Diving Into Diversity

How many ways can you classify Minnesota's diverse fish species?

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Diving Into Diversity

Minnesota Academic Standards

◓ Lesson *introduces* this Benchmark.
◓ Lesson *partially* addresses this Benchmark.
◓ Lesson *fully* addresses this Benchmark.

Language Arts

Grade 3
III. Speaking Listening, and Viewing
A. Speaking and Listening:
Benchmark 1—The student will participate in and follow agreed-upon rules for conversation and formal discussions in large and small groups. ◓
Benchmark 2—The student will demonstrate active listening and comprehension. ◓
Benchmark 4—The student will give oral presentations to different audiences for different purposes. ◓
Benchmark 5—The student will organize and express ideas sequentially or according to major points. ◓

Grade 4
III. Speaking Listening, and Viewing
A. Speaking and Listening:
Benchmark 1—The student will participate in and follow agreed-upon rules for conversation and formal discussions in large and small groups. ◓
Benchmark 2—The student will demonstrate active listening and comprehension. ◓
Benchmark 3—The student will give oral presentations to different audiences for different purposes. ◓
Benchmark 4—Organize and summarize ideas, using evidence to support opinions or main ideas. ◓

Grade 5
III. Speaking Listening, and Viewing
A. Speaking and Listening:
Benchmark 1—The student will participate in and follow agreed-upon rules for conversation and formal discussions in large and small groups. ◓
Benchmark 2—The student will demonstrate active listening and comprehension. ◓
Benchmark 4—The student will give oral presentations to different audiences for different purposes. ◓
Benchmark 5—The student will restate or summarize and organize ideas sequentially using evidence to support opinions and main ideas. ◓

History and Social Studies

Grade K—3
VII. Government and Citizenship
B. Beliefs and Principles of United States Democracy:
Standard: The student will know key symbols, songs and locations that represent our nation and state.
Benchmark 2—Students will recognize symbols that are significant for the state of Minnesota. ◓ (The walleye is Minnesota's state fish.)

Science

Grade 3
I. History and Nature of Science
A. Scientific World View:
Benchmark 1—The student will explore the use of science as a tool that can help investigate and answer questions about the environment. ◓
I. History and Nature of Science
B. Scientific Inquiry:
Benchmark 1—The student will ask questions about the natural world that can be investigated scientifically. ◓

Grade 4
I. History and Nature of Science
A. Scientific World View:
Benchmark 1—The student will explore the uses and effects of science in our interaction with the natural world. ☻
B. Scientific Inquiry:
Benchmark 3—The student will recognize that evidence and logic are necessary to support scientific understanding. ☻
IV. Life Science
B. Diversity of Organisms:
Benchmark 1—The student will classify plants and animals according to their physical characteristics. ☻
Benchmark 2—The student will learn that the characteristics used for grouping depend on the purpose of the grouping. ☻

Grade 5
I. History and Nature of Science
A. Scientific World View:
Benchmark 2—The student will recognize that clear communication of methods, findings and critical review is an essential part of doing science. ☻
I. History and Nature of Science
C. Scientific Enterprise:
Benchmark 1—The student will describe different kinds of work done in science and technology. ☻

Environmental Literacy Scope and Sequence

Benchmarks
- Social and natural systems are made of parts. (PreK-2)
- Social and natural systems may not continue to function if some of their parts are missing. (PreK-2)
- When the parts of social and natural systems are put together, they can do things they couldn't do by themselves. (PreK-2)
- In social and natural systems that consist of many parts, the parts usually influence one another. (3-5)
- Social and natural systems may not function as well if parts are missing, damaged, mismatched or misconnected. (3-5)

For the full Environmental Literacy Scope and Sequence, see:
www.seek.state.mn.us/eemn_c.cfm

Chapter 2 • Lesson 5

Diving Into Diversity

Grade Level: 3-5
Duration: Part 1: 20 minutes
Part 2: 70 minutes
Group Size: any
Subject Areas: Language Arts, Science
Academic Skills: analysis, classification, comparison, inquiry, observation, presentation skills, public speaking, small group skills
Setting: indoor or outdoor gathering area
Vocabulary: biodiversity, classification, species, taxonomy
Internet Search Words: fish diversity, biodiversity, classification

Instructor's Background Information

Biodiversity
Our planet needs and supports a vast array of organisms or **species**. A species is a group of like individuals that are able to breed and produce fertile offspring. Species is also the classification category that follows the genus or subgenus grouping in the biological **classification** system. Classification is a systematic method of identifying, naming, and grouping like organisms according to shared features or characteristics.

