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| **Instrument Number 2** | **Term 1 2023** |
| **Student Name** |  |
| **Year Level** |  | **Handout Date** (Week Beginning) | 13/03/2023 |
| **Class** |  |  |  |
| **Teacher Name** |  | **Interim Check (not draft) Date** | 20/03/2022 |
| **Unit Number/Name** | Unit 1 – What’s the MATTER? | **Due Date** | **27/03/2022** |

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| **Task Title and Genre** | Scientific Report on the Rate of Dissolving |
| **Target Audience** | Teacher |
| **Syllabus Assessment Technique**  | Information Report |
| **Time/Length** | 2 Weeks |
| **Assessment Conditions** | Summative |
| **Teacher Input** | Yes, scaffolded report and check (not draft) date provided. |
| **Individual/Group Work** | Combination Individual and Group Work |
| **Seen/Unseen** | Seen |
| Materials handed out prior to assessment? | No [x]  | Yes [ ]  | **Conditions** |
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| **Criterion** | **Marks** | **Grade** |
| Scientific Inquiry Skills | /35 |  |

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| **Differentiation: If assessment conditions have been adjusted details are provided below** |
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| **Acknowledgement of assessment responsibility** |  |
| I understand the consequences of plagiarism/cheating and confirm this is my own work. |
| **Student Signature:**  | **Date:** ……………………………… |

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| B:\Common\_NEW MSHS LOGO\NEW LOGO - B&W\BW-Shield Only white outline.png | **Maroochydore State High School****Standards Matrix for Year 8 What’s the MATTER Exam** |

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| --- | --- | --- | --- | --- | --- |
| Assessable Elements | A | B | C | D | E |
|  |
| Questioning and predicting  | Predicts and justifies the expected results from the investigation using information and knowledge from their own investigations and secondary sources  | Predicts and justifies the expected results from the investigation using information and knowledge from their own investigations and secondary sources | Predicts the expected results from the investigation using information and knowledge from their own investigations and secondary sources  | Guided identification and guided construction of questions and problems for investigation | Directed prediction of the expected results  |
| Planning and conducting | Takes into consideration all aspects of fair testing, available equipment and safe investigation when planning investigationsDefines controlled, dependent and independent variables Accurate collection of reliable data | Takes into consideration all aspects of fair testing, available equipment and safe investigation when planning investigationsDefines controlled, dependent and independent variables Accurate collection of reliable data | Takes into consideration some aspects of fair testing, and safe investigation when planning investigationsDefines and identifies controlled, dependent and independent variables Accurate collection of data | Considers some aspects of fair testing, and safe investigation when planning investigationsIdentifiescontrolled, dependent and independent variables Accurate collection of data | identification of safety considerations |
| Processing and analysing data and information | Constructs an appropriate table and graph to represent relationships and trends in the collected dataDraws accurate conclusions based on primary evidence collected. | Constructs an appropriate table and graph to represent relationships and trends in the collected dataDraws accurate conclusions based on primary evidence collected. | Constructs a table and graph to represent relationships and trends in the collected dataDraw a conclusion based on primary evidence collected. | partial construction of representations of data to partially reveal patterns and trends drawing of conclusions | partial construction of representations of data statements about data |
| Evaluating | Comprehensively evaluates the quality of the data collected by identifying sources of errorIdentifies 2 improvements that are clearly linked to sources of error | Evaluates the quality of the data collected by identifying sources of errorIdentifies improvements based on sources of error | Evaluates the quality of the data collected by identifying a source of errorIdentifies an improvement based on a source of error | Makes a statement about the quality of the dataIdentifies an improvement | Makes a statement about the quality of the data or Identifies an improvement |
| Communicating | Concisely and clearly communicates ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate  | Concisely and clearly communicates ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate  | Communicates ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate | use of everyday language and representations to communicate science ideas, methods and findings | fragmented use of language and representations to communicate science ideas, methods and findings |
| Results | A+≥33 A≥30 A-≥28 | B+≥26 B≥24 B-≥22 | C+≥20 C≥18 C-≥16 | D+≥13 D≥11 D-≥ 9 | E+≥6 E≥3 E 1 |

