Winter 2017-18

NORTH DAKOTA Ag Mag

A Magazine about Agriculture for North Dakota Students

Beef

This issue of the North Dakota Ag Mag focuses on beef production, processing, distribution and consumption. The information and activities are geared primarily toward the state's third, fourth and fifth graders.

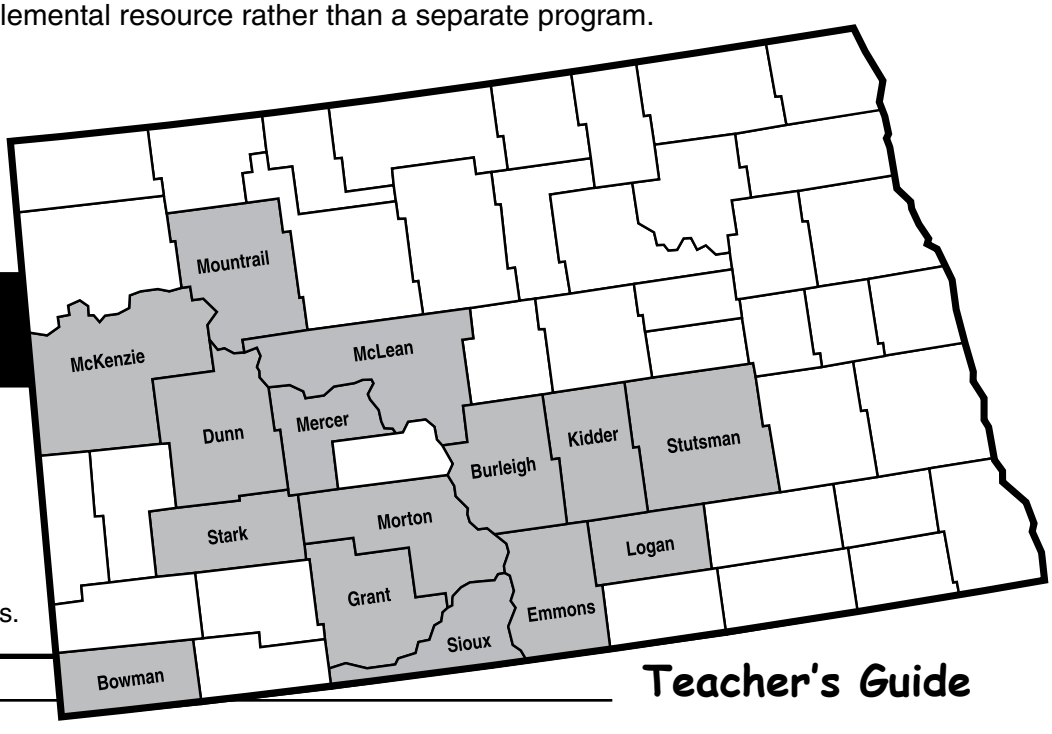
The Ag Mag is distributed three times per year. Subscriptions are free, but if you're not on the mailing list or if you know someone else who wants to be added, contact the North Dakota Department of Agriculture at 1-800-242-7535 or ndda@nd.gov.

The magazine also is on the Web at **www.ag.ndsu.edu/agmag** or through the North Dakota Agriculture in the Classroom Web site at **www.nd.gov/ndda/ag-classroom**.

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

Answers to Where's the Beef?

Idea: Have students look on the North Dakota Agricultural Statistics Service website at www.nass.usda.gov/nd/ to find the ranking of the top beef-producing counties.



Teacher's Guide

Beef Production

Idea: There are about 250 different breeds of cattle around the world. Talk with your students about what a "breed" is and what breeds of cattle are in your area. Ask individuals or teams of students to research and write brief reports about a breed of beef cattle, including physical traits and history. Breeds might include Hereford, Angus, Charolais, Galloway, Brahman, Longhorn and BueLingo that was developed in North Dakota. On page 2, Zebu is listed as a breed of cattle that originated in India, but technically Zebu isn't a breed but rather an entire class of hump-backed cattle. What other breeds fit in this class? See www.cattle-today.com or www.kidscowsandmore.org/beef for more breed information.

Idea: Have students research America's cattle trails of the 1800s and draw maps of the most important trails. Why were these trails first used, and why were they abandoned?

Idea: Have students visit the Kids' Zone at www.animalsmart.org to become a Jr. Animal Scientist and learn more.

