TEACHER RESOURCE GUIDE

HABITATS OF NORTH DAKOTA

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Table of Contents

Riparian Areas

Assessments

Activities

Resources

Web links and children's literature relating to the habitats of North Dakota are available at **www.NDStudies.org**.

Answers

Answers to the Comprehension and Critical Thinking questions from each of the student texts are included. Answers for the discussion, vocabulary, and magic square activities from this **Teacher Resource Guide** are also included.

Suggested Uses

Purpose

The purpose of these units is to gain an understanding of the North Dakota habitats by including a variety of instructional strategies and assessments that may be incorporated into other areas of study (i.e., language arts, reading, math, science, social studies, art, music, and physical education).

Activities

This **Teacher Resource Guide** is intended to be used in combination with the **Student Texts** for each of North Dakota's five habitats. Specific activities are listed for each of the habitats; however, the *General Activities* section includes activities that may be used when studying any of North Dakota's habitats.

To meet the diverse needs of all students, two types of questions are included in the **Student Text** (Comprehension and Critical Thinking) and one type in the **Teacher Resource Guide** (Discussion). These questions may be used for oral or written review after a section is read or for assessment purposes throughout the unit of study. The classroom teacher may decide not to use all the questions since a wide variety of additional activities and assessments is included in the **Teacher Resource Guide**.

The three-hole punched pages may be placed in a binder, and your own individualized activities for each unit may be added.

Assessments

A variety of assessments is included in this unit. A suggested assessment tool that may be used with a certain activity will be indicated in parentheses. Please refer to the Assessments section to learn more.

Answer Key

The answer key for each habitats unit is divided into two sections. The first section includes answers to the Comprehension/Critical Thinking activities from the **Student Text**.

The second section includes answers to the Discussion, Vocabulary, and Magic Square activities in this **Teacher Resource Guide**.

Resources

Specific resources are listed for each of the habitats; however, the *General Resources* section includes resources appropriate for any of North Dakota's habitats.

The resources accompanying these units are intended to provide the classroom teacher with numerous choices when teaching about the ***Habitats of North Dakota***. Additional resources, agency contact information, and available publications are just a few areas contained in this section.

> A DVD discussing the five habitats of North Dakota is included so that students can view the actual habitat being studied. The DVD has been produced by the Game and Fish Department and features North Dakota students interacting in the natural habitat settings.

The main objective for each classroom teacher is that you will enjoy teaching *Habitats of North Dakota* and make it an exciting and educational adventure for both you and your students! ENJOY!

About Habitats of North Dakota

Distribution of these **Habitats of North Dakota** units is made possible by the North Dakota Game and Fish Department in collaboration with the North Dakota Center for Distance Education.

The information presented in **Habitats of North Dakota** seeks to promote teaching and learning about the wildlife and conservation topics of North Dakota. Five separate units have been developed to discuss the habitats. They are ***Wetlands***, ***Prairie***, ***Badlands***, ***Woodlands***, and ***Riparian Areas***.

The **Habitats of North Dakota** units have been produced, published, and distributed by the North Dakota Center for Distance Education.

The **Habitats of North Dakota** units are made possible through the efforts of a dedicated team of individuals at the North Dakota Game and Fish Department and the North Dakota Center for Distance Education.

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About the Authors

Dr. Gwyn Herman and Ms. Laverne Johnson were born and raised in rural North Dakota, and both have a deep love for their home state. They are educators who have over 60 years of combined teaching experience at all grade levels, including the teaching of ***North Dakota Studies*** to both fourth and eighth grade students.

Dr. Herman earned her bachelor of science degree from Dickinson State University, her master of science degree from Minot State University, and her doctor of philosophy degree from the University of North Dakota. She taught for 10 years at the secondary level and 16 years at the fourth grade level. Since 2000, Dr. Herman has been teaching education courses and coordinating the Elementary Education program at the University of Mary in Bismarck.

Ms. Johnson received her bachelor of science and master of science degrees from Minot State University. Her experience includes 23 years as an elementary and middle school teacher in grades ranging from kindergarten through eighth grade, and 10 years as a speech/language pathologist in grades nine through twelve. She is currently an adjunct professor at the University of Mary where she supervises pre-service and student teachers.

Welcome to the study of *Habitats of North Dakota*! The purpose of this **Teacher Resource Guide** is to assist you in teaching about wetlands, prairie, Badlands, woodlands, and riparian areas of North Dakota. It is intended to be interdisciplinary and to act as a guide to supplement your own activities. Because of the vast number of instructional materials available, it is possible to include only a sampling of the activities that might take into consideration the diversity and learning styles of your students. We hope this **Teacher Resource Guide** supplements your own strategies and activities as you teach about the habitats of North Dakota.

Gwyn Herman (left) and Laverne Johnson (right).

Standards and Benchmarks

Standard 1: Students understand the unifying concepts and processes of science.

4.1.1: Explain changes in the real world using a model.

5.1.2: Explain how changes alter the balance within a system.

6.1.2: Identify systems that are composed of subsystems.

6.1.3: Explain the connection between cause and effect in a system.

Standard 2: Science Inquiry

3.2.3: Record observations based on simple investigations.

4.2.2: Conduct simple investigations to answer questions based on observations.

5.2.2: Formulate an explanation supported by data.

6.2.2: Select alternative methods of scientific investigations to address different kinds of questions.

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

3.4.3: Identify the needs of living things.

4.4.2: Identify adaptations that help plants and animals survive and grow in their environment.

4.4.4: Identify ways that an organism's pattern of behavior is related to the nature of the organism's environment.

5.4.3: Identify the producers, consumers, and decomposers in a food web.

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

4.7.1: Identify consequences of natural and human-induced environmental changes.

6.7.1: Explain how natural hazards affect populations, resources, and the environment.

Wetlands

Objectives

As a result of the experiences in this unit on the Wetlands of North Dakota, each student will be able to:

- Define the ecosystem of wetlands and demonstrate knowledge of its four major types;
- Identify, describe, and discuss the importance of wildlife and plants found in wetlands;
- Compare and contrast the three major natural regions of North Dakota in relation to the types of wetlands found in each;
- Understand the impact and importance of natural flood control and water quality in relation to wetlands;
- Demonstrate knowledge of the hydrologic cycle and how groundwater is recharged through wetlands;
- Validate the outdoor recreation and aesthetic value of wetlands;
- Scrutinize both the positive and negative impact of wetlands in North Dakota; and
- Understand the importance of wetlands to North Dakota and how each individual can play a part in the preservation of wetlands.

NAME _____

Wetlands

KWL—Use this activity prior to beginning your unit of study to determine the prior knowledge of your students.

K	W	L
What I *Know*	What I *Want* to Know	What I Have *Learned*

NAME _____

Wetlands
Discussion Questions

1. **Explain how the Wisconsinan glacier changed the landscape of North Dakota.**

2. **Describe the Prairie Pothole Region. What does it include?**

3. **Why is the southwestern part of North Dakota not part of the Prairie Pothole Region?**

4. **Explain the differences between the four major types of wetlands.**

5. **Explain why broods need wetlands.**

NAME _____

6. **Explain the difference between fens and bogs.**

7. **Explain how the Red River Valley was formed.**

8. **Explain what oxbow lakes are. In which region of the state are they commonly found?**

9. **Describe the Missouri Coteau.**

10. **Explain why the Badlands do not contain the types of wetlands found in other parts of the state.**

NAME _____

Wetlands Wildlife
Discussion Questions

1. **Why are wetlands sometimes called "nurseries of life"?**

2. **Explain what invertebrates are and why they are essential members of the food chain.**

3. **What are waterfowl?**

4. **Explain the difference between dabbling ducks and diving ducks.**

5. **Describe mergansers.**

NAME _____

6. **Describe differences between ducks and geese.**

7. **Describe swans.**

8. **Explain why pelicans are not classified as waterfowl.**

9. **How do cranes and herons fly differently?**

10. **What are shore birds?**

11. **Describe plovers.**

12. **What is the Endangered Species Act?**

13. **What are amphibians?**

NAME _____

14. Why are aquatic insects so important?

15. Explain why muskrats sometimes eat their homes.

16. Describe the northern pike.

17. Describe the walleye.

18. Describe the yellow perch.

19. What is a food chain?

NAME _____

The Importance of Wetlands
Discussion Questions

1. **Why have the wetlands of North Dakota been called a "national treasure"?**

2. **Explain how wetlands help control floods.**

3. **Explain how wetlands help improve water quality.**

4. **What is erosion? Sedimentation? Nutrification?**

5. **Explain the difference between surface water and groundwater.**

NAME _____

6. **Describe the water cycle.**

7. **Explain how wetlands can create more precipitation.**

8. **Describe some public uses for wetlands.**

9. **Explain what has happened to North Dakota wetlands over the past century.**

10. **Explain why protecting wetland ecosystems is necessary.**

11. **Explain the significance of wetlands.**

NAME _____

Wetlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ aquatic
- ☐ bog
- ☐ brood
- ☐ cattails
- ☐ fen
- ☐ glacier
- ☐ habitat
- ☐ marsh
- ☐ Missouri Coteau
- ☐ permanent wetlands
- ☐ potholes
- ☐ Prairie Pothole Region
- ☐ rushes
- ☐ saline
- ☐ seasonal wetlands
- ☐ sedges
- ☐ semi-permanent wetlands
- ☐ temporary wetlands
- ☐ wetland
- ☐ Wisconsinan glacier

WETLANDS

1. Basin, or low area of land, that holds water

_____

WETLANDS

2. Gigantic mass of ice thousands of feet thick

_____

WETLANDS

3. Last glacier that moved over North Dakota; covered all of North Dakota except for the southwest corner

_____

WETLANDS

4. Low spots in the ground where water collects

_____

NAME _____

Wetlands
Vocabulary and Definitions

WETLANDS

5. About 300,000-square-mile area carved by Wisconsinan glacier; known for its rolling hills and millions of potholes

_____

WETLANDS

6. Permanent wetland that contains a lot of peat, or dead plant material; receives its water from groundwater seepage

_____

WETLANDS

7. Environment that provides the food and shelter for an animal to make its home

_____

WETLANDS

8. Shallow depressions that hold water from melting snow or heavy rain; usually dry out in early June

_____

WETLANDS

9. Refers to water

_____

WETLANDS

10. Depressions that usually contain water from the time of snowmelt until the middle of July; consist of two vegetation zones

_____

WETLANDS

11. Look like grasses, except they have solid stems

_____

WETLANDS

12. Plants with hollow stems that may have a pithy (sponge-like) center

_____

NAME _____

Wetlands
Vocabulary and Definitions

WETLANDS

13. Area of low, soggy land containing grass-like vegetation

_____

WETLANDS

14. Baby birds hatched together

_____

WETLANDS

15. Basins that generally hold water all year, except during very dry years; consist of three vegetation zones

_____

WETLANDS

16. Tall marsh plants with seeds embedded in the thick, brown tops of the plant

_____

WETLANDS

17. Basins that hold water all year long; consist of four zones

_____

WETLANDS

18. Salty

_____

WETLANDS

19. Eastern part of Missouri Plateau; contains more semi-permanent wetlands than any other area of the state

_____

WETLANDS

20. Permanent wetland that receives its water from groundwater seepage; often high in alkaline (salt)

_____

NAME _____

Wetlands Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ amphibian
- ☐ anglers
- ☐ carnivore
- ☐ Central Flyway
- ☐ cob
- ☐ cygnet
- ☐ dabbling duck
- ☐ diving duck
- ☐ drake
- ☐ food chain
- ☐ gamefish
- ☐ gander
- ☐ hen
- ☐ invertebrates
- ☐ merganser
- ☐ Migratory Bird Treaty Act
- ☐ pen
- ☐ waterfowl

WETLANDS WILDLIFE

1. Animals without backbones

_____

WETLANDS WILDLIFE

2. Wetland birds that may be hunted

_____

WETLANDS WILDLIFE

3. Route of migrating birds that passes through North Dakota

_____

WETLANDS WILDLIFE

4. Feeds in shallow water or on land; tips forward in the water to get food; flies straight up out of the water; also called "puddle duck"

_____

NAME _____

Wetlands Wildlife
Vocabulary and Definitions

5. Male duck

_____

6. Female bird

_____

7. Gets food by diving to the bottom of a pond or lake; excellent underwater swimmer, but awkward walker on land

_____

8. Duck that catches fish

_____

9. Male goose

_____

10. Male swan

_____

11. Female swan

_____

12. Young swan

_____

NAME _____

Wetlands Wildlife
Vocabulary and Definitions

WETLANDS WILDLIFE

13. Law that makes it illegal to harm or possess most species under the protection of the law

_____

WETLANDS WILDLIFE

14. Cold-blooded animal that lays its eggs in water or on moist land; has a tadpole stage with gills and an adult stage with lungs

_____

WETLANDS WILDLIFE

15. Meat eater

_____

WETLANDS WILDLIFE

16. Fish caught by anglers

_____

WETLANDS WILDLIFE

17. People who fish

_____

WETLANDS WILDLIFE

18. Transfer of energy from one species to another; begins with plants that are formed by energy from the sun

_____

NAME _____

The Importance of Wetlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ algae
- ☐ aquifer
- ☐ conservation
- ☐ ecology
- ☐ ecosystem
- ☐ groundwater
- ☐ natural resource
- ☐ surface water
- ☐ water quality
- ☐ water table

IMPORTANCE OF WETLANDS

1. Tells how clean or polluted water is

_____

IMPORTANCE OF WETLANDS

2. Green plant-like organisms that grow in wet areas

_____

IMPORTANCE OF WETLANDS

3. A supply of something useful that comes from nature

_____

IMPORTANCE OF WETLANDS

4. Water located on the surface of the land in rivers, lakes, and wetlands

_____

IMPORTANCE OF WETLANDS

5. Water that is found under the surface of the ground

_____

IMPORTANCE OF WETLANDS

6. Natural storage area for groundwater

_____

NAME _____

The Importance of Wetlands
Vocabulary and Definitions

IMPORTANCE OF WETLANDS

7. Top of an aquifer; water is obtained by drilling wells into this

_____

IMPORTANCE OF WETLANDS

8. The study of the interactions that living things have with other living things and with their environment

_____

IMPORTANCE OF WETLANDS

9. An area that contains organisms (living things) interacting with one another and with their non-living environment

_____

IMPORTANCE OF WETLANDS

10. Preserving natural resources by careful use and management of the resources

_____

NAME _____

Wetlands
Magic Square Vocabulary

Select the best answer for each of the Wetlands terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers is the same across and down, you have found the magic number!

A. waterfowl
B. habitat
C. potholes
D. marsh
E. cattails
F. aquifer
G. temporary wetlands
H. water table
I. wetland
J. Central Flyway
K. semi-permanent wetlands
L. Missouri Coteau
M. seasonal wetlands
N. permanent wetlands
O. Prairie Pothole Region
P. conservation

C ____	**A** ____	**M** ____	**K** ____
E ____	**H** ____	**D** ____	**N** ____
F ____	**J** ____	**G** ____	**B** ____
L ____	**I** ____	**P** ____	**O** ____

Magic Number = _____

NAME _____

1. **An area of land about 300,000 square miles that was carved by the Wisconsinan glacier and which covers large parts of Alberta, Saskatchewan, Manitoba, North Dakota, South Dakota, Minnesota, and Iowa, and it is known for its rolling hills and millions of potholes.**
2. **Migratory birds that may be hunted.**
3. **Depressions that usually contain water from the time of snowmelt until the middle of July and consist of two vegetation zones.**
4. **An area of land located in the eastern part of the Missouri Plateau, was formed by the melting Wisconsinan glacier, and contains more semi-permanent wetlands than any other area of the state.**
5. **Tall marsh plants with seeds embedded in the thick, brown tops of the plant.**
6. **Shallow depressions that hold water from melting snow or heavy rain and usually dry out in early June.**
7. **Route of migrating birds that passes through North Dakota.**
8. **Basins that hold water all year long and consist of four zones.**
9. **Natural underground storage area for water.**
10. **Area of low, soggy land containing grass-like vegetation.**
11. **Top of an aquifer where water is obtained by drilling wells.**
12. **Environment that provides the food, water, shelter, and space for wildlife to make their homes.**
13. **Basins that generally hold water all year, except during very dry years.**
14. **Basin, or low area of land, that holds water.**
15. **Preserving natural resources by careful use and management of the resources.**
16. **Low spots in the ground where water collects.**

NAME _____

Wetlands Matching

Write the letter of the term from Column B that matches the definition in Column A. (Each letter will be used only once.)

	Column A	Column B
_____	1. Water that is found under the surface of the ground	A. algae
_____	2. These look like grasses, except they have solid stems.	B. aquatic
_____	3. A term that means "salty"	C. bog
_____	4. Water that is located on the surface of the land in the form of rivers, lakes, and wetlands	D. brood
_____	5. Fish caught by anglers	E. ecology
_____	6. Plants with hollow stems that may have a sponge-like center	F. ecosystem
_____	7. An area that contains organisms (living things) interacting with one another and with their non-living environment	G. fen
_____	8. Low spots in the ground where water collects	H. food chain
_____	9. A green, plant-like organism that grows in wet areas	I. gamefish
_____	10. A permanent wetland that receives its water from groundwater seepage and that is often high in alkaline	J. groundwater
_____	11. A permanent wetland that contains a lot of peat, or dead plant material, and receives its water from groundwater seepage	K. rushes
_____	12. The study of the interactions that living things have with other living things and their environment	L. saline
_____	13. A transfer of energy from one species to another	M. sedges
_____	14. Group of young birds from the same nest	N. potholes
_____	15. A term that refers to "water"	O. surface water

Prairie

Objectives

As a result of the experiences in this unit on the Prairie of North Dakota, each student will be able to:

- Define the ecosystem of prairies and demonstrate knowledge of the types of grasses found on them;
- Identify, describe, and discuss the importance of wildlife and forbs found on prairies;
- Compare and contrast the three major natural regions of North Dakota in relation to the types of grasses found in each;
- Understand the impact and importance of natural flood control and water quality in relation to prairies;
- Investigate and examine the threats to prairies; and
- Understand the importance of prairies and how to preserve them for present and future use.

NAME _____

Prairie

KWL—Use this activity prior to beginning your unit of study to determine the prior knowledge of your students.

K What I *Know*	W What I *Want* to Know	L What I Have *Learned*

NAME _____

Prairie
Discussion Questions

1. **How was the North Dakota prairie created?**

2. **Explain how the meaning of the word "prairie" changed from the original French meaning.**

3. **Why did grasslands rather than forests develop in North Dakota?**

4. **Explain why grazing animals were important for maintaining healthy grasslands.**

5. **Explain the difference between sod-forming grasses and bunch grasses.**

NAME _____

6. **Explain why the soil of the Red River Valley became more and more fertile.**

7. **Describe western wheatgrass.**

8. **Explain why mixed-grass prairies did not suffer the almost total destruction that tallgrass prairies suffered.**

9. **Describe the Little Missouri National Grassland.**

10. **Describe the metamorphosis of a butterfly.**

NAME _____

Prairie Wildlife
Discussion Questions

1. **Describe the bison.**

2. **Explain what happened to the bison.**

3. **Name and describe some mammal predators of the prairie.**

4. **Explain how pocket gophers got their name.**

NAME _____

5. **Name and describe the three types of ground squirrels found in North Dakota.**

6. **Explain how the pocket gopher keeps from getting dirt in its mouth while digging.**

7. **Describe a winter adaptation of both the jackrabbit and the weasel.**

8. **Explain the differences between rabbits and hares.**

NAME _____

9. **Explain how voles are different from mice.**

10. **Explain the differences between reptiles and amphibians.**

11. **Describe the metamorphosis of an amphibian.**

12. **Name and describe the lizard found on the North Dakota prairie.**

13. **Explain why the population of greater prairie chickens has dropped so drastically.**

14. **Describe the difference between the way native sharp-tailed grouse and non-native ring-necked pheasants respond to a snowstorm.**

NAME _____

15. Describe the mating dance of the greater prairie chicken.

16. Name and describe some prairie songbirds.

17. Explain how raptors help maintain the balance of nature.

18. Describe the American kestrel.

NAME _____

The Importance of Prairies
Discussion Questions

1. **How do prairies help prevent air pollution?**

2. **Explain how prairies help prevent soil erosion.**

3. **Explain how prairies help keep lakes and other wetlands clean.**

4. **Explain how bio-accumulation affects raptors and other wildlife high on the food chain.**

5. **Contrast the North Dakota prairie before the late 1800s with the North Dakota prairies of today.**

NAME _____

6. **Describe the drought period of the 1930s.**

7. **Explain why native prairie is still being converted to cropland today.**

8. **Describe the effects of overgrazing.**

9. **Explain how CRP helps wildlife.**

10. **Explain why prairies are such valuable resources.**

NAME _____

Prairie
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ bonanza farms
- ☐ bunch grasses
- ☐ chrysalis
- ☐ ecosystem
- ☐ elevation
- ☐ forage
- ☐ forbs
- ☐ habitat
- ☐ humus
- ☐ metamorphosis
- ☐ mixed-grass prairie
- ☐ native
- ☐ pollen
- ☐ pollination
- ☐ prairie
- ☐ sod
- ☐ sod-forming grasses
- ☐ tallgrass prairie
- ☐ western wheatgrass
- ☐ Wisconsinan glacier

PRAIRIE

1. Last glacier that moved over North Dakota; covered all of North Dakota except for the southwest corner

_____

PRAIRIE

2. Large, treeless region covered with grasses and forbs

_____

PRAIRIE

3. A powder produced by certain plants and must be carried from plant to plant in order for the plant to reproduce

_____

PRAIRIE

4. Process of pollen being carried from one flower to another; carried out when pollen sticks to the legs of bees and other insects

_____

NAME _____

Prairie
Vocabulary and Definitions

PRAIRIE

5. Naturally occurring

_____

PRAIRIE

6. An area that contains organisms (living things) interacting with one another and with their non-living environment

_____

PRAIRIE

7. Land height

_____

PRAIRIE

8. Native prairie grasses that reach 6 to 7 feet in height; made up of several species of both sod-forming grasses and bunch grasses

_____

PRAIRIE

9. Grass-covered soil which is held together by matted roots

_____

PRAIRIE

10. Grasses that spread by sending out horizontal stems both above and below the ground; hold soil tightly together

_____

PRAIRIE

11. Grass species that grow in bunches, or clumps, and are spread by seeds; have extremely long roots

_____

PRAIRIE

12. Organic (from living things) matter in the soil

_____

NAME _____

Prairie
Vocabulary and Definitions

PRAIRIE

13. Environment that provides the food, water, shelter, and space for wildlife to make their homes

_____

PRAIRIE

14. Gigantic wheat farms in eastern North Dakota begun in the 1870s; ranged in size from 3,000 acres to over 75,000 acres

_____

PRAIRIE

15. Combination of tallgrass and shortgrass species

_____

PRAIRIE

16. Tough, native grass that once covered almost all of North Dakota; official state grass of North Dakota

_____

PRAIRIE

17. Grass and other plants that grazing animals eat

_____

PRAIRIE

18. Native prairie wildflowers with deep roots

_____

PRAIRIE

19. Cocoon, or protective case, that holds an insect as it is transforming from the larva stage to the adult stage

_____

PRAIRIE

20. Process of changing from the larva stage to the adult stage; amphibians and some insects such as butterflies go through this process

_____

NAME _____

Prairie Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ carnivore
- ☐ carrion
- ☐ diurnal
- ☐ ectotherm
- ☐ furbearer
- ☐ game animals
- ☐ herbivore
- ☐ insectivore
- ☐ John James Audubon
- ☐ lek
- ☐ nocturnal
- ☐ omnivore
- ☐ raptor
- ☐ rodent

PRAIRIE WILDLIFE

1. Animals that may be hunted

_____

PRAIRIE WILDLIFE

2. Animal that eats both plants and animals

_____

PRAIRIE WILDLIFE

3. Active at night

_____

PRAIRIE WILDLIFE

4. Dead animals that have been killed by other animals, by vehicles, or from other accidents

_____

PRAIRIE WILDLIFE

5. Active during the daytime

_____

PRAIRIE WILDLIFE

6. Plant eater

_____

NAME _____

Prairie Wildlife
Vocabulary and Definitions

7. Animal harvested for its fur

_____

8. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

_____

9. Meat eater

_____

10. Carnivore that eats only insects and spiders

_____

11. Dancing area used by grouse year after year

_____

12. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

_____

13. Naturalist and artist who identified 11 new species of birds in North Dakota; became famous for his book *Birds of America*

_____

14. Bird of prey

_____

NAME _____

The Importance of Prairies
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ anglers
- ☐ bio-accumulation
- ☐ conservation
- ☐ Conservation Reserve Program (CRP)
- ☐ insecticide
- ☐ overgrazing

IMPORTANCE OF PRAIRIE

1. Chemical for killing insects

_____

IMPORTANCE OF PRAIRIE

2. People who fish

_____

IMPORTANCE OF PRAIRIE

3. Keeping livestock in an area to graze until all the grass is eaten

_____

IMPORTANCE OF PRAIRIE

4. Introduction of chemicals into the food chain

_____

IMPORTANCE OF PRAIRIE

5. Preserving natural resources by careful use and management of the resources

_____

IMPORTANCE OF PRAIRIE

6. Government program that pays farmers to plant grass on land that had been plowed for crop raising

_____

NAME _____

Prairie
Magic Square Vocabulary

Select the best answer for each of the Prairie terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers are the same across and down, you have found the magic number!

A. prairie
B. tallgrass prairie
C. bio-accumulation
D. herbivore
E. diurnal
F. overgrazing
G. metamorphosis
H. mixed-grass prairie
I. forbs
J. omnivore
K. sod-forming grasses
L. carnivore
M. bunch grasses
N. nocturnal
O. western wheatgrass
P. insectivore

P ____	**E** ____	**L** ____	**M** ____
A ____	**C** ____	**I** ____	**N** ____
G ____	**B** ____	**K** ____	**F** ____
H ____	**O** ____	**D** ____	**J** ____

Magic Number = _____

NAME _____

NOTE: TO MAKE THIS PUZZLE WORK, NUMBERS 1 AND 14 ARE NOT USED.

2. **Carnivore that eats only insects and spiders.**
3. **Keeping livestock in an area to graze until all the grass is eaten.**
4. **An animal that eats only plants.**
5. **Introduction of chemicals into the food chain.**
6. **Grasses that spread out horizontal stems both above and below the surface of the ground.**
7. **Animals that are active during the daytime.**
8. **A large, treeless region covered with grasses and forbs.**
9. **Animals that eat both plants and animals.**
10. **Tough, native grass that once covered almost all of North Dakota and is the official state grass of North Dakota.**
11. **Native prairie wildflowers with deep roots.**
12. **Grasses that grow in bunches, or clumps, and are spread by seeds plus have extremely long underground roots.**
13. **The process of changing from the larva stage to the adult stage.**
15. **Animals that are active at night.**
16. **A combination of tallgrass and shortgrass species.**
17. **Native prairie grasses that reach 6 to 7 feet in height.**
18. **Animals that are meat eaters.**

Badlands

Objectives

As a result of the experiences in this unit on the Badlands of North Dakota, each student will be able to:

- Recognize and differentiate among the various habitats located in the Badlands;
- Identify, describe, and discuss the variety of wildlife and each of their habitats found in the Badlands;
- Identify, describe, and discuss the variety of plants and shrubs of the Badlands;
- Demonstrate knowledge of the location of the South Unit, the Elkhorn Ranch, and the North Unit of Theodore Roosevelt National Park;
- Investigate and examine the threats to the Badlands; and
- Understand the importance of the Badlands and how to preserve the habitats found there for present and future use.

NAME _____

Badlands

KWL—Use this activity prior to beginning your unit of study to determine the prior knowledge of your students.

