Project WILD and Aquatic WILD Guides
and the 2018 Virginia
Standards of Learning for Science

The Project WILD Curriculum K-12 and Aquatic WILD Guides support the 2018 Virginia Standards of Learning objectives for Science by providing background content for teachers and activities that help teach science standards using creative instructional methods. The following correlations to WILD activities match the Science Standard as they are written; extensions, adaptations or secondary objectives are not included. Some of the listed activities build on the student's knowledge and further the understanding of a concept but do not correlate directly. Other activities will support the standards in math and language arts and have an indirect link to Virginia's Science Standards at the suggested grade level. Reviewing the activities in the Project WILD guide along with the Topic, Subject, and Skills indexes found in the appendices will create a comprehensive correlation to Virginia's subject area Standards of Learning.

Activities in the guides have been field tested for Lower Elementary, Upper Elementary, Middle School and / or High School. As a result, some activities are listed for multiple grade levels. Teachers should communicate with teachers in other grades to prevent the same activity being used repeatedly to teach a related standard. Many activities have extensions that will expand the use of the activity across grade levels.

Within Virginia's Science SOLs, the first objective or ".1" standard touches on Scientific and Engineering Practices. These skills should be a part of all science lessons and can be found incorporated into all of the Project WILD activities. Activities in both guides include ***STEM, Career Connections*** and ***Field Investigations*** information. Those marked with a green leaf support the **Scientific and Engineering Practices** in the Curriculum Framework**.** Teachers are referred to the *Skills Index* in the back of their Project WILD Activity Guides for activities that would assist in teaching any given skill.

Many activities in Project WILD and Aquatic WILD reinforce skills included in the ***Profile of a Virginia Graduate***: Communication, Collaboration, Critical Thinking, Creative Thinking and Civic Responsibility.

The Virginia Department of Game and Inland Fisheries is the state sponsor for Project WILD. The Department provides professional development for formal and non-formal educators. From awareness to action, this hands-on approach to learning engages students in investigating the world around them, connecting them to conservation careers, and participating in solid STEM activities.

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A copy of this correlation may be downloaded at http://www.dgif.virginia.gov/education/project-wild/

Project WILD and Aquatic WILD CORRELATION TO VIRGINIA'S SCIENCE STANDARDS OF LEARNING

Kindergarten		Project WILD K-12 Guide	Aquatic WILD Guide
K.6	The student will investigate and understand that there are differences between living organisms and nonliving objects. Key ideas include a) all things can be classified as living or nonliving; and b) living organisms have certain characteristics that distinguish them from nonliving objects.	• *My Kingdom for a Shelter* • *Insect Inspection* • *Ants on a Twig*	
K.7	The student will investigate and understand that plants and animals have basic needs and life processes. Key ideas include a) living things need adequate food, water, shelter, air, and space to survive; b) plants and animals have life cycles; and c) offspring of plants and animals are similar but not identical to their parents or to one another.	• *My Kingdom for a Shelter* • *What's That Habitat* • *Ants on a Twig* • *Seed Need*	• *Are You Me?* • *Water Safari*
K.9	The student will investigate and understand that there are patterns in nature. Key patterns include a) daily weather; b) seasonal changes; and c) day and night.	• *Seed Need*	• *Are You Me?* • *Water Plant Art*
K.10	The student will investigate and understand that change occurs over time. Key ideas include a) natural and human-made things change over time; b) living and nonliving things change over time; c) changes can be observed and measured; and d) changes may be fast or slow.	• *Color Crazy* • *What's That Habitat?*	• *Aqua Words* • *Are You Me?*
K.11	The student will investigate and understand that humans use resources. Key ideas include a) some materials and objects can be used over and over again; b) materials can be recycled; and c) choices we make impact the air, water, land and living things.	• *What You Wear is What They Were*	

First Grade		Project WILD K-12 Guide	Aquatic WILD Guide
1.4	The student will investigate and understand that plants have basic life needs and functional parts that allow them to survive. Key ideas include a) plants need nutrients, air, water, light, and a place to grow; b) structures of plants perform specific functions; and c) plants can be classified based on a variety of characteristics.	• *Busy Bees, Busy Blooms* • *Seed Need*	• *Water Plant Art*
1.5	The student will investigate and understand that animals, including humans, have basic life needs that allow them to survive. Key ideas include a) animals need air, food, water, shelter, and space (habitat); b) animals have different physical characteristics that perform specific functions; and c) animals can be classified based on a variety of characteristics..	• *Color Crazy* • *My Kingdom for a Shelter* • *Insect Inspection* • What's That Habitat	• *Fashion A Fish*
1.7	The student will investigate and understand that there are weather and seasonal changes. Key ideas include a) changes in temperature, light, and precipitation occur over time; b) there are relationships between daily weather and the season; and c) changes in temperature, light, and precipitation affect plants and animals, including humans.	• What You Wear is What They Were	•