A diversity of living organisms allows each individual organism to take advantage of the resources provided by the other organisms in the environment. For example, trees provide habitat and nutrients for birds, insects, other plants and animals, fungi, and microbes. The collection of all species in a particular area is referred to as the biodiversity of the region. **Biodiversity** on a global level is defined as the diversity of life on the planet, which includes genetic diversity, species diversity, and habitat diversity. More specifically, biodiversity is described by the Rutgers University Biodiversity Initiative as " . . . the sum total of all the plants, animals (including humans), fungi and microorganisms, along with their individual variations and the interactions between them. It is the set of living organisms and their genetic basis that make up the fabric of the planet Earth and allow it to function as it does, by capturing energy from the sun and using it to drive all of life's processes."

Summary

Students explore the diversity of Minnesota's fish species. Working in small groups, they examine similarities and differences between common fish species and design a classification system that helps them answer a question of their own devising, that they have about the fish. Each group articulates a question about Minnesota fish, shares the question in a class presentation, explains how they classified their fish species, and relates what group members learned from this activity.

Student Objectives

The students will:
1   Describe the benefits of the diversity of Minnesota's fish species.
2   Describe two different methods that can be used to classify or group fish. Students then use their classification methods to classify or group a set of fish that is new to them.
3   Conclude that fish can be sorted into groups in many different ways.
4   List two reasons why scientists classify organisms into groups.

Materials

- 8.5" x 11" illustrations or photos of fish or fish images on the *MinnAqua Leader's Guide* CD
- **Fish Identification Cards**, one set per group
- **Fish Classification Part 1 Sheet**, one per group
- **Fish Classification Part 2 Sheet**, one per group
- Assortments of old house keys, luggage keys, and other types of keys (ask students to bring these from home)
- Assorted leaves

Humans have always depended on the earth's biodiversity for food, shelter, and health. Biological resources provide goods for human use, including:

- food—numerous species that are hunted, fished, and gathered, as well as cultivated through agriculture, forestry, and aquaculture
- shelter and warmth—timber and other forest products, fibers from plants such as cotton, goose feathers for down, sheep fleece for wool, animal hides for leather
- medicines—traditional medicines as well as drugs synthesized from biological resources and processes

Biodiversity also supplies indirect services—often taken for granted—to people and other species. These include the various plants and organisms that filter and clean water, add oxygen to the atmosphere, and fertilize soils. The loss of populations, species, or groups of species can upset the normal function of an ecosystem and disrupt these ecological services.

Biodiversity provides medical models for research aimed at solving human health problems. For example, researchers study how seals, whales, and penguins use oxygen during their deep-water dives, hoping to find clues that will yield treatments for people who suffer strokes, shock, and lung disease.

Fish Diversity
In the context of the many groups of plants and animals that inhabit the earth, fish have amazing diversity. Among the vertebrates of the planet, fish actually have the *greatest* diversity. There are almost as many species of fish as amphibian, reptile, bird, and mammal species combined!

