



WHEAT ACROSS THE PRAIRIES

Next Generation Science Standards

Interdependent Relationships in Ecosystems

2-LS4-1 - Make observations of plants and animals to compare the diversity of life in different habitats.

2nd Grade Geography, History Social Studies Then and Now - compare and contrast

1. Relationships between people, place, idea, and environments are dynamic.
2. Societies experience continuity and change over time.

Background Information

Wheat is a member of the grass family. Plants, such as wheat, adapt to various habitats for growth and survival. Our ancestors were hunters and gatherers. Nearly 10,000 years ago, our ancestors began selecting seeds for food. They found that planting the seeds would produce plants they could grow and then harvest. They found out which plants had the largest seeds, the largest number of seeds and which grew best in the habitat they lived in. They saved some of the seeds and used them to produce even better plants and more grain the next growing season. This is called natural selection or survival of the fittest. They planted the food plots near water and built their communities near this food source. Having a dependable supply of food allowed for the beginning of civilization. These early wheat plants had heritable traits that could be passed on to other plants as they evolved or changed to survive in their environment. Having a dependable supply of food was a source of financial power and was traded for other things.

Materials

- [Wheat Across the Prairies](#) PowerPoint
- Crayons or colored pencils
- Wheat Across America Map (found on the page below)
- A blank U.S. map that students can color in

Objective

Students will compare and contrast how a variety of plants, including wheat, grown in different habitats and determine which places can successfully grow food crops.

Subjects

Science
Geography
History
Social Studies

Grade Level

2nd Grade

Time Required

Three 30-45 minute class periods

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Vocabulary

Adaptation: a 'feature' or trait developed over many generations which helps a plant survive in its current growing environment.

Ancestors: the beginning of a family that is genetically linked or the beginning of the family tree.

Civilization: An advanced stage of human society, beyond meeting basic needs, where people live with a reasonable degree of organization and comfort and can think about things like art and education, economics, communication methods.

Evolution: the process by which organisms change over time as a result of changes in inherited physical traits you can see or behavior traits you can observe.

Habitat: natural home or environment of an animal, plant or organism.

Heritable traits: observable traits members of a family share based on genetic variation.

Migratory: moving from one place to another.

Prairie: a large area of grassland that does not have many trees.

Traits: a characteristic or quality that makes a plant look or act different from other plants.

Lesson 1 - Habitats for Plants

A habitat is the natural home or environment of an animal, plant or organism. It is the place they prefer to live and flourish. Plants can adapt to different habitats or environments by a natural selection of traits that help the plant survive the environment they are living in.

What kind of plants would live in a mountain habitat? What would these plants need and look like?

- Needs an average amount of rain
- Must tolerate rapid weather changes.
- Must tolerate cold weather
- Must live on very little oxygen
- Grows slowly
- Grows in soil that is low in potash, phosphorus and lime or acidic.

Examples of mountain plants include: pine trees, birch trees, fir trees, lichens, and moss. Food crops include lettuce, kale, radishes, tea, coffee, and spices. Crops include wheat, soybeans and sugarcane.

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What kinds of plants would grow in a desert habitat?

- Must withstand high temperatures
- Must withstand high winds
- Must be able to grow in very sandy soil
- Must be able to grow with very little water
- Perennial plants may have very deep root systems
- Leaves are very small, may have a waxy type coat and may be more spine like.
- Plants are tough and wiry due to lack of moisture.
- Must be able to withstand water high in saline if the plants are being watered through irrigation.

Examples include: cactus, mesquite grow with no irrigation. Melons, peppers, pumpkins, squash, durum wheat and corn can grow using drip irrigation.

What kinds of plants grow in a rainforest habitat?

- Must be able to withstand high temperature
- Must be able to withstand humidity and high precipitation in the form of rain
- Must grow tall or adapt to low sunlight by more efficiently using sunlight to be able to compete for sunlight
- Must be able to grow in acidic soil after the initial soil nutrients from large scale burning of the rainforest are depleted.

Examples of food grown there include: Ferns, orchids, mushrooms, fungi, rubber tree, water lilies, and the Passion fruit flower.

What kind of plants would grow in a Prairie habitat?

- Must be able to withstand a wide variety of dramatic weather conditions.
- Must be able to withstand very hot and windy, hot dry summers
- Must be able to withstand very cold and windy, harsh winters
- Must be able to use a lot of sunlight, no shade
- Must be able to withstand drought
- Must be able to withstand high wind

Examples of food grown there include: wheat and other grains and oil seeds such as corn, grain sorghum, sunflowers, soybeans.