K What I *Know*	W What I *Want* to Know	L What I Have *Learned*

NAME _____

Badlands
Discussion Questions

1. **Describe the size and location of the Badlands.**

2. **Explain how the Badlands were formed.**

3. **Explain how clinker formed.**

4. **Explain why Theodore Roosevelt became interested in conservation.**

5. **Describe the size, location, and division of Theodore Roosevelt National Park.**

6. **Explain why the Badlands was not broken up for farming as the rest of the state was.**

7. **Explain why bunch grasses grow so well in shortgrass prairies.**

NAME _____

8. **Name and describe two shortgrass species found in the Badlands.**

9. **Name and describe some shrubs found in the Badlands.**

10. **Name and describe some Badlands forbs.**

NAME _____

Badlands Wildlife
Discussion Questions

1. **Explain what happened to bighorn sheep in the Badlands and what was done 50 years later.**

2. **Describe the pronghorn.**

3. **Explain why prairie dogs are so important.**

4. **Explain how a porcupine defends itself.**

5. **Describe the courtship display of the cottontail rabbit.**

6. **Name and describe the felines of the Badlands.**

NAME _____

7. **Name and describe Badlands rodents.**

8. **Explain how voles are different from mice.**

9. **Describe some basic differences between reptiles and amphibians.**

10. **Name and describe the reptiles found in the Badlands.**

NAME _____

11. Name and describe amphibians of the Badlands.

12. Describe sage grouse.

13. Describe the adaptations sharp-tailed grouse have for the North Dakota's climate.

14. Name and describe some Badlands songbirds.

NAME _____

15. How do western kingbird parents teach their young to hunt?

16. Explain how raptors help maintain the balance of nature.

17. Describe the nests of golden eagles.

18. Explain why the population of burrowing owls dropped significantly.

NAME _____

The Importance of the Badlands
Discussion Questions

1. **Describe the Maah Daah Hey Trail.**

2. **Explain how soil erosion can occur.**

3. **Explain why sagebrush ecosystems are in danger.**

4. **Describe what happens when new roads are built in the Badlands.**

5. **Explain what may happen if bighorn sheep are disturbed.**

NAME _____

Badlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ acre
- ☐ Badlands
- ☐ browsing
- ☐ bunchgrasses
- ☐ butte
- ☐ clinker
- ☐ coal
- ☐ coniferous trees
- ☐ conservation
- ☐ deciduous trees
- ☐ erosion
- ☐ forage
- ☐ forbs
- ☐ fossil
- ☐ fossil fuels
- ☐ habitat
- ☐ hoodoo
- ☐ lignite
- ☐ national park
- ☐ native
- ☐ natural resource
- ☐ petrified wood
- ☐ pollen
- ☐ pollination
- ☐ sedimentary rocks
- ☐ sediments
- ☐ shortgrasses
- ☐ succulent
- ☐ the public
- ☐ vegetation
- ☐ Wisconsinan glacier
- ☐ woody draws

BADLANDS

1. Area of southwestern North Dakota having colorful, rugged land features; carved by wind and water erosion thousands of years ago

_____

BADLANDS

2. Flat-topped, very steep hill with flat sides

_____

BADLANDS

3. Tall, thin pillar of rock with a capstone, or flat rock, on top

_____

BADLANDS

4. Last glacier that moved over North Dakota; covered all of North Dakota except for the southwest corner

_____

NAME _____

Badlands
Vocabulary and Definitions

BADLANDS

5. Wearing away soil by water or wind

_____

BADLANDS

6. Plant life

_____

BADLANDS

7. Small pieces of rock and dirt carried by water

_____

BADLANDS

8. Rocks formed by particles of sediment pressed together

_____

BADLANDS

9. Remains of a plant or animal that has been buried in the earth (in rock, soil, ice, etc.); skeleton, bone, shell, tree leaf, or an imprint such as a footprint

_____

BADLANDS

10. Formed from the decayed remains of prehistoric (very ancient) plants and animals; petroleum, natural gas, and coal

_____

BADLANDS

11. Solid fossil fuel created from land vegetation that had been squeezed by pressure for millions of years

_____

BADLANDS

12. A very soft coal found in western North Dakota

_____

NAME _____

Badlands
Vocabulary and Definitions

BADLANDS

13. Type of red rock formed from lignite coal burning underground; adds color and beauty to the Badlands; also called "scoria"

_____

BADLANDS

14. Stone formed from minerals filling in cells of wood as it decayed; looks exactly like the original plant, except it is stone

_____

BADLANDS

15. All of the people

_____

BADLANDS

16. Area of land approximately the size of a football field

_____

BADLANDS

17. Area of land set aside by the federal government for the purpose of preserving its natural environment for the public to enjoy

_____

BADLANDS

18. Preserving natural resources by careful use and management of the resources

_____

BADLANDS

19. A supply of something useful that comes from nature

_____

BADLANDS

20. Naturally occurring

_____

NAME _____

Badlands
Vocabulary and Definitions

BADLANDS

21. Environment that provides the food, water, shelter, and space for wildlife to make their homes

_____

BADLANDS

22. Bunchgrasses that may reach a height of only 3 to 7 inches

_____

BADLANDS

23. Grass species that grow in bunches, or clumps, and are spread by seeds; have extremely long roots

_____

BADLANDS

24. Grass and other plants that grazing animals eat

_____

BADLANDS

25. Small woodlands in the Badlands that contain trees and brush; located in low places that can hold enough moisture for large plants

_____

BADLANDS

26. Trees that lose their leaves each fall

_____

BADLANDS

27. Trees called "evergreens" because the needles stay green all year long

_____

BADLANDS

28. Animals eating leaves, stems, and buds from plants

_____

NAME _____

Badlands
Vocabulary and Definitions

BADLANDS

29. Native prairie wildflowers with deep roots

_____

BADLANDS

30. A powder produced by certain plants and must be carried from plant to plant in order for the plant to reproduce

_____

BADLANDS

31. Process of pollen being carried from one flower to another; carried out when pollen sticks to the legs of bees and other insects

_____

BADLANDS

32. A plant that stores water in its pads

_____

NAME _____

Badlands Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ amphibians
- ☐ antlers
- ☐ big game animals
- ☐ brood
- ☐ carnivore
- ☐ carrion
- ☐ decurved bill
- ☐ diurnal
- ☐ ectotherm
- ☐ ewe
- ☐ herbivore
- ☐ insectivore
- ☐ lek
- ☐ metamorphosis
- ☐ nocturnal
- ☐ ram
- ☐ raptor
- ☐ reptiles
- ☐ rodents
- ☐ songbirds
- ☐ stotting

BADLANDS WILDLIFE

1. Large animals that may be hunted

_____

BADLANDS WILDLIFE

2. Plant eater

_____

BADLANDS WILDLIFE

3. Male sheep

_____

BADLANDS WILDLIFE

4. Female sheep

_____

BADLANDS WILDLIFE

5. Bony and branched growths on the heads of members of the deer family; shed every year

_____

BADLANDS WILDLIFE

6. Running with bouncing leaps

_____

NAME _____

Badlands Wildlife
Vocabulary and Definitions

BADLANDS WILDLIFE

7. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

_____

BADLANDS WILDLIFE

8. Meat eater

_____

BADLANDS WILDLIFE

9. Active at night

_____

BADLANDS WILDLIFE

10. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

_____

BADLANDS WILDLIFE

11. Ectotherms with dry, scaly skin and claws on toes; live their entire lives on land

_____

BADLANDS WILDLIFE

12. Ectotherms with smooth, moist skin and no claws on toes; live part of their life in water and part on land

_____

BADLANDS WILDLIFE

13. Process of changing from the larva stage to the adult stage; amphibians go through this process, changing from tadpole to adult

_____

BADLANDS WILDLIFE

14. Active during the daytime

_____

NAME _____

Badlands Wildlife
Vocabulary and Definitions

BADLANDS WILDLIFE

15. Carnivore that eats only insects and spiders

_____

BADLANDS WILDLIFE

16. Dancing area used by grouse year after year

_____

BADLANDS WILDLIFE

17. Bird's bill that is bent slightly downward

_____

BADLANDS WILDLIFE

18. Group of young birds from the same nest

_____

BADLANDS WILDLIFE

19. Small, perching birds that sing a variety of different songs

_____

BADLANDS WILDLIFE

20. Bird of prey

_____

BADLANDS WILDLIFE

21. Dead animals that have been killed by other animals, by vehicles, or from other accidents

_____

NAME _____

The Importance of the Badlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ ecosystem
- ☐ herbicide
- ☐ insecticide
- ☐ weeds

IMPORTANCE OF BADLANDS

1. An area that contains organisms (living things) interacting with one another and with their non-living environment

_____

IMPORTANCE OF BADLANDS

2. Unwanted plant species

_____

IMPORTANCE OF BADLANDS

3. Chemical that kills plants

_____

IMPORTANCE OF BADLANDS

4. Chemical for killing insects

_____

NAME _____

Badlands
Magic Square Vocabulary

Select the best answer for each of the Badlands terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers is the same across and down, you have found the magic number!

A. butte
B. clinker
C. coal
D. coniferous trees
E. deciduous trees
F. fossil
G. fossil fuels
H. hoodoo
I. petrified wood

E ____	**I** ____	**D** ____
F ____	**B** ____	**A** ____
H ____	**C** ____	**G** ____

Magic Number = _____

NAME _____

NOTE: TO MAKE THIS PUZZLE WORK, NUMBERS 1, 2, 5, 6, AND 13 ARE NOT USED.

3. **A solid fuel created from land vegetation that had been squeezed by pressure for millions of years.**
4. **A flat-topped, very steep hill with flat sides.**
7. **Trees that lose their leaves each fall.**
8. **Trees that are called "evergreens."**
9. **A tall, thin pillar of rock with a capstone, or flat rock, on top.**
10. **The remains of a plant or animal that has been buried in the earth in rock, soil, ice, etc.**
11. **Stone formed from minerals filling in cells of wood as the wood decays.**
12. **A type of red rock formed from lignite coal burning underground.**
14. **Examples are petroleum, natural gas, and coal and are formed from the decayed remains of prehistoric plants and animals.**

Woodlands

Objectives

As a result of the experiences in this unit on the Woodlands of North Dakota, each student will be able to:

- Define a forest ecosystem;
- Identify, describe, and discuss the variety of plants and shrubs found in the woodlands of North Dakota;
- Distinguish between native forests, rural plantings, and community forests found in North Dakota;
- Identify, describe, and discuss the variety of wildlife and each of their habitats found in the woodlands of North Dakota;
- Demonstrate knowledge of the location of North Dakota woodlands, including state forests;
- Investigate and examine the threats of North Dakota woodlands; and
- Understand the importance of woodlands and how to preserve this habitat for present and future use.

NAME _____

Woodlands

KWL—Use this activity prior to beginning your unit of study to determine the prior knowledge of your students.

K What I *Know*	W What I *Want* to Know	L What I Have *Learned*

NAME _____

Woodlands
Discussion Questions

1. **Name and describe the three layers of a forest.**

2. **Explain how the woodland seems to come to life each spring.**

3. **Explain the difference between deciduous and coniferous trees.**

4. **Explain where North Dakota's lowland deciduous forests are located.**

5. **Explain why American elm trees did well in North Dakota for so many years and what is happening to them now.**

NAME _____

6. **Explain where North Dakota's upland deciduous forests are located.**

7. **Tell what aspen is sometimes called and explain why.**

8. **Explain why aspen trees replaced the original bur oak trees in the Turtle Mountains.**

9. **Explain how limber pines probably got started in North Dakota.**

10. **What is a windbreak?**

11. **What and where are community forests?**

12. **What do city foresters do, and why were forestry programs begun in many cities?**

NAME _____

13. Explain the difference between a tree and a shrub.

14. Name and describe some woodland shrubs.

15. Name and describe the three native vines that grow in North Dakota.

16. Explain the difference between flowering and non-flowering plants.

NAME _____

Woodlands Wildlife
Discussion Questions

1. **Describe the moose.**

2. **Explain why harvesting white-tailed deer is important.**

3. **Explain why black bears almost disappeared from North Dakota.**

4. **What happens to the coat of the snowshoe hare when winter arrives?**

5. **Explain what happens to the quills of porcupettes.**

6. **Name and describe three species of tree squirrels.**

7. **Explain what many North Dakota bats do during the winter.**

NAME _____

8. **Describe echolocation.**

9. **Explain how gray tree frogs can climb and cling to smooth branches.**

10. **How can an overpopulation of white-tailed deer threaten the ruffed grouse population?**

11. **Describe the wood duck.**

12. **Why is the downy woodpecker one of the most abundant woodpeckers in the state?**

13. **Name and give facts about some woodland songbirds.**

14. **What are raptors and how do they help maintain the balance of nature?**

NAME _____

The Importance of Woodlands
Discussion Questions

1. **Why have trees been called the "Lungs of the Earth"?**

2. **Explain how trees filter the air we breathe.**

3. **Explain how the cost of heating and cooling homes is lowered by trees.**

4. **Explain why woodlands are even more valuable in North Dakota than they are in many other states.**

5. **Explain why it is important to harvest over-mature trees.**

6. **Explain how some butterflies are affected by Dutch elm disease.**

NAME _____

7. **Explain how bio-accumulation affects raptors and other wildlife high on the food chain.**

8. **Name and give facts about North Dakota's state forests.**

NAME _____

Woodlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ acre
- ☐ browsing
- ☐ canopy
- ☐ community forests
- ☐ coniferous trees
- ☐ deciduous trees
- ☐ decomposers
- ☐ dominant trees
- ☐ ecosystem
- ☐ elevation
- ☐ erosion
- ☐ forbs
- ☐ forest
- ☐ forest ecosystem
- ☐ forest floor
- ☐ grasses
- ☐ herbaceous plants
- ☐ lowland deciduous forests
- ☐ native forests
- ☐ non-flowering plants
- ☐ nutrients
- ☐ photosynthesis
- ☐ prairie
- ☐ rural
- ☐ rural plantings
- ☐ saplings
- ☐ shelterbelt
- ☐ shrubs
- ☐ trees
- ☐ understory
- ☐ upland deciduous forests
- ☐ vines
- ☐ western coniferous forests
- ☐ woodland
- ☐ woody draws

WOODLANDS

1. Large, treeless region covered with grasses and forbs

_____

WOODLANDS

2. A piece of land approximately the size of a football field

_____

WOODLANDS

3. A land covered with woods, or trees

_____

WOODLANDS

4. Plants that do not have woody stems

_____

NAME _____

Woodlands
Vocabulary and Definitions

WOODLANDS

5. An area that contains organisms (living things) interacting with one another and with their non-living environment

_____

WOODLANDS

6. Trees and other vegetation, wildlife, and non-living things such as soil and water

_____

WOODLANDS

7. The process of a green plant using energy from the sun, along with materials from soil, water, and air, to make its own food

_____

WOODLANDS

8. The tallest and largest trees in a forest

_____

WOODLANDS

9. Roof of the forest; formed by crowns of dominant and medium-sized trees

_____

WOODLANDS

10. Layer of vegetation below the canopy

_____

WOODLANDS

11. Thin, young trees

_____

WOODLANDS

12. Ground-level of a forest; made up of fallen leaves, branches, dead trees, and other plant litter

_____

NAME _____

Woodlands
Vocabulary and Definitions

WOODLANDS

13. Tiny life forms that feed on dead plants, dead animals, and animal droppings

_____

WOODLANDS

14. Substances that are necessary for living things to grow and maintain life

_____

WOODLANDS

15. Trees that lose their leaves each fall; hardwood trees

_____

WOODLANDS

16. Trees with cones and needles; softwood trees; evergreens

_____

WOODLANDS

17. Naturally occurring forests

_____

WOODLANDS

18. Height of the land

_____

WOODLANDS

19. Hardwood forests found on low-lying land; bottomland forests

_____

WOODLANDS

20. Hardwood forests found in higher elevations

_____

NAME _____

Woodlands
Vocabulary and Definitions

WOODLANDS

21. Softwood forests located in the Badlands

_____

WOODLANDS

22. In the country, rather than in towns or cities; opposite of urban

_____

WOODLANDS

23. Trees planted in farmyards, windbreaks, shelterbelts, and living snow fences

_____

WOODLANDS

24. Long rows of trees that provide shelter from the wind

_____

WOODLANDS

25. Wearing away of soil by wind or water

_____

WOODLANDS

26. Made up of trees that have been planted in towns and cities

_____

WOODLANDS

27. The tallest plants; have one large, woody stem called a "trunk"

_____

WOODLANDS

28. Shorter and smaller plants than trees; have several small, woody stems

_____

NAME _____

Woodlands
Vocabulary and Definitions

WOODLANDS

29. Small woodlands in the Badlands that contain trees and brush

_____

WOODLANDS

30. Animals eating leaves, stems, and buds from plants

_____

WOODLANDS

31. Plants that twist along the ground or climb up shrubs and trees in order to reach sunlight

_____

WOODLANDS

32. Plants with hollow, non-woody stems and narrow leaves

_____

WOODLANDS

33. Native wildflowers with deep roots

_____

WOODLANDS

34. Mosses, lichens, and mushrooms that do not have stems, roots, or leaves

_____

WOODLANDS

35. A plant community of trees, shrubs, and herbaceous plants that covers an area

_____

NAME _____

Woodlands Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ amphibian
- ☐ antlers
- ☐ big game
- ☐ camouflage
- ☐ cavity
- ☐ diurnal
- ☐ ectotherm
- ☐ habitat
- ☐ herbivore
- ☐ insectivore
- ☐ metamorphosis
- ☐ nocturnal
- ☐ raptor
- ☐ reptile
- ☐ rodents
- ☐ songbirds
- ☐ urban

WOODLANDS WILDLIFE

1. Environment that provides the food, water, shelter, and space for wildlife to make their homes

_____

WOODLANDS WILDLIFE

2. Large animals that are hunted

_____

WOODLANDS WILDLIFE

3. Horn-like projections that are shed every year; found on members of the deer family

_____

WOODLANDS WILDLIFE

4. Plant eater

_____

WOODLANDS WILDLIFE

5. Protective coloring

_____

WOODLANDS WILDLIFE

6. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

_____

NAME _____

Woodlands Wildlife
Vocabulary and Definitions

WOODLANDS WILDLIFE

7. Active during the daytime

_____

WOODLANDS WILDLIFE

8. City; opposite of rural

_____

WOODLANDS WILDLIFE

9. Active at night

_____

WOODLANDS WILDLIFE

10. Carnivore that eats only insects and spiders

_____

WOODLANDS WILDLIFE

11. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

_____

WOODLANDS WILDLIFE

12. Cold-blooded animal with dry, scaly skin; lives its entire life on land

_____

WOODLANDS WILDLIFE

13. Cold-blooded animal that lays its eggs in water or on moist land; has a tadpole stage with gills and an adult stage with lungs

_____

WOODLANDS WILDLIFE

14. Process of changing from the larva stage to the adult stage; amphibians and some insects such as butterflies go through this process

_____

NAME _____

Woodlands Wildlife
Vocabulary and Definitions

WOODLANDS WILDLIFE

15. Open space in a dead or dying tree where wildlife raise their young

_____

WOODLANDS WILDLIFE

16. Small, perching birds that sing a variety of different songs

_____

WOODLANDS WILDLIFE

17. Bird of prey; predator bird

_____

NAME _____

The Importance of Woodlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ bio-accumulation
- ☐ defoliation
- ☐ herbicide
- ☐ insecticide
- ☐ nursery
- ☐ seedling

IMPORTANCE OF WOODLANDS

1. Complete loss of leaves

_____

IMPORTANCE OF WOODLANDS

2. Introduction of chemicals into the food chain

_____

IMPORTANCE OF WOODLANDS

3. Chemical for killing insects

_____

IMPORTANCE OF WOODLANDS

4. Chemical for killing plants

_____

IMPORTANCE OF WOODLANDS

5. A place where plants are grown for sale or for experiments

_____

IMPORTANCE OF WOODLANDS

6. A young plant that has grown from a seed

_____

NAME _____

Woodlands
Magic Square Vocabulary

Select the best answer for each of the Woodlands terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers is the same across and down, you have found the magic number!

A. dominant trees
B. canopy
C. understory
D. coniferous trees
E. deciduous trees
F. shelterbelts
G. browsing
H. defoliation
I. bio-accumulation

E ____	**I** ____	**D** ____
F ____	**B** ____	**A** ____
H ____	**C** ____	**G** ____

Magic Number = _____

NAME _____

NOTE: TO MAKE THIS PUZZLE WORK, NUMBERS 1, 3, 4, AND 11 ARE NOT USED.

2. **Long rows of trees that provide shelter from the wind.**
5. **Animals eating leaves, stems, and buds from plants.**
6. **Trees that have needles.**
7. **The layer of vegetation below the canopy.**
8. **When chemicals are entered into the food chain.**
9. **Often referred to as the roof of the forest.**
10. **Trees that lose their leaves each fall.**
12. **Complete loss of leaves.**
13. **The largest and tallest trees in the forest.**

Riparian Areas

Objectives

As a result of the experiences in this unit on the Riparian Areas of North Dakota, each student will be able to:

- Define riparian areas and their importance;
- Understand the importance of watersheds and their impacts on the renewable resource of water;
- Identify, describe, and discuss the importance of wildlife and plants found in and around riparian areas;
- Identify and locate the river systems of North Dakota;
- Identify, describe, and understand the importance of the various fish found in North Dakota;
- Understand the impact and importance of riparian areas in reducing flooding;
- Validate the outdoor recreation and aesthetic value of riparian areas;
- Scrutinize positive and negative impacts of development in riparian areas in North Dakota; and
- Understand the importance of riparian areas to North Dakota and how each individual can play a part in the preservation of them.

NAME _____

Riparian Areas

KWL—Use this activity prior to beginning your unit of study to determine the prior knowledge of your students.

K What I *Know*	W What I *Want* to Know	L What I Have *Learned*

NAME _____

Riparian Areas
Discussion Questions

1. **Explain the water cycle.**

2. **Explain how watersheds work.**

3. **Explain differences between the Great Divide and the Northern Divide.**

4. **Explain why the final destination of all river systems is an ocean.**

5. **Describe Lake Sakakawea.**

6. **Describe the path taken by the Missouri River from its source to its final destination.**

NAME _____

7. **Describe the path taken by the James River from its source to its confluence with the Missouri River.**

8. **Describe the path taken by the Red River from its source to its final destination.**

9. **Explain differences in riparian zone widths.**

10. **Explain the difference between deciduous and coniferous trees.**

11. **Describe the layers of a forest.**

NAME _____

Riparian Areas Wildlife
Discussion Questions

1. **Explain how to tell the difference between the pike family and the perch family of fish.**

2. **Explain why Lake Sakakawea is good habitat for walleye.**

3. **Describe the dorsal fins of sunfish.**

4. **Describe channel catfish.**

5. **Describe the paddlefish.**

6. **Explain a fish hatchery and its purpose.**

NAME _____

7. **Describe minnows.**

8. **Explain why carp is a nuisance fish.**

9. **Describe mussels.**

10. **Describe how aquatic insects are helpful.**

11. **Name and describe some amphibians of North Dakota.**

12. **Name and describe riparian turtles of North Dakota.**

NAME _____

13. Describe the beaver.

14. Explain how river otters play.

15. Describe the masked shrew.

16. Describe the drumming of ruffed grouse.

17. What are raptors and how do they help maintain the balance of nature?

18. Describe the nest of the bald eagle.

19. Explain how turkey vultures feed their young.

NAME _____

The Importance of Riparian Areas
Discussion Questions

1. **Explain how riparian forests are important in the oxygen cycle.**

2. **Explain why trees are important on riverbanks.**

3. **Explain how Dutch elm disease is spread and what it has done in North Dakota.**

4. **Explain what happens when eggs of pallid sturgeon and paddlefish are overharvested for caviar.**

5. **Explain how personal watercraft and motorboats may be harmful to wildlife.**

6. **Describe the North Dakota Wildlife Action Plan.**

NAME _____

Riparian Areas
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ browsing
- ☐ canopy
- ☐ coniferous trees
- ☐ continental divide
- ☐ creek
- ☐ dam
- ☐ deciduous trees
- ☐ decomposers
- ☐ ecosystem
- ☐ forbs
- ☐ forest ecosystem
- ☐ grasses
- ☐ non-flowering plants
- ☐ Northern Divide
- ☐ nutrients
- ☐ renewable resource
- ☐ reservoir
- ☐ riparian area
- ☐ river
- ☐ river basins
- ☐ river system
- ☐ sandbar
- ☐ saplings
- ☐ stream
- ☐ tributary
- ☐ understory
- ☐ vines
- ☐ watershed

RIPARIAN

1. A body of running water within a channel

_____

RIPARIAN

2. The area of vegetation that borders and is influenced by a stream; also called "riparian zone"

_____

RIPARIAN

3. A natural stream of water that empties into an ocean, a lake, or another stream

_____

RIPARIAN

4. A small, shallow stream

_____

NAME _____

Riparian Areas
Vocabulary and Definitions

RIPARIAN

5. A resource that can be used but does not get used up

_____

RIPARIAN

6. An area of land that drains downward to the lowest point

_____

RIPARIAN

7. A ridge that separates river systems so that they flow to different oceans

_____

RIPARIAN

8. A north-south continental divide that runs through North Dakota

_____

RIPARIAN

9. The largest watersheds on the continent

_____

RIPARIAN

10. All of the streams and rivers that drain a river basin

_____

RIPARIAN

11. A river that flows into another river

_____

RIPARIAN

12. A wall built across a river in order to hold back the water

_____

NAME _____

Riparian Areas
Vocabulary and Definitions

RIPARIAN

13. A lake that is formed by the water held back by a dam

_____

RIPARIAN

14. An area that contains organisms (living things) interacting with one another and with their non-living environment

_____

RIPARIAN

15. Trees and other vegetation, wildlife, and non-living things such as soil and water

_____

RIPARIAN

16. Trees that lose their leaves each fall

_____

RIPARIAN

17. Trees with needles; evergreens

_____

RIPARIAN

18. Roof of the forest; formed by crowns of dominant and medium-sized trees

_____

RIPARIAN

19. Layer of vegetation below the canopy

_____

RIPARIAN

20. Thin, young trees

_____

NAME _____

Riparian Areas
Vocabulary and Definitions

RIPARIAN

21. Animals eating leaves, stems, and buds from plants

_____

RIPARIAN

22. Plants that twist along the ground or climb up shrubs and trees in order to reach sunlight

_____

RIPARIAN

23. Plants with hollow, non-woody stems and narrow leaves

_____

RIPARIAN

24. Native wildflowers with deep roots

_____

RIPARIAN

25. Mosses and other plants that do not have stems, roots, or leaves

_____

RIPARIAN

26. Tiny life forms that feed on dead plants, dead animals, and animal droppings

_____

RIPARIAN

27. Substances that are necessary for living things to grow and maintain life

_____

RIPARIAN

28. A ridge of sand formed by the current of the water in a river

_____

NAME _____

Riparian Areas Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ anglers
- ☐ aquatic insects
- ☐ aquatic nuisance species
- ☐ barbels
- ☐ camouflage
- ☐ carnivores
- ☐ carrion
- ☐ cavity
- ☐ crustaceans
- ☐ dorsal fin
- ☐ ectotherm
- ☐ Endangered Species Act
- ☐ exoskeleton
- ☐ fish hatchery
- ☐ freshwater
- ☐ furbearer
- ☐ gamefish
- ☐ habitat
- ☐ herbivore
- ☐ insectivore
- ☐ mussels
- ☐ omnivore
- ☐ plankton
- ☐ raptor
- ☐ rodents
- ☐ swim bladder
- ☐ upland game birds
- ☐ waterfowl

RIPARIAN WILDLIFE

1. Environment that provides the food, water, shelter, and space for wildlife to make their homes

_____

RIPARIAN WILDLIFE

2. Fish that are caught by anglers

_____

RIPARIAN WILDLIFE

3. People who fish

_____

RIPARIAN WILDLIFE

4. Fin on the back of a fish

_____

NAME _____

Riparian Areas Wildlife
Vocabulary and Definitions

RIPARIAN WILDLIFE

5. An air-filled sac that helps fish float

_____

RIPARIAN WILDLIFE

6. The very tiny organisms that float in the water

_____

RIPARIAN WILDLIFE

7. Open space in a dead or dying tree where wildlife raise their young

_____

RIPARIAN WILDLIFE

8. A place where fish eggs are fertilized and hatched

_____

RIPARIAN WILDLIFE

9. Non-native plants or animals that have come into an aquatic environment and have a harmful effect on that environment

_____

RIPARIAN WILDLIFE

10. Aquatic animals that have an exoskeleton and a body segmented into three parts

_____

RIPARIAN WILDLIFE

11. A skeleton on the outside of the body

_____

RIPARIAN WILDLIFE

12. An animal that eats both plants and animals

_____

NAME _____

Riparian Areas Wildlife
Vocabulary and Definitions

RIPARIAN WILDLIFE

13. Shellfish with two hard, outer shells; also called "clams"

_____

RIPARIAN WILDLIFE

14. Water that is not salty

_____

RIPARIAN WILDLIFE

15. Insects that hatch or live in the water

_____

RIPARIAN WILDLIFE

16. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

_____

RIPARIAN WILDLIFE

17. An animal that is harvested for its fur

_____

RIPARIAN WILDLIFE

18. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

_____

RIPARIAN WILDLIFE

19. Meat eaters

_____

RIPARIAN WILDLIFE

20. Protective coloring

_____

NAME _____

Riparian Areas Wildlife
Vocabulary and Definitions

RIPARIAN WILDLIFE

21. Carnivore that eats only insects and spiders

_____

RIPARIAN WILDLIFE

22. Plant eater

_____

RIPARIAN WILDLIFE

23. Migratory wetland birds that may be hunted

_____

RIPARIAN WILDLIFE

24. A law that gives special protection to animals that are in danger of becoming extinct

_____

RIPARIAN WILDLIFE

25. Non-waterfowl birds that may be hunted

_____

RIPARIAN WILDLIFE

26. Bird of prey; predator bird

_____

RIPARIAN WILDLIFE

27. Dead animals that have been killed by other animals, by vehicles, or from other accidents

_____

RIPARIAN WILDLIFE

28. Sharp, whisker-like organs found on catfish and a few other fish species; used to sense and taste food

_____

NAME _____

The Importance of Riparian Areas
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ caviar
- ☐ conservation
- ☐ poacher
- ☐ spawning grounds

IMPORTANCE OF RIPARIAN

1. Places where fish deposit their eggs

_____

IMPORTANCE OF RIPARIAN

2. A person who hunts or fishes illegally

_____

IMPORTANCE OF RIPARIAN

3. Preserving natural resources by careful use and management of the resources

_____

RIPARIAN WILDLIFE

4. Eggs of paddlefish or sturgeon sold as a food product at high prices

_____

NAME _____

Riparian Areas
Magic Square Vocabulary

Select the best answer for each of the Riparian Area terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers are the same across and down, you have found the magic number!

A. aquatic nuisance species
B. cavity
C. continental divide
D. ectotherm
E. poacher
F. riparian area
G. river system
H. swim bladder
I. watershed

E ____	**I** ____	**D** ____
F ____	**B** ____	**A** ____
H ____	**C** ____	**G** ____

Magic Number = _____

NAME _____

NOTE: TO MAKE THIS PUZZLE WORK, NUMBERS 2, 3, AND 10 ARE NOT USED.

