**Food Web Project**

Objective: Students will create a food web presentation for a specific biome demonstrating the following knowledge and skills:

|  |  |  |
| --- | --- | --- |
| **Know** | **Understand** | **Do** |
| Producers  Primary, secondary, and Tertiary consumers  Trophic level  Food web  Food chain  Invasive species | How energy flows through a food web.  The feeding relationship between producers, primary consumers, secondary consumers, and tertiary consumers.  How food webs can be affected by invasive organisms or the removal of organisms.  How food chains make up food webs.  How different classifications of organisms are grouped into trophic levels.  How invasive species can affect a food web. | Analyze food webs to determine the feeding relationships.  Identify which organisms are producers and classify consumer levels.  Identify the trophic levels to which organisms belong.  Use a food web to predict the effects of invasive species or the removal of organisms from the food web.  Describe the energy flow in a food web. |

**Requirements:**

1. **Biome Background Information**

Select a biome to research from the attached list. As part of your project introduction, make sure you include the following information:

Location

Water

Temperature / climate

Plants

Animals

Unique characteristics

Use the following website to gather information: **http://www.enchantedlearning.com/biomes/**

1. **Food Web**

Include at **least 5 food chains**, each consisting of a producer, a primary consumer, and a secondary consumer. Label each organism with its name, and whether it is a **producer, consumer, or decomposer.** Each consumer must be labeled as an herbivore, carnivore, or omnivore. **Include a picture for each organism** (printed, cut-out, or drawn)

1. **Chart #1**

Create a chart to identify which organisms are *producers, primary consumers, secondary consumers, tertiary consumers.* Name 2 possible *decomposers* to any food web. Describe the importance of decomposers to a food web.

1. **Chart #2**

Contrast the difference between *autotrophs, heterotrophs, and decomposers*. List which organisms fit into each category.

1. **Chart #3**

Create another chart to identify which organisms fit into each *trophic level*.

1. **Feeding Relationships**

Predict what would happen to feeding relationships in the food web if one organism were removed (pick one specific organism to remove).

# Read the following article *“10 Ecosystems Devastated by Invasive Species”* by Sarah McCandless on Discovery.com

**http://www.discovery.com/tv-shows/curiosity/topics/ecosystems-devastated-by-invasive-species.htm**

Predict what would happen to feeding relationships in the food web if an invasive species were introduced in this food web.

1. **Presentation**

You can choose how you would like to present the report. Some possible formats include:

* Written Report
* Power Point or Prezi
* Web Page(s)
* Presentation Board
* Booklet or Pamphlet

All reports, regardless of the format chosen, must be professional and include pictures, charts, flow of energy arrows, and appropriate labels of organisms.

|  |
| --- |
| **Habitats/Biomes** |

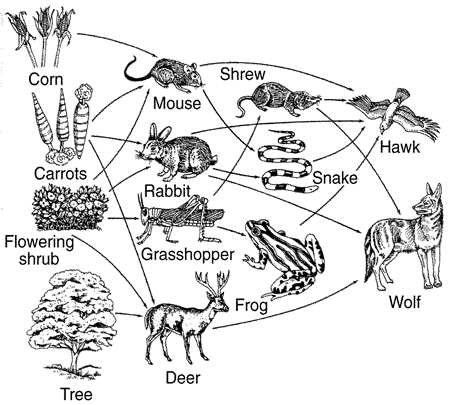
The Earth has many different environments, varying in temperature, moisture, light, and many other factors. Each of these habitats has distinct life forms living in it, forming complex communities of interdependent organisms. A complex community of plants and animals in a region and a climate is called a **biome**.

Some of the biomes on Earth include:

* [Desert](http://www.enchantedlearning.com/biomes/desert/desert.shtml) - very dry, either hot or cold
* [Tundra](http://www.enchantedlearning.com/biomes/tundra/tundra.shtml) - cool, treeless, and dry
* [Chaparral or scrub](http://www.enchantedlearning.com/biomes/chaparral/chaparral.shtml) - coastal area with hot, dry summers and mild, cool, rainy winters
* [Taiga or Coniferous Forest](http://www.enchantedlearning.com/biomes/taiga/taiga.shtml) - cool and dry, with coniferous trees
* [Temperate Deciduous Forest](http://www.enchantedlearning.com/biomes/tempdecid/tempdecid.shtml) - cool and rainy, with deciduous trees
* [Grassland](http://www.enchantedlearning.com/biomes/grassland/grassland.shtml) - Windy, partly dry sea of grass with few trees, including tropical [savanna](http://www.enchantedlearning.com/biomes/savanna/savanna.shtml), [prairie](http://www.enchantedlearning.com/biomes/grassland/prairie.shtml), steppe, pampas, etc.
* Mountain biomes: there are a lot of different mountainous biomes, from grasslands at low altitudes, taiga (coniferous forests) below the treeline, and alpine (the same as tundra)
* Temperate Rain Forest - cool and wet
* [Tropical Rain Forest](http://www.enchantedlearning.com/subjects/rainforest/animals/Rfbiomeanimals.shtml) - warm and very wet
* [Land Cave](http://www.enchantedlearning.com/biomes/cave/terrestrial.shtml) - cool and dark
* Wetlands - there are many types of wetlands, including [swamps](http://www.enchantedlearning.com/biomes/swamp/swamp.shtml), marshes, moors, bogs, fens, sloughs, etc.
* [Freshwater Marsh](http://www.enchantedlearning.com/biomes/marsh/freshwater.shtml) - a wetland located near creeks, streams, rivers and lakes
* [Temperate ponds](http://www.enchantedlearning.com/biomes/pond/pondlife.shtml)
* Marine (ocean or sea) - including
  + [euphotic (sunlit) zone](http://www.enchantedlearning.com/biomes/ocean/sunlit/)
    - [littoral or intertidal zones](http://www.enchantedlearning.com/biomes/intertidal/intertidal.shtml)
    - [coral reef](http://www.enchantedlearning.com/biomes/coralreef/coralreef.shtml) (warm shallow salt-water environments based on coral formations)
    - estuarine biomes (where rivers meet oceans)
    - pelagic biomes (open seas near the surface)
  + disphotic (twilight) zone
  + midnight (aphotic) zone
    - benthic biomes (bottom)
    - sea trenches
    - sea Caves