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Soft-water Walleye

Trout

Hard-water Walleye

Bass/Panfish

Prairie Lakes
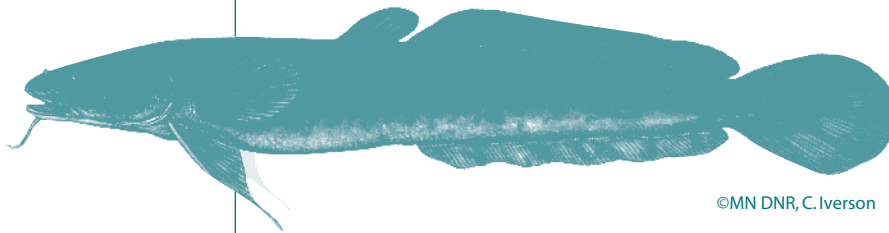
©MN DNR
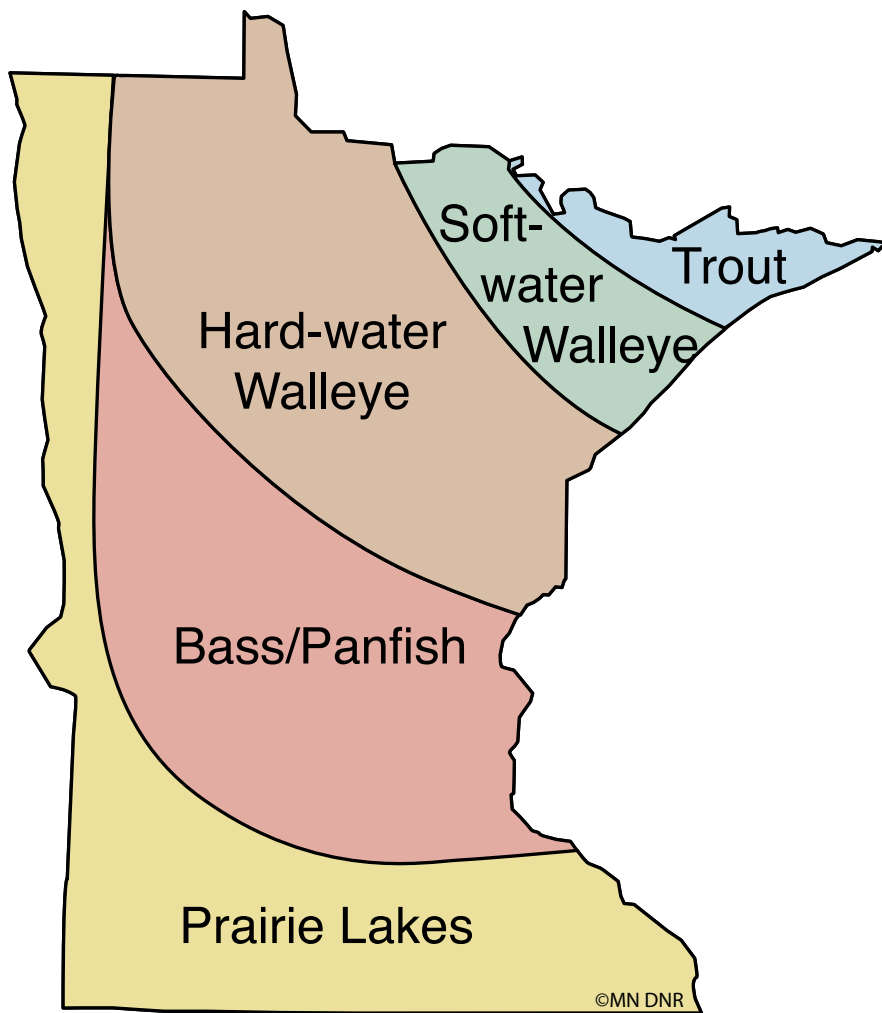
There are 19,056 fish species scientifically described in the world.

This map shows the ecological types of Minnesota waters. The state's many natural habitats shelter a rich diversity of fish. (See the Minnesota DNR publication *Managing Minnesota's Fish* for further information on habitat types.)

Minnesota Fish Diversity
With more than 12,000 lakes and 15,000 miles of fishable streams and rivers, Minnesota is currently home to 160 different species of fish. Minnesota's great diversity of fish is related to its aquatic habitats, which range from the walleye lakes of the north to the trout streams of the southeast and the prairie ponds of the southwest. This diversity allows Minnesotans to enjoy many kinds of fishing opportunities throughout the state. Fish vary in behavior traits as well as in physical characteristics. Specific behaviors and unique physical features are adaptations that help species survive the conditions existing in their environments.

Classification

Classification is the systematic grouping or arranging of objects or organisms into categories according to specific criteria. **Taxonomy** is a branch of biology concerned with classifying and naming the diverse forms of life. Carolus Linnaeus, often called the father of taxonomy, was a Swedish botanist and naturalist. In the 1700s, Linnaeus founded a classification system by assigning organisms into large groups and dividing these groups into increasingly smaller groups based on shared characteristics. Linnaeus is also credited with devising the two-part naming system for all living organisms. In the Linnaean system, also known as binomial nomenclature, an organism's name consists of its genus and species names.

Scientists use classification as a tool when researching organisms. Classification is used to show how organisms are related, and to describe changes to organisms over time. If, for example, a newly discovered organism can be placed in a classification group with organisms that share some of its characteristics, scientists may be able to learn more about it based on what they know about other organisms in that group.

As the groups in a classification system are divided and subdivided, the members of those successive groups are more and more related, sharing increasing numbers of common characteristics. The members of each successive group exhibit more shared physical features, behaviors, physiological characteristics, and genetic similarities, until the final species grouping contains one specific type of organism. This unique organism is universally distinguished from the vast diversity of all other organisms by its scientific name.