1. **The area of vegetation that borders and is influenced by a stream.**
4. **Streams and rivers that drain a river basin.**
5. **An animal whose body temperature changes with the temperature and is sometimes referred to as "cold-blooded."**
6. **A ridge that separates river systems so that they flow to different oceans.**
7. **An area of land that drains downward to the lowest point.**
8. **An open space in a dead or dying tree where wildlife raise their young.**
9. **A person who hunts or fishes illegally.**
11. **An air-filled sac that helps fish float.**
12. **Non-native plants or animals that have come into an aquatic environment and have a harmful effect on that environment.**

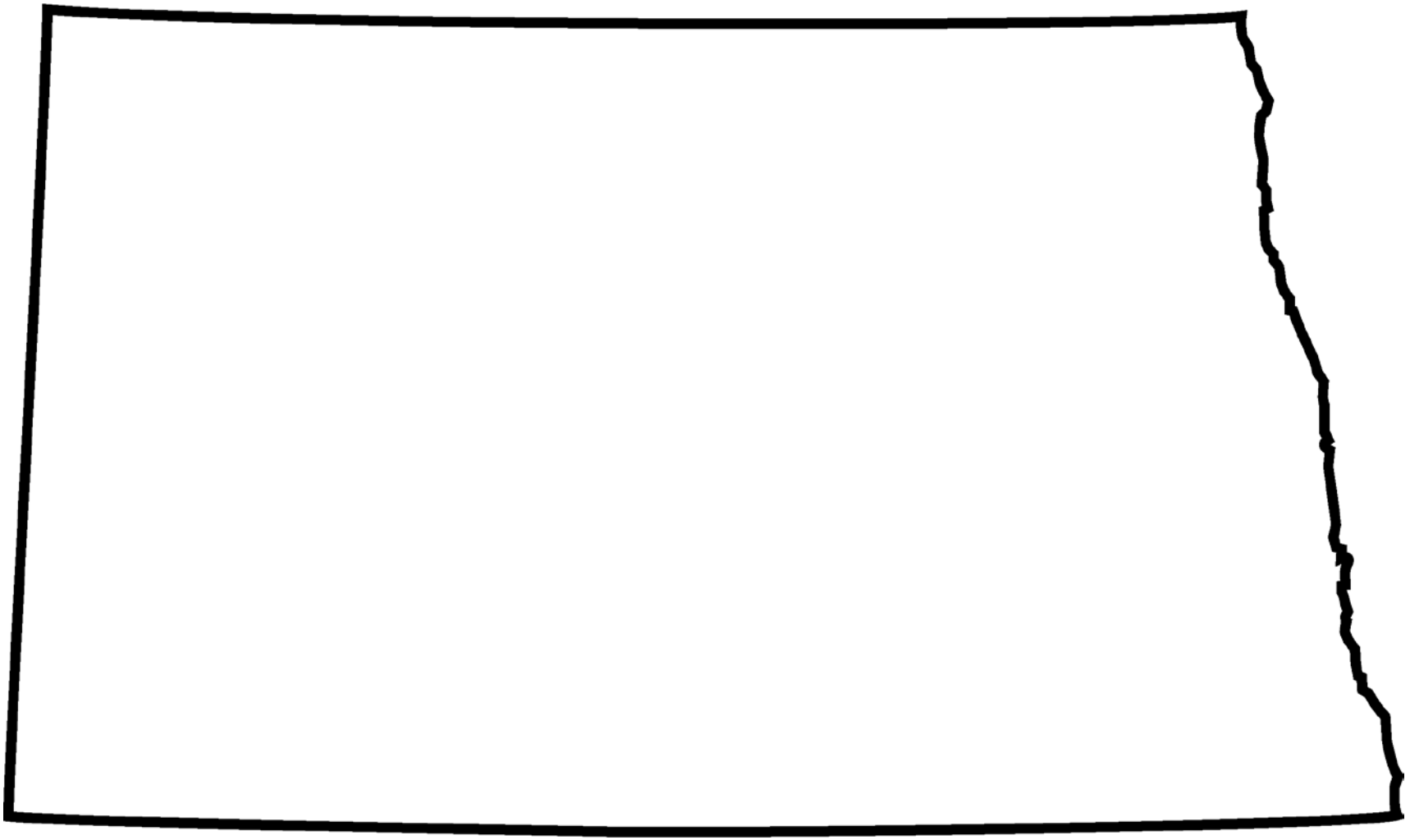
Assessments

A variety of assessments is included in this unit.

- A pre-assessment **KWL** Chart precedes each unit. This will assist you in finding out what the students **K**now about the subject, what they **W**ant to learn, and what they ultimately **L**earned after the unit was completed. The **L** would also be considered a post-assessment tool (i.e., Did the students learn what you wanted them to learn?).
- Several forms of assessments are included (i.e., T-charts, compare and contrast charts, Venn diagrams, magic square vocabulary, checklists, rubrics, etc.) to assist you in assessing your students before, during, and after a unit of study. Several rubrics are included and will assist you in evaluating the progress of students' work based on certain criteria. In order for you to know if student learning has occurred, the degrees of understanding, frequency, or effectiveness need to be assessed. Additional rubrics can be created by you for any project you wish to include by logging on to **www.teach-nology.com**, then clicking on Rubrics, and then scrolling down to General Rubric Generator. Several pre-generated rubrics are available for classroom use (i.e., Map Rubric Maker, Project Rubric Generator).
- A magic square vocabulary activity is prepared for each habitat. This activity can be used as a worksheet or as a summative assessment to see if the students have learned the vocabulary for a particular habitat.
- Several activities suggest students create a mind map, or graphic organizer, to complete an assignment.

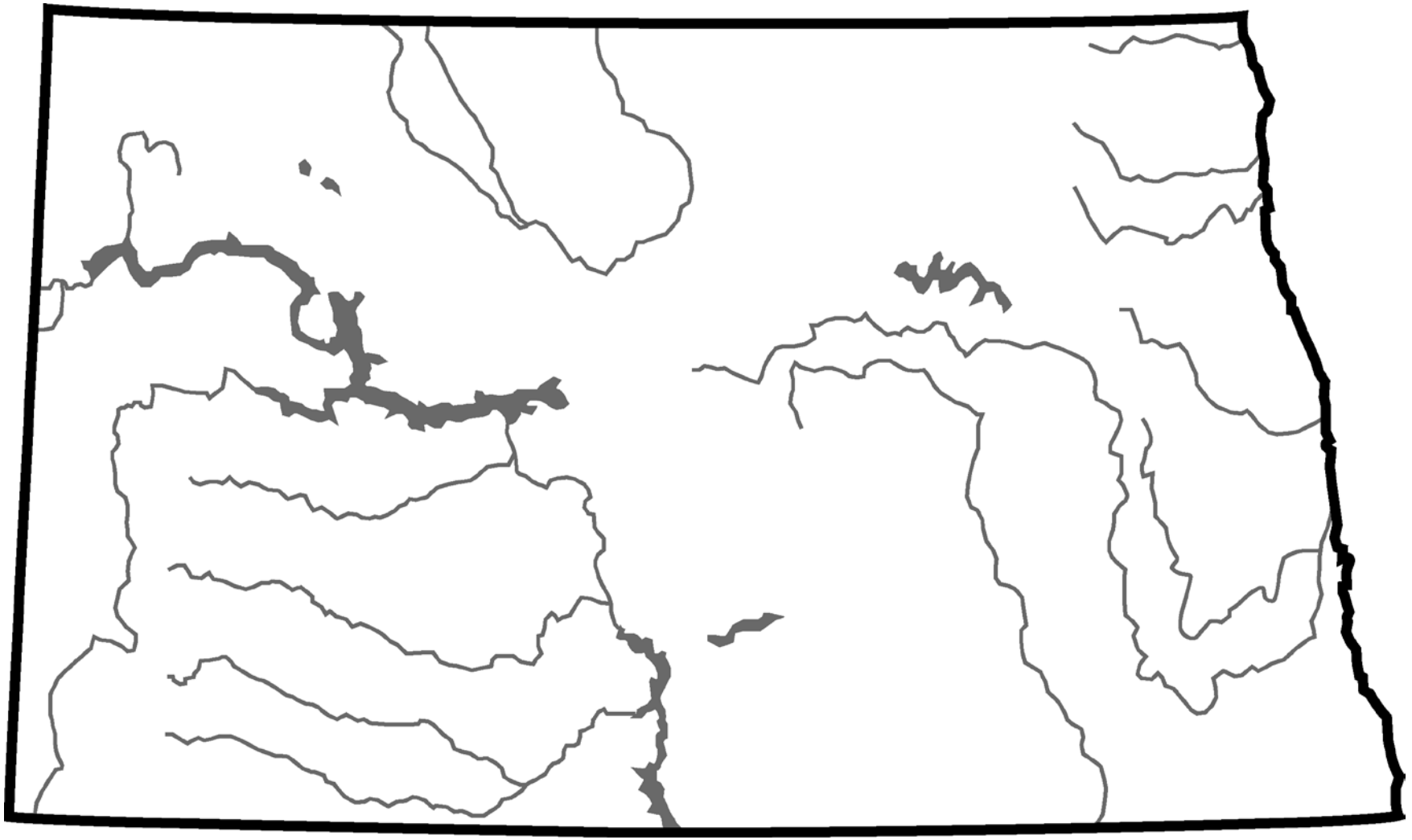
NAME _____

North Dakota



NAME _____

Major Rivers of North Dakota



NAME _____

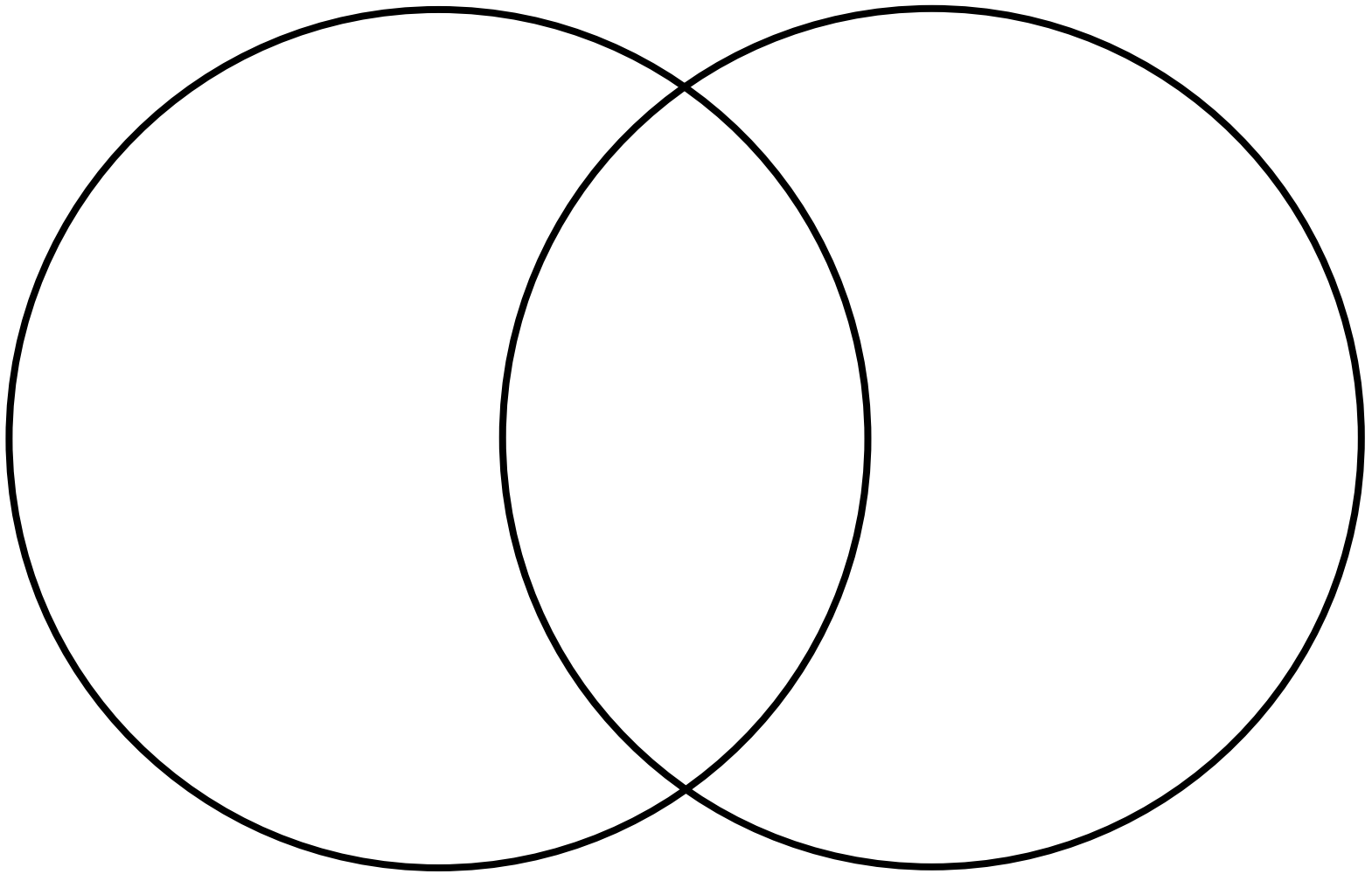
United States

NAME _____

United States and Canada

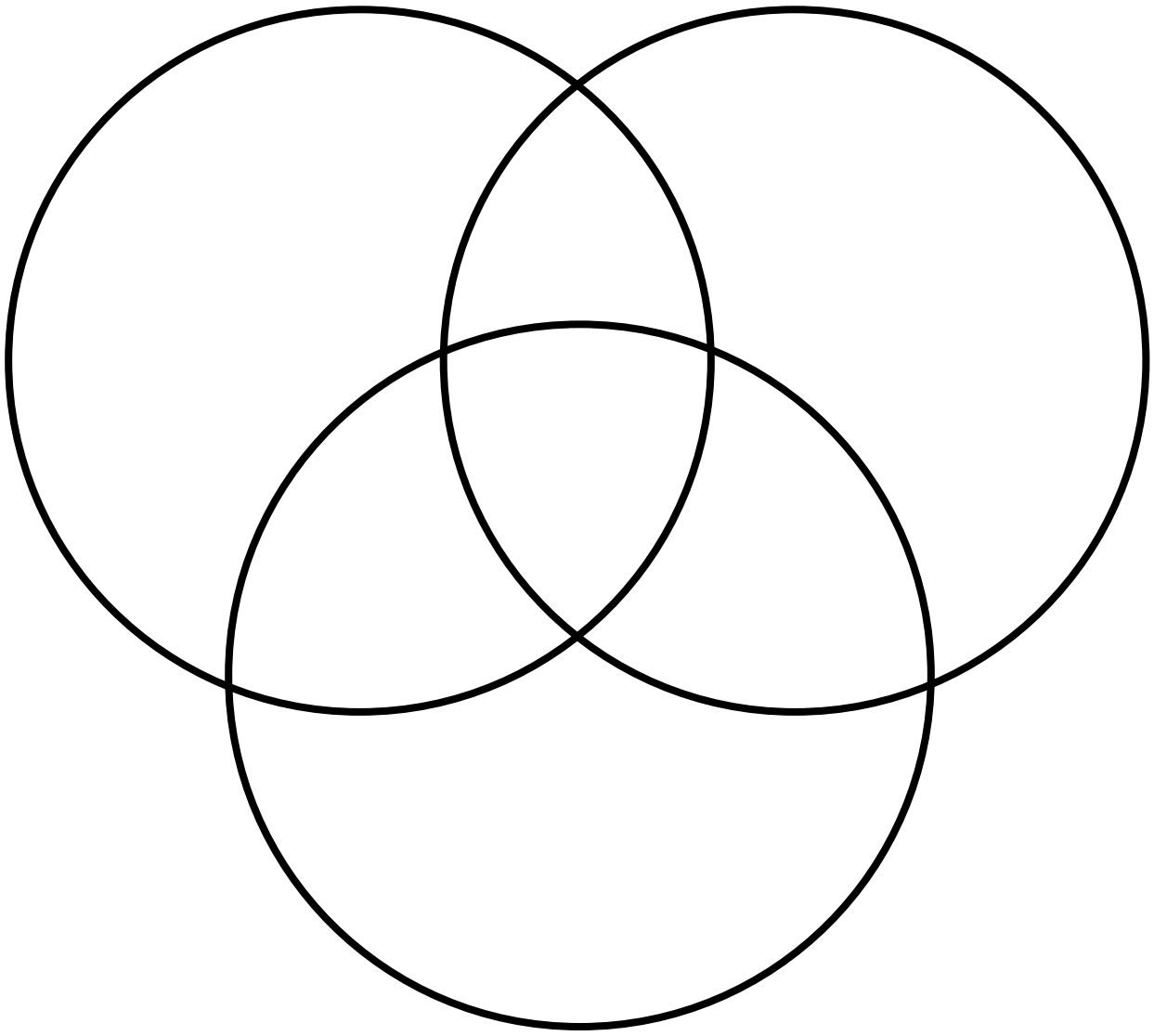
NAME _____

Venn Diagram



NAME _____

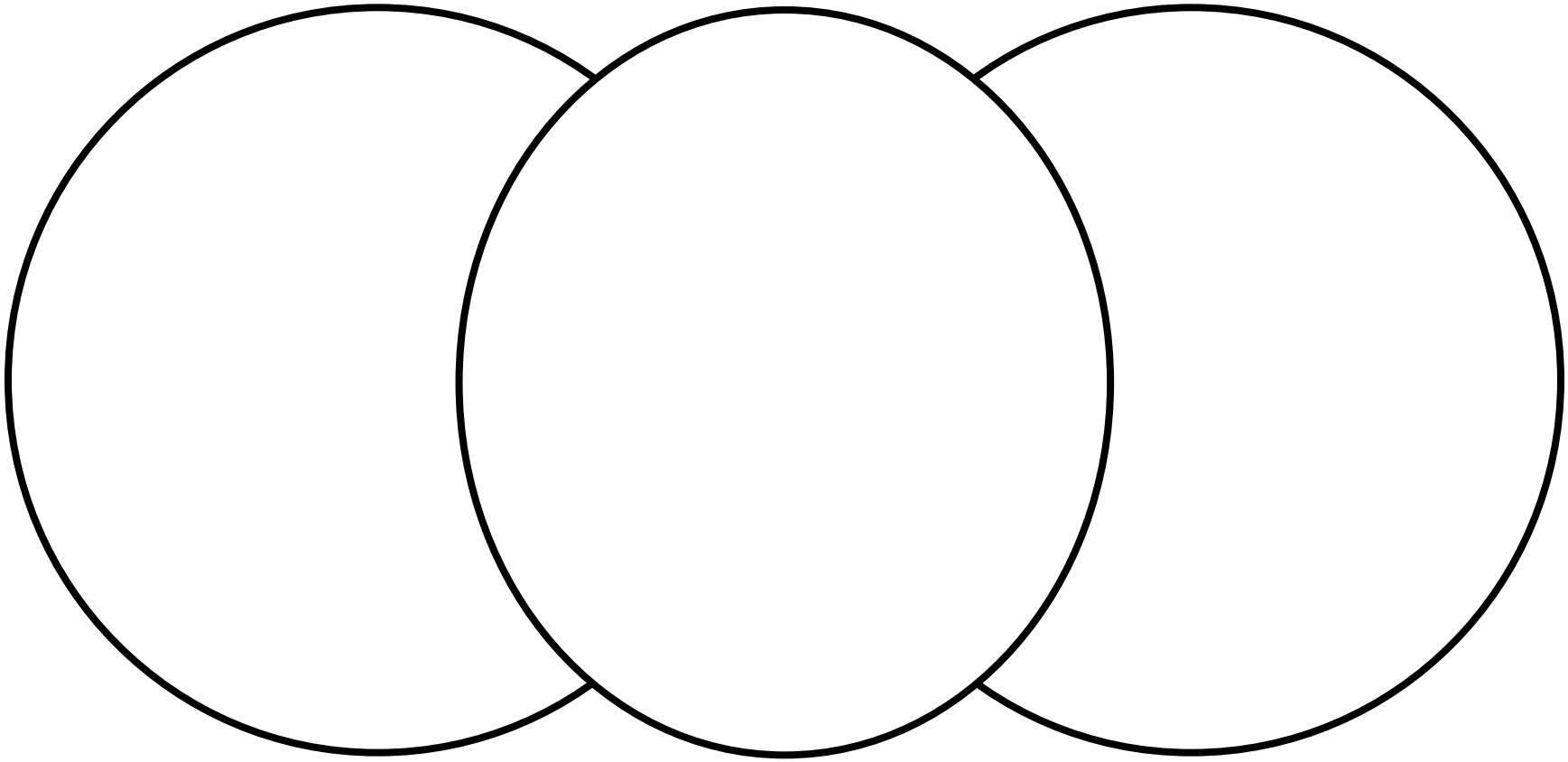
Venn Diagram



NAME _____

Venn Diagram Modified

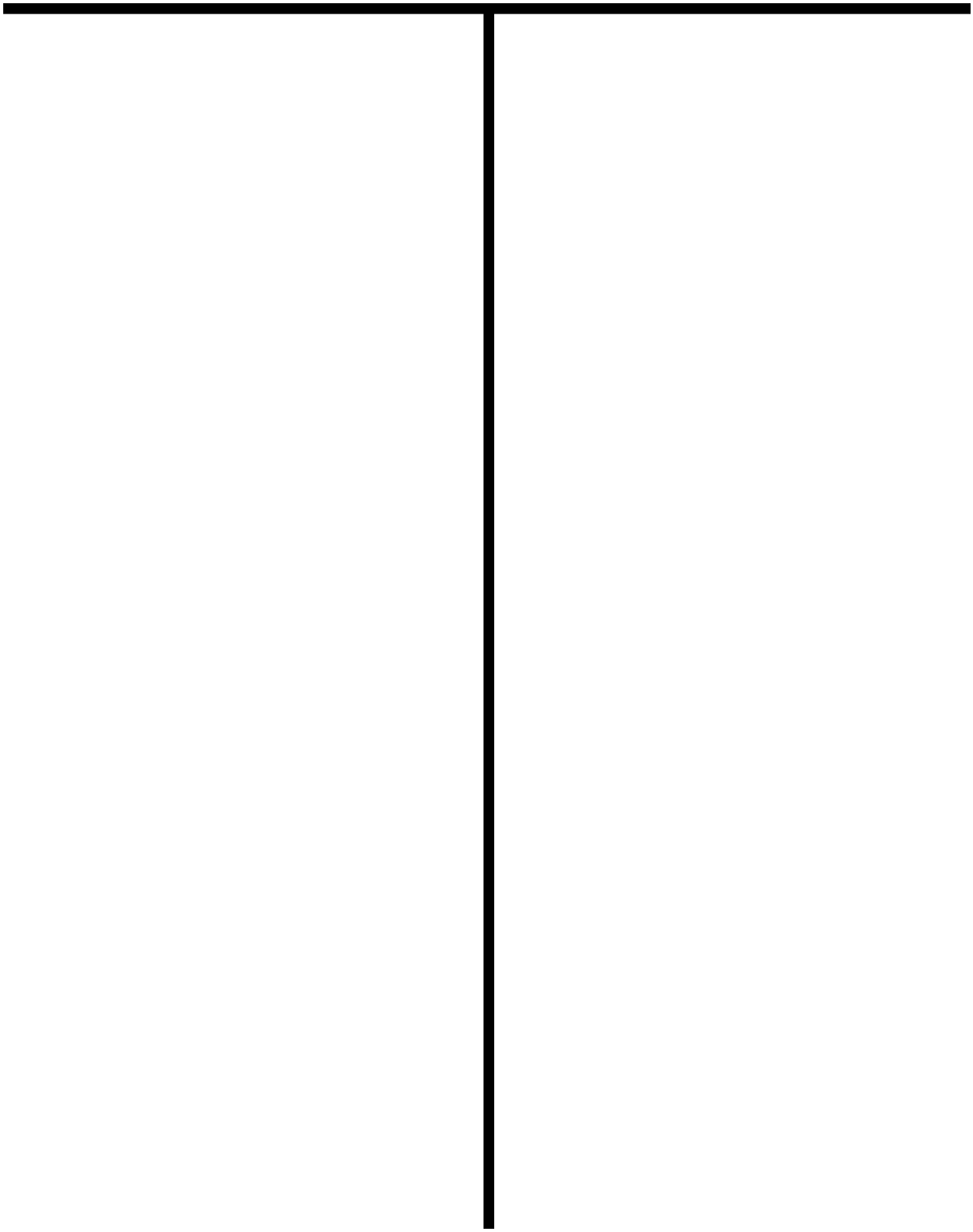
Item 1 **Item 2**



Differences Similarities Differences

NAME _____

T-Chart



NAME _____

Forb, Tree, or Shrub (Draw and Color)

Description of Plant

Distinguishing Features

Drawing of Plant

One thing I would share with others about this plant—

NAME _____

Argument Chart

Viewpoint	Support	Opposing Viewpoint
Teacher's Comments		

NAME _____

Compare and Contrast Diagram

Concept 1 _____

Concept 2 _____

How Alike?

How Different?

NAME _____

Carnivore, Herbivore, Omnivore Chart

Choose several animals from North Dakota, list them under Name of Animal, write the Type of Habitat (e.g., prairie, wetland, etc.), and place an X under the type of animal each is.

Name of Animal	Type of Habitat	Carnivore	Herbivore	Omnivore

NAME _____

Three-Column Notes: Plants or Wildlife

Sample Exercise:

Question	Answer	Examples
What is a reptile?	A reptile is an ectotherm whose body temperature changes with the temperature of its surroundings.	➤ redbelly snake ➤ western hognose snake

Question	Answer	Examples

Question	Answer	Examples

NAME _____

Wildlife Vocabulary Sheet

Type of Food Eaten

Description of Animal

Name of Animal

_____

Other Interesting Facts about This Animal

Description of Home/Habitat

Draw and Color Animal

Date_____ Title of Work_____ Name_____

Cooperative Group Rubric

Criteria					Points
	Beginning	**Developing**	**Accomplished**	**Exemplary**	
Research Information	Does not collect information.	Contributes little information.	Contributes information that relates to the topic.	Contributes a great deal of important information.	
Cooperates with Group Members	Never cooperates.	Seldom cooperates.	Usually cooperates.	Always cooperates.	
Shares Information	Keeps information to self and does not share with group.	Shares some information with the group.	Shares important information with the group.	Communicates and shares all information with the group.	
Listens to Group Members	Always talking and never allows others to speak.	Talks much of the time and rarely allows others to speak.	Talks too much at times, but usually is a good listener.	Balances listening and speaking well.	
Shares Responsibility	Always relies on others to complete assignments.	Rarely does work. Needs constant reminders to stay on task.	Usually does the work. Seldom needs reminders to stay on task.	Always does assigned work without being reminded.	
				Total ➡	

Comments:

Date_____ Title of Work_____ Name_____

_____ Poster Board Rubric

Criteria					Points
	8	12	16	20	
Eye-Catching Creative Display	Not eye-catching to the observer.	Sort of eye-catching; lacks color and creativity.	Eye-catching.	Captivating display. Exceptionally eye-catching.	
Accurate Information for _____ of North Dakota	No information was given.	Some information was given.	Accurate information was given.	Additional information was given.	
Group Participation	Group did not work cooperatively. One person did all the work.	Group sort of worked cooperatively. All the work was done by 1–2 people.	The group did well together and shared most tasks equally.	The group worked exceptionally well together. All tasks were shared equally.	
Written or Oral Presentation of Display	Nothing was shared. Work was not completed.	Most of the presentation was complete, but a little disorganized in presenting.	Good presentation. Information was complete. Sharing was equal by all members of the group.	Exceptional presentation. Complete information. Colorful. Presenters exhibited enthusiasm.	
				Total= 60 pts	

Comments:

Date_____ Title of Work_____ Name_____

_____ of North Dakota Game Rubric

Criteria					Points
	11	14	17	20	
Name of Game is Clearly Seen on the Board	Lettering is difficult to see (too small or too light).	Lettering is adequate but not lined up neatly or clearly written.	Clearly written (neat, dark lettering), but not completely professional in looks.	Bold, clear lettering, which stands out on the board. Very professional looking.	
Creative, Colorful, Captivating Board	Board lacks creativity, color, and does not draw in the players.	Board has some degree of creativity but lacks color and may or may not draw in the players.	Board is creative, colorful, and draws in the players.	Board is exceptionally creative, colorful, and draws in the players.	
Directions for the Game	No clear directions are given.	Some clear directions are given.	Directions are clear to players.	Directions are exceptionally clear to players (examples are given).	
Object of Game and Number of Players	Object of game and number of players are not stated on the board.	Object of game and number of players are somewhat clearly stated on the board.	Object of game and number of players are clearly stated on the board.	Object of game and number of players are clearly stated on the board with examples given for clarity.	
Materials Needed (e.g., dice, cards, markers)	No list of materials is stated on the board.	A partial list of materials is stated on the board.	A complete list of materials is stated on the board.	A complete list of materials along with illustrations is stated on the board.	
				Total=100 pts	

Comments:

Formal Debate Guidelines

Note: This is a formal debate. Teachers may choose to use a more informal format where the assigned two teams do not adhere to stringent time frames and just take turns expressing views for their sides.

Objective of Assignment:

Students will engage in a debate focused on two opposing views. Engaging in this structured event requires each student to critically evaluate current evidence, examine personal convictions based on values and beliefs, and synthesize relevant information to provide detailed information so that others may make an informed decision.

Format:

1. Two teams will be assigned. One team will create an affirmative presentation while the other team will be responsible for creating a negative or opposing presentation. Involvement by each student is required.

2. Debate guidelines:

    a. **Affirmative Plan: 4 minutes.** This is their introduction. What will they be discussing and why? They need to get everyone's attention.

    b. **Negative Rebuttal: 2 minutes**. This is a direct rebuttal to the Affirmative Plan. This team addresses only those issues identified in the Affirmative Team's introduction.

    c. **Negative Plan: 4 minutes.** This is their introduction. They need to get everyone's attention. What will they be discussing and why?

    d. **Affirmative Rebuttal: 2 minutes.** Direct rebuttal to the negative plan. This team addresses only those issues identified in the Negative Team's introduction.

    e. 10-minute break for preparation/adjustment to argument.

    f. **Negative Argument: 10 minutes.** This is the body of the speech. Tell students to present all the information they have gathered. Have them use facts, stats, and sources to argue their side. The Affirmative Team cannot interrupt during this argument.

g. **Affirmative Cross Examination: 8 minutes.** Have students ask the tough questions, demand answers, and do anything and everything they can to counter the argument of the negative. The Negative Team does not ask questions. Their role is to provide answers only.

h. **Affirmative Arguments: 10 minutes.** This is the body of the speech. Again, have students lay it all out—facts, stats, sources, and have them argue their side. The Negative Team cannot interrupt during this argument.

i. **Negative Cross Examination: 8 minutes.** Have students ask the tough questions, demand answers, and do anything and everything they can to counter the argument of the negative. The Affirmative Team does not ask questions. Their role is to provide answers only.

j. 10-minute break to prepare for closing.

k. **Affirmative Closing: 5 minutes.** Tell students to use emotion for a big ending. They've seen the "TV lawyers" present their closings… do it here!

l. **Negative Closing: 5 minutes**…same thing…here's their chance!

3. Involvement by each student is required.

Children's Literature Checklist

To be used by students when creating their own piece of literature.

- ☐ **Book jacket/cover is eye-catching and appealing to the reader.**
- ☐ **Title is captivating and colorful.**
- ☐ **Author's and illustrator's names are shown on the cover.**
- ☐ **Sentences are complete. Each sentence contains a subject and a predicate.**
- ☐ **Proper grammar and punctuation are used.**
- ☐ **Quotation marks are used to show when someone is speaking.**
- ☐ **Paragraphs are used as needed.**
- ☐ **All words are spelled correctly.**
- ☐ **Words are either written or typed legibly.**
- ☐ **Illustrations appropriately relate to the story.**
- ☐ **Illustrations are neatly drawn and are colorful, if color is used.**
- ☐ **The story makes sense to the reader.**
- ☐ **Characters are described or illustrated in a way that the reader can identify with them.**
- ☐ **A brief biography of the author is written on the back cover.**

General Activities

A DVD discussing the five habitats of North Dakota is included so that students can view the actual habitat being studied. The DVD has been produced by the Game and Fish Department and features North Dakota students interacting in the natural habitat settings.

