

Oregon



Developed By:

Carolyn Koskela

Summer Ag Institute Lesson Plans

Title of Lesson: From Eurasia to Harney County to the Table

Academic Subject: Science

Theme: Agriculture: Planned and not planned in Harney County

Grade Level: 4-8

CIM/CAM Standards:

Life Science: Understand structure, functions, and interactions of living organisms and the environment.

•Organisms—Understand the characteristics, structure, and functions of organisms

Benchmark 2, grade 5.

*Group or classify organisms based on a variety of characteristics.

*Describe basic plant and animal structures and their functions

Benchmark 3, grade 8

*Describe and explain the structure and functions of an organism

•Diversity/Interdependence—Understand the relationships among living things and between living things and their environments

Benchmark 2, grade 5.

*Describe the relationship between characteristics of specific habitats and the organisms that live there.

Benchmark 3, grade 8

*Identify and describe the factors that influence or change the balance of populations in their environment.

Learner Objective: (The student will)

1. Identify the basic structure of wheat and the wheat berry/kernel.
2. Tell the benefit of different parts of the wheat grain.
3. Explain why crested wheat grass was introduced to sagebrush country ecosystems.
4. Identify why some cattle are raised as grass-fed beef and how that affects the markets Harney County serves.

Vocabulary:

1. wheat—annual or biennial grass having erect flower spikes and light brown grains; grains of common wheat; sometimes cooked whole or cracked as cereal; usually ground into flour.
2. anatomy—the art of dissecting, or artificially separating the different parts of any organized body, to discover their situation, structure, and economy; dissection.
3. crest—a showy growth at the top of the wheat plant.
4. crested wheat grass—Eurasian grass grown in United States great plains area for forage and erosion control.
5. native—as a native inhabitant, originating in the region where used or sold; not foreign or imported; as, native oysters, or strawberries.
6. introduced—to bring into notice, practice, cultivation, or use; as, to introduce a new fashion, method, or plant.
7. kernel/berry—the essential part of a seed; all that is within the seed walls; the edible substance contained in the shell of a nut; hence, anything included in a shell, husk, or integument; as, the kernel of a nut.
8. bran—the broken coat of the seed of wheat, rye, or other cereal grain, separated from the flour or meal by sifting or bolting; the coarse, chaffy part of ground grain.

Instructional Outline (Teaching Content)

1. Show the students the heads of wheat that we have been growing. They may have (should have) figured out by now that it is wheat. Have them look at several different kinds.
2. Present a variety of products containing wheat. Obvious and otherwise.
3. Go over the products identifying what includes and what does not include wheat. The kids need to know how prevalent wheat is in their life.
4. Introduce vocabulary
5. Present the diagram of the wheat kernel and discuss the attributes and use of each part.
6. Discuss why we eat what we need to eat. Why would we want to eat certain things? Why would any animal want to eat certain things?
7. Introduce the history of crested wheat grass in Harney County. Why wheat grass? Discuss the differences in grass-fed beef and grain-fed beef. Grains containing proteins, drought tolerant, hardy, helps to establish a community hospitable to reseeding of some native grasses and erosion control. Introduced from Russia in early 20th century to control erosion. Used extensively in West for pasture, hay and range improvement.
8. Share the not so good news about the crested wheat grass. Crowds out natural species. "Perhaps this is one of the lasting "legacies" of this marvelous introduced range grass: it prepared the way for at least partial recovery of the native species. This is the process of reaction (later termed facilitation) in the Clementsian model of plant succession in which each seral stage improves the sere (the total environment of a given site complete with the complete sequence of plant communities that will come to occupy

Strategies (What to do, explain or have students do)

1. Have the students compare the kinds of wheat we have.
2. Students will make a t-chart for "includes" and "does not" include list for wheat.
3. Explain how they feel about this.
4. Students will read over vocabulary sheet together.
5. Students will fill out their diagram and include the benefit or use for each part of the kernel.
6. Students will give suggestions as to why we consume what we do and why we would want animals to eat certain things.
7. Students fill out graphic organizer showing the reasons for and the introduction of crested wheat grass to the grasslands.
8. How could crested wheat grass, as an introduced species, cause some problems in the natural ecosystem?

it) for the next seral stage (the plant community at that stage of vegetation development) until the termination at climax. If crested wheatgrass persists indefinitely, as seems likely, as a disclimax or anthropogenic climax it will continue to conserve soil and contribute to range restoration while providing valuable forage for livestock and wildlife. That is a most fitting accomplishment for any pasture crop. The introduction of and development of management programs for crested wheatgrass was an example of Man, Manipulator of Ecosystems, at his best. The establishment of crested wheatgrass range was a technological revolution in grassland agriculture.” “Desert crested wheatgrass (*Agropyron desertorum*) range-Desert crested wheatgrass instead of “regular” crested wheat grass is grown in drier areas to which this group of Eurasian perennial bunchgrasses is adapted.”“Once individual plants have developed to this stage of maturity and have acquired this extreme degree of rank growth they are no longer palatable to grazing animals (unless animals are feeling severe “hunger pangs” if not suffering from “holler belly”). These two grass plants were chosen from ungrazed areas to give viewers “purple ribbon” textbook examples of this species. In a grazed pasture an individual such as either of these “grand champions” is known as a wolf plant: “1) an individual plant that is generally considered palatable, but is not grazed by livestock, 2) an isolated plant growing to extraordinary size, usually from lack of competition or utilization”

9. Define unintended impacts and ask for some examples.
10. Why would we want to graze cattle rather than grain feed them in a feed lot? Compile answers on the PC viewer. We will later run some connections from their responses and add those things that they missed.
11. Discuss the nutritional findings from grass-fed beef in comparison to grain fed beef.