Scientific Names

Binomial nomenclature is especially important because it describes an organism using a scientific name that is recognized worldwide. When scientists refer to an organism, they use its scientific name to alleviate confusion and establish consistency. Most organisms also have common names, which can vary from place to place. For example, the scientific name of a certain well-known Minnesota fish is *Sander vitreum*. In many parts of North America, people refer to this fish as a walleye. But other languages may have different common names for this fish. The use of scientific names prevents this type of confusion because the walleye's scientific name is the same in every country.

The walleye is Minnesota's state fish and the game fish most often sought by the state's anglers. Yet panfish, including sunfish, are the fish that Minnesota anglers catch most often!

The classification system is comprised of seven taxonomic groups.

Kingdom	Phylum	Class	Order	Family	Genus	Species
Common Name: Walleye						
Animalia	Chordata	Osteichthyes	Perciformes	Percidae	*Sander*	*vitreum*
Common Name: Blue whale						
Animalia	Chordata	Mammalia	Cetacea	Balaenidae	*Balaenoptera*	*musculus*
Common Name: Red maple						
Plantae	Tracheophyta	Angiospermae	Sapindales	Aceraceae	*Acer*	*rubrum*
Common Name: Common loon						
Animalia	Chordata	Avies	Gaviiformes	Gaviidae	*Gavia*	*immer*

Procedure

Preparation

1 Post 8.5" x 11" fish illustrations or photos around the classroom.
2 Copy and cut out one set of **Fish Identification Cards** for each group of four or five students.
3 Copy one **Fish Classification Part 1 Sheet** and one **Fish Classification Part 2 Sheet** for each group of four or five students.

Activity

Warm-up

1 Introduce classification by telling the students that, every day, they classify things, or put objects into groups. Sorting objects, organizing them, and putting them in a specific group within a system is classification. Do you have a sock drawer in your dresser? How about a cabinet in your kitchen for storing your cups and plates? Do you collect baseball cards or stamps? How do you organize these things? Tell students that the class will practice classifying objects according to their physical structure and characteristics.
2 Begin with the assorted buttons. Have students group the buttons according to any characteristics they choose. Group or classify the buttons according to things like size, color, number of holes, and texture. Tell students to look for similarities and differences as they form the groups. Put buttons with similar characteristics into the

You may wish to laminate the **Fish Identification Cards** to preserve them for future use.

same groups. Next, group the keys according to characteristics and features including size, color, and shape.

3   Ask the students to sort the plant leaves according to external structures and characteristics. Then have students try regrouping them according to a different set of characteristics.

4   Ask students to consider how much easier it was to sort the inanimate buttons than the natural leaves and keys.

5   Emphasize that although the keys may have varied in structure, they're all still members of the same family or group of related objects.

Grouping Fish

1   Minnesota has 160 species of fish. Ask students what types of fish they have caught when they've gone fishing. How many different types can they name? Can they name the Minnesota state fish? The scientific name for walleye is *Sander vitreum.* The walleye is actually a member of the perch family because it shares characteristics with other members of that group, such as the yellow perch (or sauger), and many types of darters. When we look at fish closely, we start to notice similarities and differences. Have photos of various fish available for students to view. Ask the students to point out how two of the fish are similar and how two fish differ.

2   Tell students that sorting large numbers of fish into groups by finding similar characteristics makes it easier to learn about them. For instance, we can know that all members of the catfish family have barbels (whiskers) that help them find food and survive in a turbid environment. If we know that a yellow bullhead is a member of the catfish family, then we know it has barbels like other catfish family members, and that it probably uses its barbels to help it find food in murky water, too.

3   Ask the students if they can tell you the number of different fish species that live in Minnesota. (There are currently 160 species!) When there are many different species of fish in an area, the fish community is referred to as diverse. What are some benefits of having many species of fish in Minnesota? (There are more kinds of fish to catch, anglers can find fish in many different places such as shallow water and deep pools, and biodiversity is important and interesting.)