What habitat would best support survival of wheat plants?

- Temperature that is comfortable for people; 37 degrees Fahrenheit.
- Well drained fertile clay loam soils though some wheat cultivators are now adapted to more acidic soils and desert soils
- 9 - 30 inches of precipitation is ideal

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Engage

Show the presentation slide with pictures of various habitats (Slide 2). Have students research the habitats listed above. Have them print off pictures of plants that would grow in those habitats. Place signs with names of habitats around the room. Allow student talk time about each habitat. Guide discussions by selecting a specific habitat to and using questions such as: “What is the soil like?”, “What living plants grow here?”, “Does it look cold/hot?”, “Do you think it rains- a lot or a little?” Repeat this discussion for each of the four habitat outlined in the lesson.

Two teams will get half the supply of student generated plant pictures and a roll of masking tape. Students will compete with a timed race to place pictures with tape on them under the proper habitat sign. The entire class will assess the placement of the pictures to determine if they are placed in the correct habitat.

Explore

Preparation:

- Define what a habitat is, then display and discuss the aspects of each habitat such as sunshine, rain, and the soil available for plants to grow. After going over the aspects of the habitat students should research, find and print copies of pictures of plants that would grow in each of the four habitats.
- Print habitat cards from slide show and descriptions to tape up around the room. Divide the class into two teams.

Have students discuss in their groups which plant(s) would grow in the displayed habitat. Students should find and print a picture of that plant(s) that grow in each habitat.

Continue this process for each of the four habitats. Once all of the plants have been sorted and placed next to their habitat sign, have each group share and defend their selection using evidence from the information presented about the habitat. Record class claims on an anchor chart.

Reveal the plants that are actually found in these areas. Discuss any differences in the class anchor chart and the actual plants found.

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Lesson 2 - Wheat Across America

Explore

Display posters and/or samples of the six classes of wheat grown in the United States ([The 6 Classes of Wheat](#).) Explain to students that just as there are different plants in different habitats throughout the world, there are different types of wheat grown throughout the United States. Have students observe the wheat posters and/or samples and record similarities and differences.

Explain

Pass out the Wheat Across America Maps to each student.

Pass out a blank map of the U.S. and coloring pencils or crayons.

Display the PowerPoint presentation and guide students through each type of prairie.

Begin with wet prairies. Point out that in the United States wet prairies are found in the Northwest region. Soft white wheat is grown in this region because it prefers high moisture.

Wet Prairies

- Lots of Water
- Deep clay soil
- Poor Drainage

Soft white wheat has a high yield and is exported to Asia for noodle production.

Have students color the NW region of their blank map Blue and label it wet prairie, soft white wheat.

Next, point out the dry prairies of the United States, in the northern region of the country, North Dakota and Minnesota, and a small area in southern California and Arizona. Explain that due to the harsh winters and mild summers here, spring wheat and durum are grown. These plants are used for making many types of bread and have high gluten content.

Interesting fact: The durum wheat planted in Arizona and California is a variety known as desert durum and has a much shorter maturity time, thus takes less irrigation water. It is usually planted in December and has a June harvest date.

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Dry Prairies located in the Northern United States

- Little water
- Dry Shallow Soil
- Sand or Limestone under soil have students color these sections orange and label them dry prairies, Hard Red Spring and Durum wheat.

Finally, point out the mesic prairies of the United States, in the middle and eastern regions of the country and explain that here the class of hard wheat is grown because it prefers drier climates. These plants are used to make white bread, cookies, and cakes.

