

Grade 10 - Sustainability of Ecosystems - Pre-Assessment

Purpose:

This document is for grade 10 teachers to use as a pre-assessment for the “Sustainability of Ecosystems” unit. It assesses students understanding of the of the end of unit knowledge outcomes from the grade 7 “Interactions Within Ecosystems” unit.

Curriculum Comparison:

Grade 7 - Interactions Within Ecosystems	Grade 10 - Sustainability of Ecosystems
306-3 describe interactions between biotic and abiotic factors in an ecosystem	318-1 illustrate the cycling of matter through biotic and abiotic components of an ecosystem by tracking carbon, nitrogen, and oxygen
304-2 identify the roles of producers, consumers, and decomposers in a local ecosystem, and describe both their diversity and their interactions	318-2 describe the mechanisms of bioaccumulation, and explain its potential impact on the viability and diversity of consumers at all trophic levels
304-1 explain how biological classification take into account the diversity of life	318-3 explain why ecosystems with similar characteristics can exist in different geographical locations
306-1 describe how energy is supplied to, and how it flows through, a food web	318-4 explain why different ecosystems respond differently to short-term stresses and long-term changes
306-2 describe how matter is recycled in an ecosystem through interactions among plants, animals, fungi, and microorganisms	318-5 explain various ways in which natural populations are kept in equilibrium, and relate this equilibrium to the rescue limits of an ecosystem
304-3 describe conditions essential to the growth and reproduction of plants and microorganisms in an ecosystem, and relate these conditions to various aspects of the human food supply	318-6 explain how biodiversity of an ecosystem contributes to its sustainability
306-4 identify signs of ecological succession in a local ecosystem	331-6 analyze the impact of external factors on an ecosystems
	331-7 describe how soil composition and fertility can be altered and how these changes could affect an ecosystem

Rubric Coding:

The purpose of an assessment is not to assign a “Mark” or a “Grade”. Rather, this document demonstrates to teacher the students previous understanding of the outcome. Each question assesses on specific knowledge outcome from the grade 7 unit that precedes the grade 10 “Sustainability of Ecosystems” unit.

Code 0 - Indicates that students do not understand the concept

Code 1 - Indicates that students understand the basic concept but either cannot elaborate in detail or have not considered more information could of been added

Code 2 - Indicates that students have a mastery of the concept.

*Please note that not all outcomes will allow for a Code 2 based on complexity.

Grade 10 - Sustainability of Ecosystems - Pre-Assessment

Grade 7 Interactions Within Ecosystems

Knowledge Outcomes and Curriculum Focus

306-3 describe interactions between biotic and abiotic factors in an ecosystem

- In grade 7 this is limited to: temperature, moisture, light, aeration, and salinity

304-2 identify the roles of producers, consumers, and decomposers in a local ecosystem, and describe both their diversity and their interactions

- Focus - students should come to realize and understand that one of the most important roles green plants have in any ecosystem is that of being a food (energy) source for consumers and decomposers.
 - Students may be exposed to the concept of photosynthesis but it not a major component of the unit

304-1 explain how biological classification take into account the diversity of life

- Students can classify an organisms using the term producer, consumer, and decomposer

306-1 describe how energy is supplied to, and how it flows through, a food web

- Students should be able to take a number of simply constructed food chains and form a food web

306-2 describe how matter is recycled in an ecosystem through interactions among plants, animals, fungi, and microorganisms

- Focus - how matter (energy) is recycled in different forms through a food web

304-3 describe conditions essential to the growth and reproduction of plants and microorganisms in an ecosystem, and relate these conditions to various aspects of the human food supply

- Focus is on conditions to grow mould on break in a locker:
 - Air, Température, Light, Moisture

306-4 identify signs of ecological succession in a local ecosystem

- Pioneer Species
- Climax Community
- Primary Succession
- Secondary Succession
 - Focus - Students should be able to identify different stages of succession in an ecosystem

