Lesson Plan 5:

"Web of Life" Game

For use at or towards the end of the unit, after students have learned supporting information through previous lessons. It is adaptable to multiple grade levels. Adjust as you see fit for your students' level of knowledge and understanding.

Basic Principles:

- Each ecosystem hosts a variety of plants and animals that are uniquely suited to that environment.
- Sustainability, or a renewable balance between man and nature, is necessary for a healthy ecosystem.
- People interact with and impact their environment in both positive and negative ways.
- Healthy rangelands depend on maintaining the water, soil, plant, and animal resources.
- Active management by ranchers maintains healthy ecosystems.
- Livestock grazing is compatible with wildlife use and recreation.
- The aspects of an ecosystem (soil, water, vegetation, animals, etc.) impact and rely upon each other.

Fundamental Concepts:

- Land use / multiple use
- Ecosystems
- Monitoring
- Livestock
- Wildlife
- Sustainability
- Conservation
- Photosynthesis
- Connectivity

Montana Content Standards Met By This Lesson:

End of Grade 4

- Science #3: benchmarks 1 & 4
- Science #5: benchmark 1
- Social Studies #3: benchmarks 3 & 7
- Writing #1: benchmark 4
- Writing #4: benchmark 1
- Speaking/Listening #2: 2, 3, & 5
- Speaking/Listening #3: 1, 2, 4, & 8
- Workplace #2: benchmark 1

End of Grade 8

- Science #3: benchmarks 2 & 4
- Science #5: benchmark 4
- Writing #1: benchmark 4
- Writing #4: benchmark 1
- Speaking/Listening #2: 2, 3, & 5
- Speaking/Listening #3: 1, 2, 4, & 8
- Workplace #2: benchmark 1

Upon Graduation-End of Grade 12

- Science #5: benchmark 4
- Social Studies #3: benchmark 2
- Writing #1: benchmark 4
- Writing #4: benchmark 1
- Speaking/Listening #2: 2, 3, & 5
- Speaking/Listening #3: 1, 2, 4, & 8
- Workplace #2: benchmark 1

Student Inquiries:

- What is an ecosystem?
- How do ranchers maintain healthy ecosystems?
- Why do ranchers care about the environment?
- How do rangelands affect water quality?
- What does grazing do to the plants?
- How does grazing affect the ecosystem?
- How do plants get energy to grow?
- How do livestock and wildlife live in the same ecosystems together?
- How do the parts of an ecosystem rely upon each other?
- How does ranching benefit wildlife?
- How do grazing and ranching impact me?

Instructional Objectives:

- Students will create and interpret statements of connectivity & relationships within an ecosystem.
- Students will form a physical representation of a Web of Life.

Acknowledgements to Krista Lee Evans, Resource Policy Analyst, Montana Legislature former Education Specialist for the Montana Department of Natural Resources and Conservation.

- Students will verbally demonstrate an understanding of the relationships within an ecosystem.
- Students will analyze the interrelationships of various parts of an ecosystem.

Materials:

- one pair of scissors per group
- one large ball of string per group
- an outdoor spot in the grass or open space in the gym or classroom
- large nametags for students (if possible with string to hang them around their necks). Each group of nametags should include one labeled for each of the following: Livestock, Water, Soil, Fish, Land, Insects, Humans (or People), Plants, Sunlight, and Wildlife.

Lesson Activities

1) Divide students into groups of 5-8. If possible, the students in a group should be about the same general size.

2) Provide one set of nametags and one ball of string to each group.

3) Have each student put on a nametag.

4) Have the students of each group form a circle, using outstretched arms and touching fingertips to create even space between themselves.

5) Toss the ball of string to any student in the group and have him/her hold the loose end. Repeat this process for each group.

6) The student with the string then tosses the ball to any other student and makes a statement about a relationship between what s/he represents (i.e. what the nametag reads) and what the receiving student represents. (e.g., a toss from Livestock to Fish could be represented by the statement, "Fish depend on proper grazing management for healthy habitat.") The first student needs to maintain hold of the end of the string.

7) The receiving student keeps ahold of the string, tosses the ball of string to any other student, and makes a new relationship statement.

8) This process continues until all possible relationships have been formed (i.e. when the string has webbed its way between each combination of students).

9) Have the students loop the strings in their hand around one or two fingers so they are not holding the string tightly.

10) Have the students lean slightly backward, putting tension on the web of string. Caution them to not lean too far backwards or the whole web will be lost. They need only lean far enough to tighten the strings.

11) The teacher then reaches into the web and cuts one link of the string.

12) Theoretically, all of the students should fall slightly backward representing how the entire system is affected when one relationship is out of balance.

13) When one link of string from each group has been cut, have the students re-group as a class for a discussion of what is represented by the webs they formed, the cut string, and the effects of the cut string. Various issues relevant to the interactions of wildlife, people, and the ecosystem could be covered in this discussion.

Assessment:

- Observe student statements during the game.
- Review student input and responses during the discussion after completion of the activity.
- Have each student complete an exit card (see samples provided). Exit cards are a way to quickly assess what the students have come to understand and know, and are a form of debriefing. They can also be a springboard into a new lesson or discussion. (If you prefer, have the students complete more than one exit card.) Students can write their names on the back of the exit cards.
- Ask students how one or all of the 3 ranchers in Amazing Grazing manage to maintain all resources on their ranch.

Ascending Levels of Intellectual Demand:

- Artistic: Students could draw or paint representations of the connectivity within an ecosystem.
- Linguistic: Students could write descriptions or stories which highlight the relationships within an ecosystem.

Exit cards

*I now know:*_____

_____

_____

_____

because: _____

_____

_____

List:

THREE Facts you learned

TWO New ideas you realized

ONE Question you have

What patterns did you see?

What was the BIG IDEA?