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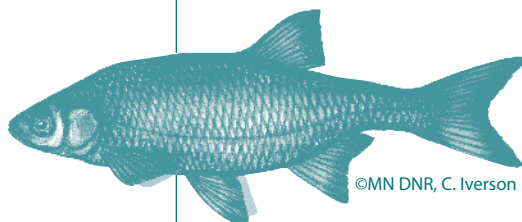
Lesson
Part 1: Classification
1 Divide the class into groups of four or five students. Distribute a set of **Fish Identification Cards** and **Fish Classification Sheets** to each group. Point out that, on one side of each **Fish Identification Card,** there are illustrations of physical features; the other side contains information about the fish.
2 Tell the students that they'll be designing their own classification system. Fish can be grouped in many ways, depending on what you want to know about them. For example, we can classify fish according to how they look (physical characteristics)**,** or we can put them into groups according to where they live (habitat).
3 Have students look at all of their **Fish Identification Cards** and come up with a question about Minnesota fish. Have them record this question on the **Fish Classification Part 1 Sheet.** (Sample questions: What kind of mouths do these fish have? Where do they live? What color are they? Are their scales large or small? What is their body shape? Are they predators or prey?) The students should be able to answer the question by looking at the picture or reading the back of the card.
4 Have the students begin sorting the fish cards into groups that answer the question. The students will need to come up with descriptive headings that answer the question. For example, a group has received **Fish Identification Cards** for bluegill, rainbow trout, northern pike, yellow perch, and largemouth bass. If the group's question is "Where do they live?" the group could sort their fish cards under the headings of weeds, rocks, open water, and rivers
5 Ask students to list at least two reasons why organisms are classified into groups. As students discuss these reasons, write them on the whiteboard or projection device.

Part 2: Group Presentations
Have the student groups prepare presentations for the class. They may choose to perform a skit, write a poem, give a report, or create a graphic organizer to illustrate their grouping system.

The presentation should include the group's question, group headings and classification system, any problems they encountered as they grouped the fish, and whether or not they think their system would be a good way to classify all fish. Why or why not? Each group member should have a role in preparing and/or making the presentation. When all presentations are complete, have the students fill out the **Fish Classification Part 2 Sheet.**

Wrap-up
Summarize the different ways that students classified the fish. Ask the students why we choose certain classification systems. (There are several possible answers. It depends upon what we want to know about fish. And one classification system might be easier to use than another.)

During this activity, observe the students in their groups and look for discussion and understanding that there are many ways to sort fish into groups.

The students may have some trouble when it's not clear to which group a fish belongs. A fish might share characteristics with fish in more than one group. Tell students that scientists have this problem, too, and that they must look for a way to make a decision based on the greatest number of similar characteristics or other criteria that they establish. Or perhaps one characteristic is more important than another characteristic for grouping purposes.

A graphic organizer is a visual instructional tool that demonstrates how well a student understands a concept. Graphic organizers illustrate various aspects of concepts, issues, or problems, showing detail as well as the big picture or overall scheme, and they efficiently show relationships between concepts or ideas. Graphic organizers can take the form of a concept map, tree, star or web showing definitions, attributes, examples, classifications, structures, examples, relationships, and brainstorming. Charts and tables show attributes, characteristics, comparison, and organization. A chain or timeline illustrates processes, sequences, cause and effect, and chronology. Diagrams, charts, and drawings show physical structures, spatial relationships, and concrete objects. Cut and folded paper can be fashioned into flaps that, when lifted, reveal details, definitions, descriptions, or explanations. Graphic organizers take on a variety of forms, but all forms enable students to use illustrations, short words, or phrases to demonstrate their understanding of complex ideas and concepts.

How does classification help you learn about fish? (One possible answer is that classification allows us to predict specific habitat needs for certain groups of fish and protect those sites. Or if a new species is discovered, and it can be placed in a group in the classification system, we might be able to learn more about it based on what we know about related organisms in that group that share many of its characteristics.) Scientists use physical characteristics and behaviors to organize fish into groups for many of these reasons. Scientists have classified the 160 species of Minnesota fish into 27 family groups.

Assessment Options

1   Assess student presentations for the following: the group question, group headings, any problems students had as they grouped the fish using the headings, and the reasons why (or why not) they think their system would be a good way to classify all fish. Students demonstrate an ability to classify fish into groups based on fish characteristics—and understand that there are multiple solutions to the problem of grouping organisms—by suggesting two or more ways to group the fish. Demonstrate how the classification methods that the groups chose helped them answer their questions about the fish. After the student presentations, ask the class to discuss the types of additional information that could be collected to help solve some of the grouping problems, or to answer questions about fish. Make sure that each student has a role in preparing and/or making the presentation, and that they participate in class discussion.

2   Have students prepare a written description of their reflections on their group's classification system and points noted in Assessment 1.

3   Have students act out different fish characteristics and determine a classification system for grouping the fish. Have students write a description of the classification system, including drawings of the fish characteristics that they portrayed. Give copies of three different grouping systems to each student and have them compare the different classification systems, describing one benefit and one problem for each grouping method.