**(Terrestrial) Biomes:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Biome** | **Water** | **Temperature** | **Soil** | **Plants** | **Animals** |
| [**Desert**](http://www.enchantedlearning.com/biomes/desert/desert.shtml) | Almost none | hot or cold | poor | sparse - succulents (like cactus), sage brush | sparse - insects, arachnids, reptiles and birds (often nocturnal) |
| [**Chaparal (scrub)**](http://www.enchantedlearning.com/biomes/chaparral/chaparral.shtml) | dry summer, rainy winter | hot summer, cool winter | poor | shrubs, some woodland (like scrub oak) | drought and fire-adapted animals |
| [**Tundra**](http://www.enchantedlearning.com/biomes/tundra/tundra.shtml) | dry | cold | permafrost (frozen soil) | lichens and mosses | migrating animals |
| [**Taiga (coniferous forest)**](http://www.enchantedlearning.com/biomes/taiga/taiga.shtml) | adequate | cool year-round | poor, rocky soil | conifers | many mammals, birds, insects, arachnids, etc. |
| [**Temperate Deciduous Forest**](http://www.enchantedlearning.com/biomes/tempdecid/tempdecid.shtml) | adequate | cool season and warm season | fertile soil | deciduous trees | many mammals, birds, reptiles, insects, arachnids, etc. |
| [**Grassland**](http://www.enchantedlearning.com/biomes/grassland/grassland.shtml) | wet season, dry season | warm to hot (often with a cold season) | fertile soil | grasses (few or no trees) | many mammals, birds, insects, arachnids, etc. |
| [**Tropical rain forest**](http://www.enchantedlearning.com/subjects/rainforest/animals/Rfbiomeanimals.shtml) | very wet | always warm | poor, thin soil | many plants | many animals |
| [**Swamp**](http://www.enchantedlearning.com/biomes/swamp/swamp.shtml) | very wet | warm | nutrient-rich soil | many plants | many animals |
| [**Cave (terrestrial)**](http://www.enchantedlearning.com/biomes/cave/terrestrial.shtml) | variable | cool (and dark) | rocks | almost no plants | few animals |
| **Biome** | **Water** | **Temperature** | **Soil** | **Plants** | **Animals** |



Sample Food Web

**Food Web Scoring Guide**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Category** | **10pts** | **8pts** | **6pts** | **4pts** | **2pts** | **0pts** | **Points Received** |
| **Energy Flow** | All flow of energy is identified correctly |  | 50% of energy flow is identified, but lacks some |  |  | No correct energy flow identified |  |
| **Categorizing organisms (producers, consumer levels, and decomposers)** | Creates a chart to categorize all organisms correctly. | Has all categories present/75% of organisms correctly identified | 50% of organisms correctly categorized/One category missing | 25% of organisms correctly categorized/or two categories missing | Three or more categories missing | No work correctly presented |  |
| **Demonstrates Correct Feeding Relationships** | Correctly identifies all relationships |  | 75% of feeding relationships correctly identified |  | 50% of feeding relationships correctly identified | No feeding relationships identified |  |
| **Trophic Levels** | Correctly identifies all 4 levels | 3 levels |  | 2 levels | 1 level | None |  |
| **Food Web**  **20 points** | Analyze/Create  Food web correctly |  |  |  |  |  |  |
| **Invasive Species** | Describes how invasive species can take over and affect an ecosystem |  | Explains the effects of invasive species but doesn’t tell what an invasive species is |  | Describes what an invasive species is but doesn’t explain the affects | Doesn’t describe invasive species |  |
| **Removal of species** | Explains how the removal of a species affects the food web |  |  |  |  | Doesn’t explain |  |
| **Impact of decomposers** | Identifies 2 decomposers and explains their importance | Identifies 1 decomposer and explains 1 importance | Only explains importance | Only names 2 decomposers | Only names one decomposer | No decomposers discussed |  |
| **Biome**  **Background Information** | Describes the characteristics of the biome completely; includes graphics | Describes the characteristics of the biome completely | Describes the characteristics of the biome but omits one significant category | Describes the characteristics of the biome but omits two significant categories | Describes the characteristics of the biome but omits more than 2 significant categories | Does not complete the section on background information |  |

**Teacher’s Comments:**