Books

- Have students research and create a class book for one of North Dakota's habitats. Divide the book into chapters in which each chapter gives information on the components that are needed for a habitat to survive. These components include food, shelter, air, water, and space. This assignment could also be a small group activity. **(A Children's Literature Checklist can be found in Assessments.)**
- Have students create an ABC Alphabet Book on one of the five habitats of North Dakota (e.g., Wetlands: A = Aquifers, B = Birds of the Wetlands, C = Cattails.) Illustrate each page and share it with another classroom or place it in the school library.
- Have students create a Glossary on one of the five habitats that includes illustrations and definitions that younger children in lower grades could understand. Have students share with others in the classroom or place it in the school library for use by other students.
- Have students use vocabulary words to create a book or comic book depicting one of the five habitats found in North Dakota. Include words, definitions, and illustrations.
- Have students create a class poetry book on one of the five habitats found in North Dakota, in which each student creates a poem on one page with illustrations. **(Various Poetry types can be found under the "Poetry" heading in this section.)**

Brochures

- Have students create a brochure encouraging the development of one of the habitats in North Dakota.

Debate Ideas

- Have students debate which habitat is the best for wildlife. Students may be divided into groups, and various groups representing one animal would debate each other. **(Formal Debate Guidelines and an Argument Chart can be found in the Assessments section.)**

Diorama

- Using a shoe box or something about that size, have students create an authentic-looking habitat for the unit of their choice highlighting one animal and the various plant life of the area.

Drawing

- Have students draw a plant or animal found in one of North Dakota's habitats (i.e., wetlands, prairie, Badlands, riparian areas, woodlands). Have them include characteristics and facts about each plant or animal. **Extension:** Create a book of _____ Animals or _____ Plants with illustrations, facts, characteristics, and other interesting information.
- Have students choose an animal found in North Dakota and draw it as it looks when it is young and when it is an adult. Using the T-Chart, list on the left side of the T characteristics of that animal when it is young and on the right side of the T the characteristics of it when it is an adult. **(A reproducible blank T-Chart can be found in the Assessments section.)**

Electronic Presentations

- Have students create an iMovie, PowerPoint, movie, or another electronic media to illustrate and describe through text, animations, clip art, etc., information about one of North Dakota's habitats.

Games

- Have students create a North Dakota Board Game on the habitat of their choice. **(A reproducible Board Game Rubric can be found in the Assessments section.)**
- Have students play these games using questions from the habitat unit of their choice: BINGO, *Jeopardy*, *Wheel of Fortune*, Trivial Pursuit, *Who Wants To Be A Millionaire*, *$100,000 Pyramid*, Twenty Questions, etc. The following sites may be helpful:
  - **http://teach.fcps.net/trt10/PowerPoint.htm**
  - **http://www1.umn.edu/ohr/teachlearn/tutorials/powerpoint/games.html**
    - Suggested categories for any North Dakota habitats might include: *Types of* ____; *Wildlife in* ____; *Plants in* ____; *Flood Control of* ____; *Recreation and Aesthetics of* ____; *Impact of* ____; *Preservation of* ____. The teacher or students can add to the categories depending on what habitat is chosen.

- ***Habitats of North Dakota*** BINGO—Have students fill in the blank boxes with words provided from the habitat unit being studied. Cut out the Vocabulary Cards provided. The caller will select a card, read the definition, and the students will place a marker on the word that matches the definition. When BINGO is called, the student must read the word and give the definition before it is counted. (**Note:** This may be used as an assessment tool.)

Graphic Organizers

- Have students choose one species of animal from one of the habitats found in North Dakota (i.e., mammals, amphibians, reptiles, fish, and birds) and graphically create a food chain for that animal.

Montage/Collage

- Have students find illustrations, words, descriptions, art, etc., to depict a type of habitat found in North Dakota, and create a montage or collage to be glued on poster paper and displayed.

Poetry

- Have students create poetry about one, all, or a combination of North Dakota's habitats:
  - **Couplets** (Two-line stanza that rhymes).
  - **Triplets** (Three-lined poems). Patterns include ABB (two of the lines rhyme), AAA (all three lines rhyme), ABC (no lines rhyme). A triplet can be written in the shape of a triangle and can be read by starting at any corner.
  - **Haiku**
    Line 1—five syllables
    Line 2—seven syllables
    Line 3—five syllables
  - **Cinquain**
    Line 1—one word (title)
    Line 2—two words (describe the title)
    Line 3—three words (describe an action)
    Line 4—four words (describe a feeling)
    Line 5—one word (refer back to the title)

- **Diamonte** (Diamond)
  Line 1—one noun (subject #1)
  Line 2—two adjectives (describing subject #1)
  Line 3—three participles (ending in –ing, telling about subject)
  Line 4—four nouns (first two related to subject #1, second two related to subject #2)
  Line 5—three participles (about subject #2)
  Line 6—two adjectives (describing subject #2)
  Line 7—one noun (subject #2)
- **ABC Poetry** (Start with A and go through the alphabet writing a word for each letter. You may make several sentences, but the information should be about North Dakota.)
- **Acrostic Poems** (The first letters of the line spell out a word that has something to do with the poem).
- **Lanterns** (A Japanese poem that is written in the shape of a Japanese lantern).
  Line 1—one syllable
  Line 2—two syllables
  Line 3—three syllables
  Line 4—four syllables
  Line 5—one syllable

Research Activities and/or Assessment

- Several specific examples are given throughout the Activities section to aid both the teacher and students in researching part or all of a North Dakota habitat.
- Assign individuals or small groups to research and demonstrate their knowledge of one of the habitats of North Dakota through one of the formats listed below. The blank lines can be filled in using one of the habitats found in North Dakota. Sample research assignments include:
  - Types of _____;
  - Wildlife of the _____;
  - Plants of the _____;
  - Food chain of an animal of the _____;
  - The importance of _____;
  - Natural flood control for _____;
  - Improving water quality of _____;
  - Recharging groundwater in _____ ;
  - Public use of _____;
  - Threats to _____; or
  - Saving _____.

- Examples of ways to research North Dakota habitats include the following:
  - Report (written or oral), radio broadcast (tape player), news reports, oral histories of events, television report (PowerPoint), commercials, interviews, TV talk shows, weather reports
  - Student-generated bulletin board on topic, map, mobiles, brochures, model or diorama, illustrated and written book on topic, scrapbooks, cartoons
  - Slide presentations (electronic or created on left-over laminated sheets and placed on an overhead projector), PowerPoint or iMovie
  - Student-generated tests of the material covered
  - Demonstrations, dramatized legends and myths, plays (puppet or real life parts), role plays, simulations, skits
  - Jump rope rhymes/poetry, song writing to fit a topic, tongue twisters, crossword puzzles, timelines
  - Be creative! Think of other ways you can demonstrate the knowledge of your topic!

Small Groups

- Divide the students into small groups and have them choose a habitat that interests them. Have students research, write, and perform a short play about some part of one habitat in which they are interested. Include wildlife, plants, food chain, etc. Puppetry could also be used.

T-Chart

- Have students list and illustrate a minimum of ____ species of wildlife or plants found in North Dakota on the left side of the T and describe on the right side its characteristics and features or why each particular animal/plant is important. **(A reproducible blank T-Chart can be found in the Assessments section.)**

Vocabulary/Spelling

Use the vocabulary words for one of the habitats as spelling words. Suggestions for use:

- Have students write each word in a complete sentence that would tell the reader through context its meaning.
- Divide the students into teams and have a SPELLDOWN. One student is asked to spell a word when it is his/her turn. If the word is spelled correctly, the student remains standing and moves to the back of the line to be in turn again. If the word is misspelled, the student must sit down and wait until all other team members have been eliminated.

- Play SPARKLE, a variation of SPELLDOWN. Have students stand by their desks (or sit on them). Determine a point for starting and state the first word to be spelled. The first person in the order gives the first letter, the next person gives the second letter, the third person gives the third letter, etc. When the last letter is spelled in the word, the next person in line says SPARKLE and needs to be seated. The next word is given, and the next person in line begins with the first letter, the second person gives the second letter, etc., until SPARKLE is called again and another student is eliminated.
- Have students alphabetize the words by using the game cards provided in the Vocabulary sections. Students can partner and check each other for accuracy.
- Have students write each word as a mirror image (write the words from right to left). This is a strong activity as it promotes greater brain activity and concentration.
- Have students divide the words into syllables, placing the accent on the correct syllable.
- Students may partner and give each other a spelling test (written and/or oral).
- Vocabulary Cards: These cards may be used as game cards or other methods of review.

Writing Activities

- Have students choose a species of wildlife from any of the habitats studied and write a story about its life as it roams through the various ecosystems. Have them explain in detail the experiences their animal encountered in each habitat. They may want to name their animal to make the story more realistic and entertaining.
- Have students choose one habitat and write a letter to the editor of a newspaper (fictional or real) giving their views on the importance of maintaining or restoring that particular habitat for future generations.
- Have students write a hypothetical (or real) letter to their local newspaper expressing their views on preventing damage to a chosen North Dakota habitat that may include a number of factors including pollution, development, drainage, etc.
- Have students imagine what it would be like in North Dakota if one of the habitats was absent. How would their lives be different if they could not experience that particular habitat?
- Have students choose a plant or animal found in one of North Dakota's habitats and write a story from their personified plant's or animal's point of view.

Wetlands Activities

Books

- Have students create an illustrated book on the four major types of wetlands found in North Dakota (i.e., temporary, seasonal, semi-permanent, and permanent). **(A Children's Literature Checklist can be found in Assessments.)**

Brochures

- Have students design and produce a 3-fold brochure to be used for tourism on the characteristics and locations of wetlands in North Dakota.

Debate Ideas

- Have students debate both the positive and the negative aspects of wetlands. **(Formal Debate Guidelines and an Argument Chart can be found in the Assessments section.)**
- Divide the class into three groups: one group represents residents, one group represents farmers, and one group represents conservationists. Have students debate their point of view of wetlands making sure to include both the positive and negative effects for each of their choices.

Graphic Organizers

- Have students graphically organize, in a way that makes sense to them, the four major types of wetlands and characteristics of each.
- Have students create a flow chart of the water cycle using the vocabulary plus illustrations of precipitation, condensation, and evaporation.
- Have students graphically organize how they use water each day. Post and discuss in small groups or as a whole class.

Map Skills

- Have students draw a map showing the Prairie Pothole Region of the United States. **(A reproducible blank map of the United States and Canada can be found in the Assessments section.)**
- Have students locate on a North Dakota map the major wetland areas of North Dakota. **(A reproducible blank map of the Major Rivers of North Dakota can be found in the Assessments section.)**
- Using a map of the United States and Canada, plot the major migratory routes of waterfowl that pass through North Dakota.

Posters

- Have students design a poster urging people to conserve the wetlands of North Dakota. **(A reproducible Poster Board Rubric can be found in the Assessments section.)**
- Have students create a poster on the use and conservation of water used in everyday living.
- Have students create a poster depicting the water cycle and its importance to wetland survival.

Small Groups

- Have small groups research and share with their group members two human activities and two environmental factors that might interfere with water bird migration. Each group member chooses one area to research and then brings it to the group to share. Each group would then create a means to share its findings with the entire class (e.g., diorama, role-play, poster, etc.).

T-Chart

- Have students list the four types of wetlands on the left side of the T and describe characteristics of each on the right side. **(A reproducible blank T-Chart can be found in the Assessments section.)**
- Have students list the Pros of wetland drainage on the left side of the T and Cons on the right.
- On the left side of the T, have students identify three actions that people can take to reduce or prevent damage to wetlands, and on the right side, have them write under what conditions each of these actions would be appropriate. Discuss and share with the class or use this information to write a paper.

Venn Diagram

- Using a three-circled Venn Diagram, show the differences and similarities of geese, ducks, and swans. **(A reproducible blank three-circled Venn Diagram can be found in the Assessments section.)**

Writing Activities

- Have students keep track of and chart the amount of water they use for one day. Then, have them write a story integrating these facts with possible solutions on how they can conserve water used daily. Encourage creativity and possible humor. Have them share their stories either in small groups or with the entire class.
- Have students take on the role of newspaper/television reporters who are visiting a wetland. Have them report on three issues involving aquatic animals and aquatic plants.

Prairie Activities

Graphic Organizers

- Have students graphically organize in a way that makes sense to them the three major types of grasslands and characteristics of each.

Map Skills

- Have students locate on a North Dakota map the major grasslands of North Dakota. **(A reproducible blank map of North Dakota can be found in the Assessments section.)**

Venn Diagram

- Using a three-circled Venn Diagram, have students write the characteristics of hawks, falcons, and owls in each of the circles. In the connecting circles where each circle connects, have students write the similarities between two of these raptors. In the final center circle, write what all three of these raptors have in common. **(A reproducible blank three-circled Venn Diagram can be found in the Assessments section.)**
- Using a three-circled Venn Diagram found in Assessments, have students compare and contrast the Richardson's ground squirrel, the thirteen-lined ground squirrel, and Franklin's ground squirrel—all found on the North Dakota prairies.

Writing Activities

- Have students write what it might have been like to come to the open prairies of North Dakota as a Euro-American settler. How might they have reacted to the "sea of grass"? Have them write a story pretending they are a member of a family that settled on the open prairies of North Dakota. Encourage them to describe their feelings, their thoughts, their hardships, and their joys.

Badlands Activities

Debate Ideas

- Have students debate the pros and cons of building a coal-generated power plant close to the Badlands. **(Formal Debate Guidelines and an Argument Chart can be found in the Assessments section.)**
- Have students debate whether a cell phone tower should have been placed near Medora and whether it spoils the natural scenic beauty of the Badlands.

Graphic Organizers

- Have students create a mind map showing the types of grasses, trees, and shrubs found in the Badlands and characteristics of each type.
- Have students research and graphically organize the animals that are found in the following habitats in the Badlands: native prairie, woody draws, sagebrush flats, caves, rock crevices, and trees.

Map Skills

- Have students locate on both a North Dakota and a United States map the location of the North Dakota Badlands. **(A reproducible blank map of North Dakota as well as a map of the United States and Canada can be found in the Assessments section.)**

Plan A Trip

- Have students plan a trip for two days and three nights for one person to the North Dakota Badlands (Medora) from any city in North Dakota. It is their responsibility to compute the mileage and how much it would cost for gas, hotel, meals, and recreation while in Medora. Their goal is to keep the cost under $500. To aid them in their planning and budgeting, log on to **http://www.medora.org/**.

Venn Diagram

- Using a three-circled Venn Diagram, compare and contrast the characteristics of the North and South Units and the Elkhorn Ranch located in the Theodore Roosevelt National Park. **(A reproducible blank three-circled Venn Diagram can be found in the Assessments section.)**

Writing Activities

- Using the site **http://community.webshots.com/album/46565168fpSIvS**, have students choose one of the numerous photos of the Badlands and write a descriptive paragraph or a poem about the photo. Poetry ideas can be found in the *General Activities* section of this book.
- Have students write a story using a rattlesnake and a bullsnake as its two main characters. Encourage the students to include factual information throughout the story so the reader will learn about these two reptiles and how they live in the Badlands.

Woodlands Activities

Debate Ideas

- Have students debate whether woodlands should or should not be cleared for development of homes. **(Formal Debate Guidelines and an Argument Chart can be found in the Assessments section.)**

Graphic Organizers

- Have students create a mind map showing the types of trees found in North Dakota woodlands, showing characteristics of each type.
- Have students graphically show the parts of a forest ecosystem.

Map Skills

- Have students locate on a North Dakota map the location of the woodlands found in North Dakota. **(A reproducible blank map of North Dakota can be found in the Assessments section.)**

Poet "Tree"

- Have students write poetry following types and examples listed in the *General Activities* section of this **Teacher Resource Guide**.
- Have students draw a tree covering an entire sheet of paper. Within the tree, write adjectives or other words they think of when describing or thinking about their tree.

Venn Diagram

- Using a two-circled Venn Diagram, compare and contrast the deciduous and coniferous trees found in North Dakota. **(A reproducible blank two-circled Venn Diagram can be found in the Assessments section.)**
- Using a three-circled Venn Diagram, compare and contrast the three types of forest ecosystems found in North Dakota: native forests, rural plantings, and community forests. **(A reproducible blank three-circled Venn Diagram can be found in the Assessments section.)**

Webquest

- **http://www2.lhric.org/kat/BLUE.HTM** is a site for a Bluebird webquest in which students work in small groups according to the directions given in the webquest to complete the assignment.

Writing Activities

- Have the students take on the role of the trees in the world and then write a story describing in detail how their role as the "lungs" of the world is important to everyone and for everything to survive.

Riparian Areas Activities

Debate Ideas

- Have students debate the pros and cons of developing homes and businesses along a river from the viewpoint of the animals, the plants, the watershed, and the people and businesses involved. **(Formal Debate Guidelines and an Argument Chart can be found in the Assessments section.)**

Drawing/Writing

- Using the link **http://www.npwrc.usgs.gov/resource/fish/ndfishes/index.htm**, have students select a fish found in North Dakota waters to illustrate it and write a story about using the facts found at this site.

Japanese Fish Printing or Gyotaku (guy-oh-ta-koo)

gyo = fish; taku = impression

http://www.enasco.com/artsandcrafts/Printmaking/Gyotaku+%28Fish+Printing%29/ is a site that will assist you in ordering materials (fish replicas, foam brayers, etc.) to do gyotaku. More ordering information on supplies can be found in *General Resources*.

- Materials Needed:
  - Fish replica
  - Black ink, fabric ink, or tempera paint
  - Newspapers
  - Cardboard
  - Paper towels
  - Paper or fabric for printing
  - Foam brayer or brushes
- Inking
  1. Cover the surface of your work area with newspaper or cardboard.
  2. Place fish replica on the newspaper.
  3. Squeeze a small amount of ink/paint on a small piece of cardboard.
  4. Coat foam brayer with ink/paint and roll ink evenly onto fish replica.
  5. Cover any ink/paint on work area with clean newspaper to prevent unwanted ink/paint blotches or specs from getting on your printing paper or fabric. **NOTE:** If using fabric, fabric ink must be used.
- Printing
  1. Holding onto the edges of printing paper, place the paper on top of the inked fish and do not move the paper once it is placed on the fish. When using fabric, gently press and roll from top to bottom.

2. Place the palm of one hand over the paper/fabric that is covering the fish's belly. Try not to move the hand to prevent smudging. Press as much of the fish as possible to get every part of the fish covered.
3. After pressing the entire fish, carefully peel off your paper/fabric.

Map Skills

- Have students locate on a North Dakota map all the major rivers in North Dakota. **(A reproducible blank map of the Major Rivers of North Dakota can be found in the Assessments section.)**

Venn Diagram

- Have students choose any two/three North Dakota species of fish found at **http://gf.nd.gov/fishing/species.html** and have them complete either a two- or three-circled Venn Diagram comparing and contrasting the different fish. **(Reproducible blank two- and three-circled Venn Diagrams can be found in the Assessments section.)**

Webquest

- Using the webquest entitled *The Fresh Water WebQuest* as a guide, have students work in small groups of five to complete a webquest found at **http://www.hobart.k12.in.us/jkousen/Biology/freshwater.html**.

Writing Activities

- Have students illustrate, label, and describe in complete sentences one of the following statements that is a part of the definition of riparian areas:
  - Green, vegetated areas on each side of streams and rivers
  - Purify water by removing sediments and other contaminants
  - Reduce the risk of flooding and associated damage
  - Reduce stream channel and stream bank erosion
  - Increase available water and stream flow duration by holding water in stream banks and aquifers
  - Support a diversity of plant and wildlife species
  - Maintain a habitat for healthy fish populations
  - Provide water, forage, and shade for wildlife and livestock
  - Create opportunities for people to fish, camp, picnic, etc.
  - Create "green zones" of water-loving vegetation along waterways, streams, rivers, lakes, reservoirs, and springs

General Resources

North Dakota Game and Fish Department

http://gf.nd.gov

Bismarck Office (Headquarters)
100 N. Bismarck Expressway
Bismarck, ND 58501-5095
Phone: (701) 328-6300
Fax: (701) 328-6352
E-mail: ndgf@nd.gov

Bismarck Game and Fish Lab
816 Airport Road
Bismarck, ND 58504-6111

Bismarck Game and Fish Shop
3001 E. Main
Bismarck, ND 58501-5095

Devils Lake Office
7928 45th Street NE
Devils Lake, ND 58301-8501
Phone: (701) 662-3617
Fax: (701) 662-3618

Lonetree Office
1851 23rd Ave. NE
Harvey, ND 58341-9112
Phone: (701) 324-2211
Fax: (701) 324-2214

Dickinson Office
225 30th Ave. SW
Dickinson, ND 58601-7227
Phone: (701) 227-7431
Fax: (701) 227-7432

Riverdale Office
406 Dakota Ave.
Riverdale, ND 58565
Phone: (701) 654-7475
Fax: (701) 654-7503

Jamestown Office
PO Box 309 (3320 E. Lakeside Road)
Jamestown, ND 58402-0309
Phone: (701) 253-6480
Fax: (701) 253-6490

Williston Office
13932 West Front Street
Williston, ND 58801-8602
Phone: (701) 774-4320
Fax: (701) 774-4305

North Dakota Game and Fish Department Publications

The following publications are available free of charge from the North Dakota Game and Fish Department.

- BIG GAME
  - *Aging Antelope: It's All in the Teeth*
  - *Aging Elk*
  - *Preventing Deer Depredation*
  - *How Old is My Deer?*

- WILDLIFE ENHANCEMENT
  - *Attracting Bluebirds and Other Cavity Nesting Songbirds in North Dakota*
  - *Attracting Wildlife To Your Backyard*
  - *Plans for Building Nest Structures and Songbird Feeders*
  - *Backyard Bird Feeding*

- WILDLIFE IDENTIFICATION GUIDES
  - *Raptors of North Dakota*
  - *The Owls of North Dakota*
  - *Reptiles and Amphibians*
  - *Bats of North Dakota*
  - *Small Mammals of North Dakota*
  - *Marshbirds and Shorebirds of North Dakota*
  - *Songbirds of North Dakota*
  - *Sparrows of North Dakota*
  - *North Dakota's Endangered and Threatened Species*
  - *Upland Game Identification: A Basic Guide for Aging and Sexing the Bird in Your Hand*
  - *Upland Game Birds of North Dakota* (available for download at **http://gf.nd.gov**)
  - *Mountain Lions in North Dakota*
  - *Profiles of North Dakota Waterfowl*

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HUNTING, FISHING, AND WILDLIFE VIEWING

- *A Birding Guide for North Dakota*
- *Wildlife Management Area Guide* (available for download at **http://gf.nd.gov**)
- *Little Missouri National Grassland Wildlife and Scenic Tour—Southern Route*
- *PLOTS Guide* (available for download at **http://gf.nd.gov**)
- *North Dakota Fishing Guide* (available for download at **http://gf.nd.gov**)
- *Fishes of North Dakota*
- *There's More Than One Way to Skin a Pike* (available for download at **http://gf.nd.gov**)
- *Catch and Release*
- *Missouri River Boating Access Guide* (available for download at **http://gf.nd.gov**)
- *Red River Angler's Guide* (available for download at **http://gf.nd.gov**)
- *Paddlefish—Questions and Answers*
- *North Dakota Boating Basics*
- *Save Our Lakes*

CONSERVATION AND EDUCATION

- *Outdoor Wildlife Learning Sites (OWLS) Guidelines for North Dakota Schools and Communities*
- *Prairie Wildflowers and Grasses of North Dakota*
- *Conservation Education Volunteer*

POSTERS AVAILABLE

- *Grassland Birds of North Dakota*
- *Woodland Birds of North Dakota*
- *Wetland Birds of North Dakota*
- *Reptiles and Amphibians of North Dakota*
- *Prairie Wildflowers of North Dakota*
- *Big Game and Furbearers of North Dakota*
- *Fishes of North Dakota*
- *Native Fish of the Missouri River*

Other Agencies:

Bureau of Land Management

http://www.blm.gov/mt/st/en.html is the site of the U.S. Department of the Interior's Bureau of Land Management. Information exclusive to North Dakota can be found at **http://www.blm.gov/mt/st/en/fo/north_dakota_field.html** that gives information on public lands and mineral estates in North Dakota.

North Dakota Field Office
99 23rd Ave. W., Suite A
Dickinson, ND 58601
(701) 227-7700
Fax: (701) 227-7701

Ducks Unlimited

http://www.ducks.org/conservation/initiative45.aspx

Ducks Unlimited has a motto that states, "Conservation Today, Wetlands for Tomorrow." Information at this site includes conservation, habitat issues, waterfowl biology, and a specific link to North Dakota.

National Wildlife Refuges

http://www.fws.gov/mountain-prairie/refuges/nd/ is a site that shows an interactive map of North Dakota with all its National Wildlife Refuges and their locations.

North Dakota Forest Service

http://www.ndsu.nodak.edu/forestservice/

The motto of the North Dakota Forest Service states, "To care for, protect and improve forest and natural resources to enhance the quality of life for present and future generations." The site has a wealth of information about North Dakota's forest areas.

North Dakota State Land Department

http://www.land.state.nd.us/surface/aerialphotos/aerialhome.htm is a site that gives aerial photographs of school trust lands found in North Dakota. Aerial views list the latitude and longitude of each location, along with County-Township-Range-Section.

Board of University and School Lands
North Dakota State Land Dept.
1707 N. 9th St.
P.O. Box 5523
Bismarck, ND 58506-5523
(701) 328-2800
Fax: (701) 328-3650

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Northern Prairie Science Center

http://www.npwrc.usgs.gov/

This site provides scientific information on the conservation and management of the nation's biological resources, with an emphasis on the species and ecosystems of the Midwest region of the United States.

River Keepers

http://www.riverkeepers.org/

This site promotes a renewed vision for the Red River of the North through workshops, youth service-learning projects, and advocacy. River Keepers is a non-profit organization established in 1990 to protect and preserve the integrity and natural riparian environment of the Red River of the North.

USDA Forest Service

North Dakota's site is found at **http://www.fs.fed.us/r1/dakotaprairie/**, and the site has a lot of information on the Sheyenne National Grasslands.

U.S. Fish and Wildlife Service

http://www.fws.gov/mountain-prairie/ is the site for the Mountain-Prairie Region of which North Dakota is a part. National wildlife and wetland refuges are found for North Dakota at **http://www.fws.gov/mountain-prairie/refuges/nd/**, and each refuge is detailed on a North Dakota map along with links for each refuge.

General Habitat Resources:

Birds

http://www.birds.cornell.edu/AllAboutBirds/BirdGuide/

This site searches for any bird desired. It gives the bird's description, sound, conservation status, other names, cool facts, habitat, food, behavior, and reproduction facts.

http://www.ndparks.com/nature/birding.htm

This site is entitled *Birding in North Dakota*, and it gives locations throughout the state, what types of birds to look for in particular areas, when to look for birds, and how to dress for bird watching.

http://nationalzoo.si.edu/Animals/Birds/ForKids/default.cfm

This site is entitled *Birds for Kids* and includes information on several different birds, offers jigsaw puzzles online on three different types of birds, and much more information.

http://www.enchantedlearning.com/subjects/birds/

All About Birds gives information on migration, diet, nesting, and other information on birds. It is a very informative and interesting site!

http://www.abirdsworld.com/html/kidsnest.html

This site has many opportunities for students to engage in numerous bird activities from e-pals, coloring pages and information on various species of birds, types of owls, birds of North America, and much more.

http://edtech.kennesaw.edu/web/birds.html

This site has numerous live links on anything you want to know about birds. It is an informative site where much can be learned about birds.

Svingen, D. & R. Martin. *Birding North Dakota*. Available through the ND Game and Fish Dept., Bismarck, ND. This colorful and informative book shows the location of all North Dakota's wildlife refuges, state parks, and national parks. The book gives a detailed explanation of where to look for specialty species of birds. In addition, each site on the map gives directions on how to find each location.

Flying Wild: An Educator's Guide to Celebrating Birds. This 2004 activity book compiled by the Council for Environmental Education is a book that focuses on getting middle school students involved in service-learning projects concerning birds and their habitats through a variety of interdisciplinary and interactive activities.

North Dakota's Groundwater

Protecting North Dakota's Groundwater from Pesticide Contamination: What You Need to Know book compiled by the

North Dakota Department of Agriculture
600 East Boulevard Ave., Dept. 602
Bismarck, ND 58505
701-328-2231
Fax: 701-328-4567
E-mail: **ndda@state.nd.us**
http://www.agdepartment.com

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Contact the following agencies for more information on pesticides and groundwater quality:

North Dakota Department of Health
Division of Water Quality
Bismarck, ND 58506
701-328-5210
Fax: 701-328-5210
http://www.health.state.nd.us/wq

North Dakota State Water Commission
900 East Boulevard Ave.
Bismarck, ND 58505-0850
701-328-2750
Fax: 701-328-3696
E-mail: **swc@state.nd.us**
http://www.swc.state.nd.us

North Dakota State University
Extension Service
Morrill Hall 315
P.O. Box 5437
Fargo, ND 58501-5437
701-231-8944
Fax: 701-231-8520
E-mail: **ext-dir@ndsuext.nodak.edu**
http://www.ext.nodak.edu/

Pesticide Training and Certification
Program, North Dakota State University
Extension Service
166 Loftsgard Hall
P.O. Box 5051
Fargo, ND 58501-5051
701-231-7180
Fax: 701-231-5907
E-mail: **pesticide@ndsuext.nodak.edu**
http://www.ndsupesticide.org

Environmental Protection Agency
Pesticides Team, Water Quality Lead
999 18th Street, Suite 200
Denver, CO 80202-2466
303-312-6395

United States Department of
Agriculture Natural Resources
Conservation Service
220 East Rosser Avenue
P.O. Box 1458
Bismarck, ND 58502-1458
701-530-2000
http://www.nd.nrcs.usda.gov

Ordering materials and supplies:

- Nasco 1-800-558-9595 or **www.eNASCO.com**
- Skull International Unlimited—**www.skullsunlimited.com**
- Acorn Naturalists—Resources for exploring art, nature, and science 1-800-422-8886 or **www.acornnaturalists.com**
- Nature Watch **www.nature-watch.com** or 1-800-228-5816
- Rex Art 1-800-739-2782

Outdoor Wildlife Learning Site (OWLS)

http://gf.nd.gov/education/instruction/owls.html

This site gives information on how schools can apply for a grant to create their own Outdoor Wildlife Learning Site where the students can learn about the importance of habitat and conservation of wildlife resources in a hands-on setting. Information on various sites in the state, as well as how to apply, is included at this site.

