Stage 2 Physics Investigation

Factors Effecting the Cooling Effect of Evaporation

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Task: Design, conduct and communicate an investigation that determines the effect of one of the following factors on the cooling effect of evaporation.

* + - Wind
    - Initial temperature
    - Surface area

For this investigation you will be provided with Methylated spirits (your report should include an explanation of why this liquid was chosen) and other equipment required. You may also request additional equipment within reason, which will be provided if available.

**Write a report which details your investigation and your findings following the criteria on the following page.**

Note: whilst it’s likely that temperature will be your measured dependent variable, *total heat flow, Q,* (out) of the liquid should be the dependent variable which is analysed.

**Investigation outline**

**Group members:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Aim of investigation:**

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**Details of all equipment required:**

**Item Size (if applicable) Number required**

Metho 1 lt bottle 2 (max!)

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| --- | --- | --- | --- | --- |
| **Criterion** | **0** | **1** | **2** | **3** |
| **Layout** | Does not meet criteria for ‘1’ | Includes title, group member names, date. Report is organised appropriately into sections and headings |  |  |
| **Introduction** | Purpose of investigation is clearly identified | Controlled, measured and independent variables identified as well as Purpose. | Background information provided which leads to a logical hypothesis as well and information on variable and purpose. |
| **Apparatus** | Apparatus is identified. A drawing is included where necessary. |  |  |
| **Procedure** | Another person could follow the procedure with little difficulty. |  |  |
| **Results/Data** | Results/data minimally complete, but more trials were needed. Results/data not presented clearly, possibly due in part to misunderstandings or missing labels and/or units. | Results/data presented reasonably clearly (in a table (where appropriate). Labels, units are present, with possible minor omissions. No. of trials is acceptable. | Results are fully described and/or data clearly presented in a neat table (where appropriate) with clear labels and units. Appropriate no. of trials has been done. |
| **Treatment of data\***  **\*Omit criterion if data is qualitative only.** | Calculations may be incomplete or incorrect. Graph is largely incomplete or inaccurate, or axes have been chosen incorrectly.\* | Any calculations are complete and generally correct. Graph is neat, generally accurate and sufficiently labelled, with axes correctly chosen. Only minor omissions or problems.\* | Any calculations are complete and correct.  Graph(s) are neat, accurate and sufficiently labelled, with axes correctly chosen. \* |
| **Discussion** | Discussion is attempted but it does not adequately relate experimental variables. Errors are not identified or only listed. | Discussion relates experimental variables, but the trends are not clearly explained. Errors are considered, but discussion could be extended/significant sources of error are omitted. | Extended discussion of the findings identifies the relationships between variables (i.e. trends, or lack of trends). Significance of various errors is evaluated. At least one suggestion for improvement in procedure is made. |
| **Conclusion** | Conclusion is included which is related to the purpose of the lab. | Conclusion is succinct, precise and relates to the purpose. Major problems or inaccuracies are mentioned. |  |
| **Investigation design** | An experiment was described but not planned adequately. Design does not meet experimental objectives. There may have been important considerations omitted from the plan.\* | Shows some evidence of planning. Experiment design is generally effectively in meeting objectives, but could be improved.\* | Shows clear evidence of planning. Experiment is effectively designed to meet objectives.\* |

Investigation Assessment Criteria