



Lesson Five: Stewardship Challenges

Grade Level: 4th Grade

Time: Two Days - 60 minutes each day

Essential Question: How can we be stewards of Wyoming's lands to benefit current and future generations?

Objective: Students will generate and compare ideas to help reduce the effects of a natural event that might occur on Wyoming lands.

Purpose: Students learn that one way we can care for our land is to try and reduce the impacts of natural disasters.

Required Materials/Resources:

- *Wildfire case file* (one per student) (Sources 14-18)
 - Video:
<https://www.youtube.com/watch?v=6NGGodu1fsA>
Wyoming Fire Burns 24 Square Miles (Source 14)
Video length: 49 seconds
 - Video: <https://www.youtube.com/watch?v=OKFRK-77Iho> *Sheep Herder Fire One Year Later* (Source 15)
Video length: 2 minutes 27 seconds
- *Avalanche case file* (one per student) (Sources 1-6)
 - Video
<https://www.tetongravity.com/video/adventure/crazy-footage-shows-snowmobiler-caught-in-avalanche> *Crazy Footage Shows Snowmobiler Caught in an Avalanche* (Source 6) *Video length: 1 minute 30 seconds*

- *Rock slide case file* (one per student) (Sources 7-13)
 - Video
<https://www.youtube.com/watch?v=5KUryO1LPj0>
train-wreck wind river canyon (Source 10) Video length: 59 seconds; Video <http://k2radio.com/wind-river-canyon-rockslide-caught-on-video-video/> *Rock Slide Wind River Canyon* (Source 11) Video length: 1 minute 24 seconds
- Stewardship Challenge document (one per student and one for the teacher to display)
- White paper (multiple sheets per student)
- Evaluating our Designs worksheets (one per student of page 1 – The Wildfire page. Page 2 or 3 – The Rock Slide and Avalanche pages – one per student depending on the group they are in.)

Suggested Teacher Preparation:

- Review each of the case files so that you are familiar with them.
- Have Smart Board or document camera ready for group work.
- Decide whether to have the class do one challenge on the second day, or if you want to split the class in half and have them do both challenges.
- Decide whether you want students to work in the same groups of three for both days.

Standards:

Science: 4-ESS3-2, 3-5-ETS1-2 (Explicit)

Social Studies: SS5.4.3, SS5.6.1 (Practiced/Encountered)

ELA: 4.RI.1, 4.RI.9, 4.SL.1.a, d (Practiced/Encountered)

CVE: CV5.1.4, CV5.3.3, CV5.4.4 (Practiced/Encountered)

Vocabulary:

- **Avalanche** - a mass of snow, ice, and rocks falling rapidly down a mountainside
- **Rock slide** - when rocks, boulders, and earth slide or fall down a hill or mountain

- **Stewardship** - As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations.
- **Wildfire** - a fire in a wild area that is not controlled and that can burn a large area very quickly

Instructional Procedure/Steps:

Day 1:

1. Say to students: **“Today, we’re going to look at another aspect of managing Wyoming land in order to be good stewards. Sometimes, there are natural earth processes that affect the land and the humans. Can you think of any natural events that would have major effects?”** *Possible answers include earthquakes, volcanic eruptions, hurricanes, avalanches, landslides, forest fires.* **“We’re going to think about the ways that humans might be able to reduce the impacts of natural events like these. That might be before the event, it might be during the event, and it might be after the event. For our first challenge we’ll be looking at wildfires.”**
2. Divide the class into groups of three. Hand out the Wildfire case files that contain evidence and recent events to help students understand what happens during these natural disasters. Say: **“In your Wildfire case file, you have several pieces of information about wildfires. Your job is to read the case file with your group. After you finish reading, discuss together evidence for the questions listed on the last page.”** Allow students time to read and start to think about the questions on the last page of the case file.
3. Bring the class back together, and display the Stewardship Challenge teacher copy, so all students can see it during the discussion. Ask the questions listed below and write responses onto the Stewardship Challenge teacher copy. Make sure that each group has input and opportunities to respond. Look for the following ideas in their answers:

TEACHER NOTE:
The purpose of this lesson is to give students opportunities to identify a problem and come up with possible solutions working through the scientific process. The emphasis will be on the process rather than a viable solution.

