

Dear Educator,

I am honored to introduce you to the Wyoming Stewardship Project. I want you to know, this unit was written with you and your students in mind. Developing this project has been a thoughtful process and multi-year commitment to offer lessons for classrooms across the state.

Wyoming educators, in collaboration with field experts and the Wyoming Department of Education, wrote, piloted, and revised the unit you are about to teach in your classroom. We are tremendously grateful for their efforts. These units are not intended to be a burden, but were created purposefully to be easy-to-use, cross-curricular, and comprehensive. Units build on each other throughout the grades, however they can be used independently without loss of integrity.

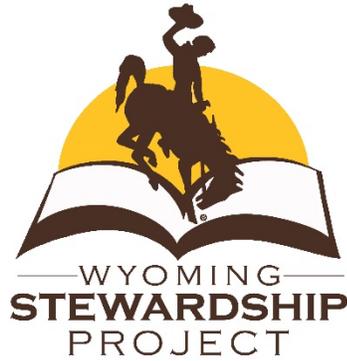
Found in the Educator Essentials document is everything needed to be prepared to teach this unit. We outline the Higher Order Thinking Skills and how to identify them throughout the units. We have compiled a material list of everything you need to complete all lessons; worksheets, PowerPoints, and video links are included in individual lessons. Additionally, a '101' sheet has been included to give you background information for the highlighted industry in Wyoming.

Our hope for the Wyoming Stewardship Project is to empower students to be our critical thinkers and problem solvers of tomorrow. We believe the stewardship definition captures the overall intent: As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations.

Thank you again for your effort in the classroom, presenting these lessons to your students, and helping advance this pivotal project for our state. Please don't hesitate to contact us with questions!

Jessie Dafoe

Executive Director
Wyoming Agriculture in the Classroom



Teacher Preparation and Required Materials

Higher Order Thinking Skills:

The critical work of Higher Order Thinking Skills (HOTS) involves breaking down complex material into parts, detecting relationships, combining new and familiar information creatively within limits set by the context, and combining and using all previous levels in evaluating or making judgments. Within each lesson you'll find reference to the Higher Order Thinking Skills that are part of the work students will be doing using language from Bloom's Taxonomy: Analysis, Synthesis, Application, and Evaluation.

- Analysis skills are used in areas with this symbol: 
- Synthesis skills are used in areas with this symbol: 
- Application skills are used in areas with this symbol: 
- Evaluation skills are used in areas with this symbol: 

The following ideas and content will be important to know for this unit:

- The parts of a plant
- The life cycle of a plant
- Impact of location on plant growth, and the reasons why
- Different plants respond to stressors in many ways (Lesson 5)
- The importance of pollination, and crop growth

- Major categories of farming equipment, and what the equipment does

The following materials will be needed for this unit:

- **Class Garden (*please see note for Class Garden*)**
- Chart paper
- Markers, colored pencils, crayons, etc.
- Substances to affect soil quality: salt, litter, flour, etc.
- Freezer
- Lamp
- Fan or blow dryer
- Items to act as wind barriers
- White paper for assessment diagrams/drawings
- Materials for mock pollinators (cotton balls, pipe cleaners, straws, tape, clothes pins, foil, felt, string, etc.)
- Materials for mock pollen (crushed chalk, glitter, baby powder, crushed up Cheetos)
- *From Seed to Plant* by Gail Gibbons
- Envelopes
- Student supplies necessary to make their projects: These can be electronic or traditional resources like poster board, paper, scissors, markers, etc.
- Optional resource to be found in your own community: Farm equipment dealerships such as John Deere, Ford New Holland, and Case International to contact for speakers or field trips
- Optional book resources:
 - o *The Homestead Act of 1862: A Primary Source History of the Settlement of the American Heartland in the Late 19th Century (Primary Sources in American History)*
 - o *The Homestead Act (True Books: Westward Expansion)* by Elaine Landau
 - o *Big Tractors: With Casey & Friends* by Holly Dufek

Class Garden Materials:

Please note, wheat seeds need to be requested, and a class “garden” needs to be started about 3 weeks before starting this unit.

