

GEOGRAPHY TIPS 3.1

INTERACTING NATURAL PROCESSES

(AS 91426)

Demonstrate understanding of how interacting natural processes shape a New Zealand geographic environment

**WHAT IS THIS ASSESSMENT ABOUT?**

The aim of this standard is to explore aspects of physical geography and how interacting processes have resulted in the shape of an environment. This builds on the more general processes studied at Level 2 (AS 91240) allowing a more in-depth investigation. It is linked to the following AO for Level 8:

- *Understand how interacting processes shape natural environments, occur at different rates and on different scales, and create spatial variations.*

**CHOOSING A NATURAL ENVIRONMENT**

There are several factors that need to be considered when choosing the most appropriate environment for your school.

1. It must be an environment where natural processes dominate and operate in their natural state. Studying a city environment may not be appropriate if the processes have been too modified for students to understand them or if many resulting natural features have been removed.

2. It must be an environment in New Zealand as this is stated in the title

3. It needs to be large enough to allow for several interacting processes to be studied within it. This would not be fulfilled if you only study one small part of a river or one small beach.

4. It needs to be small enough to allow for an in-depth study of the interacting processes operating there. If it is too big students run the risk of glossing over the many processes that occur rather than providing the depth of answer needed to fulfill level 3 requirements. A study of all the Southern Alps or Northland coastlines, for instance, would cause problems. The most appropriate environments cover a river basin or a stretch of coastline such as where both headlands and beaches are present.

5. The environment should be meaningful to the students. In most cases it is best if students are able to visit the environment to familiarize them with it and allow for field -work to back up evidence. It is possible to combine this with the 3.5 internal so that such fieldwork can be justified.

**TERMS THAT MUST BE TAUGHT**

The following terms are essential to ensure an understanding of this standard. It is best to define these in context.

**Analyse** : Both say what (describe), why (explain) and categorise in a meaningful way.

**Natural Environment** : A section of the earth with common natural characteristics

**Element**: Input into an environmental system. The nouns or things that are found eg sand.

**Process:** The actions or verbs that occur eg wave action.

**Operation of a process**: How the process works as a series of steps eg the wind picks up the sediment on the beach and transports to the backshore where it is deposited.

**Interacting**: The linkage between different elements or processes eg strength of waves effects the size of sediment.

**Shape:** How the environment has come to look like it currently does. This includes both how features or sections of the environment were formed and how they have been modified up to the present time.

**Different rates of processes:** Some processes occur all the time while others only occur occasionally.

**Different scale of processes:** Some processesare large and affect large areas while others are very small and affect small parts of the environment only.

**Feature:** The outcome of the actions or processes that occur eg a sand dune.

**Spatial Variation:** A difference between 2 or more locations in an environment. Can refer to elements, processes or features. eg the headland has erosive features while the beach has depositional features.

**Temporal Variation:** A difference between 2 or more time periods of one location. Can refer to elements, processes or features eg The beach slope is steeper in summer compared to the winter.

**SUGGESTED APPROACH**

Unlike other Achievement Standards at other levels of geography this standard does not include a neat list of aspects to be covered. Instead you have to take the standard title as the clue of what to cover. As a result there are several different approaches that can be used. The following approach acts as a template for those who require more guidance for this. While the examples provided are for a coastal environment they can be easily adapted if you cover rivers or mountains.

Each bullet point is a study outcome. Some of them will be very quick while others may take a week or more to cover.

* Go over the **definition** of coastal **environment** – meeting of land, water and air.
* How to break down your environment into **Inputs** (Elements)**, Processes** (Actions) **and Outputs** (Landform features and patterns) - (*see examples below*)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **INPUTS** | **PROCESSES** | **OUTPUTS** |
| **Meaning** | The elements needed that give an environment its characteristics | The actions that occur in the environment which transfer energy | What results from the processes in terms of physical landforms or patterns or change. |
| **Coastal examples**  *(note only a few given)* | Sand  Rock  Waves  Plants  Wind | Wave Action  Wind Action  Weathering  Vegetation Growth | Headlands  Caves  Stacks  Beaches  Sand dunes |

* **What your specific environment is like.** What main features are there? What do they look like? Draw a map of the environment showing where these are. Identify the features and their characteristics from photos or in the field. Draw cross sections of parts of the environment to show these.
* Identify the main elements that occur in this environment that make it unique and describe them. Then **categorise** them according to land, air and water.
* Identify the **spatial variations** or how these elements vary in different parts of the environment. For example where is it steepest and where flattest? Where is it windiest and where is it sheltered? Where do the highest and smallest waves occur? Where is the vegetation most and least dense? How does the sediment differ? Draw annotated maps to show this.
* Identify the main processes that occur in this environment. Such processes should be agent based so that the way energy is transferred is easy to see and can be broken down into stages eg wave action, wind action, tectonic action and vegetation growth. Then **categorise** these processes by scale (*See example below*). Select at least 4 to study in depth that are important in this environment.

|  |  |  |  |
| --- | --- | --- | --- |
| **LARGE SCALE** | **MEDIUM SCALE** | **SMALL SCALE** | **SUB-PROCESSES** |
| Hydrological  *(only this example given)* | Wave Action | Wave transport  Wave Erosion  Wave Deposition | Long shore drift  Hydraulic Action  Beach Sorting |

* For each process identify **how it** **works or operates** as a series of related steps or actions and their outcomes. First this happens, then this and then that.
* How does each process affect another process? **How do they interact?** Does one process have to occur before another can take place (ie tectonic uplift of a headland so that it is then vulnerable to wave erosion.)? Are the outputs of one process the inputs of another (sediment supplied by LSD is then used by the process of saltation)?
* How do the processes interact to **produce specific features?** What is the role of each process and how important is it in the formation of this?
* What role do these processes play in causing the **spatial variations** in the environment? Link how the processes act differently in different parts of the environment to the variations in the elements. Why are some features here and not over there? Which part of the environment shows mainly depositional features and which parts mainly erosive features?
* How has the environment shown **temporal variations** (changes over time). This may be over millions of years (geologic time), hundreds of year (recent time) now (present time) or the future. Which parts are showing changes in erosion and deposition?
* Link these changes to changes in the processes. Why have these changed over time? What is modifying the environment at the present time? Are these changes related to human actions? Could people’s actions cause changes in the future?