- **“On what kinds of land do these events occur?”** Accept any answer that lists the *TYPES* of lands or the entity that manages the land (i.e. forest or US Forest Service, Grand Teton National Park, or National Park Service, private land, etc.)
- **“What kind of recreational activities can you do on this land?”** Accept any answer reasonable for that area.
- **“What other opportunities does this land offer?”** Accept answers that address a multi-use concept.
- **“Who would you consult to gather more information?”** Students might name the agency who manages the land (National Park Service, BLM, etc.). Students may also list additional agencies involved (fire district /fire crews, law enforcement, etc.) and private landowners or businesses.
- **“Why is it important to manage or conserve this piece of land?”** Answers should address *impacts* associated with managing or not managing the land.
- **“How can YOU be a steward of Wyoming’s public lands to benefit current and future generations?”** Answers will vary but should include how they can use, develop, and care for our land. Look for specific examples connecting the student with stewardship.

To help students build additional knowledge, show students the following videos:

- *Wyoming Fire Burns 24 Square Miles*
<https://www.youtube.com/watch?v=6NGGodu1fsA>
- *Sheep Herder Fire One Year Later*
<https://www.youtube.com/watch?v=OKFRK-77lho>.

Ask students to share any additional information from the videos that deepens their understanding of wildfires.

4.  After discussing the videos, ask: **“Thinking about wildfires, what measures could be taken to minimize the impacts of this natural disaster affecting the recreation in this area in the future?”** Allow students to respond.
5. Pass out sheets of white paper. Say: **“Taking into consideration the evidence from the case file you read, as well as what you have learned about the management practices of public lands, individually list as many options as you can think of to reduce the impact of wildfires in the future. You have 5 minutes to do this.”** Give students five minutes to generate their ideas individually.
6.  When five minutes are up, say: **“In your groups, combine your lists of ideas, and revisit the case file to help you determine which would be the three best solutions for reducing the impact of wildfires. You have to work within these constraints to further narrow down your list to three solutions:”**
 - a) **“You will have 5 minutes to identify ways to reduce the effects of your natural disaster.”**
 - b) **“Your materials will be the items available in our town.”**
7. After the five minutes are up, say: **“Your group must now decide out of your three narrowed-down solutions, which solution best fits the challenge.”** Give groups a few minutes to decide. At this point, there will be one solution per group.
8. Say: **“Your groups have discussed potential solutions to reduce the effects of wildfires. You narrowed those ideas down to one. Now, sketch the solution your group chose on one of your white sheets of paper, and prepare to describe your solution to the other groups.”** Have every student sketch the design determined by their



In this task, students will be engaged in the higher order thinking skill of synthesis by creative alternative solutions.



In this task, students will be engaged in the higher order thinking skill of evaluation.

group. Give students 10 minutes to complete this task.

9. Give each group 1 to 3 minutes to present their sketches to the class. Collect the sketches.
10. Say: **“You have discussed potential solutions to mediate the effects of wildfires. Now, we will evaluate our designs.”**



In this task, students will be engaged in the higher order thinking skill of evaluation by judging.

11.  As a whole group, complete the Evaluating our Designs wildlife chart through a class discussion. List each group’s solution, and pose the questions shown in each column. Fill in the chart with student responses. Optional: When finished completing the chart, have students vote on which option would best minimize the impact of a wildfire.
12. Ask: **“How do these solutions represent good stewardship of Wyoming’s public lands?”** Give students a few minutes to discuss their ideas with group members. Allow time for students to share their ideas with the entire class.

Day 2:

1. During the remainder of this lesson, students will look at a second case file with a different natural disaster. Teachers may opt to have the whole class do one of the disasters and not the other, or to split the class into two groups and have them each look at one of the case files. Say: **“We now will look at a new case file that provides information about another natural disaster (avalanches or rock slides). You will read the case file with your group. After you finish reading, discuss together evidence for the questions listed on the last page.”**
2. Divide the class into groups of three. Hand out the additional case files that contain evidence and recent events to help students understand what happens during that natural disaster. Allow students time to read and

start to think about the questions on the last page of the case file.

