|  |  |
| --- | --- |
| outhern River College | Year 11 Earth and Environmental Science  **Task 9** |

|  |  |  |
| --- | --- | --- |
| **Name:**  **Due Date:** Week 2 Term 4 | **Teacher:** | **Score: /** |

Producers are an essential part of any ecosystem- whether on land or in the ocean. They are the only living things that can photosynthesise, harnessing the suns energy to produce food. All the consumers in an ecosystem depend on the producers as sources of energy, either directly or indirectly. So without producers, life on Earth would not exist.

Plants are an important group of producers. To grow and carry out photosynthesis, they need the right balance of abiotic factors.

**Your Task**

Choose one abiotic factor and conduct an investigation to find out how it affects plant growth. This experiment will be run over a number of weeks into term 4.

The design of the investigation is up to you but you will need to produce a written scientific report at the end of the investigation.

Some guiding questions to help you are

- How will you vary your chosen abiotic factor from one plant to another?

- How will you measure the growth of the plants?

- How long will you run your investigation for, and how frequently will you collect results?

You will need to produce a written report, however as you are planning your investigation a template that you can use in the planning stage is attached.

|  |
| --- |
| **SCIENTIFIC PROCESS** |
| **TITLE** |
| **VARIABLES**  Independent variable (What are you changing on purpose, be specific with amounts)  Dependent variable (what are you measuring?)  Controlled (what are you keeping the same?) |
| **AIM** What are you trying to find out in the investigation?  What is the effect (independent variable) on (dependent variable)  How does (independent variable) affect (dependent variable) |
| **HYPOTHESIS** Prediction with a reason  If (say how you are changing independent variable) then (what will happen to the dependent variable) because (why you think this will happen) |
| **MATERIALS** what equipment will you need to complete the lab? |
| **METHOD**(step by step process to do the investigation) |
| **RESULTS** (where you record the dependent variable or results)  Example table   |  |  |  |  | | --- | --- | --- | --- | | Independent variable | Dependent variable | | | |  | **Trial 1** | **Trial 2** | **Trial 3** | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |
| **CONCLUSION/DISCUSSION** (what did you find out in the investigation?  - Refer to your hypothesis  - Refer to your data  - Refer to individual results  - Summarise what your results show |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Excellent** | **Good** | **Satisfactory** | **Unsatisfactory** |
| **Title**  **(2 marks)** |  | Chooses an appropriate title for experiment that refers to independent and dependent variable | Chooses an appropriate title for experiment but does not reference dependent or independent variable | Missing OR  Chooses a title that is confusing and does not relate to experiment |
| **Aim**  **(3 marks)** | Aim refers to what is being investigated, refers to independent and dependent variable and describes which one will affect the other | Aim refers to what is being investigated and refers to independent and dependent variable | Aim refers to what is being investigated but may not mention independent or dependent variable | Missing or aim does not describe what is being investigated in experiment |
| **Hypothesis**  **(3 marks)** | Makes a prediction using if and then statement and justifies | Makes a prediction using if and then statement but does not justify why | Makes a prediction but does not use if and then statement | Does not make a clear prediction or prediction related to investigation |
| **Materials**  **(4 marks)** | Includes all materials in experiment and measurements of each | Includes all materials in experiment and attempts to provide measurements | Includes most materials in experiment | Does not include many materials |
| **Method**  **(4 marks)** | Step by step format provided and includes each step. Provides measurements of each material used. | Step by step format provided and includes each step. Does not provide measurements of every material | May be missing some steps. In step by step format | Not in step by step format. Missing steps |
| **Results**  **(6 marks)** | Data provided in table format with multiple varying treatments recorded. Used multiple trials and averages data out. Describes data in a simple clear format. Includes photos. | Data provided in table format. Multiple different treatments recorded. May have used multiple trial. May have included photos | Multiple different treatments recorded. Describes data and results, table may or may not be provdide | Not all data collected |
| **Conclusion/Discussion**  **(6 marks)** | Describes results obtained comprehensively. Presents reasons for results and refers to other sources. Provides references. | Describes results obtained in experiment. Provides reasons for results but does not refer to other sources and no references included. | Describes results obtained in experiment. Provides some reasons for results but does not refer to other sources and no reference included | No discussion or results are not described accurately. |