

Fall 2017

NORTH DAKOTA Ag Mag

A Magazine about Agriculture for North Dakota Students



Horticulture & Forestry

Welcome to the Horticulture and Forestry
North Dakota Ag Mag.

This issue of the North Dakota Ag Mag focuses on horticulture and forestry. 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 N.D. Department of Agriculture at 800-242-7535 or ndda@nd.gov.

The magazine also is available online at www.ag.ndsu.edu/agmag or the N.D. Agriculture in the Classroom (AITC) 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 8 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:

N.D. Department of Agriculture
600 E. Boulevard Ave., Dept. 602
Bismarck, ND 58505-0020
701-328-2231 or 800-242-7535
ndda@nd.gov
www.nd.gov/ndda

Teacher's Guide

Idea: Introduce horticulture and forestry by asking students if they know what horticulture and forestry include. What horticulture and forestry do we have in North Dakota?

Answers to Horticulture Definitions

- C. Viticulture – grapes
- D. Olericulture – vegetables
- F. Landscape horticulture – landscape plants
- A. Arboriculture – trees and shrubs
- B. Floriculture – floral crops (flowers)
- E. Pomology – fruits

Idea: Gardens A to Z – Have students brainstorm the names of vegetables and fruits for each letter of the alphabet. Q may be the most challenging letter, so have students look up quince.

Idea: Have students write an acrostic poem with phrases or sentences that start with each letter of the word horticulture or a vegetable, fruit or flower of their choosing.

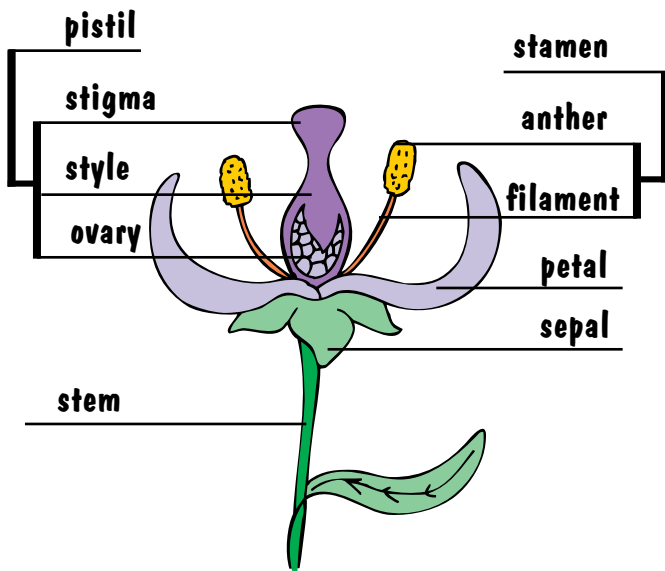
Idea: Ask students to bring a vegetable or fruit to school, talk about each (what it is, where it's grown, its nutrition, etc.) then make vegetable soup and/or fruit salad.

Idea: Take cuttings from simple houseplants, such as philodendrons or spider plants, and have each student grow a plant. Graph water provided, sunlight, growth, etc.

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

Answers to Plant Parts



Idea: Dissect a live plant for hands-on learning about plant parts.

Forestry

Obviously the answers to the introductory activity can vary greatly. This exercise is to develop critical thinking skills. It can be a classroom discussion rather than written activity.

Idea: Read and discuss Shel Silverstein's "The Giving Tree" about the relationship between a tree and a young boy as he grows through life.

Idea: Find an American elm, North Dakota's state tree, in your community and study it throughout the year. How does it change with the seasons? Why do you think the American elm was selected as North Dakota's state tree? Possibly discuss Dutch elm disease (www.ag.ndsu.edu/publications/lawns-gardens-trees/dutch-elm-disease-in-north-dakota-a-new-look) and how it has affected elm trees in your community.

Idea: Put parts of a tree and/or things made of wood in a box. Blindfold students and have each feel an item in the box and guess what it is. After the item is confirmed, have students write descriptive paragraphs about their items.

Idea: In addition to learning about the American elm, study North Dakota's other state symbols at www.nd.gov/category.htm?id=75.

Answers to Plant Life Cycles

Marigold – A

Tulip – P

Rose – P

Sunflower – A

Peas – A

Strawberry – P

Rhubarb – P

Lettuce – A

Idea: Study annuals and perennials. Show students seeds and bulbs or tubers from perennials such as tulips, daylilies or irises. Discuss the differences.

