Table Rocks Curriculum

Wildlife and Fire

Objective: Students will identify animals present in the Table Rocks' ***ecosystem*** and how each responds to wildfire. Students will play a guessing game to learn how various animals on the Table Rocks may benefit or be harmed by fire.

Benchmarks Targeted: 1 and 2 (Grades 1-5)

Oregon Standards:

Subject Area: Life Science

Common Curriculum Goals: Diversity/Interdependence: Understand the relationships among living things and between living things and their environments.

Benchmark 1: Describe a habitat and the organisms that live there.

Benchmark 2: Describe the relationship between characteristics of specific habitats and the organisms that live there. Describe how adaptations help a species survive.

Common Curriculum Goals: Organisms: Understand the characteristics, structure, and functions of an organism.

Benchmark 1: Recognize characteristics that are similar and different between organisms.

Benchmark 2: Group or classify organisms based on a variety of characteristics. Describe basic plant and animal structures and their functions.

Subject Area: Social Sciences

Common Curriculum Goals: Geography: Understand how people and the environment are interrelated.

Benchmark 1: Understand how people's lives are affected by the environment.

Benchmark 2: Understand how physical environments are affected by human activities.

Subject Area: The Arts

Common Curriculum Goals: Create, present or perform: express ideas, moods, or feelings through various art forms.

Subject Area: English/ Language Arts

Common Curriculum Goals: (All Grades) Write narrative, expository, and persuasive texts, using a variety of written forms—including journals, essays, short stories, poems, research reports, research papers, business and technical writing—to express ideas appropriate to audience and purpose across the subject areas.

Common Curriculum Goals: (All Grades) Demonstrate knowledge of spelling, grammar, punctuation, capitalization, and penmanship across the subject areas.

Common Curriculum Goals: Writing: **(Grade 5)** Write narrative, expository and persuasive texts using a variety of written forms to express ideas appropriate to audience and across the subject areas.

Subject Area: Social Science Analysis

Common Curriculum Goals: Identify and analyze an issue.

Benchmark 1: Identify how people or other living things might be affected by an event, issue, or problem.

Benchmark 2: Identify characteristics of an event, issue, or problem, suggesting possible causes and results.

Length of Lesson: 45 minutes

Materials:

- ✓ "Guess Who" cards (provided)

- ✓ Color pictures of the plants and animals described on the "Guess Who" cards (not provided - many photos can be found on the Table Rocks website in "Natural History": <http://www.blm.gov/or/resources/recreation/tablerock/index.php>)

Key Vocabulary: *adaptation, ecosystem, organism, predator, scavenger, species*

Background:

All living things have traits that enable them to deal with disturbances or changing conditions in their environments. In order for a ***species*** to survive, it must be able to adapt to natural events such as extreme temperature changes, floods, or wildfire. Plants and animals that have structural or behavioral ***adaptations*** to survive in habitats frequented by wildfire are said to live in a fire-dependent community. Most animals will either flee a wildfire or burrow deep underground.

Wildlife ***species*** have developed different methods or strategies to escape wildfires. Animals such as deer, coyotes, and bobcats are able to flee the flames by running and jumping. Other animals such as gophers, snakes, lizards, and mice burrow deep underground to escape a fire. Mature birds can fly to a safer area until the flames have passed. Nestlings and chicks however may not be able to fly and escape. Their remains attract ***scavengers*** and ***predators*** such as coyotes, foxes, and vultures to recently burned areas.

Organisms, like worms, that inhabit the litter or humus layer (the top few inches of soil) often decrease after a wildfire. Although some insect populations decline as a result of wildfire, ants seem to thrive. Ant populations have been recorded as more numerous in burned areas than in unburned areas. Many microbial ***organisms*** (decomposers) also increase in numbers following a wildfire.

For further information on fire ecology, see the Chapter Introduction.

Procedure:

Preparation:

Discuss information provided in the Background section. For grades 3-5, you may want to do the "Fire Tag" lesson, included in the Fire Ecology chapter, as an introduction. Ask students to share and come up with a list of words that come to mind when they hear the term "wildfire." Define ***adaptation*** and ask students what types of ***adaptations*** different animals may have that could help them to survive wildfire. Write these on the board. Try to incorporate the words run, hop, burrow, and fly into the list.

