Standards-Based Project WET Activity Pool – Grade 3

Pool Title: Surviving in Different Environments– (California Science Framework - Grade 3, IS3, p: 228)

IS3 focuses on the organism's interaction with the environment Every organism has its needs met by the surrounding environment, but not all organisms can survive in all environments Some plants and animals have traits that allow them to survive better in a specific environment, which ties directly to the concepts of the variation in traits from IS2 and forms the foundation for understanding natural selection in later grades At this level, students gather specific evidence of cause and effect relationships, where the environment affects which organisms survive. (CSF, p: 228)

Standards Pool:

3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change *

3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard *

3–5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3–5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Anchoring Phenomenon: Water quantity and quality effect where organisms live.

Guiding Questions:

- How do organisms' traits help them survive in different environments?
- How does the environment affect living organisms?
- What happens to organisms when the environment changes?

California Environmental Principles and Concepts:

Principle II - The long-term functioning and health of terrestrial, freshwater, coastal and marine ecosystems are influenced by their relationships with human societies.

Principle V - Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes.

Performance Expectations ***Investigative Phenomena***	**Learning Targets by PE Dimensions**	**Learning Experience Connections**	**Common Core & Engineering/ Community Action Connections**
3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment. *How do organisms' traits help them survive in different environments?*	**SEP**: **Construct Explanations and Design Solutions** Students can use evidence to explain how specific traits are designed to help an organism survive specific environmental conditions. **DCI: LS3.A: Inheritance of Traits/ LS3.B: Variation of Traits** Students can identify traits of organisms influenced by their environment. **CCC**: **Cause and Effect** Students can describe how an organism responds to water availability and other factors in its environment.	**'Water Address' (Project WET Portal)** - Students identify organisms and their environment based on a set of clues describing adaptations to water. - See detailed NGSS correlation on Project WET Portal for additional suggestions for helping students elaborate on and apply the concepts and skills in this activity. - California activity supplements available on Water Education Foundation website.	**ELA:** RI.3.1.a–d; RI.3.2.a–d; RI.3.3; W.3.1; W.3.2; W.3.8; SL.3.4 - Students can engage in national phenology efforts by observing and recording data on local organisms.
3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. *How does the environment affect living organisms?*	**SEP**: **Engage in Argument from Evidence** Students can use evidence to develop an argument that the design of salt marsh organism traits have been influenced by the environment. **DCI: LS4.C: Adaptation** Students can use evidence to explain where organisms are located within the salt marsh ecosystem. **CCC**: **Cause and Effect** Students can describe how the daily cycles of a salt marsh ecosystem are reflected in the traits of organisms living there.	**'Salt Marsh Players' (Project WET Portal)** - Students role-play how organisms adapt to life in a salt marsh—a coastal, marine habitat that is alternately flooded and drained by tides. - Use the EEI *levelled reader Sweetwater Marsh National Wildlife Refuge as a basis to begin student investigations on how humans have changed a coastal habitat. (CSF, p: 236)* - See California Science Framework, p: 236) for additional connections to this activity.	**ELA:** RI.3.1; W.3.2; RI.3.3; W.3.1; W.3.2.a-d; SL.3.4
3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the	**SEP**: **Engage in Argument from Evidence** Students can use evidence to develop an argument on how changes in macroinvertebrate population can be used	**'Macroinvertebrate Mayhem' (Project WET 2.0; p: 343)** - Students engage in a simulation to observe changes in a stream when an	**ELA:** RI.3.1 a-d; RI.3.2.a-d; RI.3.3; W.3.1; W.3.2; SL.3.4; **Math:** MP.2; MP.4

types of plants and animals that live there may change *What happens to organisms when the environment changes?* *How do human-caused changes affect the environment?* *How can changes in organism numbers be used to detect changes in natural systems?*	to detect changes in a stream community. **DCI: LS2.C: Ecosystem Dynamics, Functioning, and Resilience/ LS4.D: Biodiversity and Humans** Students can describe how changes in an aquatic habitat that can affect organisms living there. **CCC**: **Systems and System Models** Students can describe the role of macroinvertebrates in a stream community and how they respond to changes in water quality.	environmental stressor is introduced. - See detailed NGSS correlation on Project WET Portal for additional suggestions for helping students elaborate on and apply the concepts and skills in this activity.	- Students can engage in a macroinvertebrate survey to assess the water quality of a local freshwater waterbody.
3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.* *How do human-caused changes affect the environment?*	**SEP**: **Engaging in Argument from Evidence.** Students can compare current actions people use to reduce urban runoff contaminants from entering waterways. **DCI**: **ESS3.B: Natural Hazards** Students can identify common urban runoff contaminants and methods people use to reduce their impact on local waterways. **CCC**: **Cause and effect** Students can describe how urban runoff contaminants may alter aquatic ecosystems.	**'A-Maze-ing Water' (Project WET 2.0; p: 231)** - Students guide water drops through a maze of 'urban pollutants' to simulate storm water runoff. - Students tour campus and nearby storm drains to observe what kind of material is carried by storm water. - See detailed NGSS correlation on Project WET Portal for additional suggestions for helping students elaborate on and apply the concepts and skills in this activity.	**ELA:** W.3.1.a–d; W.3.7 **Math:** MP.2; MP.4; 3.MD.4 - Students design and present a brochure on steps individuals and communities can take to prevent litter and other pollutants from reaching storm drains.
3–5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. *How can we reduce or eliminate human generated trash from entering our waterways?*	**SEP**: **Ask Questions and Define Problems** Students can develop a way to reduce waste entering local waterways and landfills based on cost, realistic of user time and reduces waste products. **DCI**: **ETS1.A: Defining and Delimiting Engineering Problems** Students can compare and identify limits to current ways to reduce waste and criteria for improving or developing a new solution.	**'There's No Away' (Project WET 2.0; p: 453)** - Students compare the Litter and Water Don't Mix photos and discuss where the trash came from. - Engage students in a modified version of *'Blue River' PWET, p: 135)* with NOAA Debris Deck items integrated into 'storm drain' stream sources. - Students evaluate options and develop a method to reduce waste going into landfills and waterways in their	**ELA:** RI.5.1; RI.5.7; RI.5.9; W.3.1.a–d; W.3.7; W.5.7; W.5.8; W.5.9a,b **Math:** MP.2; MP.4; MP.5; 3.OA.1-4; 3.OA.5-6; 3.OA.7; 3.OA.8-9; 4.OA.1-3; 4.OA.4; 4.OA.5; 5.OA.1-2.1; 5.OA.3 - Students design a reusable item kit to replace items they currently add to the waste stream. - Students design and implement a

	CCC: **Influence of Engineering, Technology, and Science on Society and the Natural World** Students can generate a list of alternatives to reduce waste entering local waterways and landfills and a way to change current waste practices in the community.	community.	PSA campaigns to reduce waste entering local waterways and landfills. - Students design and experiment with methods and tools for capturing waste in waterways.