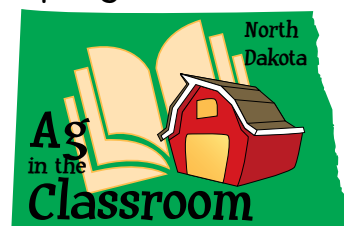


NORTH DAKOTA Ag Mag

A Magazine about Agriculture for North Dakota Students

Spring 2017



Welcome to the Wheat North Dakota Ag Mag

This issue of the North Dakota Ag Mag focuses on wheat. The information and activities are geared primarily for the state's third, fourth and fifth graders.

North Dakota Ag Mag is distributed three times each year. Subscriptions are free, but if you're not on the mailing list or know someone else who wants to be added, contact the North Dakota Department of Agriculture at (800) 242-7535 or ndda@nd.gov.

The magazine also is on the Web at www.ag.ndsu.edu/agmag or through the North Dakota Agriculture in the Classroom website at www.ndaginclassroom.org.

This magazine is one of the N.D. Agriculture in the Classroom Council activities that helps K-12 teachers integrate information and activities about North Dakota agriculture across the curriculum in science, math, language arts, social studies and other classes. It's a supplemental resource rather than a separate program. See page 6 for other AITC programs.

The N.D. Agriculture in the Classroom Council is coordinated through the N.D. Department of Agriculture.

For more information, contact:

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www.facebook.com/ndaginclassroom

Wheat — The Staff of Life

This Ag Mag focuses on wheat — North Dakota's #1 crop. On average, 8 million acres of wheat are harvested in the state each year. That's about one-fifth of the state's land.

The North Dakota Wheat Commission has many educational materials. See www.ndwheat.com and click on "consumers."

The Agriculture Cycle

Idea: Ask students to define agriculture. Most will probably say things related to farming and ranching. Explain that agriculture is production but also processing, distribution and consumption of food, fiber, forestry and biofuel products.

Production — Answers may include a variety of crops and livestock: wheat, soybeans, canola, mustard, carrots, Christmas trees, beef cattle, turkeys, emus, whatever.

Processing — Pasta processing, feed manufacturing, potato chipping, sugar beet processing, bison processing, cheese making and much more.

Distribution — Trucks and trains primarily

Consumption — Anything goes!



Teacher's Guide

N.D. Agriculture in the Classroom Mission:

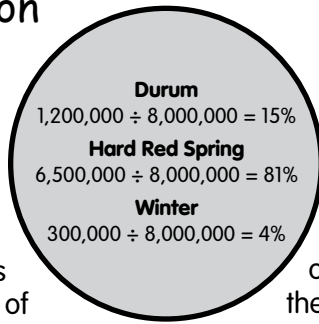
To cultivate an understanding of the interrelationship of agriculture, the environment and people by integrating agriculture into K-12 education

Wheat Production

Classes of Wheat

Help your students draw a pie chart illustrating the percentage each class of wheat makes up of the state's total wheat production. Older students can figure the percentage of each class by dividing the number of acres harvested of that class of wheat by the total number of acres harvested. Younger students can be provided with the percentages.

Rounding can be discussed since all percentages are rounded up to the nearest whole number.



Idea: Ask a wheat grower to come to your class to talk about the kinds of wheat he or she grows and the many steps required to produce wheat.

Idea: Grow wheat plants. Soak kernels of wheat overnight in three times their volume of water until they are saturated. Drain off water that hasn't been absorbed. Lightly pack soil into Styrofoam cups or small milk cartons ahead of time, and have students press

the soaked kernels into the soil. Space seeds evenly, covering lightly with about 1/2 inch of soil. Place in a sunny location. Keep soil moist (not wet), and give extra water on Fridays. Seeds sprout in 6 to 8 days. Students might also chart daily growth, document how much water is used and identify the plant's parts. (Source: Amazing Wheat Teacher's Guide)

Idea: Find the daily cash price of wheat in the newspaper, and graph how the price changes.