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1.8	The student will investigate and understand that natural resources can be used responsibly. Key ideas include a. most natural resources are limited; b. human actions can affect the availability of natural resources; and c. reducing, reusing, and recycling are ways to conserve natural resources.	• What You Wear is What They Were	

Second Grade		**Project WILD K-12 Guide**	**Aquatic WILD Guide**
2.4	The student will investigate and understand that plants and animals undergo a series of orderly changes as they grow and develop. Key ideas include a. animals have life cycles; and *b.* plants have life cycles.	• *Limiting Factors: How Many Bears? (Procedure II)* • *Surprise Terrarium*	• *Are You Me?*
2.5	The student will investigate and understand that living things are part of a system. Key ideas include a) plants and animals are interdependent with their living and nonliving surroundings; b) an animal's habitat provides all of its basic needs; and c) habitats change over time due to many influences.	• *My Kingdom for a Shelter* • *Busy Bees, Busy Blooms* • *What's That Habitat*	• *Water Safari*
2.7	The student will investigate and understand that weather patterns and seasonal changes affect plants, animals, and their surroundings. Key ideas include a) weather and seasonal changes affect the growth and behavior of living things; b) wind and weather can change the land; and c) changes can happen quickly or slowly over time.	• *What Bear Goes Where*	• *Silt: A Dirty Word*
2.8	The student will investigate and understand that plants are important natural resources. Key ideas include a. the availability of plant products affects the development of a geographic area; b. plants provide oxygen, homes, and food for many animals; and c. plants can help reduce the impact of wind and water.	• *My Kingdom for a Shelter*	• *Water Plant Art*

Third Grade		**Project WILD K-12 Guide**	**Aquatic WILD Guide**
3.4	The student will investigate and understand that adaptations allow organisms to satisfy life needs and respond to the environment. Key ideas include a) populations may adapt over time; b) adaptations may be behavioral or physical; and c) fossils provide evidence about the types of organisms that lived long ago as well as the nature of their environments.	• *Adaptation Artistry* • *Tracks*	• *Designing a Habitat* • *Marsh Munchers* • *Fashion A Fish* • *Sockeye Scents* • *Gone Fishing*
3.5	The student will investigate and understand that aquatic and terrestrial ecosystems support a diversity of organisms. Key ideas include a) ecosystems are made of living and nonliving components of the environment; and b) relationships exist among organisms in an ecosystem.	• *Thicket Game* • *Owl Pellets* • *Quick Frozen Critters* • *Which Niche?*	• *Marsh Munchers* • *Fishy Who's Who* • *Edge of Home*
3.6	The student will investigate and understand that soil is important in ecosystems. Key ideas include a) soil, with its different components, is important to organisms; and b) soil provides support and nutrients necessary for plant growth.		• *Silt a Dirty Word*
3.7	The student will investigate and understand that there is a water cycle and water is important to life on Earth. Key ideas include a. there are many reservoirs of water on Earth; b. the energy from the sun drives the water cycle; and c. the water cycle involves specific processes.		• *Aqua Words* • *Got Water?* • *Water Wings* • *Alice in Waterland*
3.8	The student will investigate and understand that natural events and humans influence ecosystems. Key ideas include a) human activity affects the quality of air, water, and habitats; b) water is limited and needs to be conserved;	• *Environmental Barometer* • *Habitat Circles* • *Urban Nature Search*	• *Silt is a Dirty Word* • *Water Works*

	c) fire, flood, disease, and erosion affect ecosystems; and d) soil is a natural resource and should be conserved.		