Background Information

Caring for Beef Cattle

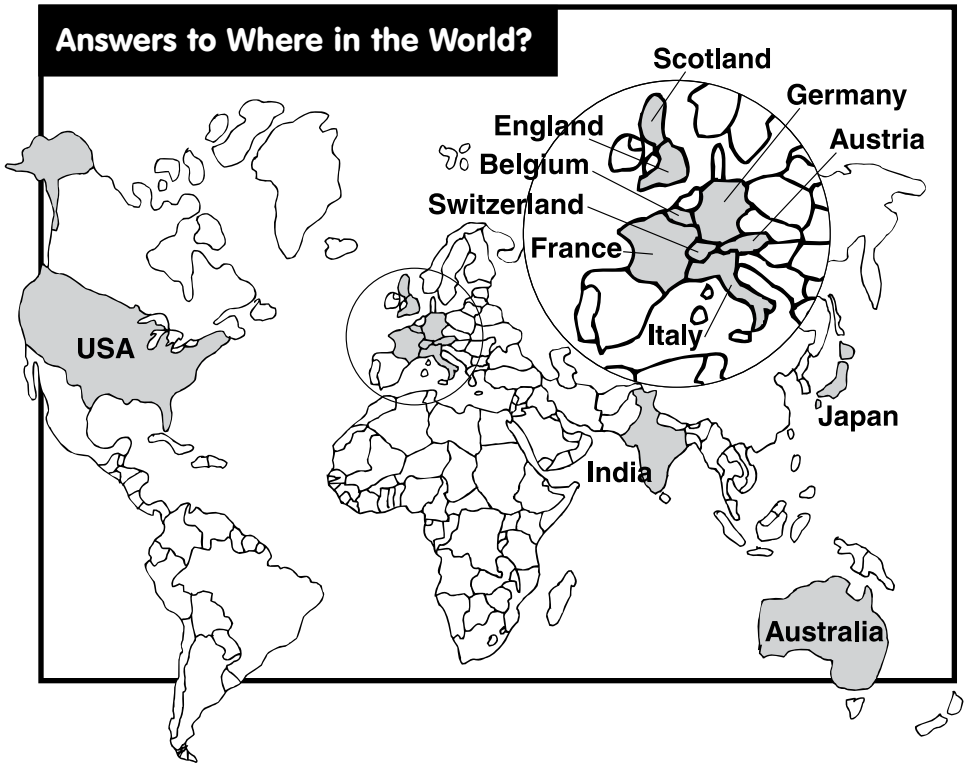
For beef cattle to grow and reproduce, they need proper attention and care. Cattle depend on ranchers for shelter, feed, water and medical attention. The rancher's job is to provide for the animals' needs and observe them for potential problems. Cattle that fail to grow or reproduce properly when given insufficient or improper care do not produce meat economically. If this happens, the rancher has fewer animals or less product to sell, and the cost of producing animal products increases. This means less income for the rancher to pay for feed, bedding, veterinary services and other costs. So the rancher's income depends on providing good animal care.

Grazing to Reduce Waste

Most cattle in the U.S. and around the world graze on land that can't be used for anything else because the terrain is too steep or hilly for building houses, or too rocky or dry for growing food crops. About half the area of the U.S. (excluding Alaska and Hawaii) falls into this category. At least 90 percent of this land is covered with grass that contains cellulose, which is indigestible by humans. However, cattle can digest this grass, converting it into beef and dairy products. This land would go to waste if it wasn't used for grazing cattle.

Adapted from "Wow that Cow!" by the American National CattleWomen, Inc.

Answers to Where in the World?



Answers to Beef in North Dakota: Then and Now

1. Marquis
2. refrigerated
3. Medora
4. computers
5. internet
6. identified
7. auctions
8. market

Idea: Ask a beef producer to share samples of what is fed to cattle.

Idea: Have students make Dirt Babies to learn the importance of cattle and grazing. It concentrates on what makes cattle special so they can eat grass, how cattle are able to help us take good care of our range and grazing lands, and why cattle are important in providing good nutrition for us.

Supplies:

Knee-high hose
Grass seed
Soil
Tall (junior size) baby food jar

Steps:

Place a pinch or two of grass seed, like Annual Ryegrass, in the hose toe, which will be the head or top of the dirt baby.

Pack a handful of soil in the end of the hose on top of the seed. Tie a knot in the hose under the ball of soil. Place the top of the hose (which is the bottom of the dirt baby) in a tall baby food jar filled with water. The soil will absorb the water through the hose and saturate the head of the dirt baby that is above the mouth of the jar. In 10-15 days the seed should germinate through the hose. You may have to cut a few small holes to aid in this step.

