



8-2. Who Lives Here? Adopting a Plant, Animal, or Fungus

Overview: This activity introduces a suite of organisms that live in 3 forest communities of the northern Rocky Mountains and North Cascades (forests dominated by ponderosa pine, lodgepole pine, and whitebark pine). Each student “adopts” an organism, learns about its characteristics and its relationship to fire, and gives a 2- to 3-minute presentation on it to the class – complete with a mask, costume, or puppet (or other medium, such as painting, poster, computer presentation, or written description). **BUT SEE THE FOOTNOTE BELOW (*) FOR A FUN, SHORT WAY TO DO THE PRESENTATIONS.**

Goal: Increase students’ understanding of ecological communities and biodiversity by learning about some of the plants, animals, and fungi that live in forests of the northern Rocky Mountains and North Cascades and their relationships with fire.

Subjects: Science, Reading, Speaking and Listening, Art

Duration*: 1-2 class periods for student preparation, 1-2 minutes each for presentations

Group size: Whole class

Setting: Classroom

Vocabulary: *autotroph, biodiversity, herb, heterotroph, kingdom, organism*

ABOUT SCHEDULING PRESENTATIONS: It may be helpful to spread the student presentations over several class periods, 2-3 at a time. Make sure they are done by the time you start **Activity E14**, in which students learn about community dynamics and succession.

It is good to schedule the presentations for all conifer trees as soon as possible, because the next 3 activities are about trees. Schedule lodgepole pine right before you do **Activity E11. Recipe for a Lodgepole Pine Forest: Serotinous Cones**. Schedule the herbs and shrubs (and possibly the two deciduous trees – quaking aspen and black cottonwood) right before you do **Activity E12. Buried Treasure: Underground Parts that Help Plants Survive Fire**.

Objectives:

- Students can create an art work (mask, costume, puppet, or other medium) depicting their “adopted” organisms.
- Students can give a 2- to 3-minute presentation to the class that describes the biology of their adopted organisms and the organism’s relationships to fire. **BUT SEE THE FOOTNOTE BELOW (*) FOR A FUN, SHORT WAY TO DO THE PRESENTATIONS.**
- Students can recognize several characteristics of organisms: their kingdom, family or life-form, way(s) of obtaining energy, and typical responses to fire.

*Students can perform charades for a very abbreviated version of this activity. Each student is assigned one species from the *FireWorks Encyclopedia*. He/she reads the essay and then acts out the species (without sound). After classmates correctly guess the species, the actor tells the class what community the species lives in and one thing about its relationship with fire.

Standards:		1st	2nd	3rd	4th	5th
CCSS	Reading Informational Texts	1, 2, 4, 7, 10	1, 2, 4, 7, 10	1, 2, 4, 7, 10	1, 2, 4, 7, 10	4, 7, 10
	Reading	1, 2, 4	3, 4	3, 4	3, 4	3, 4
	Speaking/Listening	1, 2, 4, 6	1, 2, 4, 6	1, 2, 4, 6	1, 2, 4, 6	1, 2, 4, 6
NGSS	Heredity: Inheritance and Variation of Traits	LS3.B				
	Ecosystems: Interactions, Energy, and Dynamics		LS2.A			LS2.A
	Biological Evolution: Unity and Diversity		LS4.D	LS4.C		
	From Molecules to Organisms: Structures and Processes			LS1.B	LS1.A	
EEEGL	Strand 1	A, B, C, E, F, G				A, B, C, E, F, G
	Strand 2.2	A, B, C				A, B, C

Teacher background: Different kinds of plants and animals have different needs. Some plants grow well only in sunny openings, for example, while some others grow well in shade, and others require special soil conditions or large amounts of water. Different species that live in the northern Rocky Mountains and North Cascades have different ways to live, grow, reproduce, survive fires, and thrive after fires. The traits that help them persist in habitats that burn are sometimes specific to a certain kind of fire, so changes in the kinds of fire or the frequency of fire may make life difficult for the organism.

In this activity, students teach each other about some of the species that live in the 3 communities covered in this FireWorks curriculum: forests dominated by ponderosa pine, lodgepole pine, and whitebark pine. (If you want to focus on only 1 of the 3 communities, use the last column in Table E08-2-1 “preferred forest type” to decide which organisms to assign.) Each student “adopts” a plant, animal, or fungus. Students learn about their adopted organisms by studying the short technical essays in the *FireWorks Encyclopedia* (**Elem_FireWorksEncyclopedia_NRM-NC.pdf**). Then each student prepares an art work (mask, puppet, costume, or other medium) that describes his or her organism and presents the organisms to the class.

Detailed information on most of the species in the *FireWorks Encyclopedia* is available in the literature syntheses of the Fire Effects Information System (<https://www.feis-crs.org/feis/>).