**Teacher feedback:**

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| --- | --- |
| **Investigating the effect of Temperature on the rate of dissolving** |  |
| **BACKGROUND:***Aspro Clear* is a very popular medication which works as a pain reliever. *Aspro Clear* tablets are dissolved in water and the resulting solution is consumed by the patient. The tablet cannot be swallowed directly by the patient – making the dissolving process very important to the effectiveness of the medication.There are two processes which occur when an *Aspro Clear* tablet is added to water. The first is a dissolving process. This is a *physical change****,*** **not** a *chemical* change*.* The water plays a very important role in the dissolving process – the water particles are moving, and they collide with the *Aspro Clear* particles on the outside of the solid and dissolve them one by one, from the outside of the tablet to the inside of the tablet. That is one reason dissolving can take a significant amount of time. The second process, which happens after the tablet dissolves, causes bubbles to appear. This process is a chemical reaction (a chemical change). The bubbles are carbon dioxide gas. The carbon dioxide gas is created by a reaction between citric acid and sodium bicarbonate – which are both in the tablet. As the tablet dissolves, the citric acid and sodium bicarbonate can mix in the water and are free to react. The reaction occurs almost immediately as the tablet dissolves, so it is a useful way of keeping track of how fast the tablet dissolves. When the tablet has finished dissolving the bubbles stop being created. This means the cessation of bubbling will be a useful indicator that the solvation (dissolving) process has stopped.The chemical reaction that occurs is:Sodium bicarbonate + Citric acid → Carbon Dioxide + Sodium Citrate + Water Na2CO3  + C6H8O7 → CO2 + NaC6H8O7  + H2OThere are other chemicals added to *Aspro Clear* tablets, such as sugar and flavourings. These are only added to make the *Aspro Clear* taste better.In this investigation the temperature of water will be altered and the rate at which the aspro clear tablet dissolves will be timed. The higher temperature should mean that the water molecules will have more energy and move faster. This means the water molecules will collide more oftern with the tablet, and collide with more energy. In theory, this should make the dissolving process faster. |  |
| **RESEARCH QUESTION:** *How does changing the temperature of the water affect the dissolving time of aspirin?***HYPOTHESIS (Prediction and Reasoning)**

|  |
| --- |
| *It was hypothesised that* |
| *This is because* |

 | **/2** |
| **VARIABLES:**

|  |  |  |
| --- | --- | --- |
| **Independent Variable** | **Dependent Variable** | **Controlled Variables** |
|  |  | **1.****2.****3.****4.** |

 | **/3** |
| **MATERIALS:**

|  |  |
| --- | --- |
| * 1 x 100mL Measuring Cylinder
 | * Ice Cream container
 |
| * 1 x 250mL Beaker
 | * Ice
 |
| * 1 x Thermometer
 | * Water
 |
| * 5 *Aspro Clear* tablets
 | * Hotplate or Bunsen Burner
 |
| * Stopwatch
 | * Beaker tongs
 |
| * Electric Kettle
 |  |

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| **DIAGRAM 1** | **/2** |
| **METHOD**1. Using a measuring cylinder, measure 100 ml of water at room temperature
2. Use scissors to cut asproclear wrapper carefully, avoiding breakages
3. Record the temperature of the water
4. Drop the asproclear tablet into the water, starting the timer as the tablet enters the water
5. Stop timer when the bubbles stop
6. Record the time
7. Repeat for each temperature and record the results
 |  |
| **RISK ASSESSMENT:**

|  |  |  |  |
| --- | --- | --- | --- |
| Source of risk | What amount of harm could it cause? (circle) | Safety precautions taken | If an incident occurred what should I do? |
|  | Minor Significant Major |  |  |
|  | MinorSignificantMajor |  |  |

 | **/3** |
| **RESULTS:** **Table 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **/4** |
| **Figure 1:Time for Aspro-Clear tablets to dissolve at different temperatures** | **/5** |
| **Identifying the trend / relationship:**

|  |
| --- |
| *As the temperature of the water increases, the* |

 | **/1****/1****/1** |
| **Identifying Error:**

|  |
| --- |
| *The data in this experiment contained . As Shown in the graph,* |
| *One error which occurred was* |
| *A second error which occurred was* |

 | **/2****/2** |
| **Evaluating Error:**

|  |
| --- |
| *The errors described above did / did not have a significant impact on the accuracy of the results. This is because* |
| *This investigation should be improved by* |
| *Another way the investigation should be improved by is* |
|  |

 | **/1****/2** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Conclusion:**

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|  |
| *The results did / did not answer the research question because*  |
| *The results show* |
| *These result are supported / not supported by existing theory of how temperature affects the rate of dissolving. As the temperature increased, the* |
| *This is because* |

 | **/1****/2****/3** |