To decorate, cut a round piece of fabric to fit over the mouth of the jar and add lace, ribbon or other decoration. Glue jiggle eyes on the face, and cut out a heart-shaped piece of felt to glue in place for the mouth.

Water as needed. Cut and style the "hair."

Dirt Baby Script

Do you know how to make a baby? A dirt baby, I mean. It takes just a few supplies: a knee-high hose, a cup of potting soil, a baby food jar, grass seed, water, pieces of felt, scraps of fabric, and jiggle eyes.

Within a few weeks this dirt baby will have a beautiful head of green hair that will grow and grow.

Why does this have anything to do with cattle? Because cattle love grass! Cattle are special because they can eat and utilize grass to get the nutrients they need.

They are able to do this because they are ruminant animals with four compartments to their stomachs. Cattle chew grass and swallow it. Later, they start the rumination process by "burping" the grass mass back from the first compartment known as the *rumen*. The cattle rechew their "cud" (which looks a lot like when you have a mouth full of bubble gum). The food is then swallowed again where it undergoes further chemical breakdown as it passes through the remaining stomach compartments known as the *reticulum*, *omasum* and *abomasum*.

You and I do not have this ability so we rely on cattle to get the nutrients from grass and change it into nutritious, delicious beef that we can eat to get the zinc, iron and protein we need each day.

It is important that we have cattle that have this ability because 64 percent of the continental U.S. is agricultural land and 2/3 of that land is grazing land. That adds up to about 1.1 billion acres of grazing land in the United States. Grazing means cattle walk across the land and eat the vegetation they find. This grazing promotes new grass growth — just like when you mow your lawn at home.

The cattle's hoof prints help aerate the soil and leave places that will hold water when it rains to prevent runoff. Cattle also provide natural fertilizer as they walk across the land. They can even spread seed across the prairie so the range land has many different types of grasses in different places. Grazing actually maintains, restores and encourages variety among plant life and helps prevent forest and prairie fires.

Grass

I'll tell you 'bout a family,
a most important bunch
They aren't your friends or
neighbors, but I still have a hunch
You know this family pretty well,
you see them every day.
But if you think they're people,
then think another way.

This family's a converter of
light that's from the sun.
In other words of energy,
right into food for one
To benefit our wildlife, assist
our livestock too
A family most remarkable
but understood by few.

Grass roots are fine and fibrous,
and they enrich the soil,
And keep it firm and stabilized,
and so it helps to foil
Erosion's cruel forces, by
water and by wind,
Make sure soil productivity
will never, ever end.

It feeds a world of people,
it feeds both man and beast,
And most folks don't appreciate
or understand the least
Just how this good Grass family
keeps all the Earth alive,
Because without grass,
mankind could not survive.

Source: Stan Tixier, Society for Range Management

Beef Processing

Answers to Meat Math

1. 1,280 pounds – 490 pounds = **790 pounds**
2. 790 pounds ÷ 1,280 pounds = **62 percent**
3. 71 pounds ÷ 790 pounds = **9 percent**
4. 790 pounds X .34 = **268.6 pounds**
5. $7.99 - $2.50 = **$5.49 per pound**
6. $3.50 / pound X 3 pounds = **$10.50**
7. 4 burgers / pound X 3 pounds = **12 burgers**
8. 1.5 pounds X 3 = **4.5 pounds**
9. 160 degrees F – 135 degrees F = **25 degrees F**
10. 11:45 a.m. + 2 hours = **1:45 p.m.**

Answers to Cattle as Conservationists

1. herd
2. environmental
3. soil
4. loosen
5. natural
6. prescribed
7. trough

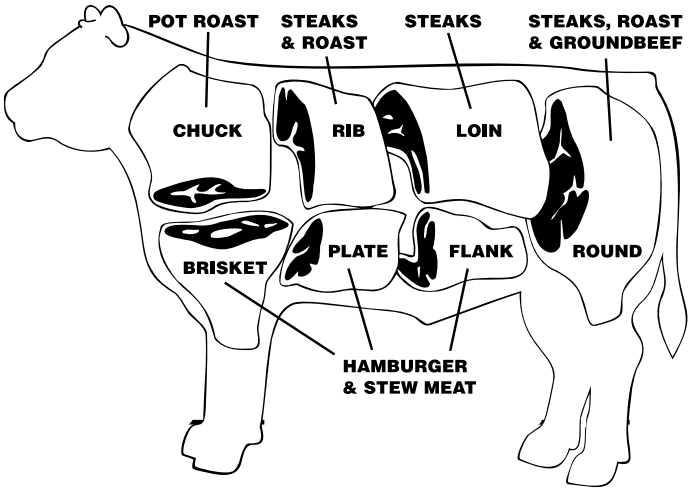
Answers to Cattleville

All the items include beef cattle products.