- **Seeds**
Wyoming Agriculture in the Classroom will be mailing wheat seeds to all 2nd Grade classrooms in the fall. If you do not receive yours or would like more, please contact us at: 307-369-1749 or info@wyaitc.org.
- **Soil**
- **10 Clear Plastic Cups of same crop (teacher planted)**
- **Grow light or lamp**

TEACHER NOTE:
You will need 10 cups of planted seeds to properly conduct the experiment that begins in Lesson 4. If you want students to have their own plant to take home, you will need to plant 10 + the number of students in your class.

We recommend students actively participate as part of the planting and care process. Students can use science notebooks to document changes in the plants.

Care for your plant with proper light and water. Plants will be used beginning in Lesson 4. Four of the plants will be used for experiments in Lesson 4, three will be used in Lesson 5, and the remaining three are control plants.

The final project in Lesson 8 summarizes information learned throughout the unit. It may be helpful to have students keep notes in a journal that can be referred to in Lesson 8. Educators are encouraged to keep anchor charts and other items throughout the unit to review with students in Lesson 8 as well.



Agriculture 101

Wyoming Agriculture Statistics at a glance:

- The value added to Wyoming's economy by the agricultural sector totaled \$1.72 billion in 2016.
- Of that total, animals and animal products accounted for \$1.084 billion, crops totaled \$338 million, and farm-related income totaled \$300 million.
- In 2016, 11,600 farms and ranches used 30.3 million acres to raise agricultural products in Wyoming.
- Farmer and rancher cash receipts totaled \$1.39 billion.
- Cattle and calves ranked as the largest livestock commodity raised in the state, followed by miscellaneous livestock (mostly horses and sheep), and hogs.
- Hay was the largest crop raised based on cash receipts, followed by sugarbeets, and barley.

*Provided by the National Agricultural Statistics Service, Wyoming Annual Bulletin, 2017

Wyoming Agriculture Overview:

Wyoming farms and ranches provide food, fiber, and open space. Farmers and ranchers make daily stewardship decisions for water, soil, rangeland, and the agricultural commodities they raise/grow. Agriculturists support communities throughout Wyoming, and the culture of hard work and neighboring help is noteworthy. Wyoming agriculture is not an easy business,

but it's a necessary way of life that farmers and ranchers pursue to provide for the nation's people, open space, and wildlife.

The story of agriculture in Wyoming started in 1830, when the first five cattle were brought to the state. Even then, it took almost another 40 years of cattle moving through Wyoming before large herds were brought to stay. The arrival of the railroad in 1867 started off the cattle boom in Wyoming. Free grass, a country hungry for beef, and railroad access for shipping provided the chance for businessmen to make money raising cattle. Raising sheep was also big business, and the sheep industry grew along with the cattle ranches. In fact, by the early 1900s, there were more sheep in Wyoming than cattle!

About that same time, homesteading acts began allowing settlers to claim pieces of land across the West. As the settlers arrived, the large areas of free grazing land used by the cattle and sheep men were broken into smaller pieces. This led to conflict between the different groups over the best uses for the land and resources. This time in history is now known as "The Range Wars" and includes events and people such as the Johnson County War, Tom Horn, and "Cattle Kate." The Taylor Grazing Act of 1934 changed the way grazing was managed on public lands and ended the "The Range Wars."

Many of the early settlers tried raising crops, as well as livestock. Farming in Wyoming was a unique challenge for the settlers because of harsh weather conditions in our state. The rain water received each year is not enough to support most crops, and unless the settler was lucky enough to claim land near a stream or river, it was not possible to irrigate. The challenge of keeping crops watered led to building irrigation districts and water storage systems in several areas of the state. In areas without access to irrigation, dryland farming allowed farms to thrive.

By the 1920s, new farming equipment and technology encouraged the growth of larger farms and ranches and led to fewer small farms and ranches. Many are still family owned and operated today. As technology and culture have changed over the years, many people have moved into urban areas. In comparison, there are fewer farms and ranches remaining, but agriculture is still alive and well in Wyoming.

Today, dryland farming and irrigation have allowed Wyoming farmers and ranchers to raise crops that can thrive in our environment. Wyoming farmers raise hay, oats, barley, corn, beans, sugarbeets, and other crops. More than one million head of cattle and over 350,000 sheep graze Wyoming's grasslands, outnumbering the people here.

Wyoming is still one of the few states in the country with agriculture at its core, and our farmers and ranchers carefully steward the water, soil, and rangeland to make sure they are available for future generations.

Stewardship

As Wyoming citizens, we are entrusted with the responsible development, care, and use of our resources to benefit current and future generations.



