature, participants/animals core body temperature will remain stable at 37 degrees Celsius. | 1 |
| Correctly identifies the independent variable  Example: External room temperature (degrees Celsius) | 1 |
| Correctly identifies the dependent variable  Example: Core body temperature (degrees Celsius) | 1 |
| **Sub-total** | **/4** |

Materials and Method

|  |  |
| --- | --- |
| **Description** | **Mark** |
| Clearly lists materials with quantities  Example: Temperature controlled room, thermometer to take temperature of subjects. | 1 |
| Explains the method in detail, including how the sampling and data collection will be determined  OR  Briefly describes the method | 1-2 |
| Uses an appropriate sample size (>30) increasing reliability  Sample size >30 and an even split of males and females, of a similar age. | 1 |
| Uses an appropriate number of trials (3+) increasing reliability  Three or more trials | 1 |
| States how the effects of uncontrolled variables and other factors were minimised during data collection in order to increase validity  Example: core body temperature must be taken for all subjects in the same way ie. Rectal thermometer is the most accurate  If human participants: health checks before participating (no heart conditions etc.) and ensure they are of the same fitness level. All participants drink the same amount of the day of (and day before the experiment)  If animals: health checks before participating and on the same diet/water consumption etc. before participating | 1 |
| Discusses ethical issues - name two (2) and explain how they are addressed  When using animals adhere to the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes. Ie valid/humane/justifiable/considerate.  Human ethical issues   * Informed consent/Right to withdraw/Confidentiality/Deception/Debriefing/ Voluntary participation | 1-2 |
| **Sub total** | **/8** |
| **Total** | **/12** |