3. Give each student a copy of the Stewardship Challenge. Say: **“Today, you will be completing the Stewardship Challenge independently. Think back to the discussions you had in your group. You may look at the case file as needed.”** Provide ten minutes for students to complete the Stewardship Challenge. Collect the Stewardship Challenges and evaluate them based on the suggested answers below.
 - **“On what kinds of land do these events occur?”** *Accept any answer that lists the TYPES of public lands or the entity that manages the land (i.e. forest or US Forest Service, Grand Teton National Park, or National Park Service, etc.)*
 - **“What kind of recreational activities can you do on this land?”** *Accept any answer reasonable for that area.*
 - **“What other opportunities does this land offer?”** *Accept answers that address a multi-use concept.*
 - **“Who would you consult to gather more information?”** *Students might name the agency who manages the land (National Park Service, BLM, etc.). Students may also list additional agencies involved (fire district /fire crews, law enforcement, etc.) and private landowners or businesses.*
 - **“Why is it important to manage or conserve this piece of land?”** *Answers should address impacts associated with managing or not managing the land.*
 - **“How can YOU be a steward of Wyoming’s public lands to benefit current and future generations?”** *Answers will vary but should include how they can use, develop, and care for our land. Look for specific examples connecting the student with stewardship.*

4. To help students build additional knowledge, show students the videos:
 - *Crazy Footage Shows Snowmobiler Caught in an Avalanche*
<https://www.tetongravity.com/video/adventure/crazy-footage-shows-snowmobiler-caught-in-avalanche>
 - *Train-Wreck Wind River Canyon*
<https://www.youtube.com/watch?v=5KUryO1LPj0> ,
 - *Rock Slide Wind River Canyon* <http://k2radio.com/wind-river-canyon-rockslide-caught-on-video-video/>
5. As a whole class, ask students to share any additional information from the videos that deepens their understanding of avalanches/rock slides.
6. After discussing the video, ask: **“Thinking about avalanches/rock slides, what measures could be taken to minimize the impacts of this natural disaster affecting the recreation in this area in the future?”** Allow students to respond.
7. Pass out sheets of white paper. Say: **“Taking into consideration the evidence from the case file you read, as well as what you have learned about the management practices of public lands, individually list as many options as you can think of to avoid the problem of avalanches/rock slides in the future. You have 3 minutes to do this.”** Give students three minutes to generate their ideas individually.



In this task, students will be engaged in the higher order thinking skill of evaluation.

8.  When three minutes are up, say: **“Now determine which would be the best option to avoid avalanches/rockslides in the future. Work within the following constraints to narrow down your options to ONE solution. You may use the case file to help you if necessary:”**
 - a) **“You have 5 minutes to identify ways to reduce the effects of your natural disaster.”**
 - b) **“Your materials will be the items available in our town.”**

9. **“Your final solution must address the natural disaster in its original location, so saying, ‘Ski somewhere else,’ is not an acceptable solution.”**
10. After three minutes are up, have each student present his or her design to help minimize the effects of avalanches to his/her group. Groups can fill out the Evaluating our Designs page using the same process that the class used on day one.
11. Once groups have filled out their charts, each group selects a spokesperson to share out their ideas with the class, as well as the considerations they discussed when comparing the solutions and deciding on which one they each thought was the best.

Credits/Sources:

1. National Park Service. (n.d.). *Grand Teton: National Park Wyoming - Winter Trip Planner*. Retrieved August 16, 2017, from <https://www.nps.gov/grte/planyourvisit/winter.htm>
2. Grand Teton Association's Jenny Lake Rangers Fund. (2017, June 12). *Grand Teton National Park: Climbing & Backcountry Information*. Retrieved August 16, 2017, from <http://tetonclimbing.blogspot.com/2017/06/snowy-conditions-persist-in-high.html>
3. Ballard, Caroline. Wyoming Public Media Statewide Network. (2016, March 9). *Wyoming Avalanche Season Deadliest Since 2009*. Retrieved August 16, 2017, from <http://wyomingpublicmedia.org/post/wyoming-avalanche-season-deadliest-2009>
4. Ballard, Caroline. Wyoming Public Media Statewide Network. (2015, December 11). *Avalanche Risk "Considerable" For Northwest Wyoming*. Retrieved August 16, 2017, from <http://wyomingpublicmedia.org/post/avalanche-risk-considerable-northwest-wyoming>
5. Chin, Jimmy. Snowbrains. (2013, July 16). *Surviving an Avalanche in the Tetons*. Retrieved August 16, 2017, from <https://snowbrains.com/surviving-an-avalanche-with-jeremy-jones-by-jimmy-chin/>

