



G-E-T High School Curriculum

Align, Explore, Empower

Scope and Sequence

Wisconsin Fisheries and Aquaculture

Unit 1 - Water and Water Management

Length of Unit - 2 weeks

Students will discover sources of freshwater, its chemistry and suitability for aquatic life. Students will study and conduct labs to measure water for oxygen, nitrogen, ammonia, phosphorus, chlorine, pH, alkalinity, total dissolved solids, and hardness.

In this unit, students will ...

Demonstrate knowledge of water properties and its effect on fish. Show knowledge of nitrogen, phosphorus, pH and dissolved oxygen. Monitor fish tank and apply management principles to maintain water quality

Standards for Wisconsin Fisheries and Aquaculture

- ESS1.a.3.m: Determine the appropriate sampling techniques needed, explain the importance of unbiased sampling and collection of samples.
- ESS1.a.5.h: Determine appropriate sampling techniques, analyze and interpret samples and generate statistical analysis report(s) and prepare valid chemical laboratory samples according to instructions.
- ESS2.b.6.e: List how pollution affects organisms.
- ESS2.c.1.e: List ways water is used in daily life tracking its source.
- ESS2.c.2.e: Define ground and surface water and reinforce the difference by comparing and contrasting.
- ESS2.c.4.e: Match environmental hazards with the natural resource that could be potentially damaged.
- ESS2.c.7.m: Describe the world's water supplies and discuss water uses.
- ESS2.c.8.m: Demonstrate knowledge of hydrogeology by differentiating between ground and surface water.
- ESS2.c.10.m: Identify environmental hazards associated with groundwater supplies.
- ESS2.c.16.h: Describe precautions taken to prevent/reduce groundwater contamination while testing and documenting results of related tests.
- ESS2.d.8.m: Explain basic chemistry principles.
- ESS3.a.1.e: Identify different types of pollution.
- ESS3.a.3.m: Identify types of pollution and distinguish between point and nonpoint source pollution.
- NR2.c.13.h: Identify indicators of the biological health of a stream.
- NR2.d.2.e: Identify parts of a watershed.

Unit 2 - Fish Anatomy and Biology

Length of Unit - 1 week

Students explore fish anatomy both internal and external. Labs will include dissection and identification of items unique to fish. They will look for applications for raising and monitoring healthy fish.

In this unit, students will ...
Demonstrate knowledge of fish anatomy and biology.

Standards for Wisconsin Fisheries and Aquaculture

AS2.c.6.h: Evaluate and select animals to maximize performance based on anatomical and physiological characteristics that affect health, growth and reproduction.
AS2.b.1.e: Identify body parts of domestic food animals and pets.
AS2.b.3.m: Describe the properties, locations, functions and types of animal tissues.
AS2.b.4.m: Describe the properties, locations, functions and types of animal organs.
AS2.b.5.m: Describe the functions of the animal body systems and system components.
AS2.b.9.h: Compare and contrast organ types, functions and body systems adaptations among and between animal species.
AS2.b.10.h: Explain how the components and systems of animal anatomy and physiology relate to the production and use of animals.

Unit 3 - Fish Species

Length of Unit - 1 week

- Students will learn major fish species of Wisconsin and those used in aquaculture and tropical fish. Fish characteristics, habitats and life cycles will be major emphasis in this unit.

In this unit, students will ...
Identify common game and fish and have an understanding of their habitats. Identify community tropical fish and make selections based on freshwater tank habitat.

Standards for Wisconsin Fisheries and Aquaculture

AS1.a.5.h: Evaluate and describe characteristics of animals that developed in response to the animals' environment and led to their domestication.
AS1.a.7.h: Predict adaptations of animals to production practices and environments.
NR1.b.4.e: Match names to aquatic species.
NR1.b.9.m: Compare and contrast aquatic species.
NR1.b.13.h: Compare and contrast wildlife species.

Unit 4 - Trout and Trout Stream Management

Length of Unit - 1.5 weeks

- Students will study trout and trout streams. Habitat and habitat improvement projects will be a major emphasis. Stream degradation and challenges will be looked at in local trout streams and through DNR projects and fact sheets. Recreational opportunities will be looked at for local streams. Equipment for

monitoring and recreation will be covered. Students will produce tackle that can be used in the fishing industry.

In this unit, students will ...

Identify trout management practices and apply these practices to local trout and streams.

Standards for Wisconsin Fisheries and Aquaculture

NR1.a.6.h: Compare and contrast the interdependence of organisms within an ecosystem.
NR1.b.4.e: Match names to aquatic species.
NR1.b.14.h: Conduct an aquatic field inventory experience.
NR2.b.1.e: Categorize natural resource inventories and/or population studies.
NR2.b.2.e: Explain why laws are needed for natural resource systems.
NR2.b.5.m: Identify laws associated with natural resource systems.
NR2.b.8.h: Identify purposes of laws associated with natural resource systems and abide by specific laws pertaining to natural resource systems.
NR2.b.9.h: Identify and evaluate issues involving mitigation of natural resources.
NR2.c.1.e: Illustrate a stream.
NR2.c.5.e: Compare and contrast natural resources used for recreational purposes.
NR2.c.6.e: Compare and contrast healthy marine and coastal natural resources.
NR2.c.7.m: Categorize the different kinds of streams.
NR2.c.13.h: Identify indicators of the biological health of a stream.
NR2.d.2.e: Identify parts of a watershed.
NR3.a.7.e: List ways to enjoy natural resources.
NR3.a.9.m: Identify wildlife and aquatic species that can be commercially and or sustainably harvested for commercial and recreational purposes.

