**Joseph Banks Secondary College**

Year 12 Integrated Science: General

****Unit 4 - Task 8 – Marking Guide

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| Section | Marks Available |
| Report | |
| Chemical properties of fuels   * *Completed table. 1 mark per fully correct row.* | **5** |
| Balanced chemical reactions | **9** |
| Experiment results table   * *Student completes the table, values are correct for the temperature change between the initial and final temps and mass used corresponds with initial mass and final mass. 1 mark per correct column.* | **6** |
| Heat capacity calculations   * *Q = 3348.8 (if the temperature change was exactly 40 degrees), m=20, C=4.186, deltaT = temperature change from previous table.* | **4** |
| Graph | **7** |
| Discussion Question 1   * *Justifies diesel calculation – 1 mark* * *Justifies ethanol calculation – 1 mark* * *Justifies unleaded calculation – 1 mark* * *Ranked in correct order – 1 mark* | **4** |
| Discussion Question 2   * *Statement that heat is lost from the system – 1 mark* * *Describes 3 ways in which energy can be lost from the system – 3 marks* | **4** |
| Discussion Question 3   * *States the general relationship that the larger the molecule, the more energy that is released from its combustion – 1 mark* * *Describes the amount of energy per gram and relates it to the number of atoms in the chemical formula – 1 mark* * *Refers to the number of hydrogen-carbon bonds in the formula – 1 mark* | **3** |
| Discussion Question 4   * *Because trucks carry heavier loads, diesel enables them to carry less fuel as it produces more energy per gram than unleaded – 1 mark* * *Family cars tend to not require the high amount of torque produced by diesel fuel, instead faster acceleration for stop-start journey – 1 mark* * *Lists one benefit and one deficit for each fuel type – 4 marks* | **6** |
| Discussion Question 5   * *Compares carbon dioxide produced from each fuel – 3 marks (1 per fuel)* * *Provides figures for fuel comparison* | **4** |
| Discussion Question 6   * *Defines complete combustion – 1 mark* * *Defines incomplete combustion – 1 mark* * *Describes production of carbon dioxide in complete combustion – 1 mark* * *Describes production of carbon monoxide and soot in incomplete combustion – 1 mark* | **4** |
| Discussion Question 7   * *Fuels ranked in order of least energy to most energy (methane, propane, butane, octane) – 1 mark* * *Correct chemical formula for each fuel – 1 mark per fuel (4 marks)* * *Balanced combustion reaction of each fuel – 1 mark per fuel (4 marks)* * *BONUS MARKS AS KEROSENE REMOVED FROM FINAL ASSESSMENT (2)* | **11** |
| Safety | |
| Safe and appropriate laboratory behaviour | **3** |
| TOTAL | **70** |