Idea: Have students brainstorm careers related to the beef industry.

Idea: Have students bring cattle by-products. Discuss and make a display.

Idea: Enlarge this "Where Does Beef Come From?" graphic to project or copy. Talk about what part of the beef animal the different cuts of beef students see at the grocery store come from.



Beef Distribution

Answers to The Journey of Beef

1. Calves are born on farms and ranches, weighing about 80 pounds at birth.
2. When cattle are about a year old (called yearlings) and weigh about 800 pounds, they are usually sold at an auction or livestock market to a feedlot where they eat grain along with hay or silage until they weigh about 1,200 pounds.
3. When cattle are ready for market at about 1,200 pounds (14-20 months of age), they may be sold to a packer or processor.
4. Finished cattle are trucked to a packing plant where they are converted to beef to eat and byproducts.
5. From the packing plant, beef is shipped to the supermarket where it is purchased to be eaten at home or to schools, restaurants and hospitals.

Idea: Visit a butcher shop or supermarket to learn about how beef arrives and is marketed.

Beef Consumption

The Clean Scene Rap

All of us should wash our hands with soap and water for at least 20 seconds before and after handling food, and after going to the bathroom. An easy way for kids to measure this time is to have them sing "Happy Birthday" twice as they scrub.

The Meat and Beans Group

USDA's www.choosemyplate.gov includes protein foods as part of a healthy lifestyle. All foods made from meats, poultry, seafood, processed soy products, beans, peas, eggs, nuts and seeds are part of this group. The amount of food from the protein group you need to eat depends on your age, gender and level of physical activity. Most Americans eat enough food from this group but need to make leaner and more varied selections of these foods.

In general, 1 ounce of meat, poultry or fish, ¼ cup cooked dry beans, 1 egg, 1 tablespoon of peanut butter or ½ ounce of nuts or seeds is considered as 1 ounce equivalent from the protein group. Boys and girls ages 9 to 13 who get less than 30 minutes per day of moderate physical activity usually need about a 5-ounce equivalent from the protein group every day. A 3-ounce serving of meat is about the size of a deck of playing cards.

Answers to Hamburger History

1. Russia
2. German
3. chef
4. sandwich
5. American
6. favorite

Idea: Have students go to www.choosemyplate.gov to develop their personalized eating plans and print a worksheet to track their food intake and physical activity.

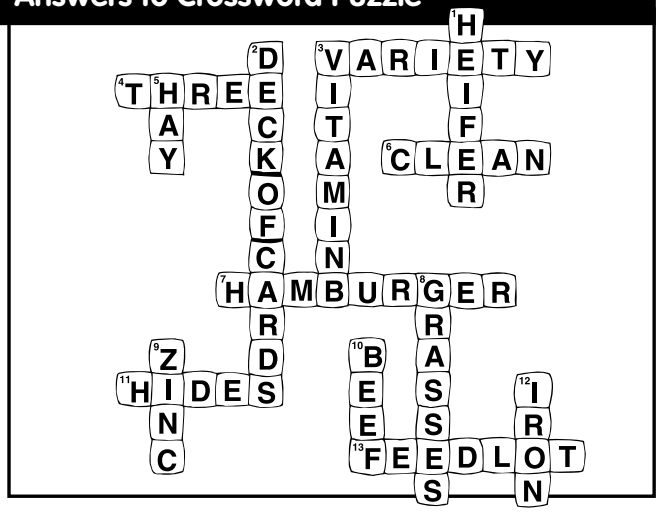
Idea: Talk about the different ingredients that can make up a hamburger sandwich and which segment of the plate each fits in. Examples: bun - grain, beef - protein foods, cheese - dairy, tomato - fruit, onion - vegetable.

Idea: Have students develop a print or radio advertisement for beef.

Idea: Have students use grocery ads to develop or complete math problems related to different prices of various cuts of beef. Include processed and prepared meats.

Idea: Have students create their own beef recipe. Use www.beefitswhatsfordinner.com and www.beefnutrition.org for ideas.