**SKILLS THAT NEED TO BE COVERED**

As well as the content there are several geographic skills required that could be examined. These include:

* Drawing a geographic map of an environment using mapping techniques such as the use of a frame, arrow, appropriate colour, key, scale (may need to be an estimate but must be provided) and title (where it is and what showing). These can be easily abbreviated – many use the term FACKTS.
* Drawing a cross section of part of the environment or a feature using standard techniques such as frame, direction, scale, colour, labels and title.
* Drawing diagrams to answer a specific question in the standard such as spatial or temporal variations. If this is specifically asked for, it must include the normal mapping conventions.
* Being able to annotate maps or diagrams. This means to put simple notes by the appropriate spot that allow analysis or explanation to occur. It is more than being able to label.
* Being able to write essays. While they are not marked on their structure it is a good habit to provide a simple introduction (what you intend to cover), body and conclusion. Use of a plan helps an answer to flow, which gets better marks.
* If an essay asks to include maps or diagrams then you draw them where appropriate to your answer and refer to them in an answer. These can be very simple and do not have to have all the mapping/diagram techniques.
* Know the requirements to analyse. You must say **WHY or HOW** something happens not just describe it and put into a logical order. Not ‘the waves erode the headland to form a cave’ but ‘the waves slow down when they approach a headland and are directed onto the end of it where energy breaks it down to form a cave.’ The link between the ‘cause’ and ‘effect’ is made clear.
* Know the different requirements for ‘achievement’, ‘merit’ and ‘excellence’. This relates to the amount of technical detail given as well as the linkage between the processes and the environment shown.
* Appreciate the importance of referring to the specific environment all the time. The title is about a SPECIFIC environment so this must be the focus. If you do not name the environment in each answer you will not pass the standard. Learn a few statistics you can quote to back up answers.

**WHAT** **THE ASSESSMENT IS LIKE**

Because of the time constraints of this standard it is likely to only be ONE essay style question. Students must therefore be prepared for how to write good essays.

This will either be broken up into parts or will be an illustrated essay (essay with maps/diagrams included). The parts may or may not be linked together so it could consist of a map that supports a written answer or could be a diagram on a separate criteria to the essay question. Assessment specifications generally give an idea of what is expected. If it is broken into parts then the whole question is marked holistically to give a mark out of 8. This means that students will have to complete all parts to get maximum marks. It also means there is no point in repeating information from one part into another.

As from 2016 students are only given ONE question although it is not impossible for this to include some choice within it.

As the standard is about natural processes (plural) they must include at least 2 named processes within the answer.

There are really only 4 possible criteria that can be examined. These relate to:

* How the interacting processes have shaped a feature/ features/ sections of the environment.
* How the interacting processes have resulted in spatial variations in the environment
* How the interacting processes have shown variations over time in the environment.
* A general question that is the title of the standard ‘How Interacting Processes have shaped the Environment”. This question can include ALL of the above or just one or two of them. As long as the link between interacting processes and the shaping of the environment is present it will score.

Care should also be taken if the question asks about ‘operation of the processes’. Inclusion of this term indicates that students must show how different processes used work as a series of steps or actions so that technical depth can be applied.

**COMMON ERRORS IN ASSESSMENT OF THIS STANDARD**

* Students not answering the question. Questions are written in such a way to assess student understanding so it is imperative that students adapt their knowledge to individual questions rather than giving a rote learnt answer. Teach students to identify the key words of a question to focus their answers on.
* Not showing sufficient depth of answer required to ‘analyse’. This requires more than ‘describe’ but also to give reasons for what is happening and a logical order.
* Not showing an understanding of the difference between an element and a process. The latter must indicate some action. Hence ‘vegetation’ is an element while ‘vegetation growth’ is a process. ‘Rainfall’ is an element while ‘convectional rainfall’ is a process. At the other end of the scale are processes that are too broad and do not have an identified agent involved. The term ‘erosion’ is not counted while ‘wave erosion’ is OK.
* Not understanding common terms such as ‘spatial variation’. If 2 different locations in an environment are not identified and compared, it does not show an understanding of the term. Spatial Variation is not the same as distribution of features – this only counts if the answer also includes why the same feature does not occur in a different place.
* Not showing any linkage between elements/ processes or features. The term ‘interacting’ is in the title and an understanding of this is required for achievement. This acknowledges that these do not occur in isolation but work together. Simply stating they ‘work together’ is sufficient for achievement. For higher grades the linkage needs to be explained further. Does one process have to occur first before another can occur? Do the outputs of one process form the inputs of another? Does one process weaken the rock and so makes it easier for a second process to happen?
* Failure to adapt diagram answers to a question. A map showing the distribution of features in an environment may appear ‘relevant’ but not if the question asks to show spatial variation. Maps at this level should be annotated to show the link to the question. In a map showing spatial variation it is expected that annotations like ‘this occurs most here’ or ‘this process dominates here’ or ‘this beach is totally different here because …”is used.

**OTHER STANDARDS THAT APPLY TO THIS TOPIC**

As previously mentioned it is common practice to combine this standard with the 3.5 research as this gives the opportunity to visit the environment and to gain more in-depth knowledge about it by carrying out the necessary fieldwork.

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