6. Desabris, Jonathan, Salmon, Mike. Teton Gravity Research. (2015, February 9). *Crazy Footage Shows Snowmobiler Caught In Avalanche*. Retrieved August 16, 2017, from <https://www.tetongravity.com/video/adventure/crazy-footage-shows-snowmobiler-caught-in-avalanche>
7. Travel Wyoming. Wind River Canyon Scenic Byway. (n.d.). *Description*. Retrieved July 31, 2019, from <https://www.travelwyoming.com/listing/shoshoni/wind-river-canyon-scenic-byway>
8. Prepelka, Benjamin. Scenic USA Artist Website. (2013-2015). *Wind River Canyon Scenic Byway*. Retrieved August 16, 2017, from <http://www.scenicusa.net/081213.html>
9. Gordon, Elias & Seely LLP. (2010, May 14). *BNSF Train Derails in Wyoming Wind River Canyon - Photos*. Retrieved August 16, 2017, from <http://www.gordon-elias.com/blog/570/bnsf-train-derails-in-wyoming-wind-river-canyon-photos/>
10. doggbiter. (2010, May 12). *train-wreck wind river canyon*. Retrieved August 16, 2017, from youtube <https://www.youtube.com/watch?v=5KUryO1LPj0>
11. Wright, Christina. (2017, May 14). *Rock Slide Wind River Canyon*. Retrieved August 16, 2017, from <http://k2radio.com/wind-river-canyon-rockslide-caught-on-video-video/>
12. Casper Star Tribune. (2015, May 26). *[Updated] U.S. 20 through Wind River Canyon could reopen Wednesday following rock slides*. Retrieved August 16, 2017, from http://trib.com/news/state-and-regional/updated-u-s-through-wind-river-canyon-could-reopen-wednesday/article_49274497-8443-51a3-9d95-f27fa56c82bc.html#comments
13. Casper Star Tribune. (2017, May 3). *Wind River Canyon route reopens after rock slide destroys guardrail*. Retrieved August 16, 2017, from http://trib.com/news/state-and-regional/wind-river-canyon-route-reopens-after-rock-slide-destroys-guardrail/article_df4365e9-0553-5eae-85de-505bf25c5de2.html
14. Associated Press. (2012, September 12). *Wyoming Fire Burns 24 Square Miles*. Retrieved July 12, 2019, from <https://www.youtube.com/watch?v=6NGGodu1fsA>.
15. Cooper, Elizabeth. (2013, September 10). *Sheep Herder Hill Fire One Year Later*. Retrieved July 12, 2019, from <https://www.youtube.com/watch?v=OKFRK-77Iho>.

16. Natrona County Wyoming. (n.d.). *Casper Mountain*. Retrieved July 12, 2019, from <http://www.natronacounty-wy.gov/232/Casper-Mountain>.
17. Casper Star Tribune. (June 26, 2019). *Editorial Board: Fire danger should be taken seriously*. Retrieved July 12, 2019, from https://trib.com/opinion/editorial/editorial-board-fire-danger-should-be-taken-seriously/article_a6afb6af-7299-5de4-905f-71b6c4eaf21a.html.
18. Wyoming Public Media. (2013, August 2). *Reviving local saw mills could limit fire danger in the Rocky Mountain Region*. Retrieved July 12, 2019, from <https://www.wyomingpublicmedia.org/post/reviving-local-saw-mills-could-limit-fire-danger-rocky-mountain-region#stream/0>.
19. Casper Star Tribune. (2019, June 22). *Wildfire can affect the environment in more ways than you might expect*. Retrieved July 31, 2019 from https://trib.com/news/state-and-regional/wildfire-can-affect-the-environment-in-more-ways-than-you/article_73bafdaf-51d5-52ec-8954-c0d3fc4e61f5.html