Fourth Grade		Project WILD K-12 Guide	Aquatic WILD Guide
4.2	The student will investigate and understand that plants and animals have structures that distinguish them from one another and play vital roles in their ability to survive. Key ideas include a) the survival of plants and animals depends on photosynthesis; b) plants and animals have different structures and processes for obtaining energy; and c) plants and animals have different structures and processes for creating offspring.	• *Trophic Transfer* • *Busy Bees, Busy Blooms* • *Seed Need* • *Quick Frozen Critters* • *Keeping Cool*	• *Sockeye Scents* • *Turtle Hurdles*
4.3	The student will investigate and understand that organisms, including humans, interact with one another and with the nonliving components in the ecosystem. Key ideas include a) interrelationships exist in populations, communities, and ecosystems; b) food webs show the flow of energy within an ecosystem; c) changes in an organism's niche and habitat may occur at various stages in its life cycle; and d) classification can be used to identify organisms.	• *Which Niche?* • *Interview A Spider* • *Monarch Marathon* • *Adaptation Artistry* • *Keeping Cool* • *Career Critters*	• *Edge of Home* • *Designing a Habitat* • *Fashion a Fish* • Got Water?
4.8	The student will investigate and understand that Virginia has important natural resources. Key resources include a) watersheds and water; b) plants and animals; c) minerals, rocks, and ores; and d) forests, soil, and land.	• *What's Wild* •	• *Fishy Who's Who* • *Water Plant Art* • *Blue Ribbon Niche* • *Silt – A Dirty Word*

Fifth Grade		Project WILD K-12 Guide	Aquatic WILD Guide
5.2	The student will investigate and understand that energy can take many forms. Key ideas include a) energy is the ability to do work or to cause change; b) there are many different forms of energy; c) energy can be transformed; and d) energy is conserved.	• *Trophic Transfer*	
5.9	The student will investigate and understand that the conservation of energy resources is important. Key ideas include a) some sources of energy are considered renewable and others are not; b) individuals and communities have means of conserving both energy and matter; and c) advances in technology improve the ability to transfer and transform energy.	• *Trophic Transfer* • *Lights Out* • Sustainability: Then, Now, Later	

Sixth Grade		Project WILD K-12 Guide	Aquatic WILD Guide
6.6	The student will investigate and understand that water has unique physical properties and has a role in the natural and human-made environment. Key ideas include a) water is referred to as the universal solvent; b) water has specific properties; c) thermal energy has a role in phase changes; d) water has a role in weathering; e) large bodies of water moderate climate; and f) water is important for agriculture, power generation, and public health.	• Raindrops and Ranges	• Water Works
6.8	The student will investigate and understand that land and water have roles in watershed systems. Key ideas include a) a watershed is composed of the land that drains into a body of water;		• Watershed • Water Wings • Watered Down History

	b) Virginia is composed of multiple watershed systems which have specific features; c) the Chesapeake Bay is an estuary that has many important functions; and d) natural processes, human activities, and biotic and abiotic factors influence the health of a watershed system.		• Net Gain, Net Effect • Facts and Falsehoods
6.9	The student will investigate and understand that humans impact the environment and individuals can influence public policy decisions related to energy and the environment. Key ideas include a) natural resources are important to protect and maintain; b) renewable and nonrenewable resources can be managed; c) major health and safety issues are associated with air and water quality; d) major health and safety issues are related to different forms of energy; e) preventive measures can protect land-use and reduce environmental hazards; and f) there are cost/benefit tradeoffs in conservation policies.	• *Lights Out* • *Wildlife and the Environment : Community Survey* • *Bat Blitz* • *The Power of Planning*	• *Alice in Waterland* • *What's In The Air?* • *Urban Waterway Checkup* • *Water Works*

Life Science		Project WILD K-12 Guide	Aquatic WILD Guide
LS.5	The student will investigate and understand that biotic and abiotic factors affect an ecosystem. Key ideas include a) matter moves through ecosystems via the carbon, water, and nitrogen cycles; b) energy flow is represented by food webs and energy pyramids; and c) relationships exist among producers, consumers, and decomposers.	• *Eco-Enrichers* • *Trophic Transfer*	• *Micro Odyssey*
LS.6	The student will investigate and understand that populations in a biological community interact and are interdependent. Key ideas include a) relationships exist between predators and prey and these relationships are modeled in food webs; b) the availability and use of resources may lead to competition and cooperation; c) symbiotic relationships support the survival of different species; and d) the niche of each organism supports survival.	• *Good Buddies* • Water Mileage • Which Niche?	• *Blue Ribbon Niche* • *Gone Fishing*
LS.7	The student will investigate and understand that adaptations support an organism's survival in an ecosystem. Key ideas include a) biotic and abiotic factors define land, marine, and freshwater ecosystems; and b) physical and behavioral characteristics enable organisms to survive within a specific ecosystem.	• Water Mileage • Adaptation Artistry • Muskox Maneuvers	• *Where have all the Salmon Gone?*
LS.8	The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time. Key ideas include a) organisms respond to daily, seasonal, and long-term changes; b) changes in the environment may increase or decrease population size; and c) large-scale changes such as eutrophication, climate changes, and catastrophic disturbances affect ecosystems.	• *Phenology at Play* • *Raindrops and Ranges* • *Time Lapse*	• *Pond Succession*
LS.9	The student will investigate and understand that relationships exist between ecosystem dynamics and human activity. Key ideas include a. changes in habitat can disturb populations; b. disruptions in ecosystems can change species competition; and c. variations in biotic and abiotic factors can change ecosystems.	• Habitat Circles • Ecosystem Architects • Changing the Land • Migration Barriers	• *To Dam or Not to Dam* • *Dam Design*