4   Find pictures of fish that aren't in the **Fish Identification Card Set**. Have students figure out where the fish fit in the classification scheme they developed. They should describe why the fish fits, and the type of information about the fish that would help them better classify it.

5   Assessment options include the Checklist and Rubric on the following pages.

Diving Into Diversity Checklist

Possible Points	Points Earned Student	Points Earned Instructor	
2	_____	_____	Student presentation includes the question the group posed for deciding how to group fish.
2	_____	_____	Student presentation includes mention of group headings.
2	_____	_____	Student presentation includes mention of the problems the student team faced as they grouped their fish.
2	_____	_____	Student presentation includes an explanation of whether or not their grouping system would be a good way to classify all fish.
2	_____	_____	Student identifies two reasons why scientists would classify fish into groups.
3	_____	_____	Student classifies the fish into groups based on reasonable criteria (such as features or food preferences).
2	_____	_____	Student appreciates that there are multiple ways to classify organisms.
2	_____	_____	Student understands that the details addressed in a classification system can influence the perception of organisms.
2	_____	_____	Student explains that there are many different fish species in Minnesota.
4	_____	_____	Student gives examples of three different fish groups whose members share some similar characteristics.

Total Points

23	_____	_____	Score _____

Checklists are tools for students and instructors. Checklists involve students in managing their own learning. They help students understand and set learning goals before the lesson begins, and help them monitor their progress during the lesson, ensuring that they meet learning goals and objectives by the end of the lesson. Students can also use checklists to discover areas that may need improvement. Checklists help instructors monitor each student's progress throughout the lesson, facilitating appropriate adjustment of instruction to ensure learning by the end of the lesson. The instructor may wish to have students add several of their own learning goals to the checklist to personalize it, and to accommodate varied learning needs and styles.

Grade

20-23 points = A
Excellent. Work is above expectations.

18-19 points = B
Good. Work meets expectations.

15-17 points = C
Work is generally good. Some areas are better developed than others.

11-14 points = D
Work does not meet expectations; it's not clear that student understands objectives.

0-10 points = F
Work is unacceptable.

Diving Into Diversity Scoring Rubric

Presentation Criteria	3 Excellent	2 Good	1 Fair	0 Unacceptable
Content	Presentation includes the question, group headings, problems encountered in grouping fish, and explanation of whether or not the group thinks their method would be a good way to classify all fish.	Presentation includes three-quarters of the required information.	Presentation includes half of the required information.	Presentation includes less than half of the required information.
Reasons for classification systems	Identifies two reasons why scientists would classify fish into groups.	Identifies two reasons why scientists would classify fish into groups with prompting.	Identifies one reason why scientists would classify fish into groups.	Can't identify why scientists would classify fish into groups.
Classification system details	Classifies the fish into groups based on reasonable criteria (such as features or food preferences). Appreciates that there are multiple ways to classify organisms. Understands that details addressed in a classification system can influence perceptions of organisms.	Classifies the fish into groups based on reasonable criteria (such as features or food preferences.). Appreciates that there are multiple ways to classify organisms.	Classifies the fish into groups. Appreciates that there are multiple ways to classify organisms.	Classifies the fish into groups, but the groups aren't based on reasonable criteria and are random.
Minnesota fish diversity	Explains that there are many fish species in Minnesota and that some species share some similar characteristics. Gives examples of three groups of fish that share some similar characteristics.	Explains that there are many fish species in Minnesota and that some species share some similar characteristics. Gives and example of one group of fish that shares some similar characteristics.	Explains that there are many fish species in Minnesota and that some species share some similar characteristics.	Can't explain that there are many fish species in Minnesota.

Score _____ **(Calculate score by dividing total points by number of criteria.)**

Diving Deeper

🎣 *Extensions*

1   Do **Lesson 2:6—Adapted For Habitat** to illustrate that different species of fish have adaptations that that help fish survive in the conditions of their environments.

2   Do **Lesson 2:4—Using a Key for Fish ID** to illustrate how scientists identify fish.

3   Relate species diversity to habitat diversity by playing a relay game. Divide the class into two teams. Set up three hula-hoops representing habitat types (such as a shallow area of lake, a deep area of lake, and a stream) across the far end of the field. Line up the teams on the other end of the field. When signaled to start, the first person in line from each team picks up a **Fish Identification Card**, races across the field, and places it in the appropriate hula-hoop habitat. Upon returning to their team, the next student in line takes a card and runs across the field to the hula-hoops to place their card in the appropriate habitat. (Rather than grouping fish by physical characteristics, the students group the fish according to behavior. Where does each fish live?) It can be difficult, sometimes, to decide which habitat is appropriate for the fish. The student should make a choice, however, and be able to explain why they chose a particular habitat for their fish.