Project Learning Tree

Project Learning Tree Coordinator
North Dakota Forest Service
307 First Street East
Bottineau, ND 58318-1100
(701) 228-5422
Fax: (701) 228-5448
http://www2.edutech.nodak.edu/plt/
E-mail: **gfauske@plains.nodak.edu**

Project Learning Tree is affiliated with the American Forest Service and is a multi-disciplinary environmental education program for educators and students in PreK–grade 12. For additional information, log on to **http://www.plt.org/** or **http://www.plt.org/cms/pages/21_19_1.html**.

A list of 749 children's literature books connected with Project Learning Tree can be found at **http://65.109.144.97/curriculum/Literature_(annotated)_list_alph_by_author.doc**.

Project WILD Aquatic

http://www.projectwild.org/ProjectWILDK12AquaticCurriculumandActivityGuide.htm

The Project WILD Aquatic K–12 Curriculum and Activity Guide emphasizes aquatic wildlife and aquatic ecosystems. It is organized in topic units, is interdisciplinary, and is based on the Project WILD conceptual framework. For more information about the K–12 curriculum guide of Project WILD Aquatic, contact Project WILD or Council for Environmental Education at 5555 Morningside Drive, Suite 212, Houston, TX, or call (713) 520-1936 or fax (713) 520-8008, or e-mail at **info@projectwild.org**.

Project WILD (Wildlife In Learning Designs)

www.projectwild.org or **www.c-e-e.org**

Since its inception in 1983, Project WILD trainers have trained numerous teachers in grades kindergarten through high school on how to implement its conservation and environmental educational activities into the classroom. Project WILD's mission is to provide wildlife-based conservation and environmental education that fosters responsible actions toward wildlife and related natural resources through the use of interdisciplinary activities. For more information about the K–12 curriculum guide of Project WILD, contact Project WILD or Council for Environmental Education at 5555 Morningside Drive, Suite 212, Houston, TX, or call (713) 520-1936 or fax (713) 520-8008, or e-mail at **info@projectwild.org** or **info@c-e-e.org**.

WOW! The Wonders of Wetlands: An Educator's Guide

https://sslserver.com/wetland.org/shop/mainpub.shtml?id=pub1 is the site that gives a review for this interdisciplinary wetlands' activity book for grades K–12 written in 1995 by Kesselheim and Slattery. This book includes more than 50 fun and effective learning activities for both indoor and outdoor use. These activities focus on water, soil, and plants and how they relate to wetlands. Check for availability at the ND Game and Fish Department.

Miscellaneous

http://www.enature.com/home/

This site lists more than 5,500 species of mammals, amphibians, reptiles, birds, insects, trees, fish, wildflowers, etc.

http://gf.nd.gov/hunting/

This site has live links to all wildlife and game hunted in North Dakota.

http://gf.nd.gov/fishing/

This site has live links to all types of fish found in North Dakota.

Web Links

Web links and children's literature relating to the habitats of North Dakota are available at **www.NDStudies.org**.

Wetlands Answers

Comprehension/Critical Thinking

This Answer Key includes answers to the Comprehension and Critical Thinking activities located throughout the ***Wetlands*** **Student Text**.

To locate answers for the Comprehension and Critical Thinking activities from the ***Wetlands*** **Student Text**, refer to the footer. The information in the footer will align with the page in the ***Wetlands*** **Student Text**. For example, the answers for the Comprehension and Critical Thinking activity on page 3 of the ***Wetlands*** **Student Text** will be indicated as follows:

Discussion, Vocabulary, and Magic Square

The answers for the discussion, vocabulary, and magic square activities found in this **Teacher Resource Guide** follow the Comprehension and Critical Thinking activity answers.

To locate the answers for activity B1, for example, simply refer to the footer in the Answer Key. Answers for B1 will be indicated as B1.

Comprehension

1. **Name three common characteristics of wetlands.**
   water; wetland soil called hydric soil; plants that can live in water

2. **How were most of the wetlands in North Dakota formed?**
   from the action of glaciers

3. **Which glacier shaped the surface of almost all of North Dakota? How long ago did it leave the state?**
   Wisconsinan glacier; 12,000 years ago

4. **The Prairie Pothole Region is known for what?**
   rolling hills and millions of potholes

5. **Name the seven main states and provinces included in the Prairie Pothole Region.**
   North Dakota, South Dakota, Minnesota, Iowa, Alberta, Manitoba, Saskatchewan

6. **The Prairie Pothole Region produces more what than any other place in the world?**
   waterfowl

Critical Thinking

1. **Describe what you think North Dakota may have looked like if glaciers had not entered the area.**
   Answers will vary.

Comprehension

1. **Name the four major types of wetlands.**
   temporary, seasonal, semi-permanent, permanent

2. **Temporary wetlands provide what primary food supply for migrating birds?**
   aquatic insects

3. **In what way can most seasonal wetlands be used by farmers?**
   for pasture or hay land

4. **Name five important functions of semi-permanent wetlands.**
   habitat for wildlife; nesting areas for water birds; cover for broods; nesting places for migrating birds; food sources for birds and other wildlife

5. **What do many permanent wetlands contain that other wetlands do not?**
   fish

6. **What two forms of wetlands do not receive their water from precipitation? How do they get their water?**
   fens and bogs; from groundwater seepage

7. **Name the three major natural regions of North Dakota. Which region has the fewest wetlands? Why?**
   Red River Valley, Drift Prairie, Missouri Plateau; Red River Valley has the fewest; it is so flat

8. **What are small lakes called that were formed when a crooked river straightened out?**
   oxbow lakes

9. **Which natural region has the most wetlands?**
   Drift Prairie

10. **What is the Drift Prairie sometimes called?**

    Glaciated Plains

11. **What is the eastern part of the Missouri Plateau called? How was this area formed?**

    Missouri Coteau; formed by the melting Wisconsinan glacier

12. **What part of North Dakota was not shaped by the Wisconsinan glacier? How was this area formed?**

    Badlands; carved out of the landscape by water erosion from the Little Missouri River and thousands of years of wind erosion

Critical Thinking

1. **Explain why a farmer might be taking a risk by planting crops in a dry temporary wetland.**

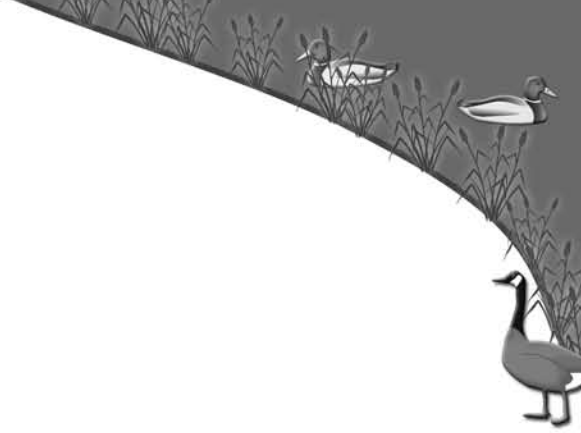
   Heavy rains could fill the temporary wetland, and the crops would be flooded.

2. **Explain why saline wetlands do not have vegetation zones.**

   Salt kills vegetation.

3. **Explain why the Red River Valley is so flat.**

   Answers may vary. It is the floor of a lakebed. Sediment from the lakebed filled the low places and made the whole area level.



Comprehension

1. **Name North Dakota's waterfowl.**
   ducks, geese, swans

2. **What are characteristics of waterfowl?**
   dependant on wetlands, webbed feet, and water-repellent feathers

3. **What is the migration route through North Dakota called?**
   the Central Flyway

4. **Name the two main classifications of ducks.**
   dabbling ducks, diving ducks

5. **Which dabbler is a perching duck?**
   wood duck

6. **Which type of duck seems awkward walking on land? Why?**
   diving duck; its feet are set back so far on the body

7. **Which ducks catch fish?**
   mergansers

8. **How do ducks and geese differ in their eating habits?**
   Ducks almost always feed in the water; geese are land grazers that eat grasses and grains.

9. **What are the largest waterfowl in the state?**
   swans

10. **What law makes it illegal to harm or possess certain birds?**
    the Migratory Bird Treaty Act

11. **Which bird looks something like a duck except it has a thin, pointed bill and lobed toes?**
    grebe

12. **What law gives special protection to animals that are in danger of becoming extinct?**

    the Endangered Species Act

13. **Name three songbirds that depend on wetland habitats.**

    yellow-headed blackbird, marsh wren, red-winged blackbird

Critical Thinking

1. **North Dakota has a hunting season for sandhill cranes but not for whooping cranes. Why is there no hunting season for whooping cranes?**

   Answers will vary. Whooping cranes are protected under the Endangered Species Act. At one time, they were almost extinct.

Comprehension

1. What class of animals has a tadpole stage with gills and an adult stage with lungs?
   amphibians
2. Which North Dakota tiger is less than 1 foot long?
   tiger salamander
3. What group of animals can be good indicators of environmental pollutants?
   amphibians—frogs, salamanders, toads
4. What is the most common snake in North Dakota?
   garter snake
5. Name the wetland furbearing mammals in North Dakota.
   muskrat, mink, beaver, raccoon
6. What are three important gamefish of prairie wetlands in North Dakota?
   northern pike, perch, walleye
7. What is the state fish of North Dakota? What length and weight can this fish reach?
   northern pike; 4 feet in length, over 30 pounds
8. To what fish family do largemouth bass belong?
   sunfish family
9. What is the transfer of energy from one species to another called?
   the food chain or food web

Critical Thinking

1. People in North Dakota do not eat mink. Explain how a dead mink can help provide food for people.
   Answers will vary. It decomposes and goes back into the soil to provide nutrients for plants that people eat.

Comprehension

1. **Name five reasons North Dakota wetlands are important.**

   support wetland plants, animals, insects; control floods; improve water quality; recharge groundwater; public use

2. **What function do wetlands have when snow melts and heavy rain falls?**

   they store water

3. **What is a resource that can be used but does not get used up called?**

   renewable resource

4. **Water seeping into the ground to keep aquifers filled is called what?**

   recharging groundwater

5. **Where does water come from for cities, farms, ranches, and industries?**

   wells are dug into the water table

6. **Name some recreational activities involving wetlands.**

   waterfowl hunting, fishing, trapping, canoeing, bird-watching, wildlife viewing, wetland photography

Critical Thinking

1. **Pretend you are a teacher taking your students on a field trip to a wetland. What lessons would you teach them in this "outdoor classroom"?**

   Answers will vary.

Comprehension

1. What has happened to North Dakota wetlands in the past 100 years? Most of them were taken for what?

   almost half have been lost; agriculture

2. What happens if one part of an ecosystem is destroyed?

   It has an effect on everything else in that community.

3. What problems occur when nutrients and soil are carried to rivers and lakes?

   algae bloom, or uncontrolled growth of algae kills aquatic plants and fish

   sedimentation which eventually fills lakes with soil leading to shallow water and poor fish habitat

4. Name serious consequences that can occur when wetlands are destroyed or abused.

   more flooding, poorer water quality, pollution, decrease in wildlife

5. Why was the National Blue Heron Award given to the North Dakota Game and Fish Department?

   for preserving wetlands

6. What is the first step in helping with wetland management and protection?

   becoming educated about conserving wetlands

7. What do wetland activities bring into the state each year?

   millions of dollars

Critical Thinking

1. Explain why the loss of wetlands can threaten some species with extinction.

   Answers will vary. Certain species depend on wetlands for their habitats, or food, water, shelter, and space. Without the wetlands, they would not survive.

Wetlands
Discussion Questions

1. **Explain how the Wisconsinan glacier changed the landscape of North Dakota.**
   - ➤ It acted like a giant bulldozer, scraping the land and moving huge amounts of Earth.

2. **Describe the Prairie Pothole Region. What does it include?**
   - ➤ rolling hills and millions of potholes; covers about 300,000 square miles
   - ➤ includes large parts of Alberta, Saskatchewan, Manitoba, North Dakota, South Dakota, Minnesota, Iowa

3. **Why is the southwestern part of North Dakota not part of the Prairie Pothole Region?**
   - ➤ Wisconsinan glacier did not cover that area

4. **Explain the differences between the four major types of wetlands.**
   - ➤ temporary—usually dry out in early June
   - ➤ seasonal—usually dry out in the middle of July; two vegetation zones
   - ➤ semi-permanent—generally hold water all year, except during very dry years; three vegetation zones
   - ➤ permanent—hold water all year; quite large and deep; four zones

5. **Explain why broods need wetlands.**
   - ➤ Wetlands contain certain foods needed by the young birds to grow quickly.

6. **Explain the difference between fens and bogs.**
   - ➤ Bogs contain dead plant material (peat); fens do not.

7. **Explain how the Red River Valley was formed.**
   - ➤ scraped by glacier; floor of ancient Lake Agassiz

8. **Explain what oxbow lakes are. In which region of the state are they commonly found?**
   - ➤ Small lakes formed when a crooked river straightened out, and the U-shaped curves became separated from the river.
   - ➤ Red River Valley

9. **Describe the Missouri Coteau.**
   - ➤ eastern part of Missouri Plateau; hilly; contains larger, deeper, and more permanent wetlands than any other part of the state

10. **Explain why the Badlands do not contain the types of wetlands found in other parts of the state.**
    - ➤ They were not shaped by glaciers, but by water and wind erosion.

Wetlands Wildlife
Discussion Questions

1. **Why are wetlands sometimes called "nurseries of life"?**
   - Countless numbers and different kinds of wildlife are raised there.

2. **Explain what invertebrates are and why they are essential members of the food chain.**
   - animals without backbones
   - Millions of waterfowl and shore birds depend on them as a major food source.

3. **What are waterfowl?**
   - wetland birds that may be harvested by hunters
   - dependent on wetlands; have webbed feet and water-repellent feathers

4. **Explain the difference between dabbling ducks and diving ducks.**
   - dabbling ducks—legs centered on the body; nest in grasslands; feed in shallow water or on land; can fly straight up out of the water
   - diving ducks—legs set farther back on the body; nest on floating platforms of vegetation in the water; get their food by diving to the bottom of ponds or lakes; must run across the surface of the water to get started flying

5. **Describe mergansers.**
   - catch fish; bodies much like divers; long, thin bills with rough, tooth-like edges

6. **Describe differences between ducks and geese.**
   - geese—larger bodies, longer neck and legs than ducks
   - Male and female geese have the same coloring; male and female ducks are colored differently from each other.
   - Geese are land grazers; ducks almost always feed in the water.
   - Goose call is a honk; duck call is a quack.
   - Geese have more webbing between their toes than ducks.
   - Both goose parents care for young; only one duck parent cares for the young.
   - Geese mate for life; ducks pick a new mate every year.
7. **Describe swans.**
   - largest waterfowl in the state; eat water plants and use their long necks to reach plants underwater
8. **Explain why pelicans are not classified as waterfowl.**
   - They belong to a different family.
9. **How do cranes and herons fly differently?**
   - Cranes fly with necks stretched forward; herons fly with necks in an S-shape.
10. **What are shore birds?**
    - small to medium-sized wetland birds with long legs
11. **Describe plovers.**
    - shore birds with large eyes, short necks, thick bills
12. **What is the Endangered Species Act?**
    - law that gives special protection to animals that are in danger of becoming extinct
13. **What are amphibians?**
    - cold-blooded animals that lay their eggs either in water or on moist land near water
    - have gills and live in water during the tadpole stage

14. **Why are aquatic insects so important?**
    - serve as a major food supply for migrating birds and early-nesting birds
    - help keep wetlands clean by eating dead plant and animal material in the water
    - filter particles from water which allows sunlight to reach plants on the bottom
    - Some help control the mosquito population.
15. **Explain why muskrats sometimes eat their homes.**
    - The walls of their "huts" are made of cattail roots and other plants. These can serve as a food supply during the winter.

16. **Describe the northern pike.**
    - can be 4 feet long and weigh over 30 pounds
    - have a pointed snout and one dorsal fin set near the tail
    - yellow-green with horizontal body spots
    - large, strong jaw with teeth
17. **Describe the walleye.**
    - member of perch family
    - olive color with dark blotches on sides; white belly
    - can be 30 inches long and weigh 15 pounds
    - two dorsal fins, separated
18. **Describe the yellow perch.**
    - yellow-green with 6 to 8 dark horizontal bars on body
    - can be 14 inches long and weigh 2 pounds
    - two dorsal fins, separated
19. **What is a food chain?**
    - a transfer of energy from one species to another
    - begins with plants and cycles through various animal species and back to plants

The Importance of Wetlands
Discussion Questions

1. **Why have the wetlands of North Dakota been called a "national treasure"?**
   - A large variety and countless number of plants, animals, and insects depend on wetland environments.

2. **Explain how wetlands help control floods.**
   - Wetlands are natural water storage areas that slowly release the water into the air or drain water into the groundwater table.
   - Wetlands reduce the amount of water that would otherwise quickly drain to rivers and lakes, causing them to flood.

3. **Explain how wetlands help improve water quality.**
   - Pollutants are filtered out of the water by plants which absorb the pollutants.

4. **What is erosion? Sedimentation? Nutrification?**
   - erosion—large amounts of soil are carried from the fields
   - sedimentation—washing of soil from fields into wetlands, making the wetlands more shallow
   - nutrification—nutrients from fertilizers, manure, or soil are carried to wetlands, resulting in algae blooms

5. **Explain the difference between surface water and groundwater.**
   - surface water—water located on the surface of the land in rivers, lakes, and other wetlands
   - groundwater—water located under the ground in aquifers

6. **Describe the water cycle.**
   - ➤ Energy from the sun heats water on Earth; water rises into the air in the form of water vapor; water vapor forms clouds; water from clouds falls back to the earth.

7. **Explain how wetlands can create more precipitation.**
   - ➤ The more water there is to evaporate, the more water will fall back to the earth.

8. **Describe some public uses for wetlands.**
   - ➤ recreation—waterfowl hunting, fishing, trapping, swimming, boating, canoeing, bird-watching, wildlife viewing, taking photographs
   - ➤ outdoor classrooms—school field trips to wetlands

9. **Explain what has happened to North Dakota wetlands over the past century.**
   - ➤ Almost half of the wetlands have been destroyed through agriculture, construction, and other human activities.

10. **Explain why protecting wetland ecosystems is necessary.**
    - ➤ If one part of an ecosystem is destroyed, everything else in that community is affected.

11. **Explain the significance of wetlands.**
    - ➤ necessary for flood control, water quality, recharging groundwater, pollution control, public use, and maintaining wildlife populations

Wetlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ aquatic
- ☐ bog
- ☐ brood
- ☐ cattails
- ☐ fen
- ☐ glacier
- ☐ habitat
- ☐ marsh
- ☐ Missouri Coteau
- ☐ permanent wetlands
- ☐ potholes
- ☐ Prairie Pothole Region
- ☐ rushes
- ☐ saline
- ☐ seasonal wetlands
- ☐ sedges
- ☐ semi-permanent wetlands
- ☐ temporary wetlands
- ☐ wetland
- ☐ Wisconsinan glacier

WETLANDS

1. Basin, or low area of land, that holds water

wetland

WETLANDS

2. Gigantic mass of ice thousands of feet thick

glacier

WETLANDS

3. Last glacier that moved over North Dakota; covered all of North Dakota except for the southwest corner

Wisconsinan glacier

WETLANDS

4. Low spots in the ground where water collects

potholes

Wetlands
Vocabulary and Definitions

WETLANDS

5. About 300,000-square-mile area carved by Wisconsinan glacier; known for its rolling hills and millions of potholes

Prairie Pothole Region

WETLANDS

6. Permanent wetland that contains a lot of peat, or dead plant material; receives its water from groundwater seepage

bog

WETLANDS

7. Environment that provides the food and shelter for an animal to make its home

habitat

WETLANDS

8. Shallow depressions that hold water from melting snow or heavy rain; usually dry out in early June

temporary wetlands

WETLANDS

9. Refers to water

aquatic

WETLANDS

10. Depressions that usually contain water from the time of snowmelt until the middle of July; consist of two vegetation zones

seasonal wetlands

WETLANDS

11. Look like grasses, except they have solid stems

sedges

WETLANDS

12. Plants with hollow stems that may have a pithy (sponge-like) center

rushes

Wetlands
Vocabulary and Definitions

WETLANDS

13. Area of low, soggy land containing grass-like vegetation

marsh

WETLANDS

14. Baby birds hatched together

brood

WETLANDS

15. Basins that generally hold water all year, except during very dry years; consist of three vegetation zones

semi-permanent wetlands

WETLANDS

16. Tall marsh plants with seeds embedded in the thick, brown tops of the plant

cattails

WETLANDS

17. Basins that hold water all year long; consist of four zones

permanent wetlands

WETLANDS

18. Salty

saline

WETLANDS

19. Eastern part of Missouri Plateau; contains more semi-permanent wetlands than any other area of the state

Missouri Coteau

WETLANDS

20. Permanent wetland that receives its water from groundwater seepage; often high in alkaline (salt)

fen

Wetlands Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ amphibian
- ☐ anglers
- ☐ carnivore
- ☐ Central Flyway
- ☐ cob
- ☐ cygnet
- ☐ dabbling duck
- ☐ diving duck
- ☐ drake
- ☐ food chain
- ☐ gamefish
- ☐ gander
- ☐ hen
- ☐ invertebrates
- ☐ merganser
- ☐ Migratory Bird Treaty Act
- ☐ pen
- ☐ waterfowl

WETLANDS WILDLIFE

1. Animals without backbones

invertebrates

WETLANDS WILDLIFE

2. Wetland birds that may be hunted

waterfowl

WETLANDS WILDLIFE

3. Route of migrating birds that passes through North Dakota

Central Flyway

WETLANDS WILDLIFE

4. Feeds in shallow water or on land; tips forward in the water to get food; flies straight up out of the water; also called "puddle duck"

dabbling duck

Wetlands Wildlife
Vocabulary and Definitions

WETLANDS WILDLIFE

5. Male duck

drake

WETLANDS WILDLIFE

6. Female bird

hen

WETLANDS WILDLIFE

7. Gets food by diving to the bottom of a pond or lake; excellent underwater swimmer, but awkward walker on land

diving duck

WETLANDS WILDLIFE

8. Duck that catches fish

merganser

WETLANDS WILDLIFE

9. Male goose

gander

WETLANDS WILDLIFE

10. Male swan

cob

WETLANDS WILDLIFE

11. Female swan

pen

WETLANDS WILDLIFE

12. Young swan

cygnet

Wetlands Wildlife
Vocabulary and Definitions

13. Law that makes it illegal to harm or possess most species under the protection of the law

Migratory Bird Treaty Act

14. Cold-blooded animal that lays its eggs in water or on moist land; has a tadpole stage with gills and an adult stage with lungs

amphibian

15. Meat eater

carnivore

16. Fish caught by anglers

gamefish

17. People who fish

anglers

18. Transfer of energy from one species to another; begins with plants that are formed by energy from the sun

food chain

The Importance of Wetlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ algae
- ☐ aquifer
- ☐ conservation
- ☐ ecology
- ☐ ecosystem
- ☐ groundwater
- ☐ natural resource
- ☐ surface water
- ☐ water quality
- ☐ water table

IMPORTANCE OF WETLANDS

1. Tells how clean or polluted water is

water quality

IMPORTANCE OF WETLANDS

2. Green plant-like organisms that grow in wet areas

algae

IMPORTANCE OF WETLANDS

3. A supply of something useful that comes from nature

natural resource

IMPORTANCE OF WETLANDS

4. Water located on the surface of the land in rivers, lakes, and wetlands

surface water

IMPORTANCE OF WETLANDS

5. Water that is found under the surface of the ground

groundwater

IMPORTANCE OF WETLANDS

6. Natural storage area for groundwater

aquifer

The Importance of Wetlands
Vocabulary and Definitions

IMPORTANCE OF WETLANDS

7. Top of an aquifer; water is obtained by drilling wells into this

water table

IMPORTANCE OF WETLANDS

8. The study of the interactions that living things have with other living things and with their environment

ecology

IMPORTANCE OF WETLANDS

9. An area that contains organisms (living things) interacting with one another and with their non-living environment

ecosystem

IMPORTANCE OF WETLANDS

10. Preserving natural resources by careful use and management of the resources

conservation

NAME _____

Wetlands
Magic Square Vocabulary

Select the best answer for each of the Wetlands terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers is the same across and down, you have found the magic number!

A. waterfowl
B. habitat
C. potholes
D. marsh
E. cattails
F. aquifer
G. temporary wetlands
H. water table
I. wetland
J. Central Flyway
K. semi-permanent wetlands
L. Missouri Coteau
M. seasonal wetlands
N. permanent wetlands
O. Prairie Pothole Region
P. conservation

C 16	A 2	M 3	K 13
E 5	H 11	D 10	N 8
F 9	J 7	G 6	B 12
L 4	I 14	P 15	O 1

Magic Number = 34

Wetlands Matching

Write the letter of the term from Column B that matches the definition in Column A. (Each letter will be used only once.)

	Column A	Column B
J	1. Water that is found under the surface of the ground	A. algae
M	2. These look like grasses, except they have solid stems.	B. aquatic
L	3. A term that means "salty"	C. bog
O	4. Water that is located on the surface of the land in the form of rivers, lakes, and wetlands	D. brood
I	5. Fish caught by anglers	E. ecology
K	6. Plants with hollow stems that may have a sponge-like center	F. ecosystem
F	7. An area that contains organisms (living things) interacting with one another and with their non-living environment	G. fen
N	8. Low spots in the ground where water collects	H. food chain
A	9. A green, plant-like organism that grows in wet areas	I. gamefish
G	10. A permanent wetland that receives its water from groundwater seepage and that is often high in alkaline	J. groundwater
C	11. A permanent wetland that contains a lot of peat, or dead plant material, and receives its water from groundwater seepage	K. rushes
E	12. The study of the interactions that living things have with other living things and their environment	L. saline
H	13. A transfer of energy from one species to another	M. sedges
D	14. Group of young birds from the same nest	N. potholes
B	15. A term that refers to "water"	O. surface water

Prairie Answers

Comprehension/Critical Thinking

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Discussion, Vocabulary, and Magic Square

The answers for the discussion, vocabulary, and magic square activities found in this **Teacher Resource Guide** follow the Comprehension and Critical Thinking activity answers.

To locate the answers for activity B1, for example, simply refer to the footer in the Answer Key. Answers for B1 will be indicated as B1.

Comprehension

1. **Name the three major natural regions of North Dakota. Where is the Missouri Coteau located? What part of the state was not formed by the Wisconsinan glacier?**

   Red River Valley, Drift Prairie, Missouri Plateau; eastern part of Missouri Plateau; Badlands

2. **Name four conditions that enabled prairie grasses, but not trees and other woody plants, to survive.**

   low amounts of precipitation; long, cold winters, hot summers, and strong winds; frequent fires; grazing animals

3. **What has significantly decreased the populations of ground-nesting birds in North Dakota?**

   the disappearance of native prairie

4. **What are the three types of prairies in North Dakota? What determined the type of prairie that developed in each part of the state?**

   tallgrass prairie, mixed-grass prairie, shortgrass prairie; the amount of precipitation the region receives and the fertility of the soil

Critical Thinking

1. **French trappers and explorers used the term "sea of grass" to describe the prairies. What other terms might have been fitting for them to use? Explain.**

   Answers will vary.

Comprehension

1. How much tallgrass prairie was in North Dakota before Euro-Americans came? How much remains?
   320,000 acres; less than 300 acres

2. How tall do native tallgrass species get?
   6 to 7 feet

3. How do sod-forming grasses spread? How do bunch grasses spread?
   sod-forming send out horizontal stems both above and below the surface of the ground; bunch grasses spread by seeds

4. How was humus built up in the soil? Which region of the state has the most fertile soil?
   as grasses and forbs died, they decomposed and returned to the soil; Red River Valley

5. What were bonanza farms?
   gigantic wheat farms that ranged in size from 3,000 acres to over 75,000 acres

6. What is one of the most endangered habitat types in the world? Where in North Dakota is most of this habitat type located?
   tallgrass prairie; Sheyenne National Grassland

Critical Thinking

1. Why was the tallgrass prairie the first prairie type to be destroyed in North Dakota?
   It had the most fertile farmland.

Comprehension

1. Name the national grassland that is made up mainly of mixed-grass prairie. Where is it located?
   Cedar River National Grassland; Sioux County

2. What is the official state grass of North Dakota? What kind of grass is it?
   western wheatgrass; sod-forming grass

3. What types of grasses are found in mixed-prairie regions?
   sod-forming grasses and bunch grasses
4. What percent of North Dakota was covered by mixed-prairie grasses before Euro-Americans started breaking up the sod? What percent exists today?
   85 percent; 30 percent
5. What is the main activity on much of North Dakota's mixed-grass prairie today?
   cattle ranching
6. Why was the prairie not overgrazed when herds of bison grazed?
   The herds never stayed on a piece of prairie very long.

7. Name one species of shortgrass. How tall does this species get? How are shortgrass prairies used by ranchers?
   blue grama; 3 to 7 inches; rangeland for grazing cattle

8. What is the largest grassland in the United States? What national attraction is located within this grassland?
   Little Missouri National Grassland; Theodore Roosevelt National Park

Critical Thinking

1. Explain why national grasslands are so important.
   Answers will vary. Grasslands are important to preserve existing native prairie, and they are available for all the public to use and enjoy.

Comprehension

1. What features enable forbs to get enough moisture from the prairie?

   deep roots, thick leaves

2. What is the earliest-blooming spring forb in North Dakota?

   prairie crocus

3. What is the official state flower of North Dakota? Where does it grow? How was it used by Plains Indians? How is it used today?

   wild prairie rose; along roadsides and in pastures all over the state; as food and as treatment for illnesses; in tea, as vitamin supplements, in air fresheners

4. What is the scientific name for purple coneflower? How is it used today?

   Echinacea; as a health supplement to prevent colds and to strengthen the immune system

5. Which plant is necessary in the life cycle of Monarch butterflies? Why do grazing animals not eat Monarch butterfly caterpillars?

   showy milkweed; milkweed eaten by the caterpillars makes them taste bad to birds

6. Name the three stages in metamorphosis of the Monarch butterfly.

   larva, chrysalis, adult

7. How are plants pollinated?

   Bees and other insects carry pollen on their legs from plant to plant.

