

Classroom Activity:

Living with Fire CD-ROM

What's the Point? Fires have shaped the wildlands of North America for thousands of years, but fire has been excluded from many of these ecosystems for nearly a century. Does it matter? One of the consequences of fire exclusion, scientists believe, is a change in the fire behavior likely when a fire does finally occur—a change in the *fire regime*. In this activity, students play a simulation game to explore the effects of various management choices (*treatments*) on the behavior of a subsequent wildland fire in ponderosa pine/western larch/Douglas-fir forests. They use the CD-ROM *Living with Fire*, which displays data from mathematical models of tree growth and fire spread in a “cartoon forest” format, to make management choices and view the consequences. *Living with Fire* is limited to ponderosa pine/larch/Douglas-fir forests; students will not learn about other kinds of forest (for example, cedar/hemlock, grand fir, lodgepole pine, or whitebark pine) in this activity.

Living with Fire requires a computer with CD reader and Internet Explorer 4.0 or higher. The CD can be loaded on multiple computers. The activity can be done individually or by teams of two students. The teacher introduces the activity and assignment and then schedules students to use the computer and complete the work. Class discussion of results follows completion of the activity

Teacher's Map:

Grade levels: Middle, High

Objective: Given a simulation game that predicts effects of forest management on fire behavior, students can identify the effects of treatment weather on behavior of a subsequent wildland fire.

Subjects: Science, Mathematics, Reading, Writing, Speaking and Listening, Social Studies, Technology, Workplace Competencies

Duration: 10 minutes to introduce, 15 to 20 minutes/computer teams, 10 minutes to conclude

Links to Standards:

National Science Teachers' Association—Grades 5-8:

- D3) Describe interaction of organisms with atmosphere
- E1) Identify a need for technological design; plan, implement and evaluate design
- E3) Demonstrate risks and tradeoffs in technological design
- E4) Recognize that technology produces benefits and also unintended consequences
- F1) Identify potential for accidents, make choices that minimize risk of injury
- F3) Recognize sources and challenges of natural and human-induced hazards
- F6) Recognize difference between science questions and other questions
- G3) Recognize that uncertainty, debate, further investigation, and evaluation are part of science

National Science Teachers' Association—Grades 9-12:

- E1) Identify need for technological design; plan, implement, evaluate design, communicate
- F1) Identify hazards, make choices that minimize risk of injury to self and others
- F3) Recognize extent, sources and challenges of natural and human-induced hazards
- F5) Incorporate quantitative understanding of risk in decisions on science and technology
- G1) Understand science as career and hobby

North American Association for Environmental Education—Grades 5-8:

- 1D) Judge weaknesses and strengths of the information they are using
- 2.4A) Understand that human-caused changes affect environment
- 2.4D) Understand human ability to control environment as function of knowledge, technology
- 3.1A) Use information to investigate environmental issues
- 3.1B) Identify consequences of specific environmental issues
- 3.1C) Develop action strategies for addressing particular issues
- 3.2A) Develop personal views on environmental issues
- 3.2B) Evaluate need for action

North American Association for Environmental Education—Grades 9-12:

- 0A) Identify several plants and animals common to local ecosystems, describe concepts
- 0B) Investigate short- and long-term environmental changes
- 1D) Apply logic to assess completeness and reliability of information
- 2.3A) Understand influence of individual and group actions on environment
- 2.4A) Understand that humans change environment and environment has limited ability to adjust
- 2.4D) Examine social and environmental impact of various technologies
- 3.1A) Investigate environmental issues
- 3.1B) Evaluate consequences of specific environmental changes, conditions and issues for humans and ecosystems
- 3.2C) Decide whether action is needed in a situation

Vocabulary: prescribed burn, surface fire, thin, treatment

Materials: You will need one copy of the Student Page, *Living with Fire*, for each student or team.

Procedure:

1. Explain: The assignment will give students a taste of some of the choices that land owners, firefighters, and managers of public lands make when they work in forests where fire has been an important force. They will use the CD to answer questions.
2. Explain your strategy, the schedule for computer use, and when the assignment is due.
3. OPTIONAL: Explain the decision-making structure of the CD: First, an introductory section provides information they will need to make wise choices. Then they enter the game, make choices, and view consequences. The CD is organized with 5 levels of choice:
 - Choose a kind of ponderosa pine forest—old growth or second growth (60 years post clearcut).
 - Choose to manage passively (no action) or actively (harvest and/or surface burn).
 - Choose to wait 1 or 50 years before a wildland fire burns into the forest.

- Choose weather during the fire—moist conditions, moderate, or very dry and windy. view potential fire behavior.
 - Choose how to manage the fire—with monitoring alone, or with aggressive fire suppression.
4. Have students use the CD, complete the worksheet, and hand it in. Use for

Evaluation.

Closure: Use a few minutes of class time to discuss:

1. What was the most severe ("scary?" "destructive?" "dramatic?") fire behavior found?
2. What conditions led to the severe fire behavior?
3. Were the game results always what you expected, or were there some surprises? Explain.
4. Were the results from your choices believable? What made the information on the CD believable... or not?
5. How important is scientific information to decisions like the ones used in this game? What other information is important for making those decisions?

Extension:

Assignment for discussion or writing project: The CD shows predictions for forests dominated in past centuries by ponderosa pine. What about lodgepole pine forests, whitebark pine forests, and the dozens of other kinds of wildlands that occur in your local area? Do library research, use the Fire Effects Information System (www.fs.fed.us/database/feis), and talk to local experts. Learn the effects of various kinds of forest treatment, including the use of no treatment at all, on potential fire behavior.