Where the Wheat Grows

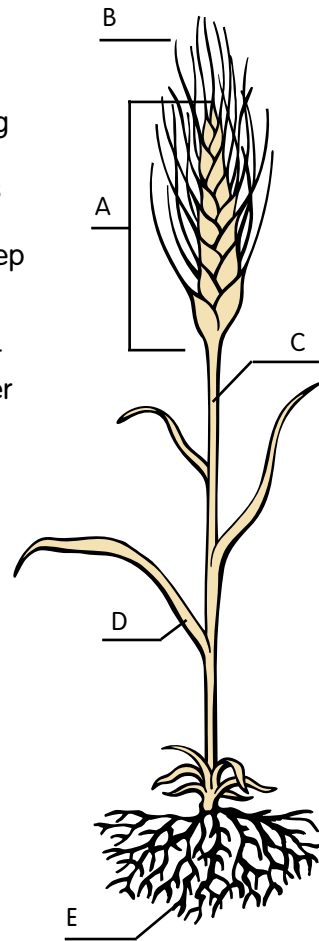
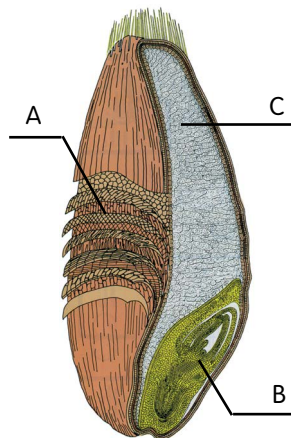
Ask your local Farm Service Agency or NDSU Extension Service staff to provide wheat production data for your county. The students could chart annual production.

The top 10 wheat-producing counties, using average data, are:

	Bushels
Cavalier	14,700,000
Ward	14,100,000
Williams	13,400,000
Bottineau	12,600,000
McLean	12,200,000
Stark	9,200,000
Walsh	9,200,000
Pembina	8,900,000
Mountrail	8,900,000
Renville	8,700,000

The Wheat Kernel and Wheat Plant

Idea: Check the quality of wheat seeds by conducting a germination test. Place 100 seeds on paper towels in a tray, and place towels on top, sandwich style. Keep towels moist by adding water every day. After one week, count the seeds that have sprouted. The number of sprouted seeds is the germination percentage.



Source: Amazing Wheat Teacher's Guide

Wheat Processing

Idea: Ask students to bring labels of wheat foods from home. Remember that the bran and germ are in food products too. Make a bulletin board. You might even categorize the labels by the class of wheat from which the product is made.

Idea: Place different shapes of pasta in different sizes and shapes of jars. Have students estimate how many pieces of pasta are in each jar. You might have students bring a few pieces of pasta they have at home to show the variety.

Idea: Have students brainstorm other wheat-related careers. Older students might select and research one career area.

North Dakota Mill and Elevator, Grand Forks spring wheat and durum mill
 Dakota Growers Pasta Company, Carrington durum mill and pasta plant
 Cando Pasta, Cando durum mill and pasta plant
 Conte Luna Foods, Grand Forks pasta plant
 Golden Plains Frozen Foods, Leeds pasta plant
 Minot Milling, Minot spring wheat and durum mill
 Horizon Milling, Fairmount spring wheat mill
 Abbiamo Pasta, Casselton pasta plant

Wheat Distribution

The Journey of Wheat

- 3 Elevator sells wheat to mill or to a foreign country
- 1 Farmer produces wheat
- 5 Bakery or pasta manufacturer packages products to sell at grocery store
- 2 Farmer delivers wheat to elevator
- 6 You buy wheat foods at the grocery store
- 4 Mill bags flour to sell at grocery store or sells flour or semolina to bakery or pasta manufacturer

Idea: Use a world map to find the locations mentioned in Around the World.

Idea: Conduct research to learn more about each kind of wheat food in Around the World or others.

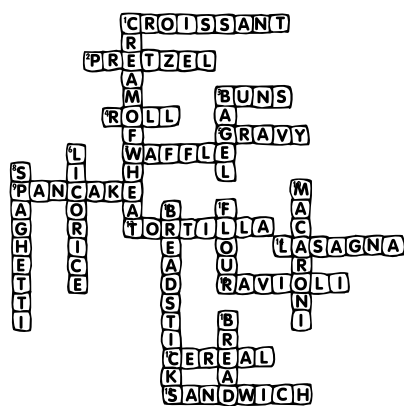
Idea: Complete the Breads Around the World lesson from the Project Food, Land and People resource book. Project Food, Land and People is a program supported by the N.D. Agriculture in the Classroom Council.

Around the World

- | | |
|------------------------|----------------------|
| <u>H</u> Matzo | A. Mexico |
| <u>E</u> Pita | B. Ireland |
| <u>C</u> Hamburger Bun | C. America |
| <u>A</u> Tortilla | D. Norway |
| <u>F</u> Scone | E. Greece |
| <u>G</u> Wonton | F. Scotland, England |
| <u>M</u> Fry Bread | G. China |
| <u>J</u> Croissant | H. Jewish |
| <u>L</u> Naan Bread | I. Italy |
| <u>B</u> Soda Bread | J. France |
| <u>D</u> Lefse | K. Morocco |
| <u>K</u> Couscous | L. India |
| <u>I</u> Spaghetti | M. Native American |

Adapted from: AgVenture: Exploring Ohio Agriculture, Ohio Agricultural Council and Ohio State University Extension

Wheat Foods Crossword Puzzle



Wheat Consumption

Bread in a Bag

Bread in a Bag is a simple way to make 2 large loaves or 4 small loaves of bread with students. Ask a few adult volunteers for help with measuring and mixing and the school cafeteria staff for help with baking. Before beginning, have students wash their hands and cover a few desks with paper for quick cleanup of the work area. Fill large pitchers with warm water and warm milk (105-115F) for students to measure out the amount needed.