Activity:

Using the "Guess Who" cards included with this lesson, describe an animal living on the Table Rocks and allow students to guess the animal. A suggested technique is to have students silently place their finger on their nose once they know the answer. This allows you to finish reading the card without interruption from a student yelling the answer on the first sentence and gives everyone in the class an opportunity to listen, learn about the animal, and guess the animal's identity. After reading the entire "Who am I?" clue, say "I am a …1…2…3 _____!" (allowing students to fill in the blank). As an addition, find pictures that illustrate each animal as you discuss them. Once the students have guessed the animal being described, ask the students to determine:

1) How would the animal escape or survive wildfire?

2) How might the animal benefit from wildfire?
3) How might wildfire harm the animal?

Some benefits of wildfire include:

- **Improved habitat for certain wildlife *species*-** after a wildfire a greater diversity of plant ***species*** will grow providing more types of food and shelter for animals
- **Insect and disease control-** plants will be healthier
- **Removal of noxious weeds-** noxious weeds often lack food value for animals and can even be toxic. They also can take over important habitat
- **Return of nutrients to the soil-** healthier plants, better chances for seed germination, and consequently more food and habitat for wildlife
- **New sprouts-** shrubs and other plants provide food for smaller animals and are often preferred by larger grazers like deer and elk
- **Removal of underbrush-** less cover for small animals means easier hunting for their ***predators***
- **Creation of snags-** provides homes for animals like birds, raccoons, woodpeckers, and other animals who live in cavities
- **Food for *scavengers*-** remains of animals who did not survive the wildfire attract vultures, coyotes, and other ***scavengers***

Ways a wildfire may harm an animal include:

- **Removal of Coverage:** clearing brush and fuels may benefit the forest, but ***predators*** and prey alike are more visible and unable to hide
- **Food Stock Removal:** ***Species*** that store food may lose their supply. Acorn Woodpeckers' granary trees may be destroyed
- **Destruction of Homes:** Many animals may have to rebuild their home or find a new one. During this process, the animal is more likely to be spotted by a ***predator*** and must put itself in danger while searching for a new home or gathering material to rebuild its home
- **Invasive *Species*:** While wildfire can destroy noxious weeds, often noxious weeds and invasive plants take over areas just after a burn. Noxious weeds outcompete native plants that serve as a food source or habitat for wildlife. Many noxious weeds are inedible and some are even poisonous!
- **Severity/Intensity of Fire:** The severity of the fire can have different implications in an ***ecosystem***. A low intensity wildfire can enhance an ***ecosystem***; whereas, a high intensity, severe wildfire can have detrimental affects on the overall recovery of the forest and its inhabitants.

Follow up:
• After completing the above activities, ask students to revisit the pictures or lists they created to represent their feelings and thoughts on wildfire. Have their thoughts and feelings about wildfire changed? Give students time to create a visual or written representation of this "before and after" in the form of a collage, poem, or essay.

• Ask students to choose an animal that lives on the Table Rocks. Have them write journal entries from the perspective of that animal for the day before a wildfire, the day of a wildfire, and the day after a wildfire, giving them specific points to address. Students can then create news reports, skits, or puppet shows about the challenges their animal faced to the class.

Extensions:

- Investigate the US Forest Service website at http://www.fs.fed.us/database/feis/about.html, and learn about the effects of wildfire on plants and animals. There is also a great glossary on wildland fire terms you could use to create a list for a spelling or vocabulary quiz.
- Explore the website http://www.smokeybear.com/wildfires.asp for more information, teacher resources, and activities.
- Explore additional resources at: http://www.blm.gov/education/LearningLandscapes/teachers.html

Discussion Questions:

How can wildfire keep a forest healthy?
Burned plants give the soil nutrients, which in turn helps new plants grow, providing food and shelter for wildlife. Wildfires also clear clutter, preventing high intensity severe fires from occurring and creating space and sunlight for new plants to grow. Wildfires kill pests and diseases that may be taking over an area. Wildfires can also create habitats for wildlife. Fallen logs and limbs provide homes for all sorts of insects, small mammals, and plants! More ***species*** *live in a dead tree than a live tree. Wildfires keep the forest diverse in age and variety of* ***species****, which means a healthy forest!*

Do you think wildfire is a good thing or a bad thing? Why?
For the above mentioned reasons wildfire is a good thing. However large-scale, uncontrollable, high intensity severe wildfires can disrupt and damage the ***ecosystem*****.** *Homes built in or on the outskirts of the forest are at a greater risk of destruction by wildfire, and more and more homes are being built there. These forests have had fire excluded for a hundred years. This fire exclusion can lead to large-scale, unconventional wildfires that can damage the* ***ecosystem*** *and the surrounding homes and people. Small-scale, regular interval fires that are closely monitored are more beneficial for forest health and fire prevention.*

If you could choose to be any of the animals that live on the Table Rocks during a fire, which would you choose and why? How would you survive the fire and how could it help or harm you?
Answer will vary based on student's choices.