Critical Thinking

1. For how many years has the wild prairie rose been the official state flower of North Dakota?

   Subtract 1907 from the current year.

Comprehension

1. Name the largest land animal on the continent of North America.

   American bison

2. Name the large game animals of North Dakota.

   elk, white-tailed deer, mule deer, pronghorn

3. What makes the red fox look larger than it actually is?

   long, bushy tail and thick fur coat

4. What has sometimes been referred to as a prairie wolf? Why is this a misname?

   coyote; coyotes are not wolves

5. What is the first thing that skunks will do when trying to escape predators?

   turn around and run away

6. Which prairie carnivore is noted for its fierce nature?

   badger

7. Name the three types of ground squirrels that live in North Dakota. Which two are curious and stand upright to look around?

   Richardson's ground squirrel, thirteen-lined ground squirrel, Franklin's ground squirrel; Richardson's ground squirrel and thirteen-lined ground squirrel

8. Before North Dakota's official nickname was adopted, what was the nickname that was related to an animal? What is the actual name of that animal?

   the Flickertail State; Richardson's ground squirrel

9. **What are the "pockets" on pocket gophers? For what are they used?**
   fur-lined pouches on the outsides of their cheeks; used for carrying seeds and other vegetation to their burrows

10. **What is unusual about a pocket gopher running in its burrow?**
    It can run backward just as fast as it can run forward.

11. **How was the white-tailed jackrabbit misnamed?**
    It is not a rabbit but a hare.

12. **Why do cottontails need to give birth to so many rabbit kittens each year?**
    Most of the rabbits do not survive.

13. **How do the coats of both the jackrabbit and weasel change in response to shortened daylight hours during the winter?**
    Their brown coats are replaced by white coats.

14. **What is the difference between voles and mice?**
    Voles have shorter faces, shorter ears, and shorter tails than mice.

Critical Thinking

1. **Are bison more like water buffalo or like goats? Explain.**
   They are more like goats; bison are part of the same family as cattle and goats but are not related to the buffalo family.

Comprehension

1. How are reptiles and amphibians alike?
   They are both ectotherms.

2. What three types of reptiles live in North Dakota?
   snakes, turtles, and lizards

3. How does the smooth green snake camouflage itself?
   It either freezes or lifts its body up and sways with the grass.

4. Which lizard is so shy that it is seldom seen by people?
   prairie skink

5. How can the Great Plains toad be recognized? Which toad has eye pupils that are vertical?
   by the large, dark, warty spots on its back; plains spadefoot toad

6. Why do toads lay their eggs in the water? What happens to most of the tadpoles before they go through metamorphosis?
   They are amphibians; they die.

Critical Thinking

1. Which would you rather get close to—a skink or a skunk? Explain.
   Answers will vary.

Comprehension

1. Name the three species of the grouse family found on the prairie. What is the habitat of each?

   greater prairie chicken—tallgrass prairie; sharp-tailed grouse—mixed-grass and shortgrass prairies; sage grouse—sage brush

2. What adaptations do sharp-tailed grouse have on their bodies that help them adapt to cold, snowy climates?

   feathers on legs to keep them warm, projections on feet to enable them to walk on top of snow

3. Who identified 11 new species of birds in North Dakota in 1843? Which of these birds was not identified again for almost 30 years? What North Dakota feature was named after this naturalist?

   John James Audubon; Baird's sparrow; Lake Audubon

4. Which bird looks as if it is wearing a collar? What is a toe with a long, sharp claw called?

   chestnut-collared longspur; a spur

5. What four types of birds make up the raptors of North Dakota?

   eagles, hawks, falcons, owls

6. Which two hawks are more common on the prairie today than they were 100 years ago? Why?

   red-tailed hawk, Swainson's hawk; nest in trees, which were rare on the prairie 100 years ago

7. What three owl species live on the North Dakota prairies? Which are the first to begin nesting in the spring? Which nest underground?

   great horned owl, short-eared owl, and burrowing owl; great horned owl; burrowing owl

Critical Thinking

1. If you had a chance to pick the state bird of North Dakota, would you pick the one that was adopted as the state bird, or would you pick a different one? Explain.

   Answers will vary.

Comprehension

1. Name some recreational activities enjoyed by people on the prairies.
   hunting, camping, picnicking, bird-watching, viewing wildlife, sight-seeing, taking photographs

2. What happened as prairie land was plowed for planting crops?
   Wildlife habitat was destroyed.

3. What are negative consequences of prairies being destroyed or mismanaged?
   air pollution, poorer soil and water quality, lower wildlife populations, decrease in the state's economy

4. What are the prairie conservation goals?
   enhancing wildlife habitat, preventing soil erosion, maintaining high-quality grasslands for grazing, restoring prairie, ecosystems to serve the public

5. What does the Conservation Reserve Program do? What is happening to this program? How does this affect wildlife?
   CRP pays farmers for planting grass on land that had been plowed for crop-raising. It is shrinking. Wildlife populations will decline.

6. How do people and communities benefit from prairies?
   clean air, clean water, good soil, income

Critical Thinking

1. Explain why insects are so important to prairie game bird hunters.
   Insects are a major part of the food chain for game birds.

2. North Dakota has very little forested land. Explain why the U.S. Forest Service is so important to North Dakota.
   The U.S. Forest Service is in charge of managing the National Grasslands.

Prairie
Discussion Questions

1. **How was the North Dakota prairie created?**
   - ➤ The Wisconsinan glacier scraped the land and moved huge amounts of earth creating flat and rolling plains on which grassland developed over time.

2. **Explain how the meaning of the word "prairie" changed from the original French meaning.**
   - ➤ "Prairie" originally meant a grassy clearing in a forest; it now means a large, treeless region covered with grasses and forbs.

3. **Why did grasslands rather than forests develop in North Dakota?**
   - ➤ The area did not get enough precipitation for forests to develop.

4. **Explain why grazing animals were important for maintaining healthy grasslands.**
   - ➤ They ate the tops off the plants, which resulted in new growth that was thicker and had more nutrients than the old growth.

5. **Explain the difference between sod-forming grasses and bunch grasses.**
   - ➤ Sod-forming grasses spread by sending out horizontal stems both above and below the surface of the ground; bunch grasses grow in bunches and are spread by seeds.

6. **Explain why the soil of the Red River Valley became more and more fertile.**

   ➤ **When the grasses and forbs died, they decomposed and returned to the soil, building up more and more humus. Humus makes the soil fertile.**

7. **Describe western wheatgrass.**

   ➤ **It is a sod-forming grass that reaches a height of 1 to 3 feet. In the spring, it is tender and good for grazing; later in the summer, it becomes tough.**

8. **Explain why mixed-grass prairies did not suffer the almost total destruction that tallgrass prairies suffered.**

   ➤ **Some of the mixed-grass prairie is on land unsuitable for farming; others are in wetlands that do not dry out long enough for crops to be raised.**

9. **Describe the Little Missouri National Grassland.**

   ➤ **over 1 million acres of short and medium prairie grasses; largest grassland in the United States; not all connected; both Theodore Roosevelt National Park and White Butte are located within this grassland**

10. **Describe the metamorphosis of a butterfly.**

    ➤ **egg develops into a larva (caterpillar) that feeds on milkweed leaves; caterpillar enters a chrysalis for about two weeks; butterfly emerges from the chrysalis**

Prairie Wildlife
Discussion Questions

1. **Describe the bison.**
   - ➤ big head with short horns; a hump on its shoulders; shaggy, brown fur with a mane; beard under its chin; long tail with a tuft of hair at the end; bull stands up to 6 feet tall and weighs up to 1 ton; cow stands about 5 feet tall and weighs half a ton

2. **Explain what happened to the bison.**
   - ➤ When Euro-Americans began settling on the prairie, bison were slaughtered until they were almost extinct.

3. **Name and describe some mammal predators of the prairie.**
   - ➤ red fox—omnivore; strong senses of hearing and smell; long, bushy tail and thick fur coat make it look bigger than it is; young are born in underground dens
   - ➤ coyote—sometimes called "prairie wolf," but is not a wolf; larger than foxes; diet mostly small mammals, but also eats insects, reptiles, fruit, and carrion
   - ➤ striped skunk—heavy-bodied with short legs; black body contains two white stripes; mainly nocturnal; runs away from threats but also sprays a strong-smelling fluid when threatened
   - ➤ American badger—carnivore; short legs and wide, flat body; excellent digger; has underground dens with extensive tunnels; noted for fierce nature

4. **Explain how pocket gophers got their name.**
   - ➤ They have fur-lined pockets on the outsides of their cheeks, used for carrying seeds.

5. **Name and describe the three types of ground squirrels found in North Dakota.**
   - Richardson's ground squirrel—diurnal; omnivore; got nickname "flickertail" because the tail constantly flicks; curious and stands upright to check surroundings
   - thirteen-lined ground squirrel—diurnal; most common ground squirrel in the state; has a pattern of dark and light stripes extending down its back; not a gopher, but sometimes misnamed "striped gopher"; curious and stands upright to check surroundings
   - Franklin's ground squirrel — larger than other North Dakota ground squirrels; found mainly in tallgrass regions; diurnal; flees to its burrow when it sees something unusual
6. **Explain how the pocket gopher keeps from getting dirt in its mouth while digging.**
   - It can close its lips behind the teeth.
7. **Describe a winter adaptation of both the jackrabbit and the weasel.**
   - brown coat is replaced by white coat for camouflage in the snow
8. **Explain the differences between rabbits and hares.**
   - rabbits—born hairless and blind; need parents' care for 4 to 5 weeks after birth; have shorter ears and hind legs than hares; weigh up to 4 pounds; live in colonies; usually live in burrows; stay the same color year round; freeze in place or run to burrow when threatened
   - hares—born with fur and open eyes; able to move around and feed on their own after birth; long ears and long, powerful hind legs; weigh up to 9½ pounds; live alone; live on the surface of the ground; brownish-gray in summer, white in winter; escape predators by outrunning them

9. **Explain how voles are different from mice.**
   - Voles have shorter faces, shorter ears, and shorter tails than mice.

10. **Explain the differences between reptiles and amphibians.**
   - reptiles—scaly skin; claws on toes; lay eggs on land; young hatch on land and breathe through lungs; live on land; dry skin
   - amphibians—smooth skin; no claws; lay eggs in water; young hatch as larvae in water and get oxygen through gills; live part of life in water and part on land; moist skin

11. **Describe the metamorphosis of an amphibian.**
   - Egg that is laid in water develops into a larva (tadpole); tadpole develops into the adult amphibian.

12. **Name and describe the lizard found on the North Dakota prairie.**
   - Prairie skink lives in sandy areas in grasslands in the eastern part of the state; it is so secretive that people seldom see it.

13. **Explain why the population of greater prairie chickens has dropped so drastically.**
   - Tallgrass prairie was destroyed when the land was plowed for farming. Without tallgrass prairie habitat, the greater prairie chicken cannot survive.

14. **Describe the difference between the way native sharp-tailed grouse and non-native ring-necked pheasants respond to a snowstorm.**
   - Sharp-tailed grouse form a snow shelter to stay warm; pheasants stand out in the storm and die from exposure or starvation.

15. **Describe the mating dance of the greater prairie chicken.**

- Each spring, several males gather on a lek, fluff out their feathers and fan their tails; make a booming sound with air sacs in their necks; strut, bounce, leap, and stomp their feet; voices make a hoot sound that can be heard up to 2½ miles.

16. **Name and describe some prairie songbirds.**

- Western meadowlark—state bird of North Dakota; perches on fence posts; familiar song that is a sign of spring
- lark bunting—medium-sized sparrow with a large, white patch on its wings; changes its color according to the season; build cup-like nests in the grass
- bobolink—only American bird that has white on its back and a black underside; has a yellow patch on the back of the neck; migrates to southern hemisphere
- horned lark—two small feather tufts that look like horns; black stripes on each side of the head that meet below the eyes; walks or runs rather than hops
- grasshopper sparrow—part of its song sounds like the buzz of a grasshopper; eats mostly grasshoppers and crickets
- chestnut-collared longspur—male has a red band on its neck that looks like a collar; back toe and nail (spur) is about twice as long as front toes

17. **Explain how raptors help maintain the balance of nature.**

- They control the population of rodents.

18. **Describe the American kestrel.**

- most common falcon on the North Dakota prairies; about the size of a robin; smallest falcon in North America; nests in dead tree cavities; eats grasshoppers, crickets, and mice

The Importance of Prairies
Discussion Questions

1. **How do prairies help prevent air pollution?**
   - ➤ Living plants trap and remove pollutants, such as toxic chemicals, from the air.

2. **Explain how prairies help prevent soil erosion.**
   - ➤ Thick matting of plant roots and surface entanglements of plants hold the soil in place.

3. **Explain how prairies help keep lakes and other wetlands clean.**
   - ➤ Prairie grasses prevent soils and nutrients from entering wetlands.

4. **Explain how bio-accumulation affects raptors and other wildlife high on the food chain.**
   - ➤ So much chemical accumulates in the bodies of the prey that it can kill raptors and other predators.

5. **Contrast the North Dakota prairie before the late 1800s with the North Dakota prairies of today.**
   - ➤ Before the late 1800s—almost all of North Dakota was covered with grasslands.
   - ➤ Today—about 80 percent of the prairie is gone; over 95 percent is gone in the Red River Valley.

6. **Describe the drought period of the 1930s.**
   - ➤ **severe wind erosion—soils on plowed land dried up, became dust, and blew away in "black blizzards"**

7. **Explain why native prairie is still being converted to cropland today.**
   - ➤ **Farm crops bring in so much money that more land is broken up to plant crops.**

8. **Describe the effects of overgrazing.**
   - ➤ **Soil erosion occurs because not enough plants are left to hold down the soil. Exposed soil allows weeds to take over the area.**

9. **Explain how CRP helps wildlife.**
   - ➤ **Grass has been planted on land that was plowed. These grasslands become habitat for wildlife.**

10. **Explain why prairies are such valuable resources.**
    - ➤ **habitats and food sources for wildlife; clean air, clean water, good soil; income of millions of dollars each year**

Prairie
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ bonanza farms
- ☐ bunch grasses
- ☐ chrysalis
- ☐ ecosystem
- ☐ elevation
- ☐ forage
- ☐ forbs
- ☐ habitat
- ☐ humus
- ☐ metamorphosis
- ☐ mixed-grass prairie
- ☐ native
- ☐ pollen
- ☐ pollination
- ☐ prairie
- ☐ sod
- ☐ sod-forming grasses
- ☐ tallgrass prairie
- ☐ western wheatgrass
- ☐ Wisconsinan glacier

PRAIRIE

1. Last glacier that moved over North Dakota; covered all of North Dakota except for the southwest corner

Wisconsinan glacier

PRAIRIE

2. Large, treeless region covered with grasses and forbs

prairie

PRAIRIE

3. A powder produced by certain plants and must be carried from plant to plant in order for the plant to reproduce

pollen

PRAIRIE

4. Process of pollen being carried from one flower to another; carried out when pollen sticks to the legs of bees and other insects

pollination

Prairie
Vocabulary and Definitions

PRAIRIE

5. Naturally occurring

native

PRAIRIE

6. An area that contains organisms (living things) interacting with one another and with their non-living environment

ecosystem

PRAIRIE

7. Land height

elevation

PRAIRIE

8. Native prairie grasses that reach 6 to 7 feet in height; made up of several species of both sod-forming grasses and bunch grasses

tallgrass prairie

PRAIRIE

9. Grass-covered soil which is held together by matted roots

sod

PRAIRIE

10. Grasses that spread by sending out horizontal stems both above and below the ground; hold soil tightly together

sod-forming grasses

PRAIRIE

11. Grass species that grow in bunches, or clumps, and are spread by seeds; have extremely long roots

bunch grasses

PRAIRIE

12. Organic (from living things) matter in the soil

humus

Prairie
Vocabulary and Definitions

PRAIRIE

13. Environment that provides the food, water, shelter, and space for wildlife to make their homes

habitat

PRAIRIE

14. Gigantic wheat farms in eastern North Dakota begun in the 1870s; ranged in size from 3,000 acres to over 75,000 acres

bonanza farms

PRAIRIE

15. Combination of tallgrass and shortgrass species

mixed-grass prairie

PRAIRIE

16. Tough, native grass that once covered almost all of North Dakota; official state grass of North Dakota

western wheatgrass

PRAIRIE

17. Grass and other plants that grazing animals eat

forage

PRAIRIE

18. Native prairie wildflowers with deep roots

forbs

PRAIRIE

19. Cocoon, or protective case, that holds an insect as it is transforming from the larva stage to the adult stage

chrysalis

PRAIRIE

20. Process of changing from the larva stage to the adult stage; amphibians and some insects such as butterflies go through this process

metamorphosis

Prairie Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ carnivore
- ☐ carrion
- ☐ diurnal
- ☐ ectotherm
- ☐ furbearer
- ☐ game animals
- ☐ herbivore
- ☐ insectivore
- ☐ John James Audubon
- ☐ lek
- ☐ nocturnal
- ☐ omnivore
- ☐ raptor
- ☐ rodent

PRAIRIE WILDLIFE

1. Animals that may be hunted

game animals

PRAIRIE WILDLIFE

2. Animal that eats both plants and animals

omnivore

PRAIRIE WILDLIFE

3. Active at night

nocturnal

PRAIRIE WILDLIFE

4. Dead animals that have been killed by other animals, by vehicles, or from other accidents

carrion

PRAIRIE WILDLIFE

5. Active during the daytime

diurnal

PRAIRIE WILDLIFE

6. Plant eater

herbivore

Prairie Wildlife
Vocabulary and Definitions

PRAIRIE WILDLIFE

7. Animal harvested for its fur

furbearer

PRAIRIE WILDLIFE

8. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

ectotherm

PRAIRIE WILDLIFE

9. Meat eater

carnivore

PRAIRIE WILDLIFE

10. Carnivore that eats only insects and spiders

insectivore

PRAIRIE WILDLIFE

11. Dancing area used by grouse year after year

lek

PRAIRIE WILDLIFE

12. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

rodent

PRAIRIE WILDLIFE

13. Naturalist and artist who identified 11 new species of birds in North Dakota; became famous for his book *Birds of America*

John James Audubon

PRAIRIE WILDLIFE

14. Bird of prey

raptor

The Importance of Prairies
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ anglers
- ☐ bio-accumulation
- ☐ conservation
- ☐ Conservation Reserve Program (CRP)
- ☐ insecticide
- ☐ overgrazing

IMPORTANCE OF PRAIRIE

1. Chemical for killing insects

insecticide

IMPORTANCE OF PRAIRIE

2. People who fish

anglers

IMPORTANCE OF PRAIRIE

3. Keeping livestock in an area to graze until all the grass is eaten

overgrazing

IMPORTANCE OF PRAIRIE

4. Introduction of chemicals into the food chain

bio-accumulation

IMPORTANCE OF PRAIRIE

5. Preserving natural resources by careful use and management of the resources

conservation

IMPORTANCE OF PRAIRIE

6. Government program that pays farmers to plant grass on land that had been plowed for crop raising

Conservation Reserve Program (CRP)

Prairie
Magic Square Vocabulary

Select the best answer for each of the Prairie terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers are the same across and down, you have found the magic number!

A. prairie
B. tallgrass prairie
C. bio-accumulation
D. herbivore
E. diurnal
F. overgrazing
G. metamorphosis
H. mixed-grass prairie
I. forbs
J. omnivore
K. sod-forming grasses
L. carnivore
M. bunch grasses
N. nocturnal
O. western wheatgrass
P. insectivore

P 2	E 7	L 18	M 12
A 8	C 5	I 11	N 15
G 13	B 17	K 6	F 3
H 16	O 10	D 4	J 9

Magic Number = 39

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page side

Badlands Answers

Comprehension/Critical Thinking

This Answer Key includes answers to the Comprehension and Critical Thinking activities located throughout the ***Badlands*** **Student Text**.

To locate answers for the Comprehension and Critical Thinking activities from the ***Badlands*** **Student Text**, refer to the footer. The information in the footer will align with the page in the ***Badlands*** **Student Text**. For example, the answers for the Comprehension and Critical Thinking activity on page 9 of the ***Badlands*** **Student Text** will be indicated as follows:

Discussion, Vocabulary, and Magic Square

The answers for the discussion, vocabulary, and magic square activities found in this **Teacher Resource Guide** follow the Comprehension and Critical Thinking activity answers.

To locate the answers for activity B1, for example, simply refer to the footer in the Answer Key. Answers for B1 will be indicated as B1.

Comprehension

1. **What is the location of the North Dakota Badlands?**
   along the Little Missouri River in southwestern North Dakota

2. **What makes up the rugged landscape of North Dakota's Badlands?**
   hills, cliffs, valleys, gullies, buttes, hoodoos, and other natural features

3. **What shaped most of North Dakota's landscape? What part of the state was not shaped by this force?**
   Wisconsinan glacier; southwestern corner (Badlands)

4. **What forces created the Badlands?**
   wind and water

5. **The area of public land in the Badlands is about the same size as what state?**
   Delaware

6. **What national park is located in the Badlands? Name its three units.**
   Theodore Roosevelt National Park; South Unit, Elkhorn Ranch, North Unit

Critical Thinking

1. **French trappers and traders called southwestern North Dakota "bad land to travel across." What other descriptions might have been fitting for them to use? Explain.**
   Answers will vary.

Comprehension

1. What kind of grass can cause injury to animals when it matures?
   needle and thread grass

2. Name some bushes found in woody draws.
   juneberry, chokecherry, current, American plum

3. Which slow-growing tree can reach the age of 300 years?
   Rocky Mountain juniper

4. Which trees need so little water that they can grow on dry hillsides?
   junipers

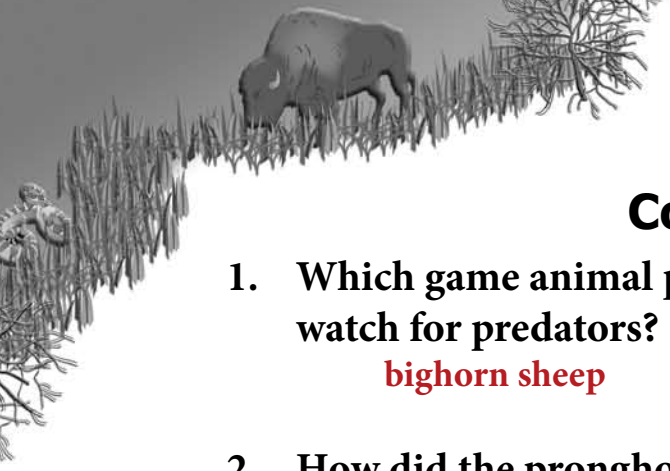
5. Name the common silver-gray shrub that several wildlife species depend on for food and shelter.
   sagebrush

6. What helps forbs hold moisture in dry conditions?
   thick leaves (also deep roots)

7. What kind of wildlife is necessary for pollination to occur?
   insects

Critical Thinking

1. Make up a name for each of these forbs and explain why each would be a fitting name: yucca; gumbo lily; coneflower; scarlet globemallow; prickly pear cactus.
   Answers will vary.



Comprehension

1. **Which game animal prefers steep and open land so that it can watch for predators?**
   bighorn sheep

2. **How did the pronghorn get its name?**
   from prongs on its horns

3. **Which mammal got its name because of its large ears?**
   mule deer

4. **What were the "barking squirrels" that Lewis and Clark wrote about?**
   prairie dogs

5. **Which rodent's name comes from a word meaning "thorny pig"? What are the young called?**
   porcupine; porcupette

6. **What is the most common wildcat on the continent?**
   bobcat

7. **Which rodent is sometimes called a "pack rat"?**
   bushy-tailed woodrat

Critical Thinking

1. **The pronghorn is the fastest animal in North America, but the cheetah is considered the fastest animal in the world. Nevertheless, a pronghorn would beat a cheetah in a two-mile race. Explain.**
   A cheetah can run fast for only a short distance before it gets tired; a pronghorn can run fast for long distances without getting tired.

Comprehension

1. How are reptiles and amphibians alike?
   They are both ectotherms (cold-blooded).

2. What is the only venomous snake in North Dakota?
   prairie rattlesnake

3. What can a snake do with its jaws? Why?
   unhinge them; so it can swallow prey larger than its mouth opening

4. How does the bullsnake kill its prey?
   squeezes it until it cannot breathe

5. Which snake moves very fast?
   racer

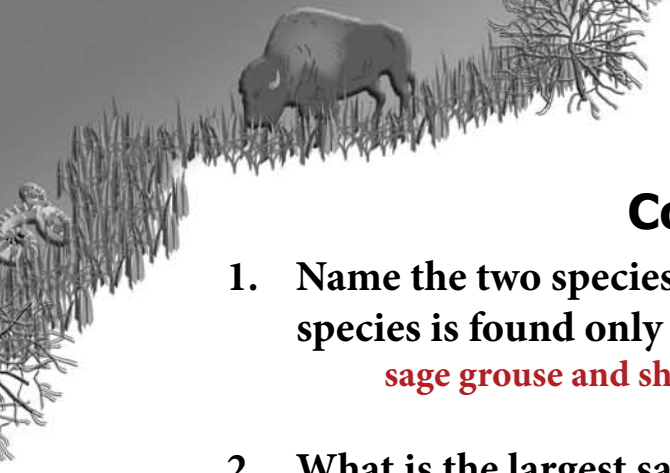
6. Which lizard lives in areas that have sagebrush and large patches of bare ground?
   northern sagebrush lizard

7. What two defense mechanisms does the short-horned lizard use?
   inflates body, squirts blood from its eyes

8. Which toad has vertical eye pupils?
   plains spadefoot toad

Critical Thinking

1. Explain why more reptiles than amphibians live in the Badlands.
   The Badlands area is dry. Amphibians need water in which to hatch and to live as tadpoles.



Comprehension

1. Name the two species of grouse that live in the Badlands. Which species is found only in the southwestern part of the state?
   sage grouse and sharp-tailed grouse; sage grouse

2. What is the largest sandpiper in North Dakota?
   long-billed curlew

3. After the rock wren builds its nest, what else does it build?
   rock walkway to the nest

4. How long does it sometimes take for a black-billed magpie pair to build a nest?
   six weeks

5. What makes it possible for eagles to soar for a long time without flapping their wings?
   a long wingspan

6. Who may legally possess eagle feathers?
   members of American Indian tribes

7. Which raptor can fly at speeds up to 45 miles per hour? Which can dive at speeds of more than 100 miles per hour?
   prairie falcon; golden eagle

Critical Thinking

1. Explain how the population of burrowing owls is related to the population of prairie dogs.
   If the prairie dog population is up, more burrows are available for burrowing owls to nest, so the burrowing owl population will be up. The reverse is also true.

Comprehension

1. What is the second largest industry in North Dakota? What is the number one tourist destination in the state?
   tourism; Medora

2. What does the Maah Daah Hey Trail connect?
   the South Unit and North Unit of Theodore Roosevelt National Park

3. What is the greatest threat to the Badlands ecosystem?
   habitat destruction

4. When the prairie dog population in the Badlands declined, what mammal was extirpated from the state?
   black-footed ferret

5. What are the keys to saving fragile ecosystems?
   conservation and wise management

6. Whose responsibility is it to help care for public land?
   each person's

7. Which U.S. President lived in the Badlands? When did he become President?
   Theodore Roosevelt; 1901

Critical Thinking

1. What can you as an individual do to help save the Badlands?
   Answers will vary.

Badlands
Discussion Questions

1. **Describe the size and location of the Badlands.**
   - about 20 miles wide; 150 miles long
   - extend from South Dakota border to Lake Sakakawea
2. **Explain how the Badlands were formed.**
   - Over thousands of years, the fast-moving Little Missouri River, along with wind, eroded the land.
3. **Explain how clinker formed.**
   - Lignite coal that burned underground formed this red rock.
4. **Explain why Theodore Roosevelt became interested in conservation.**
   - He had lived in the Badlands and wanted to preserve wilderness places for future generations to enjoy.
5. **Describe the size, location, and division of Theodore Roosevelt National Park.**
   - covers over 110 square miles, or 70,000 acres
   - located in the Little Missouri Grassland in the Badlands
   - divided into the South Unit near Medora, the North Unit near Watford City, and the Elkhorn Ranch located between the South and North Units
6. **Explain why the Badlands was not broken up for farming as the rest of the state was.**
   - The land is steep, rugged, and not suitable for farming.
7. **Explain why bunch grasses grow so well in shortgrass prairies.**
   - They have extremely long roots that stretch downward many feet to reach moisture deep underground.