9. Give examples of some of the unintended impacts of crested wheat grass.
10. Students give some reasons for this practice.
11. Students will make a pro and consequence chart for the nutritional values.

12. Discuss the effects from grass-fed beef and from grain-fed beef.

Grass-fed beef not only is lower in overall fat and in saturated fat, but it has the added advantage of providing more omega-3 fats.

In addition to being higher in healthy omega-3s, meat from pastured cattle is also up to four times higher in vitamin E than meat from feedlot cattle, and much higher in conjugated linoleic acid (CLA), a nutrient associated with lower cancer risk.

Humanitarian perspective

Just as organic does not mean grass-fed, grass-fed does not mean organic.

It takes a long time and a lot of grassland to raise a grass-fed steer. Western rangelands are vast, but not nearly vast enough to sustain America's 100 million head of cattle. There is no way that grass-fed beef can begin to feed the meat appetites of people in the United States, much less play a role in addressing world hunger.

Extensions:

- Students could measure the vegetation on the range in quadrants.
- Students could research invasive weeds.
- Students could research varieties of grains for feed in humans and animals.
- Cheatgrass discussion and project. Weed infestation.

Closure:

Students will develop a brochure using Microsoft Publisher including the three following ideas: the parts and uses/benefits of a wheat kernel, range resources for feed including the introduction of crested wheat grass, and promoting Harney County Beef. They must include a tie for these three concepts based on the information taught. Ex: from Eurasia to Harney County to our table.

Added activity for a later date.

- Review basic grain vocabulary by using the word puzzle from OWGL
<http://www.owgl.org/images/e0046101/dontgrainonmyparade.pdf>

12. Students will make suggestions as to the differences of effects between grass-fed beef and grain-fed beef. They must use reason behind their thoughts.

Resources:

1. Trimble, Stephen. The Sagebrush Ocean. Reno: University of Nevada Press, 1989.
2. Jackman, E.R., and John Scharff. Steens Mountain in Oregon's High Desert Country. Caldwell: Caxton Printers, 1967.
3. Taylor, Ronald. Sagebrush Country. Missoula: Mountain Press Publishing, 1992.
4. Robbins, John. Food Revolution. Food Revolution. July 2, 2005. <<http://foodrevolution.org/grassfedbeef.htm>>
5. Putting Life Back into Worn Out Pastures. Canadian Cattlemen's Association. July 2, 2005 <<http://www.jpccs.on.ca/biodiversity/ghg/news/f-2004-09-22.html>>
6. Introduced Forages. Tarleton State University. July 2, 2005. <[http://www.tarleton.edu/%7Erange/Grasslands/Introduced%20Forages/introduced for ages.htm](http://www.tarleton.edu/%7Erange/Grasslands/Introduced%20Forages/introduced%20for%20ages.htm)>
7. Sagebrush Shrub Steppe. Tarleton State University, July 2, 2005. <<http://www.tarleton.edu/%7Erange/Grasslands/Shrub%20Steppe/Shrub%20Steppe.htm>>
8. Garden Crop Wheat. Kansas State University. July 2, 2005. <<http://www.oznet.ksu.edu/fieldday/kids/crops/wheat.htm>>
9. OUTREACH: SUPER-DWAF SEED INFORMATION. Utah State University. July 2, 2005. <http://www.usu.edu/cpl/outreach_seed_info.htm>
10. Soft White Wheat. Oregon State University Department of Crop and Soil Science. July 2, 2005. <<http://cropandsoil.oregonstate.edu/crops/seeds/orscr/sowhwh/index.htm>>
11. "wheat grass." The Columbia Electronic Encyclopedia. ©1994, 2000-2005, on Fact Monster. ©2000-2005 Pearson Education, publishing as Fact Monster. 02 Jul. 2005 <<http://www.factmonster.com/ce6/sci/A0852024.html>>

Definitions found at:

http://www.dictionarydefinition.net/fairway_crested_wheat_grass.html

<http://www.websters-online-dictionary.org/definition/English/Wh/Wheat.html>

Crested wheatgrass fact sheet <http://www.sharpseed.com/pdf/crestedwheatgrass.pdf?PHPSESSID=bdd11f9b90f3809c390c3c3asf12c4e7>

Materials:

1. Worksheet of Wheat Berry
2. USU-Apogee, a space-age wheat variety—Starts having been started forty five days before lesson so students can see head development.
3. Several types of wheat heads and seed including crested wheat grass
4. Crested wheatgrass fact sheet available at: <http://www.sharpseed.com/pdf/crestedwheatgrass.pdf?PHPSESSID=bdd11f9b90f3809c390c3c3a2f12c4e7>
5. Word puzzle from OWGL available at: <http://www.owgl.org/images/e0046101/dontgrainonmyparade.pdf>

Evaluation:

1. Student brochures will be evaluated for the three focus areas: the parts and uses/benefits of a wheat kernel; range resources for feed including the introduction of crested wheat grass; and Harney County Beef.
2. And a reasonable strand for connecting these three concepts based on the information taught. Ex: From Eurasia to Harney County to our table.