

California Department of Fish and Wildlife
Classroom **A**quarium **E**ducation **P**rogram
Correlation with the Next Generation Science Standards
and
Selected Common Core Standards in Mathematics and English/Language Arts
August, 2013

The California Department of Fish and Wildlife's Classroom Aquarium Education Project (CAEP) lends itself to teaching a variety of standards in not only Science but also Mathematics and English/Language Arts. The CAEP is not a curriculum itself, but participating teachers receive the *Project WILD Aquatic K-12 Curriculum and Activity Guide* as well as a variety of other curriculum materials.

As of this writing (August, 2013), the Council for Environmental Education, which publishes *Wild Aquatic*, is working on identifying the correlations with the Next Generation Science Standards (NGSS). When they are available, you should be able to find them at: <http://www.projectwild.org>. (In 2002 they did a correlation with National Science Content Standards, but the 2013 NGSS are very different.)

In the "notes" section of the following pages we have noted some *WILD Aquatic* activities that are particularly well suited to specific standards. These are listed in brackets by the titles of the activities, like this: [WA: *name of activity/activities*]. While the activities are listed with the grade level standards corresponding to the grade spans indicated in the *WILD Aquatic* guide, most can readily be adapted to other grade levels. Following these correlations is a matrix showing correlation of both the *Project WILD Aquatic* and the *Project WILD K-12 Curriculum and Activity Guides* activities and the CAEP topics.

Next Generation Science Standards:

The California Department of Education has not yet adopted new Science Standards. However, it is anticipated that the Next Generation Science Standards (NGSS), developed by the National Research Council and Achieve, will be adopted in late 2013, possibly with some modification. It is further expected that the "Performance Expectations" of the NGSS will be the basis for the actual California State Standards in Science. Based on those assumptions, the Classroom Aquarium Education Program activities and goals correlate well with many of the Next Generation Science Standards.

NGSS Performance Expectations for which a strong correlation with the CAEP was found are noted in this document. Some others with moderate correlations are also noted. These correlations assume that the aquarium user is doing other activities with students in addition to simply raising eggs and releasing fish. The Next Generation Science Standards have many other not-so-strong correlations with the CAEP.

Selected Common Core Standards:

Throughout the Classroom Aquarium Education Program, students participate in a variety of activities that support the achievement of English/Language Arts Common Core Standards and Mathematics Common Core Standards.

Selected English/Language Arts and Mathematics Common Core Standards that are particularly well suited to teaching through the CAEP are noted. Since the Common Core Standards tend to be rather lengthy, they are paraphrased. The CAEP can, of course, also be useful in teaching other Common Core Standards

Kindergarten Correlations with CAEP

(LS = Life Sciences, ESS = Earth and Space Sciences)

Kindergarten NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.	Discuss reasons for aquarium components such as water, aerator, gravel, air pump, food. [WA: <i>Fashion a Fish, Water Safari</i>]
K-ESS3-1: Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.	Discuss differences between terrestrial animals' needs and those of aquatic animals, including how they obtain oxygen. "Model" can include drawings, posters, etc. [WA: <i>Fashion a Fish, Water Planet Art, Water Safari</i>]
K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.	Discuss how aquatic environments can be degraded by silt, pollution, stagnation, etc., and how to reduce such impacts.

Kindergarten NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	Include ways that humans can protect and improve both terrestrial and aquatic environments. Find out about placement of large woody debris in streams, "setbacks" required for logging, etc. Salmonids create redds. [WA: <i>Water Planet Art</i>]

Kindergarten CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP (Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.K.1.7 (...describe relationships between illustrations and text...)	Use the CAEP as a topic of written and oral discussion. Videos and posters can provide a different kind of illustrations. [WA: <i>Aqua Words, Aquatic Roots, Water Safari</i>]
W.K.3 (...narrate a single event...)	
SL.K.2 (...ask and answer questions...)	
SL.K.5 (...add drawings to provide detail...)	
SL.K.6 (...express thoughts, feelings, and ideas...)	
L.K.1 (Demonstrate command of the conventions...)	
L.K.6 (Use words and phrases...)	