Combine in 1-gallon heavy-duty resealable freezer bag:

- 1 cup bread flour
- 2 packages yeast
- 1 cup warm water
- 2 tablespoons sugar

Squeeze upper part of bag to force out air. Close top of bag tightly and mix well by working bag with fingers until ingredients are completely blended. Allow mixture to rest 15 minutes.

Add:

- 1 1/4 cups warm milk
- 1 tablespoon salt
- 2 tablespoons shortening, softened

Mix well by working bag with fingers.

Gradually add:

- 5-6 cups flour, half bread flour and half whole wheat flour

Add enough flour to make a stiff dough or until dough pulls away from bag. Turn dough onto floured surface. Divide dough in half. Knead each half 5 minutes or until dough is smooth and elastic. Add more flour if dough is too sticky.

Cover with plastic bag and let rise for 10 minutes.

Flatten dough into a 12x7-inch rectangle. Starting from a narrow end, roll dough toward you. Pinch edges to seal. Tuck ends under. Press each end to seal.

Place seam side down in greased 9x5x3-inch pan. Repeat for other loaf. Cover loosely with plastic bag and let rise in warm place until doubled (about 45-60 minutes). Uncover. Bake in 400 degree F oven 35-45 minutes. Remove from pans. Cool on wire racks.

If preferred, this amount of dough can be flattened into four 7 1/2 x 5-inch rectangles and placed in four 5 3/4 x 3 1/4 x 2-inch mini loaf pans. Baking time will be slightly shorter.

Source: North Dakota Farm Bureau

MyPlate

Idea: Have students brainstorm foods that fit in the Grains group. Which foods are made from wheat?

Idea: Have students keep a food diary, listing all the foods they eat for one day, a few days or a week. In which segment of MyPlate does each food fit?

Idea: Have students go to www.ChooseMyPlate.gov to learn more.

Tying It All Together

Idea: Have students write descriptive paragraphs about:

- the aroma of bread baking at a bakery or in someone's home
- the sound, smell and feel of wheat harvest on a hot summer day
- why one kind of cereal is their favorite
- the steps wheat goes through from production to consumption

Idea: Check out the following Web sites.

North Dakota Wheat Commission

www.ndwheat.com

Wheat Foods Council

www.wheatfoods.org

Whole Grains Council

www.wholegrainscouncil.org

North Dakota Agricultural Statistics

www.nass.usda.gov/nd/

National Pasta Association

www.ilovepasta.org

Home Baking Association

www.homebaking.org

ND Health Content Standards 2008

Gr. 3, Standard 1: Human Growth and Development, Benchmark 3.1.4 Describe the effects of healthy and unhealthy foods on the body.

Gr. 3, Standard 2: Personal Health, Benchmark 3.2.1 Describe how personal health behaviors, e.g. proper nutrition, affect individual well-being.

Gr. 5, Standard 1: Body Systems, Benchmark 5.1.2. Explain the maintenance of human body systems (e.g., skeletal: choose foods high in calcium and vitamin D, be physically active).

Common Core English Language Arts Standards for Reading Informational Text

Gr. 3, Standard 1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

Gr. 3, Standard 2: Determine the main idea of a text; recount the key details and explain how they support the main idea.

Gr. 3, Standard 3: Describe the historical events, scientific ideas, or steps in procedures using words to show the sequence.

Gr. 4, Standard 1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Gr. 4, Standard 2: Determine the main idea of a text and explain how it is supported by key details; summarize the text.

Gr. 4, Standard 4: Determine the meaning of general academic words or phrases in a text relevant to a Grade 4 topic.

Gr. 4, Standard 7: Interpret information presented visually and explain how the information contributes to an understanding of the text in which it appears.

Gr. 5, Standard 1: Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Gr. 5, Standard 2: Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

Science Standards and Benchmarks

Standard 4: Students understand the basic concepts and principals of life science, 3.4.2. Life Cycles: Describe the life cycles of plants and animals (e.g., birds, mammals, grasses, trees, insects, flowers).

Standard 6: Students understand the relations between science and technology, 4.6.1. Technological Design: Evaluate the effects of technology on people and the environment (e.g., new construction, oil drilling, electric cars).

Standard 6: Students understand the relations between science and technology, 5.6.1. Technological Design: Use technology to design a solution to a problem.