LS.10	The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key ideas include a) DNA has a role in making proteins that determine organism traits; b) the role of meiosis is to transfer traits to the next generation; and c) Punnett squares are mathematical models used to predict the probability of traits in offspring.	• *Bottleneck Genes*	• *Eat and Glow*
LS.11	The student will investigate and understand that populations of organisms can change over time. Key ideas include a) mutation, adaptation, natural selection, and extinction change populations; b) the fossil record, genetic information, and anatomical comparisons provide evidence for evolution; and c) environmental factors and genetic variation, influence survivability and diversity of organisms.	• *Here Today, Gone Tomorrow* • *Bottleneck Genes* • *Back from the Brink*	

Physical Science		Project WILD K-12 Guide	Aquatic WILD Guide
PS.5	The student will investigate and understand that energy is conserved. Key ideas include a) energy can be stored in different ways; b) energy is transferred and transformed; and c) energy can be transformed to meet societal needs.	• *Light's Out* • *The Power of Planning*	

Earth Science		Project WILD K-12 Guide	Aquatic WILD Guide
ES.6	The student will investigate and understand that resource use is complex. Key ideas include a. global resource use has environmental liabilities and benefits; b. availability, renewal rates, and economic effects are considerations when using resources; c. use of Virginia resources has an effect on the environment and the economy; and d. all energy sources have environmental and economic effects.	• *The Power of Planning* • *To Zone or Not to Zone*	• *Living Research: Aquatic Heroes & Heroines* • *Dragonfly Pond* • *To Dam or Not to Dam* • Net Gain Net Effect • Sea Turtle International • Plastic Voyages
ES.8	The student will investigate and understand that freshwater resources influence and are influenced by geologic processes and human activity. Key ideas include a) water influences geologic processes including soil development and karst topography; b) the nature of materials in the subsurface affect the water table and future availability of fresh water; c) weather and human usage affect freshwater resources, including water locations, quality, and supply; and d) stream processes and dynamics affect the major watershed systems in Virginia, including the Chesapeake Bay and its tributaries.	• *Rainfall and Ranges*	• *Watershed* • *Where Does Water Run?*
ES.10	The student will investigate and understand that oceans are complex, dynamic systems and are subject to long- and short-term variations. Key ideas include a) chemical, biological, and physical changes affect the oceans; b) environmental and geologic occurrences affect ocean dynamics; c) unevenly distributed heat in the oceans drives much of Earth's weather; d) features of the sea floor reflect tectonic and other geological processes; and e) human actions, including economic and public policy issues, affect oceans and the coastal zone including the Chesapeake Bay.		• *Conservation messaging* • *Plastic Voyages* • *Sea Turtles international*

Biological Science		Project WILD K-12 Guide	Aquatic WILD Guide
BIO.5	The student will investigate and understand that there are common mechanisms for inheritance. Key ideas include a) DNA has structure and is the foundation for protein synthesis; b) the structural model of DNA has developed over time; c) the variety of traits in an organism are the result of the expression of various combinations of alleles; d) meiosis has a role in genetic variation between generations; and e) synthetic biology has biological and ethical implications.	• *Bottleneck Genes*	
BIO.7	The student will investigate and understand that populations change through time. Key ideas include a) evidence is found in fossil records and through DNA analysis; b) genetic variation, reproductive strategies, and environmental pressures affect the survival of populations; c) natural selection is a mechanism that leads to adaptations and may lead to the emergence of new species; and d) biological evolution has scientific evidence and explanations.	• *Back from the Brink* • *Bottleneck Genes*	• *Eat and Glow (indirect)*
BIO.8	The student will investigate and understand that there are dynamic equilibria within populations, communities, and ecosystems. Key ideas include a. interactions within and among populations include carrying capacities, limiting factors, and growth curves; b. nutrients cycle with energy flow through ecosystems; c. ecosystems have succession patterns; and d. natural events and human activities influence local and global ecosystems and may affect the flora and fauna of Virginia.	• *Turkey Tallies* • *Carrying Capacity* • *Checks and Balances* • *Changing the Land* • *Environmental Barometer* • *Phenology at Play*	• *Where Have All The Salmon Gone* • *Watershed* • *The Glass Menagerie*

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