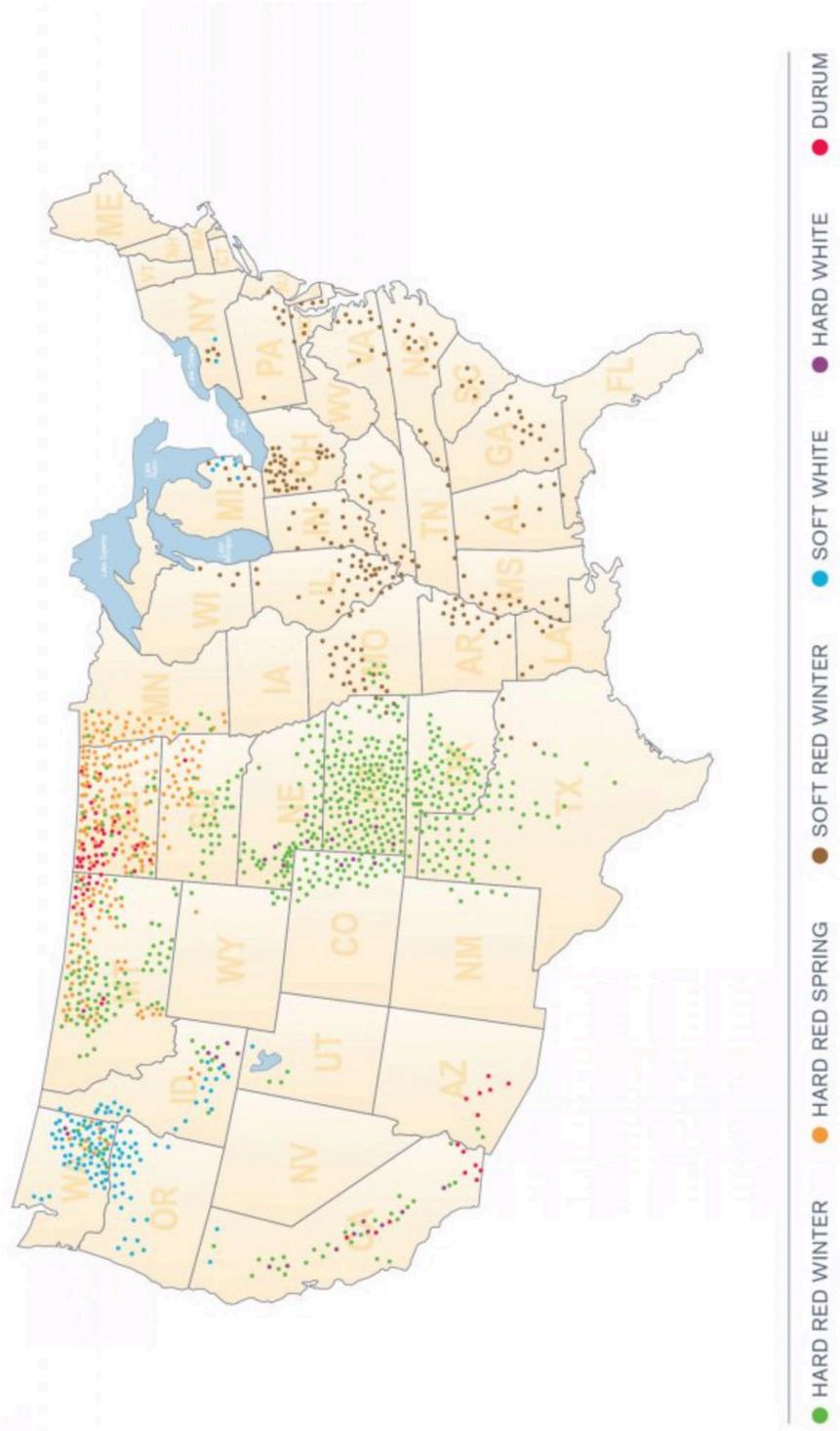
Have students color these sections green for the central state and label them hard red winter wheat. Color the eastern mesic prairie states, purple and label them soft red winter wheat.

