**GENERAL INTEGRATED SCIENCE– UNIT 3**

**TASK 3 – Nutrient Cycle Investigation**

**WEIGHTING: 12 %**

**MARK: \_\_\_\_ /44 = Task 3:**

**Mark Scheme**

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| --- | --- |
| Description | Mark |
| Explains what the processes are and how the two processes cycle nutrients  or  States what photosynthesis and respiration are | 2  1 |
| Explains how the activities increase carbon dioxide in air & ocean  Or  States the activities that lead to increased carbon dioxide in air and ocean | 2  1 |
| Explain why ocean acidification causes the effects on plants and animals  Or  States effect of ocean acidification on fish and plants | 2  1 |
|  | **/6** |

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| --- | --- |
| Description | Mark |
| Formulates a testable hypothesis that clearly states the relationship between dependent and independent variables.  Or  Formulates a hypothesis, that includes dependent and independent variables, within a context that has been provided | 2  1 |
| States the independent and dependent variables and their specifications  Or  States the independent and dependent variables | 2  1 |
| Identifies at least 3l controlled variables with specific detail.  or  Identifies at least controlled variables without specific detail  or  Identifies some controlled variables without detail. | 3  2  1 |
| Full equipment list provided | 1 |
| Plans an investigation to collect appropriate data. Provides a clear and logical experimental procedure with sufficient detail to allow the investigation to be repeated by others  or  Plans an investigation to collect appropriate data Provides a sequenced experimental procedure that lacks specific detail.  or  Plans an investigation to collect appropriate data Outlines the main steps in the experimental procedure | 3  2  1 |
| Provides a description of how the data could be analysed | 1 |
| States what type of graph could be used | 1 |
| Includes any risks or ethical considerations | 1 |
|  | **/14** |

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| Quest. | Description | Mark |
| 1. | Title including independent and dependent  Axis labelled correctly with units  Line graph draw  Key for the two different lines  Scales correct  Points plotted correctly | 1  1  1  1  1  1 |
| 2. | Analyses experimental data to accurately describe trends –   * in the tank with plants and fish there was no change * in the tank with fish only the pH of the water dropped steadily * the tank became more acidic | 1  1  1 |
| 3. | Need to state why the variable needs to be controlled, for second mark what effect it would have. Need two eg  The temperature of the water would need to be kept the same as this effects the concentration of gases in the water/could cause more plant growth – hotter less gases in water  The types of plants needed to be the same so rate of photosynthesis and growth was the same or this would affect the amount of gases in the water – bigger plants more use of oxygen | 1-2  1 -2 |
| 4. | Uses evidence to make and justify conclusions that relate to the hypothesis.  or  Draws general conclusions that may not be linked to the hypothesis. | 2  1 |
| 5. | A statement about what the experiment tested was not the same as what the scientist wanted to prove:  Eg The experiment tested removing plants from the ocean only and seeing the effect which does not really relate to deforestation and the atmosphere  Therefore the experiment is not valid because it does not test what it is suppose to | 2  1 |
| 6. | 2 specific relevant suggestions to improve the design of the investigation and why  2 suggests general improvements | 2  1 |
| 7. | Deforestation – removing plants that use carbon dioxide therefore carbon dioxide levels in atmosphere going up  More carbon dioxide diffusing into ocean so making more acidic killing animals first then plants  Increase carbon dioxide in atmosphere causes global warming effecting water cycle  resulting in more water evaporating causing severe rain/ effecting weather patterns/droughts  Fish die so less nitrates in the ocean for the plants to use for growth – plants do not grow as well  Therefore less food for animals  (must have two cycles effected and how) | 1  1  1  1  1  1  Max of 5 points |
|  |  | **/24** |