Kindergarten California Common Core Standards in MATHEMATICS Correlations with CAEP (Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
K.CC.4 (Understand the relationship between numbers and quantities...)	Students can count and compare things like numbers of eggs and fish, sizes of pebbles, and size of the aquarium components.
K.CC.5 (Count to answer "how many?"...)	
K.CC.6 (Identify... greater than, less than or equal...)	
K.CC.7 (Compare two numbers...)	
K.MD.1 (Describe measurable attributes of objects...)	
K.MD.2 (Directly compare two objects...)	

Grade 1 Correlations with CAEP

(LS = Life Sciences)

Grade 1 NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
1-LS3-1: Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Simple observations of different stages in fishes' life; discuss human life stages (infant, child, teen, adult, elder) and other animals such as kittens/cats, cow/calf, chick/chicken, etc. [WA: <i>Are You Me?</i>]

Grade 1 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP (Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.1.3 (Describe the connection between...)	As the fish eggs develop, many opportunities for written and oral observations and discussion will develop, including opportunities to add drawings to descriptions. [WA: <i>Aqua Words, Aquatic Roots</i>]
W.1.3 (Write narratives...)	
SL.1.3 (Ask and answer questions...)	
SL.1.5 (Add drawings...to descriptions...)	
SL.1.6 (Produce complete sentences...)	
L.1.1 (Demonstrate command of the conventions...)	
L.1.6 (Use words and phrases...)	

Grade 1 California Common Core Standards in MATHEMATICS Correlations with CAEP (Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
1.MD1 (Order three objects by length...)	Measurements and comparisons of fish lengths and pebble sizes can be made.
1.MD.2 (Express...length...as a whole number...)	
1.MD.4 (Organize, represent, and interpret data...)	Numerical and written data can be organized, possibly in a data table.

Grade 2 Correlations with CAEP

(LS = Life Sciences, ESS = Earth and Space Sciences)

Grade 2 NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.	Students can compare the aquarium with aquaria with plants and other animals, or with other habitats, either in the real world or in books or films. [WA: <i>Fashion a Fish, Water Plant Art, Water Safari</i>]

Grade 2 NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Ask students what plants need, then have them design and carry out investigations. Relate to animals' needs, including fish and humans. . [WA: <i>Water Safari</i>]
2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid.	Introduce aquatic vocabulary such as lake, river, pond, stream, ocean. Include fresh and salt water. Use globes and maps. [WA: <i>Water Safari</i>]

Grade 2 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP	
(Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.2.3 (Describe the connection...)	Use the CAEP as a topic of written and oral discussion. Videos and posters can provide a different kind of illustrations. [WA: <i>Aqua Words, Aquatic Roots</i>]
RI.2.7 (Explain how specific images...contribute...)	
RI.2.10 (...read and comprehend informational texts...)	

Grade 2 California Common Core Standards in MATHEMATICS Correlations with CAEP	
(Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
2.MD.1 (Measure the length of an object...)	Students can measure various objects associated with CAEP, including the dimensions of the aquarium.
2.MD.2 (Measure the length of an object twice...)	
2.MD.3 (Estimate lengths...)	
2.MD.4 (Measure to determine how much longer...)	

Grade 3 Correlations with CAEP

(LS = Life Sciences, ETS = Engineering, Technology, and Science (Engineering Design))

Grade 3 NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	“Models” can include 2- and 3-dimensional representations. [WA: <i>Fishy Who’s Who</i> , <i>Micro Odyssey</i> , <i>Sockeye Scents</i> , <i>Turtle Hurdles</i> ,]
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.	Compare different environments such as deserts and streams. Include changed environments as being different. E.g.: a polluted stream is a different environment from a clean stream; a gravelly stream bottom is a different environment than a silted stream bottom. [WA: <i>Design a Habitat</i> , <i>Edge of Home</i> , <i>Fashion a Fish</i> , <i>Turtle Hurdles et al.</i>]
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.	Discuss both pro and con of various changes, both natural and human-caused. [WA: <i>Aquatic Roots</i> , <i>Edge of Home</i> , <i>Silt: A Dirty Word</i>]
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.	e.g., fishing regulations, planting shade plants along a stream, or placing large woody debris in a stream. [WA: <i>Alice in Waterland</i> , <i>Dragonfly Pond</i> , <i>Plastic Voyages</i> , <i>Water We Eating?</i> , <i>Water Works</i>]