Standard 7: Students understand relations between science and personal, social, and environmental issues, 4.7.2. Science and Social Issues: Identify ways in which science and technology have greatly improved human lives (e.g., food quality and quantity, transportation, health, sanitation, communication).

Standard 7: Students understand relations between science and personal, social, and environmental issues, 5.7.2. Science and Social Issues: Explain ways humans benefit from Earth's resources (e.g., air, water, soil, food, fuel, building materials).

Standard 8: History and Nature of Science, 3.8.1. Identify ways people of all ages, genders, and backgrounds use science in their careers and in daily life (e.g., children check temperature conditions to decide what to wear, farmer uses genetic grains, hikers use GPS, depth-finder in boat, hearing-aides for disabilities).

Standard 8: History and Nature of Science, 4.8.1. Identify a variety of careers in the field of science.

Common Core English Language Arts Literacy Standards for Writing for “Tying It All Together” on page 4 of the Teacher’s Guide

CCSS.ELA-Literacy.W.4.3 – Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

CCSS.ELA-Literacy.W.4.3.c – Use a variety of transitional words and phrases to manage the sequence of events.

CCSS.ELA-Literacy.W.4.3.d – Use concrete words and phrases and sensory details to convey experiences and events precisely.

CCSS.ELA-Literacy.W.4.3.e – Provide a conclusion that follows from the narrated experiences or events.

ND Math Standards and Benchmarks (For math activities suggested in the Teacher’s Guide page 2)

3.MD.3 – Represent and interpret data: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.

4.MD.2 – Represent and Interpret Data Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

5.NBT.4 – Number and Operations in Base Ten: Use place value understanding to round decimals to any place.

ND Social Studies Standards and Benchmarks

Standard 1: Students use social studies skills and resources, Benchmark 4.1.4 Interpret current events using print and electronic media (e.g., newspaper, children’s news magazines, television, internet).

Standard 3: Economic Concepts, Benchmark 3.3.3 Explain the differences among natural and human resources, and how they are used locally.

Standard 3: Economic Concepts, Benchmark 4.3.2 Identify ways that natural resources (e.g. soil, people, trees) contribute to the economy of the local community and of North Dakota.

Standard 3: Economic Concepts, Benchmark 4.3.4 Identify principal exports of North Dakota (e.g., crops, energy, livestock).

Standard 5: Students understand and apply concepts of geography, Benchmark 4.5.5 Identify different patterns of land use in North Dakota (land use in urban and rural areas, agriculture, manufacturing).

North Dakota Agriculture in the Classroom Activities

This **Ag Mag** is just one of the North Dakota Agriculture in the Classroom Council projects. Each issue of the Ag Mag focuses on an agricultural commodity or topic and includes fun activities, bold graphics, interesting information and challenging problems. Send feedback and suggestions for future Ag Mag issues to:

Becky Koch
NDSU Agriculture Communication
(701) 231-7875
becky.koch@ndsu.edu

Another council teacher resource is **Project Food, Land & People** (FLP). Using the national FLP curriculum, N.D. Ag in the Classroom provides 600-level credit workshops for teachers to instruct them in integrating hands-on lessons that promote the development of critical thinking skills so students can better understand the interrelationships among the environment, agriculture and people of the world. Teachers are encouraged to adapt their lessons to include North Dakota products and resources.

Project Food, Land & People's 55 lessons include:

- Amazing Grazing
- Cows or Condos?
- By the Way
- Seed Surprises
- Schoolground Caretakers
- Could It Be Something They Ate?
- What Piece of the Pie?
- and many more.

For information, contact:

Jill Vigesaa
N.D. Farm Bureau Foundation
(701) 799-5488
jill.vigesaa@gmail.com

The N.D. Geographic Alliance conducts a two-day **Agricultural Tour for Teachers**. The tour includes farm and field visits, tours of agricultural processing plants to see what happens to products following the farm production cycle, and discussions with people involved in the global marketing of North Dakota farm products.

For information, contact:

Marilyn Weiser
North Dakota Geographic Alliance
(701) 858-3063
marilyn.weiser@gmail.com

Educators may apply for **mini-grants for up to \$500** for use in programs that promote agricultural literacy. The Agriculture in the Classroom Council, working with the N.D. FFA Foundation, offers these funds for agriculture-related projects, units and lessons used for school-age children. The mini-grants fund hands-on activities that develop and enrich understanding of agriculture as the source of food and/or fiber in our society. Individuals or groups such as teachers, 4-H leaders, commodity groups and others interested in teaching young people about the importance of North Dakota agriculture are welcome to apply.

Examples of programs that may be funded: farm safety programs, agricultural festivals, an elementary classroom visiting a nearby farm and ag career awareness day. Grant funds can be used for printing, curriculum, guest speakers, materials, food, supplies, etc. More ideas and an application are at www.ndaginclassroom.org.

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