**Engagement (Teacher Handout)**

Instructions for Wild Wapiti Modeling Activity

**Purpose**:

Wild Wapiti is a activity that models basic ecological patterns involving the concepts of habitat components, carrying capacity, natural fluctuations of populations, and predatory/prey relationships. Students assume the role of researcher, elk, wolf, and habitat component to simulate consecutive years in Yellowstone National Park.

**Materials**:

Props for elk and wolf (most can be purchased at general discount store):

Bull elk: antler template can be downloaded from the Internet and attached

to a hat or thick headband or during the Christmas holiday season antler head gear is available);

Cow elk: apron;

Baby elk: rattles (do not use a prop that goes in a student’s mouth);

Old elk: cane (large plastic candy canes during the holiday season or meter stick;

Weak elk: no materials needed, follow directions on the Elk Identity Card;

Wolf: wolf mask template can be downloaded from the Internet and attached

to a hat or thick headband;

Researcher’s Data Table

Elk and wolf identity cards written on index cards. Put each elk identifier on a different color card.

**Directions**:

1. Engage students in a discussion about elk: What kind of animal is an elk? What do elk eat? Where do you find elk? Describe their environment. Does a male elk look different than a female elk? What do elk need to survive?

2. This last question will lead into a discussion of the essential components of habitat: food, water, shelter, and space in a suitable environment. This activity emphasizes three of those components – food, water, and shelter. In Yellowstone National Park, that space requirement is assumed to be sufficient.

3. Assign “initial” roles for the Wild Wapiti activity:

* **Researchers**. Two students will work collaboratively and take on the role of Yellowstone Researcher. They will receive the Wild Wapiti Data Table to record the number of elk, habitat, and wolves for each round of the activity. Emphasize the importance of making thorough observations for the class to use later in the lesson. The student researchers work as a team to ensure that correct numbers and descriptive observations are collected.
* **Researcher’s Assistant**. One student will travel back and forth from the Elk line to the Habitat line throughout the activity. They are responsible for handing out the Elk Identity Cards and props to Elk on the elk line. After handing out the Elk Identity Cards and corresponding props, the assistant moves over to the Habitat line and prepares to collect the identity cards and props from the elk who perish due to lack of habitat availability or because of getting eaten by a predator. After collecting Elk Identity Cards and props from the elk who perished, and during the teacher led discussion about fluctuations in elk numbers, the assistant travels back to the elk line and is ready to provide new Elk with an identity card and prop. The Research Assistant works “behind” the scene to help the activity flow smoothly.
* **Elk** (~1/5 of students, initially). Each elk will receive an Elk Identify Card. This card will inform students of their elk identity and thus which prop to use.
* **Habitat** (remaining students).
* **Wolf/Wolves** (one student and then a second student). Wolf roles will be assigned later in the activity. Select a student from the habitat to play the role of a Yellowstone wolf at the beginning Round #9. Give them their Single wolf Identity Card. Before beginning Round #13, select a second student from the habitat to play the role of a second wolf (making a wolf pack). Give both wolves the Wolf Pack Identity Card.

4. Have students representing Elk form a straight line. Then about 15 yards apart have students representing the Habitats form a straight line facing the shorter Elks line.

5. Review the three essential components of a habitat that will be modeled in this activity: water, food, and shelter. Teach both groups (Elks and Habitats) the symbols for each habitat component.

* The symbol for water is hands over mouth;
* The symbol for food is hands over stomach;
* The symbol for shelter is hands forming a tent far above head. \*If hands are not way above their head, some students may be inclined to change their symbol for water and shelter if they are unable to find a match. But if their hands are touching way above their head representing shelter, the switch is more obvious to observers.

6. Wild Wapiti Activity Instructions.

* For Elk to survive they must find food, water, or shelter. During each round, all Elk and Habitat will select a habitat component by making one of the three symbols (hands over mouth, hands over stomach or hands forming a tent above head).
* Once all Elk and Habitat have selected a symbol, Elk walk over to a Habitat displaying the same habitat component symbol, take the hand of the corresponding habitat component, and bring them back to the elk side where the Habitat now becomes an Elk.
  + If students do not hold hands on the way back or run back, they will experience a natural disaster, perish and become a Habitat for the next round.
* If an Elk does not find a matching habitat component they perish and become a Habitat during the next round.
* Students cannot change their habitat component symbol in the middle of the round but they can change between rounds.
* Before beginning Round One, remind the two researchers to record the number of Habitat, Elk and wolves during each round, record the Identify of Elk who perish, and identify the cause of death (habitat limitations, prey, or something else).
* To begin round one, have students representing the Elk line and students representing the Habitat line turn their backs to one another. Instruct students to select and make a habitat component symbol, without looking at one another.
* Instruct students to turn and face the students in the other line.
* Instruct Elk to move toward the Habitat that displays their same habitat component symbol. Habitat should stand still and wait to be chosen. The elk’s habitat component must match the one on the Habitat they have chosen.
* Instruct the Elk who found a matching habitat to return, with their Habitat, back to the elk side. (Elk should maintain physical contact with their Habitat all the way back). The Habitat now becomes an Elk and receives an Elk Identity Card and prop.
* Year 6, ask Elk to turn their backs to the Habitat. Quickly gather the Habitat and tell that that because of a severe drought they are unable to choose the symbol for water. Continue with the activity. Elk, who selected the habitat component symbol for water, perish.
* Year 7, ask Elk to turn their backs to the Habitat. Quickly gather the Habitat and tell that that as a result of last year’s drought this ecosystem experienced a loss in vegetation (food) and thus they will be unable to select to be the habitat component of food. Continue with the activity. Elk, who selected the habitat component symbol for food, perish.
* Year 9, introduce an Elk predator- the Grey Wolf (have researchers note this on their data table). Provide the Wolf with a Wolf Identity Card and wolf hat. Wolf rules: the wolf must stay on an imaginary line in the middle of the playing field. The Wolf must walk, hop or skip to capture its prey. The Wolf can tag an Elk only as the elk crosses to retrieve a habitat component or on their way back to the elk line. When tagged, that elk perishes and becomes a Habitat during the next round.
* Year 13, introduce a second Grey wolf to simulate a wolf-pack. Provide both wolves with the Wolf-Pack Identity Card and wolf hats.
* Year 15, the original Wolf perishes due to an injury sustained from a rival wolf pack, hit by a car, or a disease outbreak such as canine distemper, canine parvovirus, or bordetella.
* Stop the activity around year 18. This provides students with enough data to draw conclusions.