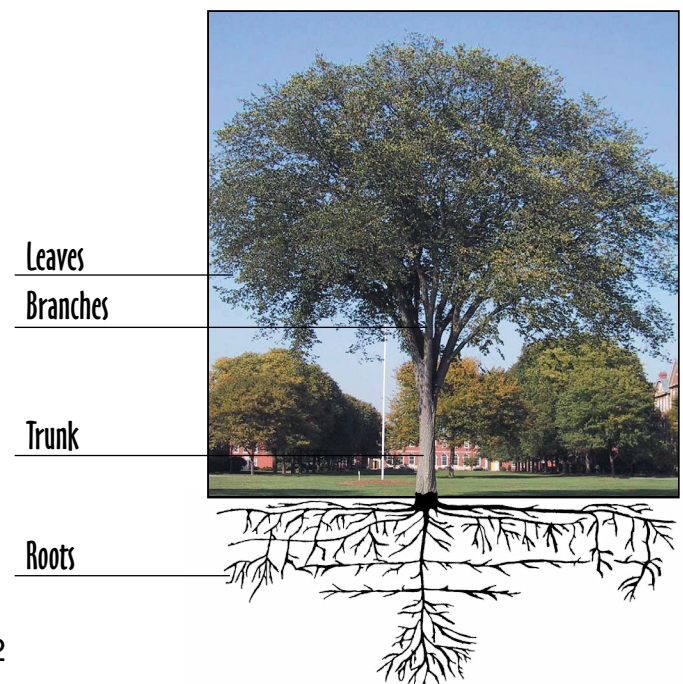
Career Corner

Idea: Brainstorm other careers related to horticulture and forestry. Have someone who works in a horticulture or forestry career speak to the class.

Idea: Visit a garden center to learn more about vegetables, fruits, trees and related careers.

Idea: Have students study the International Peace Garden website at www.peacegarden.com then write a paragraph describing what they imagine a visit to the Peace Garden to be like that includes all of their senses (sight, hearing, smell, taste and touch).

Answers to Parts of a Tree



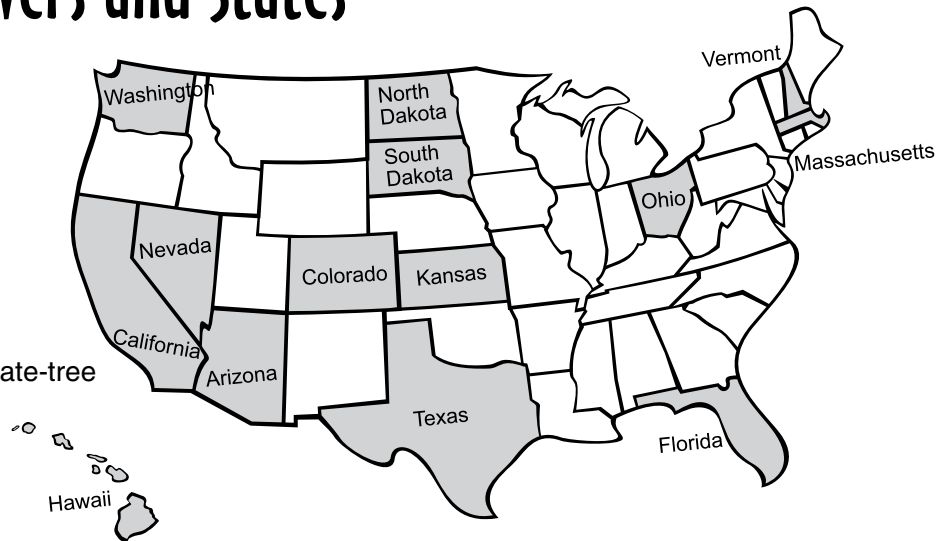
Answers to Trees, Flowers and States

- South Dakota – Black Hills Spruce
- Texas – Pecan
- California – Redwood
- Florida – Palm
- Colorado – Blue Spruce
- Hawaii – Kukui
- Ohio – Buckeye
- Vermont – Sugar Maple

<https://statesymbolsusa.org/categories/state-tree>

- Arizona – Saguaro cactus blossom
- Colorado – Rocky Mountain columbine
- Florida – Orange blossom
- Kansas – Sunflower
- Massachusetts – Mayflower
- Nevada – Sagebrush
- North Dakota – Wild prairie rose
- Washington – Coastal rhododendron

<https://statesymbolsusa.org/categories/flower>



Idea: Have each student select a state and research it. Write a short report or develop a card that lists its state tree, flower and other items. Discuss why those items might have been chosen.

