Virgin Islands Energy Flow Project

Focus: Food Chain, Food Web, Energy Pyramid

# Objective

Create a document illustrating the food chains, food webs and energy pyramids found in the Virgin Islands (U.S. and British).

# IB Learning Objectives

* Describe what is meant by a food chain, giving three examples, each with at least three linkages (four organisms).
* Explain the energy flow in a food chain.
* Describe what is meant by a food web.
* Construct a food web containing up to 10 organisms, using appropriate information.
* Deduce the trophic level of organisms in a food chain and a food web.
* State that light is the initial energy source for almost all communities.
* State that energy transformations are never 100% efficient.

# Procedure

1. Create a Google document with four sections: Virgin Islands Food Chains, Virgin Islands Food Web, Virgin Islands Energy Pyramid, and Works Cited. Standard MLA heading to the top left and name/page numbers on the right. Note: common or scientific names may be used for organisms.
2. Virgin Islands Food Chain:
   1. Write one paragraph briefly describing the concept of a food chain and how energy flows in a web. Write one paragraph describing the three food chains you create.
   2. Use Google Drawing to create three food chains with at least four organisms. The organisms must be found in the Virgin Islands environment (not zoo/aquarium). Use high quality illustrations or photos. The drawings must be labeled with a descriptive title, the organisms must be identified, and the tropic levels must be identified. Use arrows to illustrate the energy flow.
   3. Insert drawings after your paragraphs.
3. Virgin Islands Food Web
   1. Write one paragraph briefly describing the concept of a food web. Write one paragraph describing the food web that you create.
   2. Use Google Drawing to create a food web with 9-12 organisms. The organisms must be found in the Virgin Islands environment (not zoo/aquarium). Use high quality illustrations or photos. The drawings must be labeled with a descriptive title, the organism must be identified, and the tropic levels must be identified. Use arrows to illustrate the energy flow.
   3. Insert drawings after the paragraphs.
4. Virgin Islands Energy Pyramid
   1. Write one paragraph briefly describing the concept of a pyramid. Include the initial source of energy for all organisms and the efficiency of energy traveling up through the pyramid. Write one paragraph describing the energy pyramid that you create.
   2. Use Google Drawing to create an energy pyramid based on the organisms found in the Virgin Islands environment (not zoo or aquarium). You may use one of your food chains from Step 2. Use high quality illustrations or photographs. Use graphic representation to illustrate how many organisms must support the tropic level above. The drawing must be labeled with a descriptive title, the organisms must be identified, and the tropic levels must be identified.
   3. Insert drawings after the paragraphs
5. Works Cited
   1. Create a Works Cited page using MLA format.

# More Help

To insert a Google Drawing into a Google Document:

<http://support.google.com/docs/bin/answer.py?hl=en&answer=179708>

Websites on Virgin Islands Ecology (Just to get you started. Books, websites, and aquariums are all good places):

<http://www.visitstthomas.com/ecology.html>

<http://www.dpnr.gov.vi/>

# Grading

Your paper will be graded for Criterion B & C. Look at the following grading template to further improve your project.

**Basic Checklist:**

* **One paragraph describing food chains**
* **One paragraph describing VI food chains**
* **Three food chains, four organisms each, organisms & tropic levels labeled**
* **One paragraph describing food webs**
* **One paragraph describing VI food web**
* **One food web, 9-12 organisms, organisms & tropic levels labeled, arrows UP**
* **One paragraph describing energy pyramids**
* **One paragraph describing VI energy pyramid**
* **One food pyramid, organisms & tropic levels labeled, graphic representation of amounts**
* **Works Cited, MLA format**
* **Re-read directions – look for all small details**

**Criterion B: Communication in science**

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| --- | --- |
| **Achievement** | **Level descriptor** |
| 1–2 | The student uses a **limited range** of scientific language **correctly**. The student communicates scientific information with **limited effectiveness**. When appropriate to the task, the student **makes little attempt** to document sources of information. |
| 3–4 | The student uses **some** scientific language correctly. The student communicates scientific information with **some effectiveness**. When appropriate to the task, the student **partially documents** sources of information. |
| 5–6 | The student uses **sufficient** scientific language correctly. The student communicates scientific information **effectively**. When appropriate to the task, the student **fully documents** sources of  information **correctly**. |

**Criterion C: Knowledge and understanding of science**

|  |  |
| --- | --- |
| **Achievement** | **Level descriptor** |
| 1–2 | The student **recalls some** scientific ideas, concepts and/or processes. The student applies scientific understanding to solve **simple problems**. |
| 3–4 | The student **describes** scientific ideas, concepts and/or processes. The student applies scientific understanding to solve **complex problems in familiar situations**. The student **analyses** scientific information by identifying parts, relationships or causes. |
| 5–6 | The student **uses** scientific ideas, concepts and/or processes **correctly** to **construct scientific explanations**.  The student applies scientific understanding to solve complex problems **including** those in **unfamiliar situations**.  The student **analyses** and **evaluates** scientific information and **makes judgments supported by scientific understanding**. |