THE NATIONAL WWI MUSEUM AND MEMORIAL

Photograph of a demolished German 77mm Howitzer at Verdun, France
Online Collections Database, **1976.227.41**, www.theworldwar.org/research/database. National WWI Museum and Memorial. Online.

The Zone Rouge: Human Impacts on Ecological Succession

Recommended Grade Levels: 6-12

Course/Content Area(s): Science

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LESSON OVERVIEW:	In this lesson, students will learn about the concept of Ecological Succession through Zone Rouge. This was land, after World War 1, that was deemed too physically and environmentally damaged by conflict for human habitation. Rather than attempt to immediately clean up the former battlefields, the land was allowed to return to nature. Using primary sources from the National WW1 Museum and Memorial, and the concept of ecological succession, students will draw and predict what ecological succession could have looked like over time from the time the Red Zone was declared until 100 years after.
OBJECTIVES:	*Students will:*
	● Conduct a notice and wonder by analyzing photos from the Red Zone from the past and 100 years after ● Learn about the different stages of ecological succession ● Apply knowledge on ecological succession to develop a model of different periods of succession within the Red Zone over the past 100 years
STANDARDS ALIGNMENT:	**Next Generation Science Standards** **HS-LS2-7.** Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. **MS-LS2-3.** Develop a model to describe the cycling of matter and flow of energy among living and non-living parts of an ecosystem
TIME NEEDED:	45 to 60 mins
INTERDISCIPLINARY:	World History
PRIOR KNOWLEDGE:	Students should have some prior knowledge on ecosystems and how ecosystems can change over time. If taught in a world history class, exposure to concepts such as WWI and trench warfare would be helpful for setting the stage for this lesson.
MATERIALS NEEDED:	Slides for students (provide this digitally for students or printed and prepare the links for their access in a different way)

LESSON

INTRODUCTION/HOOK:

Prior to the lesson, students will complete a notice and wonder by going through a set of images from the National WWI Museum and Memorial. Students will be introduced to the Red Zone (Zone Rouge) that was established after the war. Students will explore a set of images from the battlefield and from 100 years after the war, record their notice and wonders, and then share their responses. Record responses on a class anchor chart. **These images and chart can be found on slides 2-5 of the slides for students.**

DIRECTIONS:

Part 1:

To begin the lesson, students will watch a video by Bozeman Science on Ecological Succession. The video is roughly 6 minutes long. At the end of the video, the students should have the following takeaways:

1. Definition of the following terms in relation to ecological succession: primary succession, secondary succession, pioneer species, disturbance, and climax.
2. Understanding of what the disturbance event of the Red Zone was, and that because soil was present with little wildlife, secondary, not primary succession is taking place.
3. A discussion of what is similar and what is different from the succession of Mt. St Helens and the Red Zone. What is in the ground and microclimate (local air) in the Red Zone that is not in Mt. St Helens.

This can be found on slides 6-7 of the slides for students.

Part 2:

Upon completion of the activity, students will be asked to develop a model of forest succession similar to the visual model used in the Bozeman video.

1. Provide students with the images of the start of stage 2 and the climax forest as starting and end points (these are the images from the pre-assessment).
2. Then ask students to draw and explain the stages in between and develop a model of what succession looked like to get to the climax forest that exists today.
3. **A descriptor of what is to be included within the model and where students will submit their images can be found on slides 8-14 of the slides for students.**
4. The expectation is that students will draw the middle stages on a sheet of paper, take a picture, and upload it into their slides or PowerPoint. Students could also draw online if they choose and upload or draw directly into the slides.

POST-ASSESSMENT:

As a post assessment, students can set their slides to present mode on their devices or submit their slides into an online “gallery”. Have students visit the various models that other students created and add to the notice and wonder anchor charts.

Students will have to identify in what time frame they feel each stage occurred. This is where you can refer to the ecological succession video and identify that, more likely than not, the climax forest was established long before 100 years after the war. However, because of the lack of human disturbance since, it has maintained the climax for some time. Review the lesson objectives and the anchor chart and see if all items were addressed.

MODIFICATIONS/ACCOMMODATIONS

The following modifications and accommodations can be made during the lesson

- Print the slides for students who will benefit from having a physical versus a digital copy of the assignment.
- This assignment can be complete asynchronous or synchronous or a hybrid depending on class time.
- A digital copy is provided and translations can be generated if needed.
- Sentence frames may be needed for some portions of creating the model.

Further Resources: Vice News Story on The Iron Harvest

Bibliography:

"Ecological Succession." *YouTube*, YouTube, 27 Apr. 2012,

https://www.youtube.com/watch?v=V49IovRSJDs&t=281s

"Red Zone." *Education*, education.nationalgeographic.org/resource/red-zone/. Accessed 14 Nov. 2023.

"WWI Bombs Are Still Being Found over 100 Years Later." *YouTube*, YouTube, 5 July 2019, www.youtube.com/watch?v=YNIBE64CAgs.