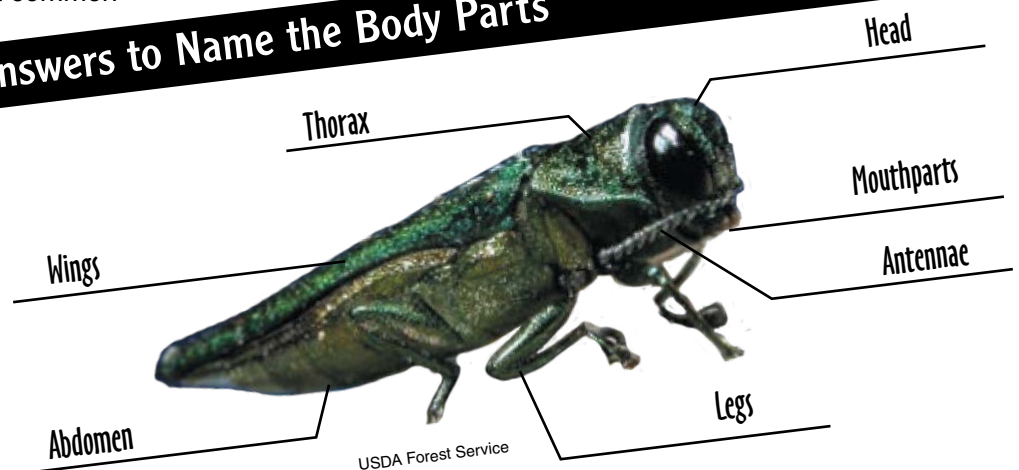
Answers to Which Word?

1. The **emerald** ash borer is an insect that is killing ash trees east of North Dakota as near as Minnesota.
2. The borer was discovered in **Michigan** in 2002.
3. Scientists **speculate** the borer arrived in the U.S. on a ship from China.
4. The adult **beetles** are metallic green and about 1/2 inch long.
5. The insects tunnel inside the wood, destroying the **vessels** that carry water and food throughout the tree, which causes the tree to starve.
6. Since the borer travels in wood, don't move **firewood** from ash trees into North Dakota from other states.
7. The ash is North Dakota's most common tree. To reduce the risk of the borer destroying our forests over time, we should plant a **diversity** of tree species.
8. This borer will not harm oak, maple or **birch** trees.

Idea: Have students read Joyce Kilmer's poem "Trees" and write their own poems about trees.

www.ag.ndsu.edu/horticulture/protect-north-dakota-from-emerald-ash-borer-eab

Answers to Name the Body Parts



Answers to Math Challenges

1. Hunter planted 700 Christmas trees per acre on his farm. (One acre is about the size of a football field.) How many trees are planted on his 12-acre farm? $700 \text{ trees/acre} \times 12 \text{ acres} =$ **8,400 trees**
2. Kenyon needs 24 square feet for his raised-bed garden. If his plot is 4 feet wide, how long does it need to be? $24 \text{ feet} / 4 \text{ feet} =$ **6 feet**
3. Amanda is a florist who sells roses wrapped in paper for \$14.99 or in a vase for \$19.99. How much more does it cost to buy the roses in a vase? $\$19.99 - \$14.99 =$ **\$5**
4. At the farmers market, Will sells three tomatoes for \$1, and Sue sells tomatoes for 40 cents each. Which farmer charges less for one tomato? $\$1.00 / 3 =$ **33 cents each, so they're less expensive than the 40-cent tomatoes**
5. Abby has 1 gallon of tomatoes from her garden in a kettle, and the salsa recipe says to cook the tomatoes down to half the original volume. How many quarts will she have after cooking the tomatoes? $\frac{1}{2} \text{ gallon} =$ **2 quarts**
6. Nate picked enough strawberries to fill a 1-gallon bucket. How many pint boxes can he fill to sell? $1 \text{ gallon} =$ **8 pints**
7. The fertilizer label says the entire bag is for a garden that is 100 square feet. How much of the bag should Sunee use for his 5-foot by 5-foot garden? $5 \times 5 = 25 \text{ square feet}$, $25 \text{ square feet} / 100 \text{ square feet} =$ **.25 or $\frac{1}{4}$ of the bag**
8. Maleah's houseplant fertilizer bottle says dilute 3 tablespoons of fertilizer in 1 gallon of water. However, she only needs a half gallon for her two plants. How much fertilizer should she put in the half gallon of water? $3 \text{ tablespoons} / 2 =$ **1½ tablespoons**