Answers to Crossword Puzzle



Resources

North Dakota Beef Commission
4023 State Street
Bismarck, ND 58503
701-328-5120, ndbeef@ndbeef.org
www.ndbeef.org

Whiteboard Lessons

http://exchange.smarttech.com/
and search for "beef" – SMART Exchange

http://aitc.okstate.edu/lessons/beef/beef.html
– Oklahoma Ag in the Classroom

Additional Websites

www.sciencekids.co.nz/sciencefacts/animals/cow.html
– a New Zealand science teacher

www.americasheartland.org/education/index.htm
– study guides, related stories and videos of different lengths sponsored by a collaboration of organizations for both teachers and students

Books

Metz, Lorijo. Cattle: Cows, Bulls and Calves. New York, NY 2011 by The Rosen Publishing Group, Inc. www.powerkidslinks.com/otf/cattle. For third to fourth grade students.

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

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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.

Health Content Standards:

Standard 1: GROWTH AND DEVELOPMENT

Body Systems

3.1.4 Describe the effects of healthy and unhealthy foods on the body (e.g., healthy foods provide nutrients for growth and development; unhealthy foods contribute to a lack of energy and obesity)

5.1.2 Explain the maintenance of human body systems (e.g., skeletal: choose foods high in calcium and vitamin D, be physically active)

Standard 2: PERSONAL HEALTH

3.2.1 Describe how personal health behaviors (e.g., grooming habits, wellness exams, proper nutrition, health fitness) affect individual wellbeing

4.2.2 Explain the relationship between food choices and personal health (e.g., unhealthy food choices contribute to high cholesterol, diabetes, heart disease, high risk of cancer, high blood pressure)

5.2.2 Explain the benefits of nutrition and physical activity as they relate to total wellness

Standard 3: EXTERNAL HEALTH FACTORS

Health and the Environment

3.3.4 Explain how people use natural resources (e.g., air, water, land)

4.3.1 Explain how health careers (e.g., dietician, doctor, nurse) benefit an individual's community

Standard 5: DECISION MAKING AND GOAL SETTING

3.5.1 Describe how to use goal setting to enhance personal health (e.g., increasing activity, making healthy food choices, improving endurance, flexibility, and strength)

4.5.1 Develop a long term plan to achieve a personal health goal (e.g., eating the proper servings from each food group)

Standard 6: CONSUMER HEALTH

4.6.1 Describe the characteristics of valid health information, products, and services (e.g.choosemyplate.gov, USDA, FDA, nutrition labels, CDC)

North Dakota Mathematics Content Standards:

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 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts.

4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.

4.NF.6 Use decimal notation for fractions with denominators 10 or 100.

Measurement and Data

3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve elapsed time word problems on the hour and the half hour, using a variety of strategies.

3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units.

4.MD.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 2: Students use the process of science inquiry.

3.2.2. Abilities Necessary to Do Scientific Inquiry: Ask questions directly related to a scientific investigation.

4.2.1. Abilities Necessary to Do Scientific Inquiry: Review and ask questions about the scientific investigations of others.

Standard 4: Students understand the basic concepts and principals of life science.

3.4.1. Structure and Function: Identify parts of an organism that have specific functions (e.g., roots absorb water, heart pumps blood).

3.4.2. Life Cycles: Describe the life cycles of plants and animals (e.g., birds, mammals, grasses, trees, insects, flowers).

3.4.3. Organisms and Their Environments: Identify the needs of living things (e.g., food, shelter, soil, space, water).

4.4.4. Organisms and Their Environments: Identify ways that an organism's pattern of behavior is related to the nature of the organism's environment (e.g., the availability of food, space, and resources).

Standard 6: Students understand 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 7: Students understand relations between science and personal, social, and environmental issues.

3.7.1. Science and Personal Health: Identify ways to prevent the spread of germs.

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)

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. People In Science: 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).

4.8.1.: People In Science: Identify a variety of careers in the field of science.

ND Social Studies Standards and Benchmarks

Standard 1: Skills and Resources:

RESOURCES:

Benchmark 3.1.3 Use a variety of resources (e.g., maps, charts, bar graphs, Internet, books) to gather information about people, places, and events

Benchmark 3.1.4 Describe current events using print and electronic media (e.g., newspaper, children's news magazines, television, Internet).

Benchmark 4.1.4 Interpret current events using print and electronic media (e.g., newspaper, children's news magazines, television, Internet).

Benchmark 5.1.3 Evaluate current events using print and electronic media (e.g., newspaper, children's news magazines, television, Internet.)

Standard 3: Economic Concepts:

Personal Finances

Benchmark 3.3.3 Explain the differences among natural and human resources, and how they are used locally.

State Economics

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.

4.3.4 Identify principal exports of North Dakota (e.g., crops, energy, livestock).

Standard 5: Students understand and apply concepts of geography.

Human Geography

4.5.6 Describe ways geography has affected the development (e.g., the development of transportation, communication, industry, and land use) of the state over time.