Materials and Preparation:

- Find in the trunk or make available to students (in print or electronically): *FireWorks Encyclopedia (Elem_FireWorksEncyclopedia_NRM-NC.pdf)*.
- Print 1 copy of Table E08-2-1: Species in the *FireWorks Encyclopedia*, Key to “Walk Your Talk.” Use this list to record the species adopted by each student. The list contains more than 30 species; if you do not need all of them, start with **those shown in bold print (and shaded in blue)**, since these are the species shown on the 3 feltboards used in Activities E08-1 (“What’s a Community?”) and E14 (“Story Time”).
- Art supplies for masks, puppets, costumes, etc.

Procedure:

1. Explain: We’re going to learn about some of the organisms that live in 3 forest communities of the northern Rockies and North Cascades – forests dominated by ponderosa pine, lodgepole pine, and whitebark pine. We learned many of their names in **Activity M08-1**, when we learned about biological communities. We’ll only learn about a few of the species though. There’s a lot of biodiversity in our wildlands. In Glacier National Park, for example, there are more than 1,100 species of plants, 276 species of birds, and 71 species of mammals. Think how many kinds of insects, worms, and fungi there must be!
2. Explain: Each of you will “adopt” an organism that lives in one (or more) of the 3 forest communities. Then you will:
 - Learn about the organism from the essay in the *FireWorks Encyclopedia*.
 - Prepare an art work (mask, costume, puppet, or other medium) to use in a short presentation to teach the class about the organism.
 - Give a 2- to 3-minute presentation on your adopted organism. Include a short description of the organism, its needs and habitat, the kind(s) of fire that occur there (surface fire, crown fire, or a mixture of these), and how it deals with fire.

TEACHER – PLEASE SEE THE FOOTNOTE ON THE FIRST PAGE OF THIS LESSON FOR A SHORTER WAY TO DO THIS.

3. Make species assignments and hand out (or provide computer access to) essays from the *FireWorks Encyclopedia (Elem_FireWorksEncyclopedia_NRM-NC.pdf)*.

*Students can perform charades for a very abbreviated version of this activity. Each student is assigned one species from the *FireWorks Encyclopedia*. He/she reads the essay and then acts out the species (without sound). After classmates correctly guess the species, the actor tells the class what community the species lives in and one thing about its relationship with fire.

Assessment:

1. Have students give their 2- to 3-minute presentations.
2. **Review:** After the presentations, have all students get into or display their art work and form a circle around the classroom. Better yet, do this activity outdoors! Then go through this **“Walk Your Talk” activity**. It might be fun to spread out the different parts of the activity over several days. **Solutions for the prompts in the activity are listed in Table H08-2-1 below.**
 - 1) Explain: Living things are grouped according to their kingdoms. We have been studying organisms in 3 kingdoms – plants, animals, and fungi.
 - 2) Designate a space in the classroom for each kingdom. Then instruct: **Everyone, walk to your kingdom!**
 - 3) Have students form a circle from wherever they are standing. Then... **Walk your talk - what kind of organism are you?**
 - a. All mammals, take 2 steps forward¹. One at a time, announce your species name, have the class repeat it, and then step back.
 - b. Birds, take 2 steps forward. One at a time, announce your name, etc.
 - c. Insects, take 2 steps forward. One at a time, announce your name, etc.
 - d. Fungi, take 2 steps forward. One at a time, announce your name, etc.
 - e. Trees, take 2 steps forward. One at a time, announce your name, etc.
 - f. Shrubs, take 2 steps forward. One at a time, announce your name, etc.
 - g. Explain: Grasses, sedges, and wildflowers are all called *herbs* (pronounced “ERBS”). Herbs, take 2 steps forward. One at a time, announce your name, etc.
 - 4) **Walk Your talk – how do you earn your living?**
 - a. If you get energy directly from sunlight, you are an autotroph. Autotrophs, take 2 steps forward. One at a time, have the organism to your RIGHT say your name and have the class repeat it. Then step back.
 - b. If you get your energy from other organisms (plants animals, or fungi – living or dead), you are a heterotroph. Heterotrophs, take 2 steps forward. One at a time, have the organism to your RIGHT say your name, etc.
 - 5) **Walk Your talk – how do you deal with fire? Be flexible with this one, since many organisms have effective ways to respond to almost any kind of fire.**

¹ You can vary the “stepping forward” part by adding a different motion each time, such as turning around, raising their arms, walking backwards, jumping, etc.