Ideas to Supplement the Ag Mag

Check with your county office of the NDSU Extension Service to see if they offer the **Junior Master Gardener** program. See www.ag.ndsu.edu/extension/directory to find county Extension agents. Resources available on the Junior Master Gardener website at <http://jmgkids.us/> under Kids Zone include Plant Growth and Development, Soils and Water, Ecology and Environmental Horticulture, Insects and Diseases, Landscape Horticulture, Fruits and Nuts, Vegetables and Herbs, Operation Thistle and Operation WATER. Curricula are available for purchase. Source: Texas AgriLife Extension Service, Texas A&M University System.

The **Project Food, Land and People** PreK-12 curriculum includes lessons on Tree-mendous; Seed Surprises; Fruits and Veggies; Buzzy, Buzzy Bee; and much more. Order at www.foodlandpeople.org. Also, see the N.D. Agriculture in the Classroom Council Activities on page 6 to learn about Project Food, Land and People summer courses for teachers in the state. Source: Project Food, Land and People

Project Learning Tree (PLT) is an environmental education program for teachers working with preschool through grade 12 youth. PLT provides lesson plans to help students learn how to make sound choices about the environment. PLT uses trees as a window into the world to study the natural resources. The curriculum helps educators teach tomorrow's decision makers how to think, not what to think. Project Learning Tree also helps empower students to take action to improve the environment at their schools and communities based on what they learn in the classroom. Service-learning programs, like GreenWorks! and GreenSchools!, provide teaching opportunities to engage students in service through a process integrated with learning objectives. Grants funds to complete service-learning projects are available each year on Sept. 30. Check out www.plt.org. For more information, contact:

Project Learning Tree
NDSU ND Forest Service
307 1st Street East
Bottineau ND 58318-1100
701-228-5446
www.ndsu.edu/ndfs

Ideas to Supplement the Ag Mag

N.D. Forest Service professional development workshops for K-12 educators

Each summer the N.D. Forest Service offers summer professional development opportunities. Call 701-228-5446 or email **forest@nd.gov** for details each spring.

Hands-on Project Ideas

Art

Make paper. Recycle old paper to make unique handmade paper. Search the Web for various instructions.

Science

Give straws to students and have them breathe through the straw, plugging their noses or trusting them to breathe through their mouths. Then have them bend the straw in several places and see how much harder it is to breathe through the straw. Explain how the emerald ash borer technically cuts off the water flow of the tree, depriving it of its life-giving water, similar to how the straw cuts off your supply of oxygen when bent. Source: **www.emeraldashborer.info/documents/k12/edpacket.pdf**

Develop a paper recycling program for your school if it doesn't already have one.

Additional Resources for Teachers

Schools Online includes lessons (some with animation and audio) at **<http://urbanext.illinois.edu/SchoolsOnline/>** on Trees are Terrific, Dr. Arbor Talks Trees, The Adventures of Herman (the worm), The Great Plant Escape, A Walk in the Woods, Exploring the Secret Life of Trees and My First Garden. Source: University of Illinois Extension

Flower Power: An Introduction to Heredity lesson plan at **www.agclassroom.org/ut**. Source: Utah Agriculture in the Classroom

Nature's Partners: Pollinators, Plants and You is a comprehensive pollinator curriculum for grades 3-6 at **www.kidsbutterfly.org/curriculum**. Source: Butterfly and Moth Information Network.

Gardening with Children at **www.ag.ndsu.edu/publications/lawns-gardens-trees/gardening-with-children** explains steps and tips for those able to work with students on a garden during the summer. Source: NDSU Extension Service

ChooseMyPlate.gov has many resources and activities, including how fruits and vegetables are an important part of a healthy diet. Source: U.S. Department of Agriculture

Standards and Benchmarks

English Language Arts and Literacy Content Standards for Reading Informational/Nonfiction Text:

Gr. 3, RI.1 Ask and answer questions to demonstrate understanding of a text (textual evidence), referring explicitly to the text as the basis for the answers.

Gr.3, RI.2 Determine the main idea of a text and recount the key details to 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.3, RI.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

Gr.4, RI.1 Refer to details and examples in a text (textual evidence) when explaining what the text says explicitly and when drawing inferences from the text. Summarize the text.

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

Gr.4, RI.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

Gr.5, RI.1 Quote accurately using textual evidence when explaining what the text says explicitly and when drawing inferences from the text. Summarize the text.

