

Burnside High School Biology Department

Student Assessment Sheet

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| L2 Biology AS 2.6 Investigate a Pattern in an Ecological Community with Supervision Internal Assessment Credits 4 |



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| Intro Blurb Investigate involves describing observations or findings, and using those findings to identify the pattern (or absence of a pattern) in an ecological community, relating this pattern to an environmental factor, and describing how the environmental factor might affect chosen species within the community.    © New Zealand Qualifications Authority 2012 Number AS91158 Version 1 Page 2 of 3    Investigate in-depth involves providing a reason for how or why the biology of one of the chosen species relates to the pattern (or absence of a pattern). The biology involves structural, behavioural or physiological adaptations of the organism which are related to the environmental factor and to an interrelationship with an organism of another species (eg competition, predation, or mutualism).    Investigate comprehensively involves using an environmental factor and the biology of interrelated organisms of different species to explain the pattern (or absence of a pattern). The explanation may involve elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing. |

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# AS 91158 - Achievement Criteria:

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| Standard  **Achieved** | Standard Achieved with  **Merit** | Standard Achieved with  **Excellence** |
| To investigate a pattern in an ecological community, with supervision  Investigate involves **describing observations or findings**, and using those findings to **identify the pattern** (or absence of a pattern) in an ecological community, relating this pattern to an **environmental factor**, and describing how the environmental **factor might affect chosen species** within the community. | To investigate in-depth a pattern in an ecological community, with supervision  Investigate in-depth involves providing a reason for how or why the **biology of one of the chosen species relates to the pattern** (or absence of a pattern). The biology involves **structural, behavioural or physiological adaptations** of the organism which are **related to the environmental factor** and to an **interrelationship with an organism of another species** (eg competition, predation, or mutualism). | To comprehensively investigate a pattern in an ecological community, with supervision  Investigate comprehensively involves using an **environmental factor** and the **biology of interrelated organisms of different species** to explain the pattern (or absence of a  pattern). The explanation may involve elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing. |

Your investigation should include:

1. ***Sufficient field data in a systematic format***Involves appropriate sample size or repeats and can be achieved through the collaboration of data.  
   Means data will be presented in a way (eg table, tally chart etc) that allows it to be clearly interpreted without reference to the collection method used.
2. ***Appropriate recording:***Involves including the field data itself with all the information that allows the field data to be used or the investigation to be repeated by another person. The information with the field data should include the location of sample sites, a profile diagram of the sample area, areas where samples are taken in a distribution study, quadrat size.
3. ***Appropriate processing of field data:***Means showing accuracy using a processing method that is suitable for the type of field data, and clearly showing the relationship or pattern. Relevant statistical analysis including measure of centrality (mean, median) and spread (range, quartiles and standard deviation). Suitable formats for showing the relationship or pattern could be a kite diagram, Box-and-Whisker plot, a bar graph, or a pie chart. Only one format is required to show an interrelationship or pattern.
4. ***Description of environmental factors:***Abiotic and / or Biotic factors should be included
5. ***Interrelationships between species:***Includes competition, predation or mutualism between difference species

# PART 1 The Environment Data

This task is to be carried out in the field in groups *of no more than three students* with each student recording their own data. The students will not be given instructions on what to do but are to use their knowledge of sampling, sample size and field work techniques to determine the most appropriate method to gather and record the field data.

A range of equipment must be provided so that students are able to SELECT a sampling method appropriate for the type, size and number of organisms being sampled and the type of habitat.

Identification sheets or keys should be provided.

Data will be collected from students as they leave the field and returned to them to complete Part 2 and 3.

# PART 2 The Analysis and Presentation

This task is to be done individually in class. Students will have their work from Part 1 returned to them.

1. **Aim** or **Statement of purpose**
2. **Process and analyse** your collected field data, arranging into a **suitable table**
3. A **labeled** **location map AND a profile diagram** of the environment showing **sample locations**
4. **Environmental observations** and **factors that may relate to distribution pattern(s)**
5. Display your processed data in a **graphical form** that allows you to **identify the pattern of distribution** for your chosen organisms.

# PART 3 Discussion and Conclusion

Discuss the patterns found and the nature of the interactions between the ecology and different species recorded

This task is to be done individually in class. It is expected that the students are somewhat familiar with the way of life of the organisms being studied, but references or resources could be provided to assist students to discuss the distribution of the organisms with reference to environmental factors and the biology of the organism. Alternatively, a whole class discussion in general terms on the biotic and abiotic factors, which might be causing the distribution of the organisms in the stream, could occur when at the field site. Specific information on the biology of a number of the organisms present could also be discussed.

In your discussion you **should include:**

* Descriptions of **interactions between organisms** and the **relationship pattern** identified.
* A description of any **abiotic and biotic factors** that are present in the environment.
* Descriptions of **structural adaptations** an/or **behavioural patterns** of each chosen organism.
* **Reference to data collected** to explain the pattern.

In your discussion you **could include**:

* An **Explanation** of how **environmental factors** would affect an organisms distribution pattern.
* **Explain** how observed biological factors could **affect an organism relationships** in the community   
  (eg. competition, predation or mutualism).
* **Discuss** factors that would affect the **survival** of an organism in its **environment**.
* **Compare/contrast** two organisms and their distribution patterns.
* **Reference to any extra material** you have researched and used to explain your pattern.
* **Evaluation of the accuracy** of your data.