

Ecosystems - Wolves in Yellowstone

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Content Objective

6th Grade Science Strand 6.4: Stability and Change in Ecosystems: 6.4.4: Construct an argument supported by evidence that the stability of populations is affected by changes to an ecosystem. Emphasize how changes to living and nonliving components in an ecosystem affect populations in that ecosystem. Examples could include Utah ecosystems such as mountains, Great Salt Lake, wetlands, and deserts.

Length of Lesson: 45 + minutes

Music and Materials needed

Pictures of:

Wolves

Elk

Aspen, Willow, Cottonwood Trees

Streams

Soil

Ravens and Bald Eagles

Beavers and Dams

Aquatic Life

Music: I use "Water Drums" by Baka Forest
People of Southeast Cameroon, and "Spirit of the Forest" by Baka Beyond



Explore with movement

Play "Spirit of the Forest" as you introduce movement for the following living and non-living parts of Yellowstone National Park's ecosystem.

WOLVES

Always full of power and strength; sometimes slow (sneaking up on prey) and sometimes fast (attacking prey or running in a pack). Explore strong and powerful movements with slow and fast tempos.

ELK

Medium tempo traveling movements (running, galloping, walking) while making bent shapes with the top half of the body (representing the antlers).

TREES (Aspen, Willow, Cottonwood)

Shape of trees (bent, twisted, crooked shapes). Add hanging, swinging or swaying movements while maintaining the shape.

STREAMS

Curving pathways with sustained movement and sudden bubbling movements. Stay in a line with a group.

SOIL - with mercury

Really low movement. Roll on the ground, slither on the ground. Go as low to the ground as possible while moving.

RAVENS / BALD EAGLES

Soar up high. Leap. Swoop down. Circling pathways.

BEAVERS / DAMS

Building block shapes. Fit shapes into negative space of other shapes to create dams.



AQUATIC LIFE

"Swimming" movements. Push and pull with hands and arms in a variety of ways.



Repeat the above movements so all the students are clear with what movement represents which non-living or living thing that exists in Yellowstone National Park. Please note that there are even more living and non-living things that were affected when Yellowstone removed the wolves from the park, but from the examples used in this lesson will get the point across how each part of an ecosystem is valuable and when it's removed there are consequences.

Relationships of the Living and Non-Living things

Now explain the relationships that the non-living and living things have with each other and how one will affect the other. First, have the students stand in a line in front of the 8 pictures that are placed on the walls. Depending on the size of your class, each line should not have more than 3-4 students in it. (So there will be 3-4 wolves, 3-4 elk, etc).



1. First set the scene: have the **TREES** go out on the floor and create their shapes. Then have the **STREAMS** go in curving pathways really close to and around the swaying, swinging **TREE** shapes. Plants flourish best by rivers and streams.
2. Have the **WOLVES** “sneak” (go slow with power) in and around the **TREES** and **STREAMS**. Then have them go to the edges of the room and collapse and “die”. This represents taking the wolves out of Yellowstone park.
3. Without wolves, the elk are not hunted and they stay closer to the **STREAMS** and **RIVERS** and eat the surrounding plants. Have the **ELK** twist around the **TREE** shapes while maintaining the bent shape with the top part of their body and while traveling from one **TREE** to the next. With too many elk eating the trees by the rivers the trees cannot regenerate so the trees die. The **TREES** will melt down slowly to the ground as the **ELK** twist and circle around them.
4. Because the trees cannot regenerate, they do not help to stabilize the banks of the rivers, so **STREAMS** start to erode. Have the **STREAMS** spread out (no longer follow in a line that travels in a curving pathway, go in individual curving pathways) and jump over and around the “dead” **TREES** lying on the ground.
5. As the streams erode, the **SOIL** loses it’s acids. Without the acids, the **AQUATIC LIFE** dies. Have the **SOIL** start to move low to the ground while the **AQUATIC LIFE** is doing the “swimming” movements (pushing and pulling with arms and legs) around the soil. Have the **SOIL** become lifeless and freeze in a shape on the ground. After the **SOIL** becomes lifeless, have the **AQUATIC LIFE** slowly swim lower and lower until they, too, are lifeless on the ground.
6. Now reintroduce the **WOLVES**. As the **WOLVES** enter with both slow and fast powerful movements, have the shapes on the ground roll away (the dead **AQUATIC LIFE** and the **SOIL**). Have the **ELK** travel out into the space. As the **WOLVES** get near the elk, have them pounce (leap and jump) and the **ELK** will either collapse or travel fast and get to a new location (travel to a new spot in the room).
7. Now since the elk can no longer stay down by the **STREAMS** due to wolf attacks, have the **STREAMS** keep as much negative space as they can away from the **ELK** while they travel. Remember **STREAMS** travel in curving pathways with sustained and bubbling movements, and **ELK** travel (walk, run, gallop) with their top half in a bent shape. Maintain great distance between the two.
8. Because the **ELK** cannot hang out by the **STREAMS**, the **TREES** begin to flourish again! Have the **STREAMS** go in curving pathways really close to and around the swaying, swinging **TREE** shapes (repeating section #1). Since the **TREES** are really flourishing, have the **TREES** swing and sway with more energy. (And you can mention that the birds came back to live in the trees as well!).
9. Because the trees were flourishing, the **BEAVERS** came back. They liked to eat the trees. They built **DAMS** in the rivers which provided habitats for other **AQUATIC LIFE** who came to live in the pools and dams. Have the **BEAVERS** create their shapes (create one shape, then the next person adds a new shape into the negative space of the first shape, and so on). Then hold that **DAM** shape (not swearing! :) while the **AQUATIC LIFE** “swims” in and around the **DAM**.
10. Because the **WOLVES** attack and kill the **ELK**, the **RAVENS** and **BALD EAGLES** can now come and feast on the dead **ELK**. So have the **RAVENS** and **BALD EAGLES** soar high and leap while they circle around the dead elk and then swoop down and do staccato movements near the **ELK** (without touching).

Connect / Analyze

Rewatch the video about Wolves in Yellowstone. <https://www.youtube.com/watch?v=ysa5OBhXz-Q>
 Discuss all the positive affects the wolves had on the ecosystem.

If you have extra time you could have the students try the “relationships” section with new parts.