References:

"Fire." BLM Learning Landscapes. Michael Smith. 2002. Bureau of Land Management. 3 December 2007 <http://www.blm.gov/education/LearningLandscapes/teachers.html>.

Fire Effects Information System. Jane Smith. 2006. USDA Forest Service. 4 December 2007 <http://www.fs.fed.us/database/feis/about.html>.

McGlauflin, Kathy, ed. Project Learning Tree: Environmental Education Pre K-8 Activity Guide. Washington, D.C: American Forest Foundation, 1995.

National Interagency Fire Center. 25 October 2006. US Department of the Interior. 11 February 2008 <http://www.nifc.gov>.

"Only You". Smokey Bear. USDA Forest Service. 11 February 2008 <http://www.smokeybear.com/wildfires.asp>.

Table Rocks Environmental Education. 2007. USDI BLM. 16 October 2007 <http://www.blm.gov/or/resources/recreation/tablerock/index.php>.

Who am I?

I have brown-gray fur and a bushy tail with a black tip. My scientific name means "barking dog" because you will sometimes hear my family and me in the distance at night yipping and barking. I rely on my strong sense of smell and excellent hearing to capture my food. I like to eat rabbits, squirrels, mice, berries, and anything else I can find. I normally spend my days sleeping and hiding in my den. I am very active at sunset, which is when I do most of my hunting.

Answer: Coyote

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I have large ears and use my strong sense of hearing to warn me of predators such as mountain lions and hunters. I am most active during the early morning and evening, as well as on moonlit nights. I like to eat grass and other low-growing plants but will also eat blackberries, acorns, apples, and the twigs of bushes or trees. As a male, I have antlers on my head that I use for protection and to compete with other males for the attention of females.

Answer: Black-tailed Deer

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I have very long, brown ears that have a white border. I use my excellent sense of hearing to protect me from predators including coyotes, owls, and bobcats. My fur is a combination of grey, black, tan, and white. My tail is short and fluffy and it has a black strip on it, which is where I get my name. I have very large hind feet and can hop 5 to 10 feet at a time. I enjoy eating low-growing plants such as grass and alfalfa, but will also eat twigs and dried plants during the winter months. I spend my days resting and hiding in the grasses and shrubs. I am most active during the late afternoon.

Answer: Black-tailed Jackrabbit

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I am the most common wildcat. My soft fur is light tan with black spots and stripes. I am good at climbing trees and I have a short, stubby tail. My ears have tufts of hair at the tips that point upward. I hunt small animals like mice, gophers, rabbits, and birds. I spend my days sleeping or hiding in dens found in rock piles or hollow logs. I am most active at night, when I am hunting.

Answer: Bobcat

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I have a large patch of bright red on the top of my head and a clown-like face. My body is black and white and my black wings have white patches underneath. I like to hang out near oak trees, where I can be seen pecking with my strong, sharp beak. I look for insects hiding in the bark. In the fall, I collect acorns with my family and store them in special trees called "granaries" so we will have enough food to eat during the winter. I live with my family in holes or cavities in trees.

Answer: Acorn Woodpecker

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I am a small critter who likes to eat bugs and worms. I sleep under rocks and tree bark. When it's sunny outside, I sit on top of rocks and bask in the sun to get warm. My scaly skin is black and grey with bright blue patches on both sides of my belly. I use the blue patches to attract females. Sometimes I do pushups for females or to show other males where I live, telling them they should stay away! When something dangerous comes near, I scurry for a hiding spot. I'm often heard rustling around in the leaves.

Answer: Western Fence Lizard

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I'm a long, lean, hunting machine. I move very quickly by slithering across the ground and I like to hunt small animals. First I bite them and inject them with my venom, and then I swallow them whole! My bite is also poisonous to humans but I don't really want to bite them. I usually bite things I want to eat and humans are too big although I may bite them if I'm startled or threatened. When I get excited I shake the tip of my tail, which makes a rustling or rattling sound, as a warning. I lie in the sun when I want to get warm and hide under a rock or in the shade if I need to cool down.

