

LESSON 8: ASPECT, TREELINE, AND CLIMATE



ESSENTIAL QUESTION:

What combination of factors both natural and manmade is necessary for healthy river restoration and how does this enhance the sustainability of natural and human communities?

GUIDING QUESTION:

Trees play an important role in salmon habitat. How can an understanding of climate, aspect, soil moisture, and treeline add to our understanding of healthy river restoration?

OVERVIEW:

This lesson focuses on the factors that determine the location of the treeline in different locations in the world. The elevation of treeline is affected by the combined effects of snowpack depth, minimum winter temperatures, aspect, and soil moisture conditions. Treeline varies by latitude, but is also affected by whether it is an arid, temperate, or tropical climate. In addition, in arid regions, aspect and elevation affects soil moisture conditions and determines where the transition from desert to forest occurs on sky islands. In addition, human impacts such as grazing and fires can impact the elevation of treeline.

TIME:

One class period.

MATERIALS:

- **Lesson 8- Aspect, Treeline, and Climate.pptx**
- **Lesson 8a- Aspect, Treeline, and Climate.pdf**
- **Predicting Treeline student edition.pdf**
- **Predicting Treeline teacher key.pdf**
- Reflection Journal pages (Printable handout)
- Vocabulary Notes (Printable Handout)

PROCEDURE:

1. Review the Essential Question. Introduce the guiding Question.
2. Students should take a few minutes to respond to the first reflection prompts. Discuss their answers and any questions they've generated.
3. Hand out the Vocabulary Notes. *With this lesson you may want to define the words before presenting the PowerPoint Lesson.*
4. Present the PowerPoint Lesson

5. Predicting Treeline Activity
6. Hand out the second Reflection Journal Page. Give students time for a final reflection on the lesson.

WASHINGTON STATE STANDARDS:

SCIENCE:

1. **EALR 1 6-8 SYSB:** The boundaries of a system can be drawn differently depending on the features of the system being investigated, the size of the system, and the purpose of the investigation.
2. **EALR 4: 6-8 LS2A** An ecosystem consists of all the populations living within a specific area and the nonliving factors they interact with. One geographical area may contain many ecosystems.
 - a. Give examples of ecosystems and describe their boundaries and contents.
3. **EALR 4: 6-8 LS2C** The major source of energy for ecosystems on Earth's surface is sunlight. Producers transform the energy of sunlight into the chemical energy of food through photosynthesis. This food energy is used by plants, and all other organisms to carry on life processes. Nearly all organisms on the surface of the Earth depend on this energy source.
 - a. Explain how energy from the sun is transformed through photosynthesis to produce chemical energy in food.
 - b. Explain that plants are the only organisms that make their own food. Animals cannot survive without plants because animals get food by eating plants or other animals that eat plants.

READING

1. **EALR 1:** The student understands and uses different skills and strategies to read.
 - a. **Component 1.2:** Use vocabulary (word meaning) strategies to comprehend text.

SOCIAL STUDIES

1. **EALR 5:** The student understands and applies reasoning skills to conduct research, deliberate, form, and evaluate positions through the processes of reading, writing, and communicating.
 - a. **Component 5.2:** Uses inquiry-based research.

WRITING

1. **EALR 2:** The student writes in a variety of forms for different audiences and purposes.
 - a. **Component 2.1:** Adapts writing for a variety of audiences.

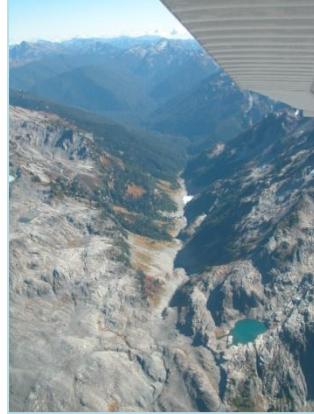
ADDITIONAL RESOURCES AND ENRICHMENT:

<http://access.nku.edu/FacilitiesManagement/TreeLineDec08.pdf>

<http://home.howstuffworks.com/tree-activities-for-kids.htm>

VOCABULARY TERMS:

- **Treeline-** The elevation in a mountainous region above which trees do not grow. The northern or southern latitude beyond which trees do not grow.
- **Sky Island-** Mountains in ranges isolated by valleys in which other ecosystems are located. As a result, the mountain ecosystems are isolated from each other, and species can develop in parallel, as on island groups such as the Galápagos Islands.
- **Aspect -** position facing or commanding a given direction; exposure
- **Snowpack-** The seasonal accumulation of snow in the winter that is available for melting in the spring and summer.



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Reflection Journal 1

Have you ever been up to the treeline? What was it like? If you haven't been to the treeline what do you imagine it is like?

What questions do you have about trees and where they can grow?



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Vocabulary Notes

Treeline:

Sky Island:

Aspect:

Snowpack:



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Reflection Journal 2

Trees play an important role in salmon habitat. How can an understanding of climate, aspect, soil moisture, and treeline add to our understanding of healthy river restoration?

What questions or comments do you have about treeline, aspect and/or the role trees play in the environment?