Gr.5, RI.2 Determine two or more main ideas of a text and explain how they are supported by key details.

Gr.5, RI.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

Craft and Structure

Gr.3, RI.4 Determine the meaning of general academic and domain specific words and phrases in a text relevant to a grade 3 topic or subject area.

Gr.4, RI.4 Determine the meaning of general academic and domain specific words or phrases in a text relevant to a grade 4 topic or subject area.

Gr.5, RI.4 Determine the meaning of general academic and domain specific words and phrases in a text relevant to a grade 5 topic or subject area.

English Language Arts Literacy Standards for Writing if using research ideas to supplement the Ag Mag in the Teacher's Guide:

Gr.3, W.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

a. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension. b. Develop the topic with facts, definitions, and details. c. Use transitional words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information. d. Provide a concluding statement or section. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

Gr.4, W.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. a.

Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within categories of information using transitional words and phrases (e.g., another, for example, also, because). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented.

Gr.5, W.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. a.

Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within and across categories of information using transitional words, phrases, and clauses (e.g., in contrast, especially). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented.

North Dakota Mathematics Content Standards:

Operations and Algebraic Thinking

3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

Number and Operation in Base Ten

3.NBT.2 Using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction, fluently add and subtract within 1000.

4.NBT.5 Using strategies based on place value and the properties of operations, multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.

5.NBT.5 Fluently multiply multi-digit whole numbers using strategies flexibly, including the standard algorithm.

Number and Operations-Fractions

3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts.

Measurement and Data

3.MD.7 Relate area to the operations of multiplication and addition. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

4.M D.2 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.

Science Standards and Benchmarks

Standard 1: Students understand the unifying concepts and processes of science. 3.1.1. Identify changes that are repetitive (e.g., seasons, day and night, water cycle).

Standard 1: Students understand the unifying concepts and processes of science. 5.1.3. Identify details of an object's form which determine its function.

Standard 2: Students use the process of science inquiry. 3.2.3. Record observations (e.g., journals, drawings, charts) based on simple investigations.

Standard 2: Students use the process of science inquiry. 4.2.2. Conduct simple investigations to answer questions based on observations.

Standard 2: Students use the process of science inquiry. 5.2.2. Formulate an explanation supported by data.

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 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.

ND Social Studies Standards and Benchmarks

Standard 1: Students use social studies skills and resources, Benchmark 3.1.4 Describe current events using print and electronic media (e.g., newspaper, children's news magazines, television, Internet).

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 1: Students use social studies skills and resources, Benchmark 5.1.3 Evaluate current events using print and electronic media (e.g., newspaper, children's news magazines, television, Internet.)

Standard 2: Students understand important historical events, Benchmark SYMBOLS 4.2.1 Identify the symbols (i.e., bird, flower, flag, tree) that represent North Dakota.

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.

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. See past issues at www.ag.ndsu.edu/agmag/agmag.htm.

Send feedback and suggestions for future Ag Mag issues to:

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

Another AITC teacher resource is **Project Food, Land & People** (FLP). Using the national FLP curriculum, N.D. Ag in the Classroom provides credit workshops in person and online 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 (FLP) is a curriculum with many lessons developed for K-12 educators to integrate easily into the classroom. The instructional units address core content and North Dakota state standards and benchmarks with inquiry based learning activities.

Participants receive the entire curriculum, plus North Dakota specific materials and information about available resources.

See details at www.ndfb.org/edusafe/flp.

For information, contact:

Jill Vigesaa
FLP Coordinator
701-799-5488
jill.vigesaa@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 application information are at www.ndaginclassroom.org. Applications are due Sept. 21 each year.

For information, contact:

Tam Maddock
N.D. FFA Foundation
tmaddock@ndffa.org
www.teamabovo.com/ndffa

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:

Jeff Beck
North Dakota Geographic Alliance
701-858-3063
jeff.beck@minot.k12.nd.us

North Dakota Agriculture in the Classroom Council

Kim Alberty – Agassiz Seed and Supply, West Fargo
Aaron Anderson – N.D. Dept. of Career and Technical Education
Nancy Jo Bateman – N.D. Beef Commission
Sheri Coleman – Northern Canola Growers Association
Kirk Olson – McKenzie County Farm Bureau
Nicole Wardner – NDSU Extension Service Sheridan County
Statutory Member: Superintendent of Public Instruction
Kirsten Baesler (Bob Marthaller, representative)