Grade 3 NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
3LS3-1: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	Students can compare pictures of various species of salmonids. [WA: <i>Fashion a Fish</i> , <i>Fishy Who’s Who</i> , <i>Water Plant Art</i>]

Grade 3 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP	
(Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.3.7 (Explain how specific images contribute to...)	Use the CAEP as a topic of written and oral discussion. Videos and posters can provide a different kind of illustrations. Students can do research on fish, other aquatic organisms, aquatic ecosystems, environmental issues, fishing, or other fish-related issues. [WA: <i>Aqua Words</i> , <i>Alice in Waterland</i> , <i>Aquatic Roots</i> , <i>Aquatic Times</i> , <i>Blue Ribbon Niche</i> , <i>Dragonfly Pond</i> , and many others involve research, writing, and discussion skills.]
RI.3.10 (...read and comprehend... texts...)	
W.3.2 (Write informative...texts...)	
W.3.7 (Participate in shared research and writing...)	
W.3.10 (Write routinely...)	
SL.3.1 (Engage ... in...discussions...)	
SL.3.6 (Speak in complete sentences...)	
L.3.1 (Demonstrate command of the conventions...)	

Grade 3 California Common Core Standards in MATHEMATICS	
Correlations with CAEP	
(Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
3/MD.2 (Measure and estimate volumes and masses...)	...of aquaria, rocks, etc. [WA: <i>Alice in Waterland</i>]

Grade 4 Correlations with CAEP

(LS = Life Sciences, ESS = Earth and Space Sciences,
ETS = Engineering, Technology, and Science (Engineering Design))

Grade 4 NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	Students can learn main external fish anatomy, and compare to human (eyes, mouth, fins/legs/arms, skin, etc. [WA: <i>Fashion a Fish, Fishy Who's Who, Mermaids and Manatees, Micro Odyssey</i> , and others])
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.	Discuss problems such as siltation, pollution, temperature changes, food, etc, and solutions. [WA: <i>Alice in Waterland, Dragonfly Pond, Water we Eating?</i>]

Grade 4 NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
4-ESS3-2: Generate and compare multiple solutions to reduce impacts of natural Earth processes on humans.	Discuss the effects of both drought and heavy rain years on both humans and aquatic organisms. [WA: <i>Alice in Waterland, Plastic Voyages, Water We Eating?</i>]

Grade 4 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP	
(Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.4.7 (Interpret information...)	Students can discuss, both orally, and in writing, what they do and learn in the CAEP. Students can do research on fish, other aquatic organisms, aquatic ecosystems, environmental issues, fishing, or other fish-related issues. [WA: <i>Aqua Words, Aquatic Roots, Aquatic Times, Blue Ribbon Niche, Designing a Habitat, Kelp Help, Mermaids and Manatees, Wetland Metaphors, Water Wings</i> and others can help teach research, writing, and discussion skills.]
RI.4.10 (...read and comprehend texts...)	
W.4.2 (Write...to convey ideas and information...)	
W.4.8 (Recall relevant information...)	
W.4.9 (Draw evidence from...texts...)	
W.4.10 (Write routinely...)	
SL.4.1 (Engage...in...collaborative discussions...)	
L.4.1 (Demonstrate command of the conventions...)	

Grade 4 California Common Core Standards in MATHEMATICS	
Correlations with CAEP	
(Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
4.MD.1 (Know relative sizes of measurement units...)	Measure various components of aquaria, using both metric and “standard” units. [WA: <i>Alice in Waterland, Got Water?</i>]
4.MD.2 (...solve word problems...)	e.g.: If we started with 30 eggs, and half survived, how many survived? If our school released 66 fish and 1/3 made it to the ocean, how many did not make it to the ocean? If the current carries a smolt 2 mph towards the ocean, how long will it take to get to the ocean from a redd that is 84 miles from the ocean?