- a. If you don't like fire, take 2 steps forward. One at a time, have the organism to your LEFT say your name and have the class repeat it. Then step back.
- b. If you like most fires, regardless of whether they burn just the surface fuels or burn through the tree crowns, take 2 steps forward. One at a time, have the organism to your LEFT say your name, etc.
- c. If you like surface fires a lot better than crown fires, take 2 steps forward. One at a time, have the organism to your LEFT say your name etc.
- d. If you like crown fires a lot better than surface fires, take 2 steps forward. One at a time, have the organism to your LEFT say your name etc.
- e. If your forest has EVER experienced a wildland fire, take 2 steps forward. **This should include everyone! Now go around the circle and have the whole class say the name of each organism.**

Evaluation:	Excellent	Fair	Needs Improvement
Presentation	-Presentation was 2-3 minutes in length. -Student prepared a visual component using considerable effort and creativity. -Student provided a basic and accurate description of organism, its needs, and how it deals with fire.	-Presentation was over or under 2-3 minutes. -Student prepared visual component. -Student's basic description of organism, its needs, and its relationship to fire were incomplete or contained minor inaccuracies.	-Presentation was greatly over or under 2-3 minutes. -Student did not prepare visual component, or put minimal effort into preparing it. -Basic information was missing or largely inaccurate.
"Walk Your Talk" activity	Student gave all correct information.	Student gave mostly correct information.	Student gave mostly incorrect information or did not participate.

Table E08-2-1: Species in the *FireWorks Encyclopedia*, Key to “Walk Your Talk”

Species	Student name	Responses for “Walk Your Talk”				Preferred forest type*
		Kingdom	Other group	Energy	Fire	
American black bear		Animal	Mammal	Other organisms	Any fire	All
American marten		Animal	Mammal	Other organisms	No fire	All moist, old forests. Especially likes fir trees
American three-toed woodpecker		Animal	Bird	Other organisms	Crown fire	All, especially LP because of tendency toward crown fire
Armillaria root fungus		Fungus	Fungus	Other organisms	Any fire	PP, in fir trees
Arrowleaf balsamroot		Plant	Herb	Sunlight	Any fire	PP
Beargrass		Plant	Herb	Sunlight	Any fire	Mainly LP
Black cottonwood		Plant	Tree	Sunlight	Any fire	PP or moist ravines at higher elevations
Black-backed woodpecker		Animal	Bird	Other organisms	Crown fire	All, especially LP because of tendency toward crown fire
Blue huckleberry		Plant	Shrub	Sunlight	Any fire	Mainly LP
Black fire beetle		Animal	Insect	Other organisms	Any fire, especially if still hot	All
Clark’s nutcracker		Animal	Bird	Other organisms	Any fire	All, but especially adapted to WB
Douglas-fir mistletoe		Plant	Shrub	BOTH sunlight and the sap of host trees	No fire	Mainly PP, also LP
Douglas-fir		Plant	Tree	Sunlight	Surface fire	Mainly PP, also LP

Elk		Animal	Mammal	Other organisms	Any fire	Uses all forest types, depending on season and food.
Engelmann spruce		Plant	Tree	Sunlight	No fire	Mainly LP, but also moist ravines at lower and higher elevations
Fireweed		Plant	Herb	Sunlight	Any fire	Mainly LP but also PP and some WB forests
Flammulated owl		Animal	Bird	Other organisms	Surface fire	PP
Glacier lily		Plant	Herb	Sunlight	Any fire	LP, WB, some PP
Grizzly bear		Animal	Mammal	Other organisms	Any fire	All, but especially loves WB because of its seeds
Grouse whortleberry		Plant	Shrub	Sunlight	Any fire	WB, some LP
Heartleaf arnica		Plant	Herb	Sunlight	Any fire	Mainly PP and LP
Lodgepole pine		Plant	Tree	Sunlight	Crown fire	LP. Also occurs mixed with PP & WB.
Mountain pine beetle		Animal	Insect	Other organisms	Crown fire	LP & PP. Thrives especially in dense LP forests that develop after crown fire.
Northern flicker		Animal	Bird	Other organisms	Any fire	All
Pileated woodpecker		Animal	Bird	Other organisms	Surface fire	PP
Pinegrass		Plant	Herb	Sunlight	Any fire	Mainly PP

Ponderosa pine		Plant	Tree	Sunlight	Surface fire	Mainly PP, also some LP
Quaking aspen		Plant	Tree	Sunlight	Any fire	LP, also moist spots in PP
Red squirrel		Animal	Mammal	Other organisms	No fire	All. Really likes WB cones.
Red-backed vole		Animal	Mammal	Other organisms	No fire	All habitat that is shady and moist
Saskatoon serviceberry		Plant	Shrub	Sunlight	Any fire	PP, also some LP
Smooth woodrush		Plant	Herb	Sunlight	Any fire	Mainly WB, also in LP if enough moisture is available.
Snowbrush ceanothus		Plant	Shrub	Sunlight	Any fire	LP and PP
Subalpine fir		Plant	Tree	Sunlight	No fire	LP & WB
Western larch		Plant	Tree	Sunlight	Any fire	PP & LP
Western redcedar		Plant	Tree	Sunlight	Little or no fire	PP, mainly in deep, moist valleys
White pine blister rust		Fungus	Fungus	Other organisms	No fire	WB
Whitebark pine		Plant	Tree	Sunlight	Surface fire	WB, some LP
Wild onion		Plant	Herb	Sunlight	Any fire	All

* PP=ponderosa pine/Douglas-fir forest community; LP=lodgepole pine/subalpine fir community; WB=whitebark pine/subalpine fir community.