4   Obtain and review the *Fisheries Tour Packet* from the Minnesota DNR MinnAqua Program to prepare for a visit to an aquarium or fish hatchery.

5   Visit an aquarium or fish hatchery to see different species of Minnesota fish, examine their characteristics, observe their adaptations, and learn about their preferred habitats.

6   Research and report on endangered Minnesota fish species. What causes fish to become endangered?

For the Small Fry

🎣 *K-2 Option*

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Group fish pictures by body shape, color, or other similar appearances. Name these fish groups. Have students create a new fish by drawing, painting, or modeling it with available craft materials. Determine to which group the new fish belongs, and give it a name.

STUDENT COPY

Name(s) _____ Date _____

Fish Classification Part 1 Sheet

After looking at the Fish Identification Cards, your group should come up with a question about Minnesota fish. Write your group question here.

_____

_____

_____

How did you group your fish? _____

_____

How many groups did you make? _____

What did you name these groups? _____

_____

_____

_____

Group Heading 1 _____

List the fish species in this group. _____

_____

_____

Which characteristic do the members of this group share? _____

_____

_____

_____

continued

STUDENT COPY

Name(s) ———————————————————— Date ————————————————

Fish Classification Part 1 Sheet (continued)

Group Heading 2 ————————————————————————————

List the fish species in this group. ————————————————————

——

——

Which characteristic do the members of this group share? ————————————

——

——

——

Group Heading 3 ————————————————————————————

List the fish species in this group. ————————————————————

——

——

Which characteristic do the members of this group share? ————————————

——

——

——

Group Heading 4 ————————————————————————————

List fish species in this group. ——————————————————————

——

——

Which characteristic do the members of this group share? ————————————

——

——

(If you have more than four groups, list them on the back of this sheet.)

STUDENT COPY

Name(s) _____ Date _____

Fish Classification Part 2 Sheet

Answer the following questions.

1. Did you have any problems putting fish into groups? If so, list these problems.

_____

_____

_____

_____

2. Would this be a good way to classify all fish? Why or why not?

_____

_____

_____

_____

3. List two reasons why scientists would classify fish into groups.

_____

_____

_____

_____

4. What did you learn about fish?

_____

_____

_____

_____

Fish Identification Cards

Copy the cards, cut them out, fold or cut them along the center lines, and laminate or mount them on card stock.

Brook Trout *Salvelinus fontinalis*

Shape: Torpedo-shaped
Mouth: Medium-sized and forward on the head
Fins: Adipose fin between the dorsal and tail fin; square caudal fin
Scales: Very small
Color: Dark green to silver with red spots; squiggly lines on back; white margins on anal and pelvic fins
**Habitat:** Cold, clear streams
Behavior: Unaggressive—often wait below aquatic vegetation such as watercress, feeding on organisms swept in front of them from upstream
Food: Small fish and insects
Fun fact: Minnesota's only native stream trout

©MN DNR, C. Iverson

Bluegill *Lepomis macrochirus*

Shape: Pan-shaped
Mouth: Small and forward on the head
Fins: Dorsal or top fin along the back is well-connected between the spines and soft rays
Scales: Medium-sized; round
Color: Olive green and purplish tinge with orange to blue belly; solid black opercular lobe
Habitat: Heavily vegetated clear warm lakes
Behavior: Travels in schools; takes insects from surface
Food: Small fish, insects, snails, and zooplankton
Fun fact: The most commonly caught game fish in Minnesota

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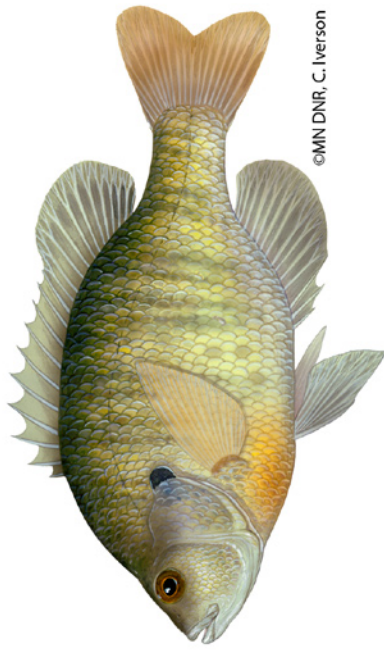
Northern Pike *Esox lucius*