8. **Name and describe two shortgrass species found in the Badlands.**
   - little bluestem—stems get tough when mature; seeds are eaten by birds; plants turn reddish-brown in the fall
   - needle and thread—sharp-pointed seed stalks, and long, twisted, thread-like strands that branch out from the stalks; tender in the spring, but needles get sharp when the plant matures
9. **Name and describe some shrubs found in the Badlands.**
   - sagebrush—silver-gray bush with a strong, spicy smell and bitter taste
   - winter fat—silvery color early in spring; turns orange-brown when it matures; upper part of stem has many tiny, white flowers
   - rabbitbrush—looks similar to sagebrush; pleasant scent; during late summer and early fall is covered with small yellow flowers
   - buckbrush—forms thickets that provide good cover for wildlife; plants are about 4 feet tall; red berries
   - buffaloberry—forms thickets; tall, thorny shrub; has berries that birds eat
   - juneberry—tall shrub that grows in woody draws; needs adequate moisture to produce fruit; green berries turn red and then purple
10. **Name and describe some Badlands forbs.**
   - yucca—stems arranged in clumps of spikes; pollinated only by yucca moth
   - gumbo lily—opens in the evening and is pollinated by night-flying insects; flowers are white but turn pink or rose-colored when mature
   - yellow coneflower—yellow petals that droop downward around a tall, brown center cone
   - scarlet globemallow—leafy spikes with four to six red flowers on each spike; deep rooted; can withstand very dry conditions
   - prickly pear cactus—pads covered with sharp, needle-like spines; red fleshy fruit eaten by birds

Badlands Wildlife
Discussion Questions

1. **Explain what happened to bighorn sheep in the Badlands and what was done 50 years later.**
   - ➤ Sport hunters killed great numbers, and diseases from domestic sheep killed many.
   - ➤ Bighorn sheep were brought from British Columbia and released into the Badlands.
2. **Describe the pronghorn.**
   - ➤ about 3 feet tall; weighs 110 to 120 pounds; runs up to 60 miles per hour; crawls under fences rather than jumping over; buck has pronged horns that curve up and back; doe has shorter horns that are barely visible; lives in herds
3. **Explain why prairie dogs are so important.**
   - ➤ They serve as a food source for many animals; their burrows are used as nest sites by several animals.
4. **Explain how a porcupine defends itself.**
   - ➤ raises its quills, turns its back on the attacker, and remains motionless
5. **Describe the courtship display of the cottontail rabbit.**
   - ➤ The male chases the female until she turns around and boxes at him; they leap about 2 feet into the air over each other and near each other.
6. **Name and describe the felines of the Badlands.**
   - ➤ bobcat—long-legged with big paws; stands about 18 inches tall; weighs from 20 to 30 pounds; round eye pupils; tufts of fur on its ears; has a short tail
   - ➤ mountain lion—stands 2 to 3 feet tall; about 8 feet long; weighs from 100 to 150 pounds; runs up to 35 miles per hour

7. **Name and describe Badlands rodents.**
   - bushy-tailed woodrat—about 14 inches long; weighs over half a pound; collect objects to store in the nest
   - Ord's kangaroo rat—very large back legs and feet; long tail; hops on its back feet like a kangaroo
   - sagebrush vole—about 4½ to 5 inches long; eats sagebrush; does not store food
8. **Explain how voles are different from mice.**
   - Voles have shorter faces, shorter ears, and shorter tails than mice.
9. **Describe some basic differences between reptiles and amphibians.**
   - reptiles—dry, scaly skin; claws on their toes; young breathe through lungs
   - amphibians—smooth, moist skin; no claws; young hatch in water and go through metamorphosis; live part of life in water, part on land
10. **Name and describe the reptiles found in the Badlands.**
   - prairie rattlesnake—about 3 feet long; venomous; rattles on its tail; vertical eye pupil
   - bullsnake—about 5 feet long; slender body; pointed tail; constrictor
   - racer—highly active, fast-moving; slithers up to 4 miles per hour; diurnal; swallows prey alive
   - northern sagebrush lizard—small, narrow body with overlapping scales; size is less than 1 inch to 2½ inches; basks in the sun during the day; diurnal
   - short-horned lizard—flat body and short legs; pointed scales; spiky scales on the head; able to inflate its body and squirt blood from its eyes

11. **Name and describe amphibians of the Badlands.**

- Woodhouse's toad—grows up to 4 inches in length; travels by short hops; mainly nocturnal; toxin in skin that tastes bad
- plains spadefoot toad—lives in loose or sandy soils; digs deep burrows by using its digging spade, or spur; vertical eye pupils
- Great Plains toad—lives in sagebrush and shortgrass prairies; large, dark, warty spots on its back

12. **Describe sage grouse.**

- largest grouse species in North Dakota; top and sides are brown, gray, and black with black undersides; males have spiked tail feathers that open into a fan; feed on sage leaves most of the year

13. **Describe the adaptations sharp-tailed grouse have for the North Dakota's climate.**

- legs are covered with feathers; small projections on feet that allow them to walk on top of snow; form a snow shelter to keep warm during snowstorms

14. **Name and describe some Badlands songbirds.**

- yellow-breasted chat—measures 6 to 7 inches in length; olive-colored upperparts; bright yellow chest
- mountain bluebird—sky-blue feathers; only the female builds the nest
- rock wren—medium-sized songbird; lives in cavities in rocky locations; builds a rock walkway to the nest
- western kingbird—medium-sized songbird; grayish-olive upperparts with white outer tail feathers; undersides bright yellow
- black-billed magpie—large black songbird with a very long tail; builds a very large dome-shaped nest; often picks ticks off large mammals

15. **How do western kingbird parents teach their young to hunt?**

    ➤ by bringing wounded insects back to the nest for the young to chase

16. **Explain how raptors help maintain the balance of nature.**

    ➤ They control the population of rodents.

17. **Describe the nests of golden eagles.**

    ➤ measure 8 to 10 feet across and 3 to 4 feet deep; built on cliffs or high in trees

18. **Explain why the population of burrowing owls dropped significantly.**

    ➤ Loss of prairie habitat and prairie dog towns where they nest

The Importance of the Badlands
Discussion Questions

1. **Describe the Maah Daah Hey Trail.**
   - ➤ connects South and North Units of Theodore Roosevelt National Park; allows mountain bikers, hikers, and horseback riders to see and enjoy the Badlands

2. **Explain how soil erosion can occur.**
   - ➤ When native plants are gone, the roots no longer hold the soil in place. Exposed soil may wash away or blow away.

3. **Explain why sagebrush ecosystems are in danger.**
   - ➤ Sagebrush is sometimes burned, dug up, pulled out with chains, or sprayed with herbicides.

4. **Describe what happens when new roads are built in the Badlands.**
   - ➤ The roads cut through primitive areas, break up habitats, and increase traffic into areas, all which can have negative impacts on wildlife.

5. **Explain what may happen if bighorn sheep are disturbed.**
   - ➤ They may abandon their lambs.

Badlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ acre
- ☐ Badlands
- ☐ browsing
- ☐ bunchgrasses
- ☐ butte
- ☐ clinker
- ☐ coal
- ☐ coniferous trees
- ☐ conservation
- ☐ deciduous trees
- ☐ erosion
- ☐ forage
- ☐ forbs
- ☐ fossil
- ☐ fossil fuels
- ☐ habitat
- ☐ hoodoo
- ☐ lignite
- ☐ national park
- ☐ native
- ☐ natural resource
- ☐ petrified wood
- ☐ pollen
- ☐ pollination
- ☐ sedimentary rocks
- ☐ sediments
- ☐ shortgrasses
- ☐ succulent
- ☐ the public
- ☐ vegetation
- ☐ Wisconsinan glacier
- ☐ woody draws

BADLANDS

1. Area of southwestern North Dakota having colorful, rugged land features; carved by wind and water erosion thousands of years ago

Badlands

BADLANDS

2. Flat-topped, very steep hill with flat sides

butte

BADLANDS

3. Tall, thin pillar of rock with a capstone, or flat rock, on top

hoodoo

BADLANDS

4. Last glacier that moved over North Dakota; covered all of North Dakota except for the southwest corner

Wisconsinan glacier

Badlands
Vocabulary and Definitions

BADLANDS

5. Wearing away soil by water or wind

erosion

BADLANDS

6. Plant life

vegetation

BADLANDS

7. Small pieces of rock and dirt carried by water

sediments

BADLANDS

8. Rocks formed by particles of sediment pressed together

sedimentary rocks

BADLANDS

9. Remains of a plant or animal that has been buried in the earth (in rock, soil, ice, etc.); skeleton, bone, shell, tree leaf, or an imprint such as a footprint

fossil

BADLANDS

10. Formed from the decayed remains of prehistoric (very ancient) plants and animals; petroleum, natural gas, and coal

fossil fuels

BADLANDS

11. Solid fossil fuel created from land vegetation that had been squeezed by pressure for millions of years

coal

BADLANDS

12. A very soft coal found in western North Dakota

lignite

Badlands
Vocabulary and Definitions

BADLANDS

13. Type of red rock formed from lignite coal burning underground; adds color and beauty to the Badlands; also called "scoria"

clinker

BADLANDS

14. Stone formed from minerals filling in cells of wood as it decayed; looks exactly like the original plant, except it is stone

petrified wood

BADLANDS

15. All of the people

the public

BADLANDS

16. Area of land approximately the size of a football field

acre

BADLANDS

17. Area of land set aside by the federal government for the purpose of preserving its natural environment for the public to enjoy

national park

BADLANDS

18. Preserving natural resources by careful use and management of the resources

conservation

BADLANDS

19. A supply of something useful that comes from nature

natural resource

BADLANDS

20. Naturally occurring

native

Badlands
Vocabulary and Definitions

BADLANDS

21. Environment that provides the food, water, shelter, and space for wildlife to make their homes

habitat

BADLANDS

22. Bunchgrasses that may reach a height of only 3 to 7 inches

shortgrasses

BADLANDS

23. Grass species that grow in bunches, or clumps, and are spread by seeds; have extremely long roots

bunchgrasses

BADLANDS

24. Grass and other plants that grazing animals eat

forage

BADLANDS

25. Small woodlands in the Badlands that contain trees and brush; located in low places that can hold enough moisture for large plants

woody draws

BADLANDS

26. Trees that lose their leaves each fall

deciduous trees

BADLANDS

27. Trees called "evergreens" because the needles stay green all year long

coniferous trees

BADLANDS

28. Animals eating leaves, stems, and buds from plants

browsing

Badlands
Vocabulary and Definitions

BADLANDS

29. Native prairie wildflowers with deep roots

forbs

BADLANDS

30. A powder produced by certain plants and must be carried from plant to plant in order for the plant to reproduce

pollen

BADLANDS

31. Process of pollen being carried from one flower to another; carried out when pollen sticks to the legs of bees and other insects

pollination

BADLANDS

32. A plant that stores water in its pads

succulent

Badlands Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ amphibians
- ☐ antlers
- ☐ big game animals
- ☐ brood
- ☐ carnivore
- ☐ carrion
- ☐ decurved bill
- ☐ diurnal
- ☐ ectotherm
- ☐ ewe
- ☐ herbivore
- ☐ insectivore
- ☐ lek
- ☐ metamorphosis
- ☐ nocturnal
- ☐ ram
- ☐ raptor
- ☐ reptiles
- ☐ rodents
- ☐ songbirds
- ☐ stotting

BADLANDS WILDLIFE

1. Large animals that may be hunted

big game animals

BADLANDS WILDLIFE

2. Plant eater

herbivore

BADLANDS WILDLIFE

3. Male sheep

ram

BADLANDS WILDLIFE

4. Female sheep

ewe

BADLANDS WILDLIFE

5. Bony and branched growths on the heads of members of the deer family; shed every year

antlers

BADLANDS WILDLIFE

6. Running with bouncing leaps

stotting

Badlands Wildlife
Vocabulary and Definitions

BADLANDS WILDLIFE

7. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

rodents

BADLANDS WILDLIFE

8. Meat eater

carnivore

BADLANDS WILDLIFE

9. Active at night

nocturnal

BADLANDS WILDLIFE

10. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

ectotherm

BADLANDS WILDLIFE

11. Ectotherms with dry, scaly skin and claws on toes; live their entire lives on land

reptiles

BADLANDS WILDLIFE

12. Ectotherms with smooth, moist skin and no claws on toes; live part of their life in water and part on land

amphibians

BADLANDS WILDLIFE

13. Process of changing from the larva stage to the adult stage; amphibians go through this process, changing from tadpole to adult

metamorphosis

BADLANDS WILDLIFE

14. Active during the daytime

diurnal

Badlands Wildlife
Vocabulary and Definitions

15. Carnivore that eats only insects and spiders

insectivore

16. Dancing area used by grouse year after year

lek

17. Bird's bill that is bent slightly downward

decurved bill

18. Group of young birds from the same nest

brood

19. Small, perching birds that sing a variety of different songs

songbirds

20. Bird of prey

raptor

21. Dead animals that have been killed by other animals, by vehicles, or from other accidents

carrion

The Importance of the Badlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ ecosystem
- ☐ herbicide
- ☐ insecticide
- ☐ weeds

IMPORTANCE OF BADLANDS

1. An area that contains organisms (living things) interacting with one another and with their non-living environment

ecosystem

IMPORTANCE OF BADLANDS

2. Unwanted plant species

weeds

IMPORTANCE OF BADLANDS

3. Chemical that kills plants

herbicide

IMPORTANCE OF BADLANDS

4. Chemical for killing insects

insecticide

Badlands
Magic Square Vocabulary

Select the best answer for each of the Badlands terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers is the same across and down, you have found the magic number!

A. butte
B. clinker
C. coal
D. coniferous trees
E. deciduous trees
F. fossil
G. fossil fuels
H. hoodoo
I. petrified wood

E 7	I 11	D 8
F 10	B 12	A 4
H 9	C 3	G 14

Magic Number = 26

Woodlands Answers

Comprehension/Critical Thinking

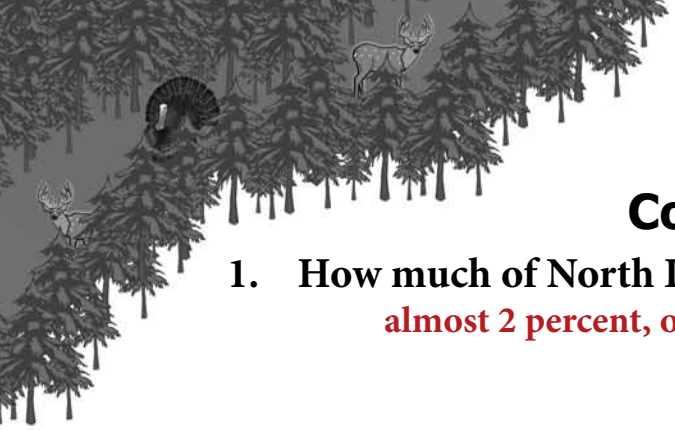
This Answer Key includes answers to the Comprehension and Critical Thinking activities located throughout the ***Woodlands*** **Student Text**.

To locate answers for the Comprehension and Critical Thinking activities from the ***Woodlands*** **Student Text**, refer to the footer. The information in the footer will align with the page in the ***Woodlands*** **Student Text**. For example, the answers for the Comprehension and Critical Thinking activity on page 11 of the ***Woodlands*** **Student Text** will be indicated as follows:

Discussion, Vocabulary, and Magic Square

The answers for the discussion, vocabulary, and magic square activities found in this **Teacher Resource Guide** follow the Comprehension and Critical Thinking activity answers.

To locate the answers for activity B1, for example, simply refer to the footer in the Answer Key. Answers for B1 will be indicated as B1.



Comprehension

1. How much of North Dakota is woodlands?
   almost 2 percent, or about 700,000 acres

2. What are the three layers of a forest?
   canopy, understory, forest floor

3. Trees are divided into what two groups? Give another name for each group.
   deciduous—hardwoods
   coniferous—softwoods, evergreens, Christmas trees

4. Name the three types of forest ecosystems in North Dakota.
   native forests, rural plantings, and community forests

5. Name the three major kinds of native forests in North Dakota.
   lowland deciduous forests, upland deciduous forests, western coniferous forests

6. What species of trees make up most of the lowland deciduous forests of the eastern and central part of the state?
   American elm and green ash

7. What is the dominant tree of the lowland deciduous forests in the western part of the state? Which two river bottomlands are dominated by these trees?
   cottonwood; Missouri River and Little Missouri River

8. **What is the location of the largest upland deciduous forest in the western part of the state? What are its dominant trees?**
   Killdeer Mountains; aspen and bur oak

9. **What tree was dominant in the Turtle Mountains before 1886? After 1886? What event triggered this change?**
   bur oak; aspen; forest fire

10. **Where in the state are western coniferous forests located?**
    Badlands

Critical Thinking

1. **If you were a bird, in which layer of the forest would you like to live? Explain.**
   Answers will vary.

Comprehension

1. **Which U.S. government program gave free land to settlers who planted trees?**
   Timber Culture Act

2. **What is a fence of trees designed to break the force of the wind called?**
   windbreak

3. **What are rows of trees that block the snow called?**
   living snow fences

4. **What was the most common tree planted in towns by the early settlers? How was it recognized in 1947?**
   American elm; became the state tree of North Dakota

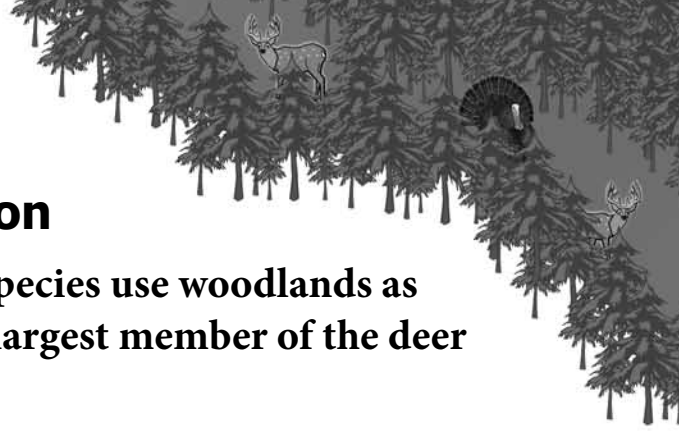
5. **Name woodland plants.**
   trees, shrubs, vines, grasses, forbs, and non-flowering plants

6. **Name common woodland shrubs in North Dakota. Which one is the state fruit?**
   juneberry, chokecherry, buffaloberry, wild plum; chokecherry

7. **Name the types of herbaceous plants of the woodlands.**
   grasses, forbs, and non-flowering plants

Critical Thinking

1. **How would your hometown be different if it had no trees? Explain.**
   Answers will vary.



Comprehension

1. **Which two North Dakota big game species use woodlands as their primary habitat? Which is the largest member of the deer family?**

   moose and white-tailed deer; moose

2. **Where is some of the best habitat for snowshoe hare in North Dakota?**

   aspen forests of the Turtle Mountains

3. **Which rodent's name comes from a word meaning "thorny pig"? What are the young called?**

   porcupine; porcupettes

4. **Name the three species of tree squirrels in North Dakota. Which one spends most of its life in trees? Which is the smallest?**

   fox squirrel, gray squirrel, red squirrel; gray squirrel; red squirrel

5. **What feature do squirrels, chipmunks, and white-footed mice have for carrying food?**

   pouches inside their mouths

6. **Name the only mammal that is able to truly fly. Which species is the most common in North Dakota? What is the system called that these animals use to locate prey by sound waves?**

   bat; little brown bat; echolocation

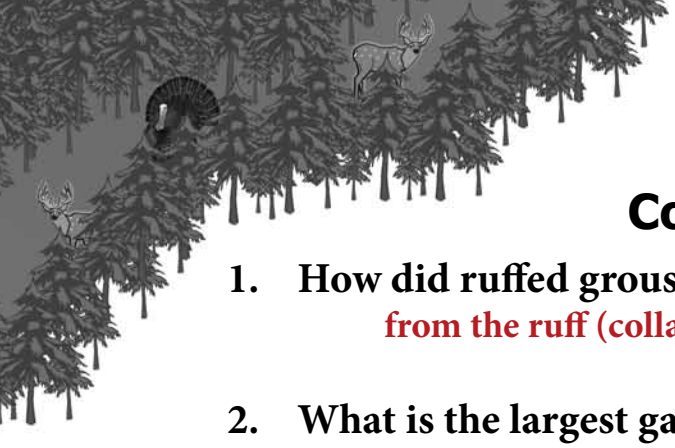
7. **Which amphibian lives high in trees? What adaptation does it have on its feet?**

   gray tree frog; large, sticky toe pads for clinging to smooth branches

Critical Thinking

1. **Explain why people should be happy if bats live in their neighborhood.**

   Answers may vary. Bats can help keep the mosquito population down.



Comprehension

1. How did ruffed grouse get their name?
   from the ruff (collar-like band of feathers) around their necks

2. What is the largest game bird in North Dakota? Where does it spend the day? The night?
   wild turkey; forest floor; tops of trees

3. What two adaptations do woodpeckers have?
   strong, stiff tail to use as a brace; long, barbed tongue to pull insects from tiny places

4. Name some songbirds that build their nests in tree cavities.
   bluebirds, black-capped chickadees, white-breasted nuthatches, tree swallows

5. For what are members of the thrush family noted? Name some members of this family.
   their singing ability; bluebirds, robins

6. What role do raptors play in maintaining the balance of nature?
   control the population of rodents

7. How did the great horned owl get its name?
   from the tufts of feathers that look like horns

Critical Thinking

1. Explain why wild turkeys can fly almost 60 miles per hour, but domestic (farm) turkeys can barely fly at all.
   Answers may vary. Domestic turkeys have been developed to be very heavy. Their wings cannot support their weight.

Comprehension

1. **With what body organ have trees been compared? Why?**
   Lungs; they exchange the gases (oxygen and carbon dioxide), which are necessary for life.

2. **How do leaves filter the air we breathe?**
   They remove dust, other particles, and pollutants from the air.

3. **What is the greatest threat to the woodlands ecosystem?**
   habitat destruction

4. **Name some natural weather disturbances that can damage or destroy trees.**
   ice storms, wind storms, drought, flooding

5. **What happens to trees if they are defoliated repeatedly?**
   They get weak and may die.

6. **Name two insects that attack conifers.**
   yellow-headed spruce sawfly, spider mite

7. **What disease threatens our state tree? How is it passed from tree to tree?**
   Dutch elm disease; carried by elm bark beetle

8. **What changed the Turtle Mountain forest ecosystem in 1886?**
   forest fire

9. **Where did the early Euro-American settlers get trees to plant on the prairie?**
   They brought seeds along with them or transplanted seedlings from riverbanks.

10. **Where was the State School of Forestry established? Why?**
    Bottineau; it was so close to the largest forest in the state

11. **What was the project that encouraged the planting of 100 million trees in North Dakota? In what year was it started?**

    Centennial Tree Program; 1989

12. **How many tree nurseries are owned by the state of North Dakota? Where are they located?**

    three; Bismarck, Oakes, Towner

13. **How many forests are owned by the state of North Dakota? What are they?**

    five; Turtle Mountain State Forest, Mouse River State Forest, Tetrault Wood State Forest, Sheyenne State Forest, Homen State Forest

14. **Where is the only true waterfall in North Dakota located?**

    Sheyenne State Forest

Critical Thinking

1. **If you were to spend time in a forest, what would you like to do there? Explain.**

   Answers will vary.

2. **Pretend that you are in charge of setting up a conservation project for your community. What will your project be, and how will you organize it?**

   Answers will vary.

Woodlands
Discussion Questions

1. **Name and describe the three layers of a forest.**
   - canopy—roof formed by crowns of dominant and medium-sized trees
   - understory—smaller trees, shrubs, and saplings
   - floor—ground-level; made up of fallen leaves, branches, dead trees, and other plant litter
2. **Explain how the woodland seems to come to life each spring.**
   - one layer at a time, beginning with the forest floor; followed by the understory; followed by the canopy
3. **Explain the difference between deciduous and coniferous trees.**
   - Deciduous trees (hardwoods) lose their leaves each fall; they have larger, wider leaves, more branches, and rounder crowns than coniferous trees.
   - Coniferous trees (softwoods) stay green all year; they have narrow, sharp needles instead of leaves and narrow crowns.
4. **Explain where North Dakota's lowland deciduous forests are located.**
   - along the Red and Sheyenne Rivers and their tributaries, along the James River, along the Mouse and Des Lacs Rivers, and along the Missouri and Little Missouri Rivers
5. **Explain why American elm trees did well in North Dakota for so many years and what is happening to them now.**
   - They can withstand very cold temperatures.
   - Dutch elm disease is spreading among them and killing them.

6. **Explain where North Dakota's upland deciduous forests are located.**
   - ➤ Turtle Mountains, Devils Lake Hills, Pembina Gorge, and Killdeer Mountains

7. **Tell what aspen is sometimes called and explain why.**
   - ➤ quaking aspen or trembling aspen
   - ➤ Its leaves quake, or tremble, in the slightest breeze.

8. **Explain why aspen trees replaced the original bur oak trees in the Turtle Mountains.**
   - ➤ A forest fire burned the bur oak trees; then fast-growing aspen shaded the slow-growing bur oak, which does not grow well in shade. Aspens became dominant.

9. **Explain how limber pines probably got started in North Dakota.**
   - ➤ American Indians brought limber pine seeds from the Black Hills of South Dakota.

10. **What is a windbreak?**
    - ➤ a fence of trees designed to break the force of the wind

11. **What and where are community forests?**
    - ➤ Trees that have been planted in towns and cities in yards, on boulevards, and in parks.

12. **What do city foresters do, and why were forestry programs begun in many cities?**
    - ➤ help manage community forests; begun when Dutch elm disease began destroying many trees

13. **Explain the difference between a tree and a shrub.**

- A tree is taller and has one large, woody stem called a trunk; a shrub is shorter (usually less than 15 feet) and smaller and has several smaller woody stems.

14. **Name and describe some woodland shrubs.**

- juneberry—tall shrub that needs adequate moisture to produce fruit; green berries turn red and then purple
- chokecherry—has white flowers and produces small, bitter, purple berries; state fruit
- buffaloberry— tall, thorny shrub; forms thickets; has berries that birds eat
- wild plum—has yellow and red fruit containing a pit

15. **Name and describe the three native vines that grow in North Dakota.**

- riverbank grape (wild grape)—has clusters of purple berries
- bittersweet—has thick vines that climb high and have bright orange flowers
- Virginia creeper (woodbine)—grows dense masses of large leaves that turn red in fall

16. **Explain the difference between flowering and non-flowering plants.**

- Flowering plants have roots, stems, and leaves; non-flowering plants do not.

Woodlands Wildlife
Discussion Questions

1. **Describe the moose.**
   - ➤ largest member of deer family; bulls have antlers; most live in aspen forests of Turtle Mountains
2. **Explain why harvesting white-tailed deer is important.**
   - ➤ prevents overpopulation, which can lead to starvation or weakness leading to disease and death
3. **Explain why black bears almost disappeared from North Dakota.**
   - ➤ because of unregulated hunting, human development, and loss of habitat
4. **What happens to the coat of the snowshoe hare when winter arrives?**
   - ➤ The brown coat is replaced with a white coat.
5. **Explain what happens to the quills of porcupettes.**
   - ➤ They have soft quills when they are born, but the quills harden after they have been exposed to air for about an hour.
6. **Name and describe three species of tree squirrels.**
   - ➤ fox squirrel—about 20 inches long, weighs about 1½ pounds; very bushy tail that makes up about half the length of the squirrel
   - ➤ gray squirrel—slightly smaller than the fox squirrel; often uses old woodpecker holes or natural cavities as its den; gathers and hides nuts to eat later
   - ➤ red squirrel—smallest North Dakota tree squirrel; about 13 inches long, including tail; stores large quantities of seeds
7. **Explain what many North Dakota bats do during the winter.**
   - ➤ migrate to the Black Hills to hibernate in caves

8. **Describe echolocation.**
   - A bat locates objects by sending out sounds that bounce off the objects and back to the bat's ears.
9. **Explain how gray tree frogs can climb and cling to smooth branches.**
   - They have large toe pads that are sticky.
10. **How can an overpopulation of white-tailed deer threaten the ruffed grouse population?**
   - White-tailed deer eat the brushy cover that ruffed grouse need to survive.
11. **Describe the wood duck.**
   - dabbling duck that is a perching duck; spends time perched on tree branches; strong feet and large, gripping claws; nests in tree cavities
12. **Why is the downy woodpecker one of the most abundant woodpeckers in the state?**
   - It can live wherever trees are present.
13. **Name and give facts about some woodland songbirds.**
   - mountain bluebird and eastern bluebird—members of thrush family; build nests in tree cavities
   - black-capped chickadee—does not migrate; attracted to urban bird feeders
   - white-breasted nuthatch—hops headfirst down trees; has back toe claws about twice the length of the front toe claws; excellent tree climber; cracks seeds and nuts open with long, sharp bill
   - tree swallow—small bird with a tiny bill; catches insects in the air; lines its cavity nest with feathers of other birds
   - cedar waxwing—has a pointed crest on its head and a black mask around the eyes; red wing tips look like wax
14. **What are raptors and how do they help maintain the balance of nature?**
   - birds of prey; control the population of rodents

The Importance of Woodlands
Discussion Questions

1. **Why have trees been called the "Lungs of the Earth"?**
   - ➤ They absorb carbon dioxide and produce oxygen.

2. **Explain how trees filter the air we breathe.**
   - ➤ They remove dust and other particles and absorb pollutants from the air.

3. **Explain how the cost of heating and cooling homes is lowered by trees.**
   - ➤ Trees provide shelter from winds and shade from hot sun.

4. **Explain why woodlands are even more valuable in North Dakota than they are in many other states.**
   - ➤ North Dakota has so few woodlands, and the rarer something is, the more valuable it is.

5. **Explain why it is important to harvest over-mature trees.**
   - ➤ Stem decay and root rot take place in over-mature trees.

6. **Explain how some butterflies are affected by Dutch elm disease.**
   - ➤ Larvae of various butterflies feed on the leaves of American elm trees. When the trees are gone, their food source is gone.

7. **Explain how bio-accumulation affects raptors and other wildlife high on the food chain.**

   - So much chemical accumulates in the bodies of the prey that it can kill raptors and other predators.