Answer: Western Rattlesnake

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I'm sometimes found near ponds and pools where I go to lay my eggs. Because I live part of my life in the water and part on land, I'm called an amphibian. I am small and move around by hopping with my strong back legs. My toes look like little suction cups which I use to grab onto smooth surfaces. My coloring can vary greatly depending on my habitat, but I always wear a black "mask" on my face. I like to eat insects. If I am male, I have a loud call.

Answer: Pacific Tree Frog

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I fly by gliding on wind currents with my large wings extended. You can recognize me because I fly with my wings in a V-shape. It's windy way up high, so sometimes I wobble a bit when I'm flying. I have black feathers and a bright red, featherless head. Some people call me a "cleaner of the land" because I like to eat animals that have died and are starting to smell bad. My strong sense of smell and great eyesight help me find carrion (food) even when I'm a mile away!

Answer: Turkey Vulture

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Who am I?

I am a tiny insect. I live with all of my relatives in colonies where we burrow underground. Sometimes there are millions of us in one colony! I eat dead insects, flower nectar, grass seeds, tree sap, and lots of other things. I am part of a caste system, consisting of workers, drones, and queens. I cannot fly, however my queen has wings and is able to fly. I need year round moisture in order to survive.

Answer: Ant

Your job is to decide:

1) How this animal would escape a fire.
2) How this animal might benefit from a fire.
3) How fire might harm this animal.

Answer Key

Coyote and fire: Coyotes can escape most fires by running away. After the fire has burned some of the bushes and trees, coyotes can see birds and other prey animals better, making it easier to hunt. The tender new grasses and plants that grow after a fire attract many small animals the coyote likes to eat.

Deer and fire: Deer have long legs and can escape fire by running and leaping to safety. After a fire, deer like to eat the new sprouts on plants because they are so tender and delicious. Fire also makes it easier for deer to see predators by clearing low brush, eliminating the cover needed by hunters like mountain lions. However, a high intensity severe fire can destroy important habitat for the deer and it may take a while for new sprouts to grow for the deer to eat!

Jackrabbit and fire: Jackrabbits will either hop quickly away from fire or try to burrow into the ground to wait it out. After a fire has passed, jackrabbits like to feed on newly sprouting plants. Fires often remove much of the brush that jackrabbits use for cover, so they are more vulnerable to predators while feeding in the open. A high intensity severe fire can destroy important habitat for the jackrabbit and it may take a while for new sprouts to grow for the jackrabbit to eat!

Bobcat and fire: Bobcats escape fire by running. When fire removes underbrush, it is easier for bobcats to hunt the small animals that come to eat the newly sprouting plants. On the other hand, when the underbrush is gone it is difficult for the bobcat to conceal itself from its prey.

Acorn woodpecker and fire: Woodpeckers can fly away from fire. After a fire, woodpeckers return to feast on insects (like ants) that are drawn to burnt areas. A fire may also create more snags, or dead trees, which make good nesting spots. Woodpeckers can see predators better after a fire but may lose stored acorns or an entire granary tree if the fire burns too hot.

Western fence lizard and fire: This lizard will usually hide in a hole, under a rock, or beneath moist leaf litter during a fire. After the fire it finds lots of insects to eat. Although the fire may remove much of the brush where it hides, this may make it easier for the lizard to see predators.

Western rattlesnake and fire: Rattlesnakes may either slither far away from a fire or hide in deep underground burrows. After a fire, when new plants sprout, rattlesnakes will hunt the small mammals that eat these new sprouts. Rattlesnakes may also bask in sunny clearings opened up by fire.

Pacific tree frog and fire: If water is nearby, Pacific tree frogs will usually stay put and remain underwater. After a fire, tree frogs might find more bugs or be able to see predators more easily. Usually, they move to a moister area where there are more plants for cover.

Turkey Vultures and fire: Turkey Vultures have such a good sense of smell that they can easily smell smoke and fly away from a fire. Because they like to eat dead animals they will return immediately after the fire to scavenge for animals that did not survive. They also enjoy sitting on burned, leafless trees because they get a better view of the land.

Ants and fire: Burrowing populations can escape fire by going underground. Ant populations are more numerous in burned areas than in unburned areas; they actually thrive after fire! Ants also help the forest to regenerate after fire because they loosen the soil and spread seeds. In addition they help to recycle the nutrients from the burned vegetation and fallen trees into the soil. However, really hot fires can destroy the soil and kill ants.