Shape: Torpedo-shaped
Mouth: Duckbilled with many teeth and forward on the head
Fins: One-part dorsal; forked tail fin
Scales: Small and round
Color: Greenish back and white belly; light spots on a dark background
Habitat: Vegetated lakes, rivers, and streams
Behavior: Very aggressive while chasing prey fish
Food: Small and medium fish
Fun fact: Northern pike grow faster than muskellunge, but they don't become as large

©MN DNR, C. Iverson

Fish Identification Cards

Fish Identification Cards

Largemouth Bass *Micropterus salmoides*

Shape: Pan- or football-shaped
Mouth: Large; jaw extends beyond eye
Fins: Dorsal fin well-connected between spines and soft rays
Scales: Medium and round
Color: Dark green with white belly and black lateral stripe
Habitat: Weedy, quiet, sand- and mud-bottomed lakes and streams
Habits: Ambushes prey from hiding spot; highly territorial
Food: Small fish, crayfish, and frogs
Fun fact: Anglers prized them for their fight and willingness to hit artificial lures

©MN DNR, C. Iverson

Yellow Perch *Perca flavescens*

Shape: Short torpedo
Mouth: Small and forward on the head
Fins: Two-part dorsal fin with a space between the spines and soft rays
Scales: Small and round
Color: Pale yellow to bright orange with dark, vertical stripes on side
Habitat: Rocky, vegetated, fairly deep lakes and rivers
Habits: Swim in large schools
Food: Small fish, zooplankton, insects, snails, and crayfish
Fun fact: Many anglers prefer the flavor of yellow perch to their more famous cousin, the walleye

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Fish Identification Cards

**Brown Bullhead** *Ameiurus nebulosus*

Shape: Flat-bottomed
Mouth: Forward and wide, with barbels
Fins: Adipose fin and one-part dorsal fin
Scales: None
Color: Body yellowish to black with a white belly
Habitat: Lakes and quiet steams and rivers
Habits: Parents guard young by patrolling edges of schools
Food: Feeds on almost anything such as minnows, crayfish, snails, and insects
Fun fact: Whiskerlike barbels are sense organs covered with taste buds, not stingers

Lake Sturgeon *Acipenser fulvescens*

Shape: Torpedo-shaped
Mouth: Points downward with barbels
Fins: Tail fin longer on the top than the bottom.
Scales: Armored plates
Color: Blackish to greenish yellow on the back and sides with white belly
Habitat: Found in large rivers and lakes
Habits: Plucks insects from the bottom with vacuum-like mouth.
Food: Snails, clams, crayfish, and insects
Fun fact: The largest fish in Minnesota, they can live to be 150 years old
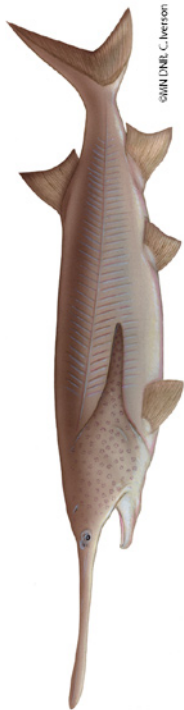
Paddlefish *Polydon spatbula*

Shape: Torpedo-shaped
Mouth: Forward with upper jaw formed into a long, paddle-like snout
Fins: Tail fin longer on the top than the bottom
Scales: Few and rhomboid-shaped
Color: Dull gray, sometimes bluish on top and white below
Habitat: Open water areas of large rivers
Habits: Collects food by straining tiny organisms from the water as baleen whales do
Food: Plankton
Fun fact: Catches food by swimming with its mouth wide-open to gather plankton.

Burbot (Eelpout) *Lota lota*

Shape: Flat-bottomed
Mouth: Forward and wide
Fins: Two-part dorsal fin with space between the spines and soft rays
Scales: Small and round
Color: Dark olive with darker markings on the back and sides
Habitat: Deep water during the summer months; moves to shallower water during the winter
Habits: Known to gorge on food to the point that the stomach balloons
Food: Voracious eaters; feed on a numerous species of fish including perch, whitefish, ciscoes, and suckers
Fun fact: Members of the cod family, this tasty fish is known as "poor man's lobster."

Fish Identification Cards