

Lesson 1: Asking Geographic Questions About Wildfire

LESSON OVERVIEW

In this lesson students define wildfire and use diagrams and maps to predict, identify and explain Minnesota wildfire locations.

OBJECTIVES

The student will be able to:

1. Define wildfire.
2. Predict, identify and explain Minnesota wildfire locations.
3. Interpret a Minnesota wildfire map on the Internet.
4. Consider causes and effects of wildfires.

ESTIMATED TIME

Two 50-minute class periods.

MATERIALS NEEDED

Teacher

Computer and LCD Projector

Internet connection

Images 1 - 5: Firewise Definition of Wildfire, Minnesota Map, Fire Triangle, Fire Behavior Triangle and Minnesota Biome Map and What is Wildfire 2016? PowerPoint presentation (2016 Teacher DVD)

Student

Firewise in the Classroom Community Assessment Process Student Guide - Sections 1-7

VOCABULARY: wildfire, Fire Triangle, Fire Behavior Triangle, topography, biomes

ACTIVITY

1. Begin Lesson 1 by asking students to silently create their own mental picture of wildfire. What does it look like? What does it sound like? What does it smell like? After a few moments, discuss their mental pictures.
2. Now, ask students to define wildfire. After students have suggested several definitions, project Image 1, Firewise Definition of Wildfire. Compare and contrast student definitions with the Firewise definition.
3. Pass out the Firewise in the Classroom Community Assessment Process Student Guide. Read and discuss the Student Learning Goals, and provide students with a preview of the Firewise project.
4. Have students turn to Section 1, What Is Wildfire, and record definitions of wildfire from the opening discussion.
5. Direct student's attention to Section 2 of the Student Guide, Minnesota Wildfire Locations. On Map 1, ask students to predict the areas of Minnesota that experience the most wildfires, and to indicate those areas on the map by circling, shading or symbolizing.
6. When students have finished, ask them to "pair and share", turning to a classmate close to them to compare and contrast their maps. While students are exchanging ideas, project Image 2, Minnesota Map. After students have had a few minutes to discuss their maps with each other, ask student volunteers to share their predictions with the class. Discuss.
7. Explain that the class will now look at two diagrams that may assist them in making a more accurate prediction of wildfire prone areas in Minnesota.

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8. Direct student's attention to Section 3 of the Student Guide, The Science of Wildfire.
9. Project Image 3, Fire Triangle. Have students sketch and label the sides of the Fire Triangle in their Student Guide. Discuss each side of the triangle.
 - What is a fire's source of oxygen?
 - What are a fire's potential sources of heat?
 - What are a fire's potential sources of fuel?

Have students list these potential sources in their Student Guide.

10. Project Image 4, Fire Behavior Triangle. Have students sketch and label the sides of the Fire Behavior Triangle in their Student Guide. Discuss each side of the triangle.
 - What is topography, and how can it affect the occurrence and spread of wildfire?
 - How can weather affect the occurrence and spread of wildfire?
 - Which types of fuels feed a wildfire?
11. Project Image 5, Minnesota Biome Map. Discuss what a biome is and which biomes are most prone to wildfire. Direct student's attention to Section 4 of the Student Guide, Minnesota Biomes. Discuss the three major Minnesota biomes. Ask students to indicate on the Minnesota Biome Map which biomes are most prone to wildfire by circling, shading or symbolizing.
12. Redirect student's attention to Section 2 of the Student Guide and their Wildfire Location Predictions map. Which areas of Minnesota did they predict would experience the most wildfires? Does the new information about the Fire Triangle, the Fire Behavior Triangle and Minnesota biomes change their predictions? If so, how? Discuss. Inform students that they will now have an opportunity to check their predictions.
13. Navigate to the Minnesota DNR Wildfire Information Center web page at <http://www.dnr.state.mn.us/forestry/fire/index.html>.
14. Examine this page briefly and then click on the link to the Fire location map. You will see a map of Current Fire Locations. Under Select Map, click on the radio button for "Year-to-Date" to view all fires reported for the current calendar year. Note the date, summary figures and legend to the right and map tools to the left.
15. Compare and contrast the current fire information with student predictions. Discuss the idea that this data is for the year-to-date, that it may be early or late in the fire season, that this year may be a typical or atypical year for Minnesota wildfire, and that this map shows only fires for which the Minnesota DNR was the primary responding agency. Inform students that this web page is an Internet Map Server powered by computer software called a Geographic Information System (GIS).
16. Redirect student's attention to Section 5 of the Student Guide, Checking Your Prediction. On Map 2, Minnesota Wildfire Locations, ask students to indicate the areas of Minnesota that have experienced the most wildfires this year, based on what they have learned from the Minnesota DNR Wildfire Information Center website.
17. Ask students to brainstorm potential causes of wildfires. How are these causes similar to or different from the causes of other types of fires? Return to <http://www.dnr.state.mn.us/forestry/fire/maps/locations.html> and click on the link to Fires by Cause, 1987-2006 under Historical Charts. Discuss the causes illustrated by the pie graph.

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18. In conclusion, direct student's attention to Section 6 of the Student Guide, Asking Geographic Questions about Minnesota Wildfire. Discuss the three basic questions of the geographer: Where is it? Why is it there? What difference does it make? Ask students to answer the three basic questions based on the day's activity.
19. Assign students to add depth to their responses by researching recent wildfires in Minnesota and/or the U.S. Where are wildfires occurring? Why are they occurring in those locations? What physical and human effects are associated with these wildfires? Research can be recorded in Section 7 of the Student Guide, Recent Wildfire Research.

CONCLUSION

Answer any questions related to the day's topics.

ASSESSMENT

Formal - Firewise Student Guide - Sections 1 - 7

EXTENSION

1. Display the Biomes of Minnesota poster and/or other thematic Minnesota maps. Discuss how map data about such things as topography, weather, fuels and population can help us predict wildfire locations.
2. Students can further explore high and low wildfire risk areas in the United States and share their findings. See Teacher Resource Links.

RESOURCE LINKS

- **Biomes of Minnesota**
 - <http://www.dnr.state.mn.us/biomes/index.html>
- **Minnesota's Fiercest Fires**
 - http://www.youtube.com/watch?v=X-cubgDiAmY&feature=player_embedded
- **Minnesota Fiercest Fires: full**
 - http://www.mnvideovault.org/mvvPlayer/customPlaylist2.php?id=23896&select_index=0&popup=yes#0
- **National Drought Mitigation Center - National Drought Map**
 - <http://droughtmonitor.unl.edu/>
- **USDA U.S. Forest Service Wildland Fire Assessment System - Current Wildfire Danger Map**
 - <http://www.wfas.net/>
- **Minnesota DNR Wildfire Information Center**
 - <http://www.dnr.state.mn.us/forestry/fire/index.html>
- **Smokey Bear's Science of Wildfire**
 - <http://www.smokeybear.com/wildfire-science.asp>
- **Firewise Interactive modules**
 - <http://firewise.org/wildfire-preparedness/teaching-tools/interactive-modules-and-quizzes.aspx>