

Aquatics

Academic Content Area: Environment and Ecology – Grade 10

Career Development Event Content

1. Students will identify: fish, reptiles, amphibians, birds, mammals, aquatic study equipment, aquatic insects and aquatic plants.
2. Students will complete an exam on aquatic resources and their management, which will include questions on: Limnology (stream biology), groundwater, ecology of aquatic species, management practices and Pennsylvania Fish and Boat Commission laws.
3. Students will engage in a hands-on problem solving/analysis practicum related to: water testing, stream flow, volume of water in a stream/pond, calculating biotic index, determining watershed boundaries and pond management.

Related Academic Standards/Anchors

Objectives 1-3: **4.1.10.A,B,C,D,E; 4.3.10.B,C; 4.5.10.A; 4.6.10.A,B; 4.7.10.A,B,C; 4.9.10.A**

Connecting Examples: CDE Objectives and Standards/Anchors

Ex. 1 Related to 4.1.10.B: Explain the relationship among landforms, vegetation and the amount and speed of water. Sub-point, delineate the boundaries of a watershed. **During this career development event, students must complete a hands-on problem solving/analysis practicum that requires them to determine the boundaries of a watershed. The students are transported to a local pond or stream for completion of the practicum.**

Ex. 2 Related to 4.3.10.B: Explain how multiple variables determine the effects of pollution on environmental health, natural processes and human practices. Sub-point, identify local and state environmental regulations and their impact on environmental health. **Throughout the examination students are required to exhibit their knowledge and understanding of local and state environmental regulations and the impact they have on the aquatic systems in Pennsylvania.**

Ex. 3 Related to 4.6.10.A: Explain the biotic and abiotic components of an ecosystem and their interactions. Sub-point, analyze the effects of abiotic and biotic factors on specific ecosystems. **Students are required to demonstrate biotic indexing within their hands-on problem solving/analysis practicum.**

Aquatics

Academic Content Area: Mathematics – Grade 11

Career Development Event Content

1. Students will identify: fish, reptiles, amphibians, birds, mammals, aquatic study equipment, aquatic insects and aquatic plants.
2. Students will complete an exam on aquatic resources and their management, which will include questions on: Limnology (stream biology), groundwater, ecology of aquatic species, management practices and Pennsylvania Fish and Boat Commission laws.
3. Students will engage in a hands-on problem solving/analysis practicum related to: water testing, stream flow, volume of water in a stream/pond, calculating biotic index, determining watershed boundaries and pond management.

Related Academic Standards/Anchors

Objectives 1-3: 2.1.11.A; 2.2.11.A,B; 2.3.11.A,C; 2.5.11.A,B,C

Connecting Examples: CDE Objectives and Standards/Anchors

Ex. 1 Related to 2.1.11.A: Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms). **Students are required to complete a variety of computations for the hands on problem solving/analysis practicum. For example, calculate the average diameter and depth of the pond, compute the gallons of water in the pond, compute the volume using acre feet of water, calculate cubic feet of water per second and calculate how many people could get their water needs for one day from this stream.**

Ex. 2 Related to 2.2.11.A: Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations. **Students need to be able to use a variety of procedures with real numbers for their problem-solving/analysis practicum.**

Ex. 3 Related to 2.3.11.A: Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations. **Students must be able to identify appropriate tools and measuring devices to make accurate measurements for their calculations and analysis.**

Aquatics

Academic Content Area: Science and Technology – Grade 10

Career Development Event Content

1. Students will identify: fish, reptiles, amphibians, birds, mammals, aquatic study equipment, aquatic insects and aquatic plants.
2. Students will complete an exam on aquatic resources and their management, which will include questions on: Limnology (stream biology), groundwater, ecology of aquatic species, management practices and Pennsylvania Fish and Boat Commission laws.
3. Students will engage in a hands-on problem solving/analysis practicum related to: water testing, stream flow, volume of water in a stream/pond, calculating biotic index, determining watershed boundaries and pond management.

Related Academic Standards/Anchors

Objectives 1-3: **3.1.10.C,E; 3.2.10.B,C,D; 3.3.10.A; 3.5.10.B,D; 3.7.10.A,B**

Connecting Examples: CDE Objectives and Standards/Anchors

Ex. 1 Related to 3.1.10.E: Describe patterns of change in nature, physical and man made systems. Sub-point, describe how fundamental science and technology concepts are used to solve practical problems. Students are required to complete several practicums that require them to know and understand patterns within aquatic systems and must be able to solve practical problems utilizing such knowledge.

Ex. 2 Related to 3.5.10.D: Asses the value of water as a resource. Sub-point, relate aquatic life to water conditions (e.g., turbidity, temperature, salinity, dissolved oxygen, nitrogen levels, pressure). **Students are required to evaluate the above water conditions to evaluate and identify aquatic life, in addition, use aquatic life to evaluate water conditions. They are prepared to determine turbidity, temperature, salinity, dissolved oxygen, nitrogen and pressure.**

Ex. 3 Related to 3.7.10.A: Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions. Sub-point, select and safely apply appropriate tolls, materials and processes necessary to solve complex problems. **Students are asked to identify specific tools and machines used to evaluate aquatic resources systems and then use the identified tools and machines appropriately and correctly for accurate results.**