8. **Name and give facts about North Dakota's state forests.**

   - Turtle Mountain State Forest—extends from the Turtle Mountains to the Canadian border; contains two recreation areas
   - Mouse River State Forest—259 acres in two land parcels; near Towner State Nursery
   - Tetrault Wood State Forest—432 acres in Pembina Gorge
   - Sheyenne State Forest—509 acres in Sheyenne River Valley; contains the only real waterfall in the state
   - Homen State Forest—east of Lake Metigoshe in the Turtle Mountains

Woodlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ acre
- ☐ browsing
- ☐ canopy
- ☐ community forests
- ☐ coniferous trees
- ☐ deciduous trees
- ☐ decomposers
- ☐ dominant trees
- ☐ ecosystem
- ☐ elevation
- ☐ erosion
- ☐ forbs
- ☐ forest
- ☐ forest ecosystem
- ☐ forest floor
- ☐ grasses
- ☐ herbaceous plants
- ☐ lowland deciduous forests
- ☐ native forests
- ☐ non-flowering plants
- ☐ nutrients
- ☐ photosynthesis
- ☐ prairie
- ☐ rural
- ☐ rural plantings
- ☐ saplings
- ☐ shelterbelt
- ☐ shrubs
- ☐ trees
- ☐ understory
- ☐ upland deciduous forests
- ☐ vines
- ☐ western coniferous forests
- ☐ woodland
- ☐ woody draws

WOODLANDS

1. Large, treeless region covered with grasses and forbs

prairie

WOODLANDS

2. A piece of land approximately the size of a football field

acre

WOODLANDS

3. A land covered with woods, or trees

woodland

WOODLANDS

4. Plants that do not have woody stems

herbaceous plants

Woodlands
Vocabulary and Definitions

WOODLANDS

5. An area that contains organisms (living things) interacting with one another and with their non-living environment

ecosystem

WOODLANDS

6. Trees and other vegetation, wildlife, and non-living things such as soil and water

forest ecosystem

WOODLANDS

7. The process of a green plant using energy from the sun, along with materials from soil, water, and air, to make its own food

photosynthesis

WOODLANDS

8. The tallest and largest trees in a forest

dominant trees

WOODLANDS

9. Roof of the forest; formed by crowns of dominant and medium-sized trees

canopy

WOODLANDS

10. Layer of vegetation below the canopy

understory

WOODLANDS

11. Thin, young trees

saplings

WOODLANDS

12. Ground-level of a forest; made up of fallen leaves, branches, dead trees, and other plant litter

forest floor

Woodlands
Vocabulary and Definitions

WOODLANDS

13. Tiny life forms that feed on dead plants, dead animals, and animal droppings

decomposers

WOODLANDS

14. Substances that are necessary for living things to grow and maintain life

nutrients

WOODLANDS

15. Trees that lose their leaves each fall; hardwood trees

deciduous trees

WOODLANDS

16. Trees with cones and needles; softwood trees; evergreens

coniferous trees

WOODLANDS

17. Naturally occurring forests

native forests

WOODLANDS

18. Height of the land

elevation

WOODLANDS

19. Hardwood forests found on low-lying land; bottomland forests

lowland deciduous forests

WOODLANDS

20. Hardwood forests found in higher elevations

upland deciduous forests

Woodlands
Vocabulary and Definitions

WOODLANDS

21. Softwood forests located in the Badlands

western coniferous forests

WOODLANDS

22. In the country, rather than in towns or cities; opposite of urban

rural

WOODLANDS

23. Trees planted in farmyards, windbreaks, shelterbelts, and living snow fences

rural plantings

WOODLANDS

24. Long rows of trees that provide shelter from the wind

shelterbelt

WOODLANDS

25. Wearing away of soil by wind or water

erosion

WOODLANDS

26. Made up of trees that have been planted in towns and cities

community forests

WOODLANDS

27. The tallest plants; have one large, woody stem called a "trunk"

trees

WOODLANDS

28. Shorter and smaller plants than trees; have several small, woody stems

shrubs

Woodlands
Vocabulary and Definitions

WOODLANDS

29. Small woodlands in the Badlands that contain trees and brush

woody draws

WOODLANDS

30. Animals eating leaves, stems, and buds from plants

browsing

WOODLANDS

31. Plants that twist along the ground or climb up shrubs and trees in order to reach sunlight

vines

WOODLANDS

32. Plants with hollow, non-woody stems and narrow leaves

grasses

WOODLANDS

33. Native wildflowers with deep roots

forbs

WOODLANDS

34. Mosses, lichens, and mushrooms that do not have stems, roots, or leaves

non-flowering plants

WOODLANDS

35. A plant community of trees, shrubs, and herbaceous plants that covers an area

forest

Woodlands Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ amphibian
- ☐ antlers
- ☐ big game
- ☐ camouflage
- ☐ cavity
- ☐ diurnal
- ☐ ectotherm
- ☐ habitat
- ☐ herbivore
- ☐ insectivore
- ☐ metamorphosis
- ☐ nocturnal
- ☐ raptor
- ☐ reptile
- ☐ rodents
- ☐ songbirds
- ☐ urban

WOODLANDS WILDLIFE

1. Environment that provides the food, water, shelter, and space for wildlife to make their homes

habitat

WOODLANDS WILDLIFE

2. Large animals that are hunted

big game

WOODLANDS WILDLIFE

3. Horn-like projections that are shed every year; found on members of the deer family

antlers

WOODLANDS WILDLIFE

4. Plant eater

herbivore

WOODLANDS WILDLIFE

5. Protective coloring

camouflage

WOODLANDS WILDLIFE

6. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

rodents

Woodlands Wildlife
Vocabulary and Definitions

WOODLANDS WILDLIFE

7. Active during the daytime

diurnal

WOODLANDS WILDLIFE

8. City; opposite of rural

urban

WOODLANDS WILDLIFE

9. Active at night

nocturnal

WOODLANDS WILDLIFE

10. Carnivore that eats only insects and spiders

insectivore

WOODLANDS WILDLIFE

11. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

ectotherm

WOODLANDS WILDLIFE

12. Cold-blooded animal with dry, scaly skin; lives its entire life on land

reptile

WOODLANDS WILDLIFE

13. Cold-blooded animal that lays its eggs in water or on moist land; has a tadpole stage with gills and an adult stage with lungs

amphibian

WOODLANDS WILDLIFE

14. Process of changing from the larva stage to the adult stage; amphibians and some insects such as butterflies go through this process

metamorphosis

Woodlands Wildlife
Vocabulary and Definitions

WOODLANDS WILDLIFE

15. Open space in a dead or dying tree where wildlife raise their young

cavity

WOODLANDS WILDLIFE

16. Small, perching birds that sing a variety of different songs

songbirds

WOODLANDS WILDLIFE

17. Bird of prey; predator bird

raptor

The Importance of Woodlands
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ bio-accumulation
- ☐ defoliation
- ☐ herbicide
- ☐ insecticide
- ☐ nursery
- ☐ seedling

IMPORTANCE OF WOODLANDS

1. Complete loss of leaves

defoliation

IMPORTANCE OF WOODLANDS

2. Introduction of chemicals into the food chain

bio-accumulation

IMPORTANCE OF WOODLANDS

3. Chemical for killing insects

insecticide

IMPORTANCE OF WOODLANDS

4. Chemical for killing plants

herbicide

IMPORTANCE OF WOODLANDS

5. A place where plants are grown for sale or for experiments

nursery

IMPORTANCE OF WOODLANDS

6. A young plant that has grown from a seed

seedling

Woodlands
Magic Square Vocabulary

Select the best answer for each of the Woodlands terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers is the same across and down, you have found the magic number!

A. dominant trees
B. canopy
C. understory
D. coniferous trees
E. deciduous trees
F. shelterbelts
G. browsing
H. defoliation
I. bio-accumulation

E 10	I 8	D 6
F 2	B 9	A 13
H 12	C 7	G 5

Magic Number = 24

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page side

Riparian Areas Answers

Comprehension/Critical Thinking

This Answer Key includes answers to the Comprehension and Critical Thinking activities located throughout the ***Riparian Areas*** **Student Text**.

To locate answers for the Comprehension and Critical Thinking activities from the ***Riparian Areas*** **Student Text**, refer to the footer. The information in the footer will align with the page in the ***Riparian Areas*** **Student Text**. For example, the answers for the Comprehension and Critical Thinking activity on page 6 of the ***Riparian Areas*** **Student Text** will be indicated as follows:

Discussion, Vocabulary, and Magic Square

The answers for the discussion, vocabulary, and magic square activities found in this **Teacher Resource Guide** follow the Comprehension and Critical Thinking activity answers.

To locate the answers for activity B1, for example, simply refer to the footer in the Answer Key. Answers for B1 will be indicated as B1.

Comprehension

1. **Where did the word "riparian" come from?**
   Latin word meaning "bank of a river"
2. **How is the earth always being supplied with fresh water?**
   through the water cycle
3. **Where is the Great Divide located? What two oceans does it divide?**
   at the crest of the Rocky Mountains; Atlantic and Pacific Oceans
4. **Which continental divide runs through North Dakota? What two oceans does it divide?**
   Northern Divide; Atlantic and Arctic Oceans
5. **What drains river basins?**
   river systems
6. **What is at the extreme lowest point of a river basin? What is the final destination of all river systems?**
   an ocean; an ocean
7. **Name the three river systems of North Dakota.**
   the Missouri River with its tributaries; the Red River with its tributaries; the Mouse, or Souris, River with its tributaries

Critical Thinking

1. **Someone standing on the Great Divide would see a very different view from what someone standing on the Northern Divide would see. Explain.**
   From the Great Divide, one would see mountains in every direction. From the Northern Divide, one would see a fairly level-looking plain in every direction.
2. **Pretend you get into a boat on either the James or the Sheyenne River, but you don't know whether it is the James or the Sheyenne. Pretend you float in that boat all the way to the ocean. When you get to the ocean, you know which river you started out on. How do you know?**
   If the weather is warm, you would know you are in the Gulf of Mexico, so you know you started on the James River. If the weather is cold, you would know you are in Hudson Bay, so you know you started on the Sheyenne River.

Comprehension

1. **What is the largest river in North Dakota and the longest river in the United States?**
   Missouri River

2. **How was the natural flow of the Missouri River through North Dakota changed in the 1950s? Name the one in North Dakota.**
   by the building of two dams; Garrison Dam

3. **Where does the Missouri River flow after it leaves North Dakota? What river does it join? Where?**
   South Dakota, Nebraska, Iowa, Missouri; Mississippi River; St. Louis, Missouri

4. **Where is the source of the James River? Into what river does it empty? In what state?**
   Wells County; Missouri River; South Dakota

5. **What is the second-largest river system in North Dakota? Where are its headwaters? In which direction does it flow? What two states does this river separate?**
   Red River; Wahpeton; north; North Dakota and Minnesota

6. **What is the largest tributary of the Red River and the longest tributary in North Dakota?**
   Sheyenne River

7. **Which river begins and ends in Canada but loops into North Dakota? What is another name for this river?**
   Souris River; Mouse River

8. **What types of vegetation generally make up riparian zones in North Dakota?**
   trees, shrubs, grasses, forbs

9. **What makes up a forest ecosystem?**

   trees and other vegetation, wildlife, and non-living things such as soil and water

10. **Which tree species usually grows closest to the edge of a river?**

    willow

11. **What is the dominant tree of western North Dakota riparian forests?**

    cottonwood

12. **What makes up the understory of a forest?**

    smaller trees, shrubs, vines, grasses, forbs, non-flowering plants

13. **What do decomposers put back into the soil?**

    nutrients

14. **Where are sandbars found?**

    in some rivers

Critical Thinking

1. **Through which states on the Missouri River did Lewis and Clark travel before they reached North Dakota? Why was traveling to North Dakota much harder than the return trip home from North Dakota?**

   They traveled through Missouri, Iowa, Nebraska, and South Dakota. They were traveling against the current to reach North Dakota and with the current on the return trip.

2. **Why do coniferous trees make better Christmas trees than deciduous trees?**

   Coniferous trees stay green all year; deciduous trees would not have any leaves at Christmas time.

Comprehension

1. How many species of fish are found in North Dakota waters?
   nearly 100

2. Which fish family got its name from the sound the fish make by moving muscles against a swim bladder?
   drum

3. How does the outside covering of catfish differ from other fish?
   Catfish have smooth skin rather than scales.

4. Which fish existed before the time of the dinosaurs? Where in the state is it found? Where is the only place in the state where anglers may fish for this species? What is unusual about its skeleton?
   paddlefish; the Missouri River, the Yellowstone River, Lake Sakakawea; the confluence of the Yellowstone and Missouri Rivers; skeleton is cartilage rather than bone

5. Which North Dakota fish is on the endangered species list?
   pallid sturgeon

6. What is the largest family of fish in North Dakota?
   minnow family

7. What is a species called that is sensitive to environmental changes and may provide clues to the health of a system?
   indicator species

Critical Thinking

1. If someone asked you to identify whether a fish was a pike, a perch, or a sunfish, what feature would you look at, and how would you determine the family by this feature?
   dorsal fin; pike have one dorsal fin, perch have two separate dorsal fins, and sunfish have two connected dorsal fins

Comprehension

1. What do mussels eat? How do they obtain it?
   plankton; their system filters it out of the water by a pumping action

2. What is the average lifespan of a mussel? How is the age determined?
   20 to 50 years; by growth rings

3. Why is it illegal to collect or harvest mussels in North Dakota today?
   They were being overharvested.

4. Why are aquatic insects so important?
   They serve as major food sources for wildlife.

5. Name two predator insects. They help control the population of what insect pest?
   dragonfly and damselfly; mosquito

6. What is the most common frog in North Dakota?
   northern leopard frog
7. Which salamander spends its entire life underwater?
   mudpuppy
8. Which unusual turtle is found in the Missouri River system? What is the most common turtle in the United States?
   smooth softshell turtle; western painted turtle

Critical Thinking

1. Do you think the most common mussel in North Dakota has a fitting name? Explain.
   Probably not because the most common mussel is the floater, and it does not float.

Comprehension

1. **Why did the populations of many furbearing animals decline so much in the 1800s?**
   overharvesting

2. **What two adaptations does the beaver have for swimming?**
   webbed feet and a flat tail used as a rudder

3. **How can beavers change the landscape?**
   by building dams across rivers

4. **Where are the entrances to the lodges of beavers and muskrats?**
   underwater

5. **What is a primary prey of the mink?**
   muskrats

6. **How does a river otter keep water out of its nose and ears? How are adult river otters different from most adult animals?**
   It can close its nose and ears to keep them dry. They play.

7. **Which mammal has a fur mask and rings around its tail?**
   raccoon

8. **What two adaptations for water do waterfowl have?**
   webbed feet and water-repellent feathers

9. **Where does the piping plover nest and raise its young?**
   on sandbars or gravelly beaches

10. **How are terns different from gulls?**
    Terns are smaller and have forked tails.

11. What is the largest gamebird in North Dakota?
wild turkey

12. How do raptors help maintain the balance of nature?
help control the population of rodents

13. What enables eagles and turkey vultures to soar long distances?
long wingspans

14. Which bird is called the "alarm of the forest"? Why?
blue jay; screams loudly at intruders in the woods

Critical Thinking

1. Which mammal would you most enjoy observing in its natural habitat? Explain.
Answers will vary.

2. In a few North Dakota cities, wild turkeys are gaining in population and becoming a nuisance. How would you advise the city council to deal with this problem?
Answers will vary.

Comprehension

1. **Why have riparian areas been called "streams of life"?**
   They are among the most productive ecosystems in the world.

2. **Name some important functions of riparian areas.**
   provide wildlife habitat, purify water, renew oxygen, filter the air, provide shade, reduce flood danger, provide recreational opportunities

3. **What has resulted in the significant decline of wildlife over the past century?**
   habitat destruction

4. **Which two large dams on the Missouri River destroyed thousands of acres of riparian habitat in North Dakota?**
   Garrison Dam and Oahe Dam

5. **How can pets be a threat to wildlife?**
   Dogs can chase wild animals, and cats can eat birds.

6. **Which aquatic nuisance species has crowded out native mussels, plugged pipelines, attached to boats, and caused injury to people?**
   zebra mussel

7. **Why do poachers steal paddlefish eggs?**
   They are valuable as caviar.

8. **What are some consequences that can occur when riparian wildlife and habitats are misused or destroyed?**
   flooding, pollution, poorer water quality, a decrease in wildlife populations, and interference with recreational activities

9. **What are some conservation goals for riparian areas?**

   maintaining good water quality, preserving stream banks and vegetation, enhancing wildlife habitat, and maintaining or increasing wildlife populations

10. **How can homeowners in riparian areas help preserve wildlife habitat?**

    eliminate the use of chemicals, keep lawns in a more natural state, plant native plants, remove non-native plants, keep dead trees, maintain the understory

11. **Who can participate in protecting and managing riparian areas?**

    everyone

12. **Where is much of the state forest land of North Dakota located?**

    in riparian areas

13. **What is the key to saving wildlife?**

    protecting their habitats

Critical Thinking

1. **What can you, as an individual, do to help save riparian areas?**

   Answers will vary.

Riparian Areas
Discussion Questions

1. **Explain the water cycle.**
   - Energy from the sun heats water on the earth; the water evaporates into water vapor; it mixes with cool air and forms droplets of water; then the water falls back to the earth as precipitation.
2. **Explain how watersheds work.**
   - The land sheds the water, which then runs downhill to the lowest point.
3. **Explain differences between the Great Divide and the Northern Divide.**
   - Great Divide—east-west divide; at crest of Rocky Mountains; separates waters that flow to the Pacific Ocean from those that flow to the Atlantic Ocean
   - Northern Divide—north-south divide; runs through North Dakota; separates waters that flow to the Arctic Ocean from those that flow to the Atlantic Ocean
4. **Explain why the final destination of all river systems is an ocean.**
   - Oceans are at the extreme lowest points of river basins.
5. **Describe Lake Sakakawea.**
   - almost 200 miles long; 1 to 14 miles wide; 70 to 175 feet deep in the main part; 1,500-mile-long shoreline
6. **Describe the path taken by the Missouri River from its source to its final destination.**
   - headwaters in Rocky Mountains in Montana; flows east to North Dakota; flows south-eastward through South Dakota, Nebraska, Iowa, and Missouri; joins the Mississippi River at St. Louis, Missouri, which flows into the Gulf of Mexico

7. **Describe the path taken by the James River from its source to its confluence with the Missouri River.**
   - source is in Wells County; flows east to New Rockford, south to Jamestown, through the Jamestown Reservoir, south into South Dakota; empties into Missouri River near Yankton, South Dakota

8. **Describe the path taken by the Red River from its source to its final destination.**
   - headwaters are at Wahpeton; flows northward separating North Dakota from Minnesota; flows into Manitoba; empties into Lake Winnipeg; waters of Lake Winnipeg are carried by Nelson River to Hudson Bay, which is part of Arctic Ocean

9. **Explain differences in riparian zone widths.**
   - Along a small creek, the riparian zone might be only 5 to 10 feet on each side of the channel; a large river might have a riparian zone of several hundred feet on each side.

10. **Explain the difference between deciduous and coniferous trees.**
    - Deciduous trees lose their leaves each fall; they have larger, wider leaves, more branches, and rounder crowns than coniferous trees.
    - Coniferous trees stay green all year; they have narrow, sharp needles instead of leaves.

11. **Describe the layers of a forest.**
    - The canopy is the roof of the forest formed by the crowns of the trees.
    - The understory is the layer of vegetation below the canopy; it consists of smaller trees, shrubs, and saplings.
    - The forest floor is the home of small animals, insects, and decomposers.

Riparian Areas Wildlife
Discussion Questions

1. **Explain how to tell the difference between the pike family and the perch family of fish.**
   - ➤ **The pike family has one dorsal fin; the perch family has two separated dorsal fins.**

2. **Explain why Lake Sakakawea is good habitat for walleye.**
   - ➤ **Walleye are adapted for hunting in dark, deep water.**

3. **Describe the dorsal fins of sunfish.**
   - ➤ **Sunfish have two dorsal fins connected to each other, the first is spiny.**

4. **Describe channel catfish.**
   - ➤ **This fish is slow-growing but may live 20 years or more; it can weigh more than 30 pounds and prefers large rivers such as the Red and Missouri Rivers.**

5. **Describe the paddlefish.**
   - ➤ **It has a very long and flattened snout and may reach 7 feet in length and weigh over 100 pounds. Its skeleton is composed of cartilage instead of bone.**

6. **Explain a fish hatchery and its purpose.**
   - ➤ **It is a place where fish eggs are fertilized and hatched. Its purpose is to release fish to stock rivers or lakes.**

7. **Describe minnows.**
   - Minnows are the largest family of fish in North Dakota; they have one dorsal fin; they serve as a food source for gamefish, birds, and other wildlife; some are species used as bait.

8. **Explain why carp is a nuisance fish.**
   - It multiplies rapidly and competes with other species for space; it tears up aquatic vegetation and muddies the water.

9. **Describe mussels.**
   - Mussels are shellfish with two hard, outer shells that protect their soft, inner parts; they have no eyes or mouth, cannot swim or walk and use gills to obtain food and oxygen.

10. **Describe how aquatic insects are helpful.**
    - They serve as a food source for wildlife; some help keep waters clean and clear; some eat harmful insects such as mosquitoes.

11. **Name and describe some amphibians of North Dakota.**
    - northern leopard frog—powerful legs that enable it to swim fast and jump in 6-foot leaps
    - western chorus frog—only about 1 inch long
    - mudpuppy—large salamander that spends its entire life underwater

12. **Name and describe riparian turtles of North Dakota.**
    - smooth softshell turtle—nearly round, soft shell covered with a leathery type of skin
    - snapping turtle—average 8 to 30 inches long; weighs up to 65 pounds; ambush prey; strong jaws and beak-like mouth can crush a finger or branch
    - western painted turtle—named for its brightly colored body and shell

13. **Describe the beaver.**

    - has thick, beautiful fur; can weigh 60 pounds; back feet are webbed; large tail is flat; uses tail as rudder when swimming and slaps it on the water as a sound of alarm; gnaws down trees and builds dams

14. **Explain how river otters play.**

    - They play tag and catch; they slide down riverbanks and on the snow.

15. **Describe the masked shrew.**

    - resembles mouse but is not a rodent; has a sharp-pointed snout, tiny eyes, and a long tail; heartbeats about 800 times per minute; eats its own weight or more in insects every day

16. **Describe the drumming of ruffed grouse.**

    - Males stand on a log and fan their wings to make a drumming sound that can carry up to one-fourth mile. The sound attracts females and defends territory.

17. **What are raptors and how do they help maintain the balance of nature?**

    - Raptors are birds of prey; they control the population of rodents.

18. **Describe the nest of the bald eagle.**

    - built high in a tree; has a foundation of sticks; lined with mosses, grasses, feathers, and other soft materials; can be 7 to 8 feet across, 12 feet deep, and weigh hundreds of pounds

19. **Explain how turkey vultures feed their young.**

    - They regurgitate food they have swallowed.

The Importance of Riparian Areas
Discussion Questions

1. **Explain how riparian forests are important in the oxygen cycle.**
   - ➤ People breathe in oxygen and breathe out carbon dioxide; trees and other green plants absorb carbon dioxide and produce oxygen.
2. **Explain why trees are important on riverbanks.**
   - ➤ Fallen leaves are the base of the food chain for aquatic organisms; shade helps keep the water from becoming too warm for fish and other aquatic life; trees support riverbanks.
3. **Explain how Dutch elm disease is spread and what it has done in North Dakota.**
   - ➤ It is spread from tree to tree by the elm bark beetle and has caused significant damage in riparian forests of the Red River, Sheyenne River, and James River Valleys.
4. **Explain what happens when eggs of pallid sturgeon and paddlefish are overharvested for caviar.**
   - ➤ Not enough young will hatch to maintain the population of the fish.
5. **Explain how personal watercraft and motorboats may be harmful to wildlife.**
   - ➤ pollution from gas and oil; loud motor noise; boat wakes can cause bank erosion and disturb floating bird nests
6. **Describe the North Dakota Wildlife Action Plan.**
   - ➤ state program for the purpose of conserving fish and other wildlife and their habitats; focuses on 100 species in need of conservation; designed to help prevent wildlife from becoming endangered

Riparian Areas
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ browsing
- ☐ canopy
- ☐ coniferous trees
- ☐ continental divide
- ☐ creek
- ☐ dam
- ☐ deciduous trees
- ☐ decomposers
- ☐ ecosystem
- ☐ forbs
- ☐ forest ecosystem
- ☐ grasses
- ☐ non-flowering plants
- ☐ Northern Divide
- ☐ nutrients
- ☐ renewable resource
- ☐ reservoir
- ☐ riparian area
- ☐ river
- ☐ river basins
- ☐ river system
- ☐ sandbar
- ☐ saplings
- ☐ stream
- ☐ tributary
- ☐ understory
- ☐ vines
- ☐ watershed

RIPARIAN

1. A body of running water within a channel

stream

RIPARIAN

2. The area of vegetation that borders and is influenced by a stream; also called "riparian zone"

riparian area

RIPARIAN

3. A natural stream of water that empties into an ocean, a lake, or another stream

river

RIPARIAN

4. A small, shallow stream

creek

Riparian Areas
Vocabulary and Definitions

RIPARIAN

5. A resource that can be used but does not get used up

renewable resource

RIPARIAN

6. An area of land that drains downward to the lowest point

watershed

RIPARIAN

7. A ridge that separates river systems so that they flow to different oceans

continental divide

RIPARIAN

8. A north-south continental divide that runs through North Dakota

Northern Divide

RIPARIAN

9. The largest watersheds on the continent

river basins

RIPARIAN

10. All of the streams and rivers that drain a river basin

river system

RIPARIAN

11. A river that flows into another river

tributary

RIPARIAN

12. A wall built across a river in order to hold back the water

dam

Riparian Areas
Vocabulary and Definitions

RIPARIAN

13. A lake that is formed by the water held back by a dam

reservoir

RIPARIAN

14. An area that contains organisms (living things) interacting with one another and with their non-living environment

ecosystem

RIPARIAN

15. Trees and other vegetation, wildlife, and non-living things such as soil and water

forest ecosystem

RIPARIAN

16. Trees that lose their leaves each fall

deciduous trees

RIPARIAN

17. Trees with needles; evergreens

coniferous trees

RIPARIAN

18. Roof of the forest; formed by crowns of dominant and medium-sized trees

canopy

RIPARIAN

19. Layer of vegetation below the canopy

understory

RIPARIAN

20. Thin, young trees

saplings

Riparian Areas
Vocabulary and Definitions

RIPARIAN

21. Animals eating leaves, stems, and buds from plants

browsing

RIPARIAN

22. Plants that twist along the ground or climb up shrubs and trees in order to reach sunlight

vines

RIPARIAN

23. Plants with hollow, non-woody stems and narrow leaves

grasses

RIPARIAN

24. Native wildflowers with deep roots

forbs

RIPARIAN

25. Mosses and other plants that do not have stems, roots, or leaves

non-flowering plants

RIPARIAN

26. Tiny life forms that feed on dead plants, dead animals, and animal droppings

decomposers

RIPARIAN

27. Substances that are necessary for living things to grow and maintain life

nutrients

RIPARIAN

28. A ridge of sand formed by the current of the water in a river

sandbar

Riparian Areas Wildlife
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ anglers
- ☐ aquatic insects
- ☐ aquatic nuisance species
- ☐ barbels
- ☐ camouflage
- ☐ carnivores
- ☐ carrion
- ☐ cavity
- ☐ crustaceans
- ☐ dorsal fin
- ☐ ectotherm
- ☐ Endangered Species Act
- ☐ exoskeleton
- ☐ fish hatchery
- ☐ freshwater
- ☐ furbearer
- ☐ gamefish
- ☐ habitat
- ☐ herbivore
- ☐ insectivore
- ☐ mussels
- ☐ omnivore
- ☐ plankton
- ☐ raptor
- ☐ rodents
- ☐ swim bladder
- ☐ upland game birds
- ☐ waterfowl

RIPARIAN WILDLIFE

1. Environment that provides the food, water, shelter, and space for wildlife to make their homes

habitat

RIPARIAN WILDLIFE

2. Fish that are caught by anglers

gamefish

RIPARIAN WILDLIFE

3. People who fish

anglers

RIPARIAN WILDLIFE

4. Fin on the back of a fish

dorsal fin

Riparian Areas Wildlife
Vocabulary and Definitions

RIPARIAN WILDLIFE

5. An air-filled sac that helps fish float

swim bladder

RIPARIAN WILDLIFE

6. The very tiny organisms that float in the water

plankton

RIPARIAN WILDLIFE

7. Open space in a dead or dying tree where wildlife raise their young

cavity

RIPARIAN WILDLIFE

8. A place where fish eggs are fertilized and hatched

fish hatchery

RIPARIAN WILDLIFE

9. Non-native plants or animals that have come into an aquatic environment and have a harmful effect on that environment

aquatic nuisance species

RIPARIAN WILDLIFE

10. Aquatic animals that have an exoskeleton and a body segmented into three parts

crustaceans

RIPARIAN WILDLIFE

11. A skeleton on the outside of the body

exoskeleton

RIPARIAN WILDLIFE

12. An animal that eats both plants and animals

omnivore

Riparian Areas Wildlife
Vocabulary and Definitions

RIPARIAN WILDLIFE

13. Shellfish with two hard, outer shells; also called "clams"

mussels

RIPARIAN WILDLIFE

14. Water that is not salty

freshwater

RIPARIAN WILDLIFE

15. Insects that hatch or live in the water

aquatic insects

RIPARIAN WILDLIFE

16. Animal whose body temperature changes with the temperature of its surroundings; also called "cold-blooded"

ectotherm

RIPARIAN WILDLIFE

17. An animal that is harvested for its fur

furbearer

RIPARIAN WILDLIFE

18. Gnawing or nibbling mammals such as rats, mice, voles, and ground squirrels

rodents

RIPARIAN WILDLIFE

19. Meat eaters

carnivores

RIPARIAN WILDLIFE

20. Protective coloring

camouflage

Riparian Areas Wildlife
Vocabulary and Definitions

RIPARIAN WILDLIFE

21. Carnivore that eats only insects and spiders

insectivore

RIPARIAN WILDLIFE

22. Plant eater

herbivore

RIPARIAN WILDLIFE

23. Migratory wetland birds that may be hunted

waterfowl

RIPARIAN WILDLIFE

24. A law that gives special protection to animals that are in danger of becoming extinct

Endangered Species Act

RIPARIAN WILDLIFE

25. Non-waterfowl birds that may be hunted

upland game birds

RIPARIAN WILDLIFE

26. Bird of prey; predator bird

raptor

RIPARIAN WILDLIFE

27. Dead animals that have been killed by other animals, by vehicles, or from other accidents

carrion

RIPARIAN WILDLIFE

28. Sharp, whisker-like organs found on catfish and a few other fish species; used to sense and taste food

barbels

The Importance of Riparian Areas
Vocabulary and Definitions

Match each definition with a word from the list. These boxes may be used as game cards or for other methods of review.

- ☐ caviar
- ☐ conservation
- ☐ poacher
- ☐ spawning grounds

IMPORTANCE OF RIPARIAN

1. Places where fish deposit their eggs

spawning grounds

IMPORTANCE OF RIPARIAN

2. A person who hunts or fishes illegally

poacher

IMPORTANCE OF RIPARIAN

3. Preserving natural resources by careful use and management of the resources

conservation

RIPARIAN WILDLIFE

4. Eggs of paddlefish or sturgeon sold as a food product at high prices

caviar

Riparian Areas
Magic Square Vocabulary

Select the best answer for each of the Riparian Area terms from the numbered definitions (on page D2). Place the number in the proper space in the Magic Square Box below. If the total of the numbers are the same across and down, you have found the magic number!

A. aquatic nuisance species
B. cavity
C. continental divide
D. ectotherm
E. poacher
F. riparian area
G. river system
H. swim bladder
I. watershed

E 9	I 7	D 5
F 1	B 8	A 12
H 11	C 6	G 4

Magic Number = 21