



'Watching Wildfires'

At the

Wenatchee River Salmon Festival

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Festival Activity: Watching Wildfire

Your students will gain an understanding of how fire affects **ecosystem health**. A great introduction to **hazards in 'fire season,'** our focus will be on how forestry decisions changed our landscape, and how we are now attempting to balance past actions through reducing the **fuels that fire needs to grow.**

Activities will demonstrate the **effect of forest restoration** work in our environment, with a **'forest fire' to 'flooding' demonstration,** linking ecosystems to their landscape level connections with a hands-on focus.

Presentation presented by the **Chumstick Wildfire Stewardship Coalition,** a local non-profit collaborative focused on wildfire stewardship activities: **'creating a culture, community, and landscape adapted to wildfire.'** Connecting forest management activities with **real-world jobs-** everything from fire fighting to forestry to work in organizations like the Chumstick Coalition. Other agencies involved are Fire Departments, Forest Service, or the Department of Natural Resources.

NGSS Connection: Earth and Human Activity, Earth's Systems

Grade	PE	Page	Activity Connection	Evidence Statements
3	3.ESS3.1	29	DCI: A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.	Students describe: - The given weather-related hazard - Problems caused by the weather related hazard - How the proposed solution addresses the problem
4	4.ESS2.1	35	PE: Make observations... to provide evidence of the effects of weathering... by water, ice, wind, or vegetation.	Students make... observations according to the given investigation plan to provide evidence for the effects of weathering or the rate of erosion on Earth materials
5	5.ESS2.1	44	PE: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and / or atmosphere interact.	Students identify and describe relationships (interactions) within and between the parts of the

				Earth systems identified in the model that are relevant to the example
5	5.ESS3.1	45	PE: Obtain and combine information about ways individual communities use ideas to protect the Earth's resources and environment.	Teacher post-event activity choice: 1.a: Students obtain information from books and other reliable media about; or 2.a: Students combine information from two or more sources to provide and describe* evidence about

- 3rd Grade: 3.ESS3.1, pg. 29: DCI: A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.
- 4th Grade: 4.ESS2.1, pg. 35: PE: Make observations... to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- 5th Grade: 5.ESS2.1, pg. 44: PE: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and / or atmosphere interact.
- 5th Grade: 5.ESS3.1, pg. 45: PE: Obtain and combine information about ways individual communities use ideas to protect the Earth's resources and environment.

Concept: The nature of fire-prone landscapes

- How can the impact of weather-related hazards be reduced?
- What happens to organisms when their environment changes?
- Using models of the natural world to demonstrate environmental change.

Key Vocabulary: Refer to 3rd and 4th Grade Standards

- Forest Health: Historical conditions vs. Overstocked conditions
- Fuels: Ladder Fuels, Fuels conditions
- Restoration: Mechanical removal, Prescribed fire
- Fire Characterization: High-intensity fires, Low-intensity fires
- Soil: Mineral dirt, Alive soil

Materials:

- All materials will be provided by activity leader

Suggested Procedure:

1. Introduce healthy forests concept:
 - a. Historical vs. current forest photos
2. Fire on the landscape: wildfire intensity
 - a. Are all fires 'bad'?
 - b. Who has experienced a wildfire?
 - c. Do some wildfires burn differently?
 - i. Low-intensity fires: historical landscape
 - ii. High-intensity fires: today's forests
3. Fire activity:
 - a. How do these 'forests' look different? Which is the 'historical' forest and which is the 'current' forest?
 - i. Which will burn hotter?
 - b. Light the match-forests. Why did the fire burn the way it did in each?
 - c. Wood rounds and fire
4. Soil activity: what does fire do to soils?
 - a. Back to the 'burns': how does the dirt look different?
 - b. Jars: 'Mineral dirt' jar vs. 'Alive soil' jar
 - i. How are these jars different? Is there life in one?
 - ii. Which dirt goes with which fire?
 - iii. What does high-intensity fire do to the life in the soil?
 - iv. Does anyone know what happens when it rains hard on mineral dirt?
 - v. Let's find out! Choose 2 kids (marked stickers) and spray the fires, see the flood.
5. Demonstrate relationship to soil quality
 - a. Mineral soil vs. undisturbed soils
 - b. Demonstrate soil behavior after fire: spray bottles!
 - c. Show jars with different river substrate compositions=> can these eggs breathe or not?
6. What is good for salmon eggs?
 - a. Does anyone know how this runoff affects salmon?
 - b. Jars: 'Muddy' vs. 'Cool and clear'
 - c. What kind of water do salmon like?
 - d. Clear, clean, cool water
 - e. Healthy uplands=> forests => healthy watersheds
7. What does the Chumstick Wildfire Coalition do?
 - a. Restore forests for the forests' health and our safety by:
 - b. Fuels reduction:

- i. Mechanical- saws, machinery, goats(?)
 - ii. Prescribed fire- low-intensity controlled burns by fire professionals
 - c. Teach people to be Firewise
 - i. Homes
 - ii. In their lives
 - d. To do this, we work with the USFS, WA DNR, and the CCFD...
- 8. FD Cadet/Volunteer:
 - a. Cascade High School Fire Program
 - b. Learn to be a fire fighter in school
- 9. Questions!
- 10. If time allows:
 - a. Show off fire gear?
 - b. Touch-a-truck?

Supply list:

1. 16 Metal pans
2. 16 Clay or other building substrate
3. Pea gravel
4. 4 big jars
5. Lots of Matches
6. Long Lighter
7. Fake 'salmon eggs'
8. Dirt for flooding demo
9. Spray bottles
10. Wood rounds
11. Large pictures of historical vs. current conditions
12. Pictures of fire: stand replacement vs. prescribed burns
13. Infographics:
 - a. List of CWSC priorities
 - b. After the Fire=> Flooding CWSC archives

Pre-Festival Lessons:

1. Forest:
 - a. Woodsy Owl, Activity Two: Meet the Trees!
 - i. If there are trees around your school, take the kids out and do the activity described in the pages below.
 - ii. The most important part of this Activity is the bit at the end, however. In 'Radical Roots' at the end of Activity Two is a great demonstration of how

roots work to hold soils together. Since the demonstration is about erosion caused by the loss of tree and soils' supporting systems, this activity is key to children's understanding of the concepts being introduced.

2. Soil:
 - a. Woodsy Owl, Activity Four: A Single Patch of Earth
 - i. Here the focus is on kids understanding that the earth is alive. Activity Four does a great job of explaining this concept to children.
 - b. Coloring activity: 'Who Made This Dirt'

Post-Festival Lessons:

1. Natural Fire Cycle: Infographic
 - a. Go through the fire cycle with the children as described in the Fire Cycle Infographic.
2. Human Altered Fire Cycles: Interactive Puzzle
 - a. Go to: <https://omsi.edu/exhibitions/forestpuzzles/cycles/et/et1.html>
 - b. This is a fun program you can have the kids visit on their own or go through with them on the projector.
3. Fun Fire Facts:
 - a. Temperatures of fuels such as wood found in an open field may be warmed to as much as 160°F by the sun?
 - b. Lightning is like a gigantic spark between a negatively charged lower cloud and the positively charged earth?
 - c. A test fire is used before igniting a prescribed fire to determine the exact burning conditions and how the fire will behave?
 - d. More than 4,000 years ago, Native Americans used fire to help with hunting and to keep their berry gathering areas clear of trees?
 - e. Some pine cones, called serotinous cones, rely on fire to help them open and release their seeds?

ACTIVITY

2

Meet the Trees!

Get to know the trees in your neighborhood.

