

Disturbance: Earth, Wind, and Fire

Total Time: 75 minutes

Overview:

This station introduces students to the importance of natural disturbance events that help regenerate and change the forest landscape. Through a series of individual and group activities, students will learn about floods, fires, landslides, and windstorms, in addition to human induced changes in the form of logging, that are often parts of old-growth forest processes. This lesson will help students understand in what specific ways life is rejuvenated and shift the narrative on what our social norm considers to be a destroyed landscape. Students will also be able to analyse the history of large events through the remnant ecological indicators of past fires, floods and wind storms, with activities that will enhance skills in journaling, critical thinking and imagination. This lesson concludes with students sharing perspectives and reviewing misunderstood concepts with the goal of understanding nature based timelines and forest self regulation.

Rationale:

Fires, landslides, windstorms and floods are often viewed socially as disasters in natural systems. A main learning goal of the disturbance station is to encourage students to learn that destructive events are natural and vital for the protection of the forests. We aim to emphasize how floods help transport important nutrients to lower elevations, fires reduce the density of forests to prevent larger fires, and windstorms help break organic matter from higher tree stories to contribute to the diversity in decomposition. Emphasizing critical observation, and understanding the natural cycles of life in the landscape, we will closely observe signs of past events through ash, layers of soils and collision paths with fallen trees.

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Learning Outcomes:

By the end of this lesson, middle-school students will be able to:

1. Recognize previous disturbance events through observation of visual clues found in the landscape.

2. Identify that disturbance events are part of the natural cycles in forest landscapes.
3. List at least one ecological benefit of forest fires.
4. Describe how dominant tree species at HJ Andrews are adapted to fire
 1. The thick bark of Douglas-fir as protection from medium intensity fires.

A Silence in the Forest: 20 minutes

Framing: Each disturbance leaves traces of an event, ranging from large downed trees and log jams in a river, to deformities and ash appearing on the bark of some Douglas-fir trees. The cards provide certain tasks such as feeling dirt, smelling moss, and critically listening to the sounds of the forest. These exercises inspire scientists and artists alike, aiding them in developing new research and creating art.

This activity provides a new approach for students to interact with the environment. Students will experience walking down a path by themselves in silence, finding cards that have certain tasks that involve different ways of interacting with the environment that surrounds them.

Step One: Setting the cards.

- Place cards evenly distributed from one another.
- Provide enough spacing to where each task will not be seen by upcoming students.
- Appropriately place certain cards that are dependant on a certain feature.

Step Two: Introduce “The Silent Hike.”

- Ask if anybody has ever done a silent hike.
- Instructions:
 - Students will file in a single line, a few feet from the trailhead.
 - A student will be let into the trail in one minute intervals.
 - The guide will go down the trail to the end point of the activity, and the chaperone will be responsible for releasing each student.

Step Three: Run the activity.

- Encourage students to participate in each task, since they will be by themselves.
- Emphasize that this will be a silent activity.
- If an upcoming student gets near another student, provide space and patience.
- When students reach the end of the trail, have them sit quietly while the rest of the students run through the activity.

Step Four: Debrief.

- Ask how did the activity make everyone feel, see, and noticed.
- Ask students if they did a specific task i.e. “Did you feel the moss on your cheek? If not, let’s all do that right now.”

Introduction to Disturbance: 15 minutes

Talking Points:

- Ask students what their perception of fires, floods, and windstorms in the forests.
- Have them write in their journal what they think about these disturbances.
- Ask them questions to prompt them such as:
 - How do you think natural disasters affect the forests?
 - Are these effects good or bad?
 - What might the benefits be of these “natural disasters”?
 - What harmful effects might fires, floods, windstorms might have?
 - Ask if they remember what O.W.L.S. stands for from the pre-trip.
 - Help them if they don’t remember it all. Then ask them how they think O.W.L.S. relates to disturbances?
- Discuss the positive perceptions of disturbances.
 - Walk down to first site near river to talk about the topic of floods.
 - Discussion on observations and soil structure/ log jams from past floods.
 - Move down trail to an open clearing and discuss the influence of fires and windstorms.
 - Recognize Molalla and Kalapuya fire management.
- Discuss the negative perceptions of disturbances.
 - Talk about how disturbances also can have negative impacts (mostly for humans).

Landscape Drawing: 20 minutes

Framing: H.J. Andrews hosts both residential scientists and artists. Artists use the rich colors of the earth, patterns, lines, and the feeling of being amongst an area so rich with age to inspire their artwork. Many accomplished artists started out the same where they sat down and invested time just simply drawing the environment that surrounded them. By doing so, it strengthens an eye for detail and patience. Taking time to observe the landscape can help open imagination and understand its history. Examples can be identifying nurse logs, wooden debris, and snags.

All four panels should be from the same perspective overlooking a specific area. Encourage students to take their time and draw carefully, including some representations of the lower, middle, higher canopy. Each drawing should be different with significant changes, a sequence for each stage should be a landscape filled with vegetation, a fire sweeping through the area, vegetation starting to reintegrate into the landscape, and then rich with thriving new plants new to the landscape.

Step One: Students will be given a blank piece of paper.

- Fold the paper twice horizontally, creating 4 equal boxes.

Step Two: Students will have approximately two minutes to find an area to sit and dedicate 13 minutes of drawing.

- Drawings should be 4 illustrations of examples of any type of disturbances.
- Guide students to examples of disturbance clues surrounding student.

Step Three: Discussion.

- Share each others landscape drawing and discuss different features unique to each drawing.
 - Ask what caught their attention? Why do they think this caught their attention?
 - Investigate and unpack the area of where some of the drawings were inspired from.

“Rock, Paper, Scis-FIRE!”: 20 Minutes

Framing: This activity illustrates the life cycles of the forest, and how fires can impact the growth of specific trees species and the forest.

In this activity, students play the role of a Douglas-Fir tree experiencing disturbances through its journey from a Fircone to a snag. The activity uses the format of playing rock, paper, scissors, with each winner advancing to their next Douglas-Fir life stage. Throughout the game the guide will call that a fire has swept the landscape 2-3 times and demote all the students to their last position of their life cycle. First student to reach the stage of a snag wins.

Step One: Space each student out across the playing field, all starting as a Fir-cone squatting down with their knees to their chests and hands down.

Step Two: Students play rock, paper, scissors, with each other and the winner advancing to the next life cycle stage of the Douglas-Fir, as well changing their body stances.

- The specified life stages of the Douglas-Fir and stances for this activity are:

1) Fir-cone (Squatting knees to chest and arms down)



2) Sapling (Squatting knees to chest and Arms out)



3) Adult (Standing and arms out)



4) Old-Growth (Standing and arms above shoulders with hands together)



5) Snag (Standing and arms down)



Step Three: During the activity, the guide will call out that a forest fire has started, and all the students are demoted back to their previous stage cycle. Repeat 2-3 times. First Student to reach Snag life stage wins.

Step Four: Discussion.

- Discuss everyone's thoughts about the game.
 - What are their thoughts on what we call “natural disasters”?
 - Are they always bad?
- Explain the correlation of how the lack of fires, can lead to more destructive fires.
- The game is an example of natural cycles in the contexts of disturbances.

Wrap-Up/Closing Thoughts:

Have a discussion with the students about disturbances and if their perspectives have changed at all. Make each student share one personal interesting detail about disturbances.