Grade 10 - Sustainability of Ecosystems - Pre-Assessment

Name: _____

Teacher/Class: _____

1. How do you interact with biotic and abiotic factors in your environment? Think of how you affect biotic and abiotic factors in your environment. You should incorporate as many of the following terms as possible: temperature, moisture, light, aerations, and salinity

2. A class took a walk through a local forest ecosystem, during the excursion they noted the following organisms and observations:

- Birch Alder Trees
 - A rotting log with moss
 - Earthworms in the soil
- Deer footprints were spotted in the soil

A. Identify a Producer, Consumer, and a Decomposer and give one justification for each of the three.

B. From this list of observations and noted organisms, describe how each of the organisms interacted in the ecosystems.

3. Below is a series of 3 independent food chains.

- Grass - deer - eagle
- Grass - rabbit - snake - eagle
- Leaves - caterpillar - robin - snake - eagle

Use these three food chains to construct a food web.

Grade 10 - Sustainability of Ecosystems - Pre-Assessment

Coding Rubric

1. How do you interact with biotic and abiotic factors in your environment? Think of how you affect biotic and abiotic factors in your environment. You should incorporate as many of the following terms as possible: temperature, moisture, light, aerations, and salinity

(303-6)

0 - Any other answer

1 - Explanation of Abiotic as being non-living and Biotic being living organisms (not focussing response on temperature, moisture, light, aerations, and salinity)

2 - Explanation of Abiotic as being non-living and Biotic being living organisms with a focus on 3 of the following factors in the response: temperature, moisture, light, aerations, and salinity)

2. A class took a walk through a local forest ecosystem, during the excursion they noted the following organisms and observations:

- Birch Alder Trees
 - A rotting log with moss
 - Earthworms in the soil
- Deer footprints were spotted in the soil

- A. Identify a Producer, Consumer, and a Decomposer and give one justification for each of the three.

(304-1)

0 - Any other answer

1. *Producer - Birch Alder Tree*
Consumer - Deer (from evidence)
Decomposer - Moss and/or Earthworm

- B. From this list of observations and noted organisms, describe how each of the organisms interacted in the ecosystems.

(304-2)

0 - Any other answer

- 1 - Simple description - deer eats the leaves and an explanation of decomposition*
2 - Birch Alder gets energy from the sun, Deer eats the leaves. Leaves fall to the ground, Earthworms decompose the leaves into soil. Tree dies or gets knocked down and moss inhabits the log

3. Below is a series of 3 independent food chains.

- Grass - deer - eagle
- Grass - rabbit - snake - eagle
- Leaves - caterpillar - robin - snake - eagle

Use these three food chains to construct a food web.

(306-1)

0 - Any other answer



Grade 10 - Sustainability of Ecosystems - Pre-Assessment

4. On farms, farmers use as much animal matter for different purposes as possible. Explain how energy is transferred from hay - cow - manure.

(306-2)

0 - Any other answer

1 - Simple Description of Cow eats hay to get energy, then cow excretes manure and energy is transferred

2 - Explanation of sources of energy and the conversion - hay get energy from the sun, cow eat hay and receives energy, cow excretes manure and the energy from cow is cycled back into soil as nutrients for growing.

5. Imagine you are a fungus or bacterium on an apple core put into a compost pile. Describe your life over a two-week period of time in the compost heap. (Focus on the air, temperature, light, and moisture conditions)

(304-3)

0 - Any other answer

1 - Simple description of how bacteria/fungus would multiply to spread over the course of the two week, but that apple core would not be totally broken down within this time frame

2 - Explanation of growing conditions: air, temperature, light and moisture conditions affecting the rate of growth of the bacteria/fungus while composting for two weeks

6. Create a model or series of sketches that illustrates various states of succession from pioneer species to climax community in an ecosystem experiencing primary succession.

(306-4)

0 - Any other answer

1 - Model/sketches correctly highlights evidence of pioneer species and climax community

2 - Model/sketches correctly highlights evidence of pioneer species and climax community and incorporates an appropriate explanation of each:

- Pioneer Species - hardy species which are the first to colonize*
- Climax Community - are plant species that will remain essentially unchanged in terms of species composition as long as the site remains unchanged*