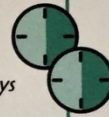


What you need

String, Construction paper, Tape, Scissors, White paper, Crayons, Paste (optional), Old magazines (optional), Measuring tape or ruler

Time

30 minutes to meet the trees
30 minutes to make tree displays



1

Get Started by telling children that they're going to meet the local trees. What are the different parts of a tree? As a group, read *The Giving Tree*, by Shel Silverstein (New York: Harper Collins, 1964). Make a list of reasons why trees are nice to have around. Here are a few:

1. Trees make things cool and shady.
2. Trees make good homes for squirrels and birds, including owls like Woody.
3. Trees grow tasty fruits like apples and oranges.
4. People can use trees to make wood, paper, medicines, and other useful things.

2

Have children form small groups. Give each one a piece of string about 30 inches long. Walk to an area with a lot of trees. Each group can choose a tree to meet and investigate. Here are some questions to get them started:

1. Do you see any birds' nests in the branches or insects on the trunk?
2. Is the bark smooth or rough? What do the leaves look like?
3. Can you see the tree's roots?

3

Help children measure the size of the trunk by wrapping their string around the tree. Cut the length of string. Take back tree souvenirs by making bark rubbings and collecting acorns, cones, berries, or leaves that have fallen from the tree. To make a bark rubbing, place a sheet of white paper against the trunk. Then rub the width of a crayon across the paper. Remind children that tearing the bark off a tree can hurt or even kill the tree.

Tip: Children whose tree trunks are very large may need to tape together several pieces of construction paper.

4

After the walk, children can use their "tree trunk" string to cut a brown strip of paper of the same length. Measure it and compare the size of each trunk. Encourage children to decorate the strip with the bark rubbings from their tree. Then, they can tape or paste the ends of the strip together to make a model tree trunk. Paste the souvenirs to the outside of the trunk model. Now find a place to display your miniature model forest!

5

Close by talking about what the area would be like without trees. How would this affect an owl like Woody?

Smooth bark lets rain run down to the roots quickly; a tree with rough bark lets rain run down slowly!

RADICAL ROOTS!

Explain to older children what erosion is—the wearing away of soil by wind and rain. Then, cut five small holes into the foot of an old brown sock. Attach a green felt band to the top of the sock. Pour enough dirt into a medium-sized box or terrarium to create a "hill" at one end. Put your hand through the sock so that your fingers become the tree roots and your arm becomes the trunk of the tree. Dig your fingers into the soil and pour water onto the dirt from the top of the hill. What happens? Remove your hand from the soil and continue to pour the water. What happens now? What do tree's roots do?

Materials: Box, brown sock, dirt, green felt, water

Follow with activities 8 (*Woody's Paper Caper*) and 10 (*Team Trash Crafts*).

Words to Know!

Root: part of a plant or tree below the ground that holds the plant or tree in place and draws water and food from the soil

Bark: outside covering of tree trunks that helps keep diseases and insects out of the tree and moisture inside the tree



ACTIVITY

4

A Single Patch of Earth

Perform detective work on a small patch of earth and see how it can be home to many living things.

What you need

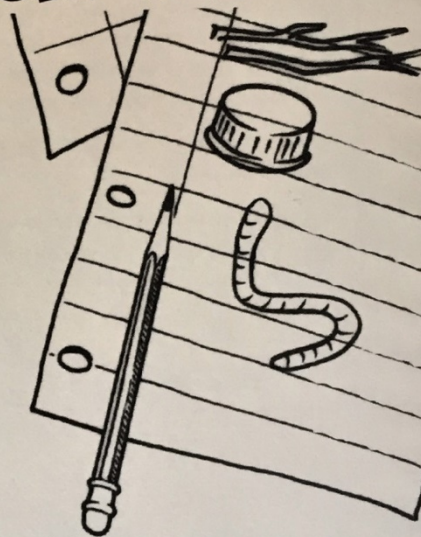
Cardboard or manila file folders, Scissors, Tape, Paper, Pen and/or crayons, Notebook or clipboard, Optional: Backpack, Jar, Rulers, Hand lens

Time

40 minutes



OUR PLOT HAD:
2 ANTS
GRASS
4 PEBBLES
2 TWIGS
1 BOTTLE CAP
1 WORM



Get Ready! Cut the cardboard into frames (about 12 x 12 inches) ahead of time for younger children. Scout out some good places to investigate.

