**2023**

**Year 12 Earth and Environmental Science – Unit 4**

**Task 9: Greenhouse Gases Investigation**

**Assessment Type: Science Inquiry**

**Weighting: 6%**

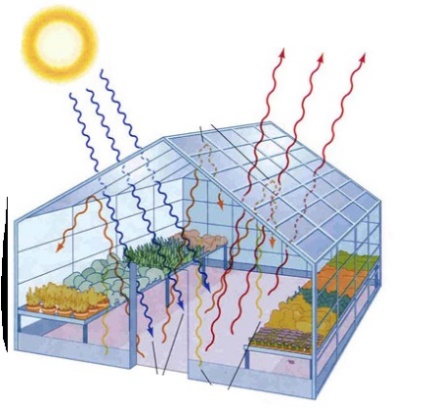
**Duration: 40 minutes**

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*Please see SEQTA for teacher feedback and comments.*



A student investigated the effect of the concentration of carbon dioxide on the temperature produced in a glass greenhouse. He used a garden greenhouse and measured the initial concentration of CO2 and the temperature. Each morning, he increased the concentration of CO2 (using bottled carbon dioxide) then recorded the temperature within the greenhouse at 4pm.

1. Write a hypothesis for this student’s investigation. (2 marks)

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1. Identify the **dependent** variable in this investigation. (1 mark)

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1. Identify the **independent** variable in this investigation. (1 mark)

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1. State **two** variables that the student controlled in his investigation. (2 marks)

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The following data was collected by the student.

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| Concentration of CO2 (mg/L) | 10 | 15 | 20 | 30 | 40 | 50 | 65 | 80 |
| Temperature inside the greenhouse (°C) | 25 | 31 | 36 | 43 | 48 | 49 | 54 | 55 |

1. Draw an appropriate graph of this data with a line (curve) of best fit. (5 marks)

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1. Describe the relationship between the independent and dependent variables of this experiment. Be specific by referring to data from your graph. (2 marks)

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1. Does the description you wrote for question 6 support or not support the hypothesis you wrote in question 1? Circle your choice below and explain your reasoning. (1 mark)

Support / Does Not Support

1. The student’s teacher told him that the investigation was not **valid (a fair test)**.
   1. What is a **fair test**? (1 mark)

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* 1. State **one** major error in the student’s investigation and explain **why** it makes the investigation invalid. (2 marks)

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* 1. Suggest **one** way the student could alter the investigation to overcome the major error you outlined in 8b and **how** it overcomes the error. (2 marks)

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**END OF ASSESSMENT**