
Interactive Learning Objects

Biology

Succession Lesson Plan

TVOntario



Succession

Learning object description

Succession is the gradual replacement over time of one species by another. It is the natural process that results in changing ecosystems. Ecologists refer to two types of succession, related to the starting soil conditions of the process. Primary succession refers to the process of plant life taking hold on a relatively lifeless area where soil has not yet formed – such as a newly formed volcanic island. Secondary succession is used to describe the process of re-colonization of an area by plants after an event such as a forest fire, when plant life was destroyed but the soil has remained intact.

Because succession is a very long-term process that cannot be directly observed as it is happening, students often find it rather abstract and challenging to truly understand. This learning object brings the process to life and permits students to manipulate variables that affect the rate at which succession proceeds. They also discover the relationship among soil formation, soil nutrient content and the type of plant growth that can be supported. The animation provides a clear distinction between primary and secondary succession. This accompanying lesson plan describes one way to make effective use of the learning object in class and a follow-up activity suggests a way to begin a long-term study of succession in your schoolyard.

Learning objective

The students will be able to:

- Define succession
- Distinguish between primary and secondary succession

- Predict the rate of succession under different conditions of temperature and rainfall
- Identify the correct sequence of colonizing plant species

Correlation to the Ontario Curriculum

Grade 7 Science and Technology:

- Identify signs of ecological succession in a local ecosystem (e.g., the presence of blueberries in an area recently devastated by fire; the presence of pioneer organisms that start the process of succession in sand dunes).

Grade 11 Biology – SBI3U Academic:

- Illustrate the process of succession and the role of plants in the maintenance of diversity and the survival of organisms.

Vocabulary

- Succession
- Primary succession
- Secondary succession

Pre-viewing

- Ask students to bring in evidence from their neighbourhood to show signs that the plant life in a specific location is changing. This may include photographs or drawings. Make a collection of your own photographs for the class to examine.
- Have the class examine all the photos and make a list of signs that the forms of plant life are changing.
- Ask them to imagine what each location might look like in 200 years if the site is left undisturbed. Accept all responses at this point – students will revisit their thinking while working through the learning object.

While viewing

Have the class work either individually or in pairs, depending on your and their preference and access to computers.

Primary Succession:

- Instruct students that they will view the animation at least 3 times to investigate the effect of temperature and rainfall (low, medium, high) on the rate of succession. They should construct a data table in which to log the results of the simulations.
- Included in the data table should be notes about the number of years it takes before each different type of plant life is seen (rate), a description of each type of plant life, and the topsoil and nutrient levels.

Secondary Succession:

- Have students complete a Venn diagram to compare the similarities and differences between primary and secondary succession.

Post viewing

- Team up the student pairs to form groups of four. Ask them to compare the trends they observed as they changed the variables of temperature and rainfall.
- Circulate to discuss with each group what they have discovered – that succession occurs at a faster rate when there is a higher temperature and level of rainfall.

Follow-up activity

- This follow-up activity will require the cooperation of your school grounds and maintenance department.

Assessment

- Have students return to the photographs. Provide each pair with one photo.
- Ask them to revise their thinking about what the site will look like to 200 years and draw a detailed and annotated diagram to illustrate their new ideas.
- Assess their diagrams for Knowledge and Understanding: understanding of concepts, principles, laws, and theories (e.g., identifying assumptions; eliminating misconceptions; providing explanations); knowledge of facts and terms; transfer of concepts to new contexts.