**Integrated Science ; Ecosystems and organisms task**

**Overview;**

These tasks will enable you to develop knowledge of energy and matter in ecosystems and the interdependence between organisms and their surroundings.

**Part 1; Environmental Investigation**

Investigate and compare the biodiversity of **two** different sites and the effect on stability of those ecosystems and their ability to respond to change. Suggest improvements that could be made to each site.

**Part 2; Animal observations and research**

* Undertake animal observations using the observations sheet provided *(including its habitat, behaviour, characteristics, classification, adaptations and its place within the food chains or web)*
* **Choose one of the animals studied**. What are some factors (environmental and human) that may affect it? You could choose an animal observed at one of the two visited sites or a marron, which is an animal that is found naturally in our local ecosystem.
* What can humans do to help this animal survive in its natural habitat?

**How long will you need?**

One week to plan your investigation and how you will proceed with parts of the tasks, two to four weeks at the sites collecting data, the two to four weeks compiling data and the report. Some data collection can be done in a group but some parts must be done individually in your report.

**Firstly, improve you investigating skills. To do this you must**

* Locate resources and references and find out about ecosystems, food chains and energy, field techniques
* Plan then visit two field sites and carry out an investigation on ecosystems and conduct animal observations
* Record data in an appropriate format
* Analyse the data to compare two sites
* Develop reporting skills
* Identify how you will communicate findings to an appropriate audience.

**Secondly, develop your understanding of Biological interaction and Interdependence and Biological change and Equilibria.** To achieve this

* Participate in class activities, question and answer sessions etc
* Locate resources and references about relevant topics
* Use information and evidence for investigations
* Construct models, tables and diagrams to explain information such as ecosystem comparison, reasons for differences, some energy and matter relationships in ecosystems, features and biology of individual animals
* Use of resources to relate organisms and their environments

**Integrated Science Task; Ecosystems and organisms**

A) **Investigate and compare the biodiversity at two different sites**.

One site will be the wetland on South Coast Hwy opposite school and one ecosystem found at the school. All students will visit the wetland site together twice to collect data and make observations. The other site must be one located on the school ground. Choose one other from the following list.

A. Upper creek line

B. Lower creek line

C. Billabong

D. River 1

**Use the following headings to compile your report.**

**INTRODUCTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **a** | What is Biodiversity? | **2** |  |
| **b** | Describe each area | **4** |  |
|  | **TOTAL** | **6** |  |

**WATER CONDITIONS**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **c** | Include features such as water conditions ie salinity, nitrates nitrites, phosphates etc, temperature, oxygen content of water, pH, algae, macro-invertebrates etc | **6** |  |
| **d** | Discuss why the results occurred. Where did the nutrients, oxygen and salt come from? | **2** |  |

**FLORA**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **e** | Compare the general structure of the vegetation at each site eg dense or sparse bush land etc | **4** |  |
| **f** | What plants are found at these two sites? (Refer to the herbariums already collected and plant reference books) | **6** |  |
| **g** | What is the dominant plant found in each site. Why is it considered the dominant plant? | **2** |  |
| **h** | What plants found commonly at both sites? | **2** |  |
| **i** | Which of these plants are considered aliens or weeds? | **2** |  |
| **j** | How many of the plants in each site were local and how many were introduced plants (weeds) | **2** |  |
| **k** | How humans have changed the vegetation. | **2** |  |
|  | **TOTAL** | **20** |  |

**FAUNA**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **l** | What animals were found at these two sites? Take photographs of the fauna and identify them later. Include these photographs in the report. Use the animal observation sheets to record observations of the fauna. | **16** |  |
| **m** | How many species of animals were found at each site | **2** |  |
| **n** | What macro-invertebrates were found. What do these indicate about water quality? | **4** |  |
| **o** | How did the two sites compare? | **2** |  |
| **p** | Complete food webs in the field book | **2** |  |
| **q** | Discuss how the animals rely on the water and plants etc around the river. | **4** |  |
|  | **TOTAL** | **30** |  |

**SOIL**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **r** | Analyse and describe the soil samples at both sites and discuss what the soil is like according to its components. Is it sandy, gravelly, muddy, etc. Give details. | **6** |  |
| **s** | Why is soil quality important? What depends on the soil? | **2** |  |
|  | **TOTAL** | **8** |  |

**STABILITY OF EACH SITE**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **t** | Investigate the effect on stability of those ecosystems and their ability to respond to change. | **2** |  |

**SITE RESTORATION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **u** | Suggest improvements that could be made to a degraded site. | **2** |  |

**Part 2; Animal Observations and research**

Undertake **animal observations** using the observations sheet provided (this includes its habitat, behaviour, characteristics, classification, adaptations and its place within food chains or webs)

**Choose one** **of the animals studied**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **v** | What are some factors (environmental and human) that may affect it? | **3** |  |
| **w** | What can humans do to help this animal survive its natural habitat? | **3** |  |
|  | **TOTAL** | **6** |  |

**CONCLUSION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tasks** | **Mark** |  |
| **x** | Give an overall conclusion about the two sites and how the **biodiversity** at each one compares to each other and why. | **4** |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **TASKS** | **Mark** |  |
| **A** | **Data and written tasks** | **70** |  |
| **B** | **REFERENCES;** Locate resources and references, recorded in a correct format (attached) | **5** |  |
| **C** | **REPORT PRESENTATION**; Presented in an appropriate report for presentation. Could be a word document, power point, poster or video. Neat, uses headings, tables and models to explain answers. Diagrams and photographs are also used in the report. | **5** |  |
| **D** | **PARTICIPATION**; works cooperatively with a team to collect data, works appropriately in the classroom and laboratory to analyse collected information, then research and report on it all. | **10** |  |
|  | **TOTAL** | **90** |  |