1 Get Started by telling children that it's possible to find over 300 worms in a small garden! Show children an Earth Investigation Frame and tell them now is their chance to be "Special Detectives of the Earth."

2 Divide your group into Detective Squads (of two or three children) and give each pair an Earth Investigation Frame. Choose two or three zones where squads can lay down their frames. Have squads rotate to another investigation plot about every 15 minutes. Remind children that good Earth Detectives always write down or draw pictures of everything they find including grass, scraps of litter, and ants. Your detectives should bring along sturdy notepads or clipboards to make



All the living things (worms, insects, plants) combined from a 6-inch-deep area the size of a football field can be almost as heavy as four elephants!

IMAGINE WHAT AN ANT MIGHT SEE!

Challenge older children to write a story or draw a picture about what a patch of earth would look like if they were the size of an ant. Activate their imaginations with the book *Two Bad Ants*, by Chris Van Allsburg (Boston: Houghton Mifflin, 1988).



Children can also take home their stories and Earth Investigation Frames—encourage them to play Earth Detectives with family members in their own backyard!

Try this activity with activities 9 (*A Great Recipe for Garbage*) and 1 (*Woodsy's World Scavenger Hunt*).



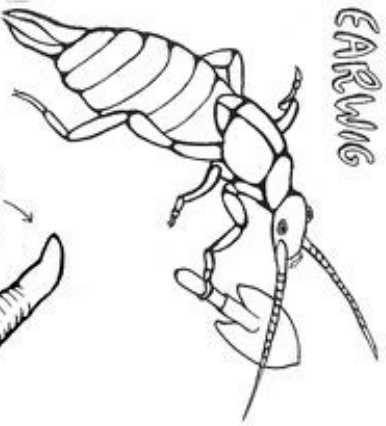
writing or drawing what they find easier. When they finish examining one plot, have them count how many items they found in it. Allow children to bring back samples of living and nonliving things when appropriate.

Tip: Make sure the area you investigate is free of poison ivy.

3 Close by having each squad draw pictures of what they found and tape them behind their Earth Investigation Frames. Have them present their frames to the group and talk about what they found in each plot.

Tip: Make copies of the Woodsy Owl detective badge on page 36 for children to wear during the investigation.

EARTHWORM



WHO MADE ALL THIS DIRTY?

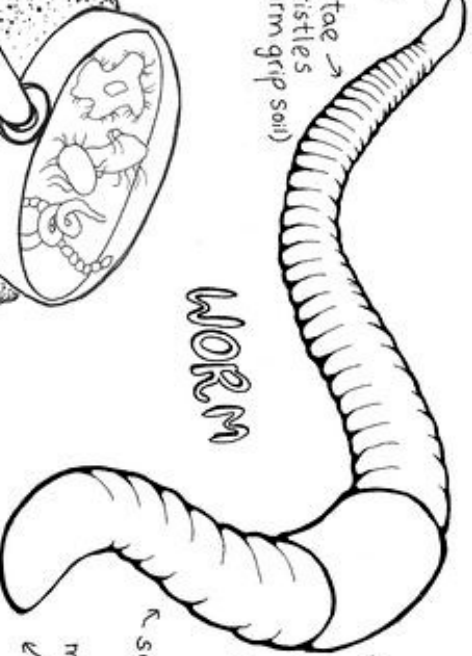
SOW BUG



PILL BUG



anus
Setae
(tiny bristles help worm grip soil)



WORM

clitellum or Saddle (only adults have it)
inside are five hearts!
segments
mouth

MICROBES



ANT



ORGANIC RESIDUALS

CENTIPEDE



green thumb growing kids
artwork: lara lucretia