Mesic Prairies

- Average rainfall or precipitation
- Medium-deep silt soil
- Soil good drainage

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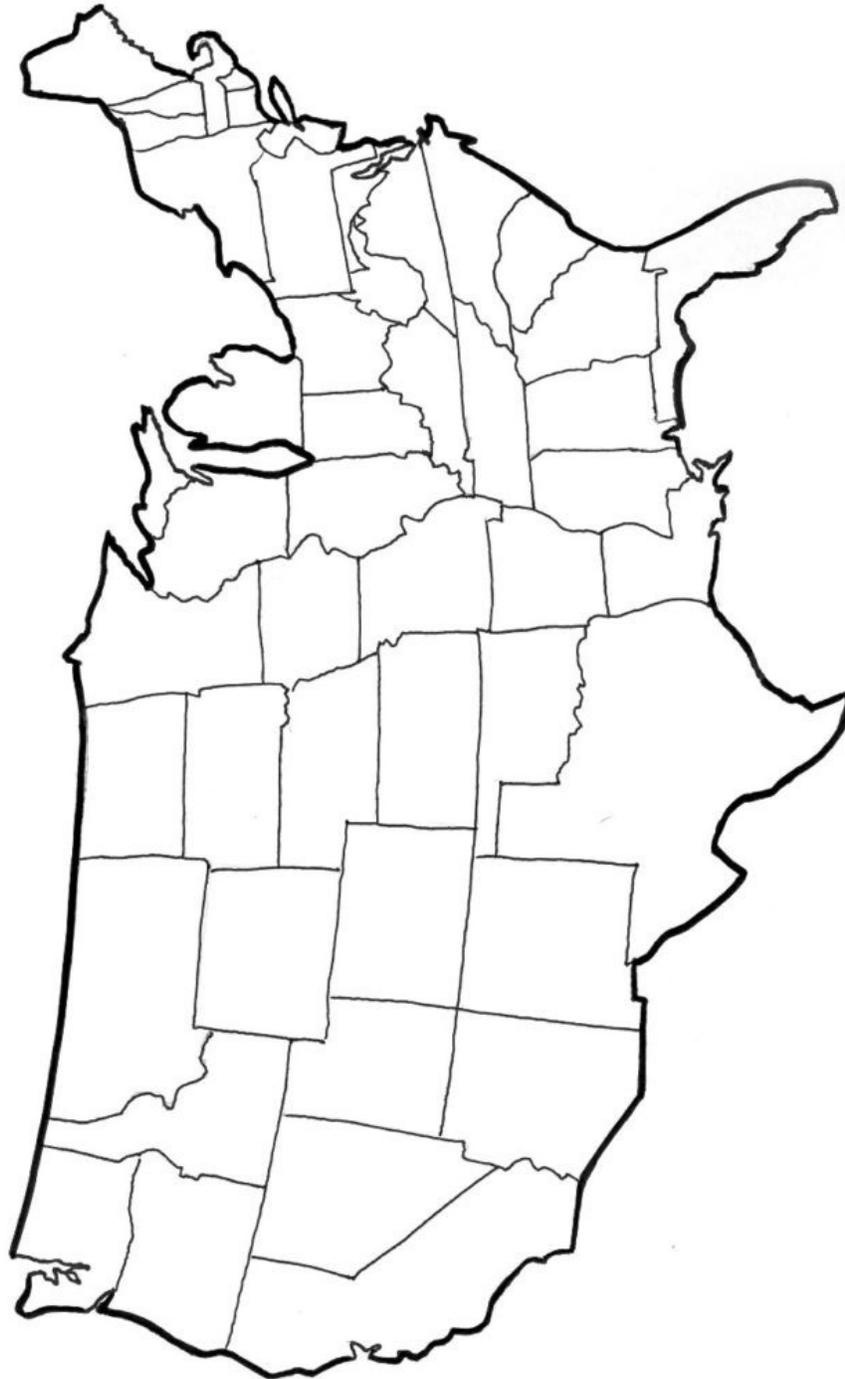
Lesson 2 - Wheat Across America Map



Source: <https://www.wheatworld.org/wheat-101/wheat-production-map/>

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Lesson 2 - Wheat Across America



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Lesson 3 - Name That Wheat

Different classes of wheat have adapted to a variety of growing environments. Each class of wheat is made into different food products depending on the milling characteristics, and amount of gluten and protein in the grain. There are six classes of wheat.

Name of Class of Wheat	Name of Class of Wheat	Products from this class of wheat
Hard Red Winter Wheat	High in Protein Strong in Gluten Excellent milling and baking	Yeast breads Hard Rolls General purpose flour Cereal
Hard Red Spring Wheat	High in Protein Improves Quality of flour mixes	Yeast breads Hard Rolls Bagels Pizza Crust Croissants
Soft Red Winter	High Yielding Lower Gluten Excellent Milling and Baking qualities	Flat Bread Cakes Pastries Crackers Pretzels Cookies
Durum	Very Hard Kernel High in Gluten Rich Amber Color	Macaroni Spaghetti Couscous
Soft White	Low Moisture Wheat Excellent Milling quality	Flat Bread Cakes Pastries Crackers Asian style Noodles
Hard White Wheat	Produces all white flour product in whole grain products	Yeast Breads Hard Rolls Noodles Flat bread

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Explore

Students will conduct a wheat product scavenger hunt, finding products from each of the regions of the United States. This can be conducted using the internet, going on a field trip to the grocery store, bringing in products from home, or using pictures from magazines of grocery store advertisements.

Evaluate

Materials needed

- 6 hula hoops or circles labeled with 6 classes of Wheat
- Pictures of food made from wheat such as cookies, cake, bread, bagels, pasta, Mediterranean flat bread pan bread, pretzels, asian noodles, couscous, crackers, cereal.

Two teams each do a timed relay to place the pictures in the correct circle. Winners make the correct choices in the least amount of time.