Unit 5 - Mississippi River

Length of Unit - 1 week

- Students will study the Mississippi River ecosystem items included will be watershed, habitat, fishery population, navigation, and invasive species.

In this unit, students will ...

Research, report, and present an issue of importance to the Mississippi river ecosystem.

Standards for Wisconsin Fisheries and Aquaculture

NR1.a.5.h: Research and debate one or more current issues related to the conservation or preservation of natural resources.
NR2.c.11.m: Identify natural resource characteristics desirable for recreational purposes.
NR2.c.17.h: Explain natural resource management techniques for improving recreation opportunities.
NR2.d.9.m: Describe properties of watersheds and identify the boundaries of local watersheds.

NR2.d.14.m: Define invasive species along with pollution descriptions and delineation between point and nonpoint source pollutions with descriptions of climatic factors that influence natural resources.
NR2.d.16.h: Relate the function of watersheds to natural resources.
NR2.d.21.h: Discuss factors that influence the establishment and spread of invasive species.
NR3.a.14.m: Identify recreational uses of natural resources.

Unit 6 - Great Lakes

Length of Unit - 1 week

- Students will discover the great lakes including: watershed, location, size, history, fishery, salmon production, food web, and invasive species. Students will connect human use and effects on the ecosystem highlighting changes that have taken place.

In this unit, students will ...

Students will identify key invasive species and their effect on the great lakes ecosystem.

Standards for Wisconsin Fisheries and Aquaculture

NR1.a.1.e: Identify natural resources.
NR1.a.5.h: Research and debate one or more current issues related to the conservation or preservation of natural resources.
NR1.a.6.h: Compare and contrast the interdependence of organisms within an ecosystem.
NR1.b.4.e: Match names to aquatic species.
NR2.b.1.e: Categorize natural resource inventories and/or population studies.
NR2.b.2.e: Explain why laws are needed for natural resource systems.
NR2.b.3.e: Identify natural resource systems that are at risk.
NR2.b.8.h: Identify purposes of laws associated with natural resource systems and abide by specific laws pertaining to natural resource systems.
NR2.b.9.h: Identify and evaluate issues involving mitigation of natural resources.
NR2.d.2.e: Identify parts of a watershed.
NR2.d.21.h: Discuss factors that influence the establishment and spread of invasive species.

Unit 7 - Aquaculture Systems

Length of Unit -1 week

- Students will become familiar with fish rearing systems, and set up lab tanks that replicate growing systems. Biological filters, oxygen supply, feeding and harvesting will be explored and compared. Systems such as those used to produce yellow perch in a recirculating system will be highlighted. Students

will monitor and maintain a recirculating system, observing fish raised in raceways and ponds.

In this unit, students will ...

Identify and compare the advantages and disadvantages of aquaculture systems.

Standards for Wisconsin Fisheries and Aquaculture

FPP1.a.2.e: Identify and explain environmental and safety concerns about the food supply.

AS7.a.1.e: Identify animal facilities and equipment used in animal husbandry.

AS7.a.2.m: Identify facilities needed to house and produce each animal species safely and efficiently.

AS7.a.3.m: Identify equipment and handling facilities used in modern animal production.

AS7.a.4.h: Critique designs for an animal facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility.

AS7.a.7.h: Select equipment and implement animal handling procedures and improvements to enhance production efficiency.

AS8.b.1.m: Identify optimal environmental conditions for animals.

AS8.b.2.h: Describe the effects of environmental conditions on animal populations and performance.

AS8.b.3.h: Establish and maintain favorable environmental conditions for animal growth and performance.

Unit 8 - Fishery Management

Length of Unit - 1.5 weeks

- Students will study Wisconsin fish management methods areas include; sampling populations, monitoring populations, stocking, and fish and game laws,

In this unit, students will ...

Use DNR population studies, angler surveys, lake biology, fish biology, invasive species, and seasons and limits to discover management strategies for a given lake or species.

Standards for Wisconsin Fisheries and Aquaculture

NR1.a.6.h: Compare and contrast the interdependence of organisms within an ecosystem.

NR2.b.5.m: Identify laws associated with natural resource systems.

NR2.b.7.h: Discuss procedures used to conduct resource inventories and population studies.

NR2.b.8.h: Identify purposes of laws associated with natural resource systems and abide by specific laws pertaining to natural resource systems.

NR2.b.9.h: Identify and evaluate issues involving mitigation of natural resources.

NR2.c.17.h: Explain natural resource management techniques for improving recreation opportunities.

NR2.d.13.m: Explain population ecology, population density and population dispersion.

NR2.d.20.h: Evaluate and create a management plan based on a population study for a community of organisms.