Grade 5 Correlations with CAEP

(PS = Physical Sciences, LS = Life Sciences, ESS = Earth and Space Sciences,
ETS = Engineering, Technology, and Science (Engineering Design))

Grade 5 NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
5-PS3-1: Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	<p>“Models” can be 2- or 3-dimensional.</p> <p>Introduce food chains and food webs, both aquatic and terrestrial, and include humans and also physical factors such as light, air/oxygen, water, and soil. Discuss how changes in part of the web affect other parts.</p> <p>[WA: <i>Blue Ribbon Niche, Design a Habitat, Got Water?. Marsh Munchers, Micro Odyssey, Plastic Voyages, Riparian Retreat, Water We Eating? Water Wings, Water Works,</i>]</p>
5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	
5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	
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.	<p>Include food web related problems such as loss of producers or carnivores, or loss of sunlight or oxygen due to siltation or algal blooms, and solutions.</p> <p>[WA: <i>Water We Eating?</i>]</p>

Grade 5 NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	<p>Include both regulations (such as fishing, road building, or logging regulations) and volunteer efforts.</p> <p>[WA: <i>Alice in Waterland, Aquatic Roots, Dragonfly Pond, Plastic Voyages, Water Works</i>]</p>

Grade 5 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP	
(Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.5.7 (Draw on information...to answer a question...)	Students can discuss, both orally, and in writing, what they do and learn in the CAEP.
RI.5.10 (Read and comprehend...texts)	
W.5.2 (Write ...texts...)	<p>Students can do research on fish, other aquatic organisms, aquatic ecosystems, environmental issues, fishing, or other fish-related issues.</p> <p>[WA: <i>Aqua Words, Aquatic Roots, Aquatic Times, Blue Ribbon Niche, Design a Habitat, Dragonfly Pond, Kelp Help, Mermaids and Manatees, Water Wings, Wetland Metaphors,</i> and others involve research, writing and discussion skills.]</p>
W.5.8 (Recall information ...)	
W.5.9 (Draw information from...texts...)	
W.5.10 (Write routinely...)	
SL.5.1 (Engage...in...discussions...)	
L.5.1 (Demonstrate command of the conventions...)	

Grade 5 California Common Core Standards in MATHEMATICS
Correlations with CAEP

(Depending on what activities teachers do, many other correlations are possible.)

Standard	Notes
5.MD.3 (Recognize volume as an attribute...)	Measure volumes of aquaria. Determine the volume of air being pumped into the aquarium. "If our school has 3 aquaria..." [WA: <i>Alice in Waterland, Whale of a Tail</i>]
5.MD.4 (Measure volumes...)	
5.MD.5 (...solve...problems involving volume.)	

Grade Six Correlations with CAEP

(LS = Life Sciences, ESS = Earth and Space Sciences,
ETS = Engineering, Technology, and Science (Engineering Design))

Grade 6 NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	Environmental factors include availability of food; genetic factors include the ability to obtain and utilize it...Include both humans and fish, among others. [WA: <i>Water Canaries</i>]
MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.	Include both terrestrial and aquatic environments. Fish surveys? Fish food surveys? Siltation? Streamside vegetation? Fishing regulations and surveys? [WA: <i>A Whale of an Issue, Dam Design, Dragonfly Pond, Fishable Waters, Migration Headache, Net Gain- Net Effect, Something's Fishy Here!, To Dam or Not to Dam, Turtle Hurdles, Urban Waterway Checkup, Water Works, Watered-Down History</i>]

Grade 6 NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
MS-LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	Compare human organ systems to fish organ systems. [WA: <i>Micro Odyssey</i>]
MS-LS1-4: Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	Among other animal behaviors, include redd building, migration to and from the ocean, feeding, and fleeing or seeking shelter from predators. When studying plants, include aquatic plants and their the importance of plants to fish. [WA: <i>Edge of Home, Migration Headache</i>]
MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	Students can investigate various ways to protect streams from siltation, fish ladders, and fish hatcheries. [WA: <i>Dam Design, Dragonfly Pond, Net Gain – Net Effect, Something's Fishy Here!, To Dam or Not To Dam, Water Canaries, Where Does Water Run?</i>]

Grade 6 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP

(Depending on what activities teachers do, many other correlations are possible.)

Standard	Notes
RI.6.7 (Integrate information...)	Use the CAEP as a topic of written and oral discussion. Videos and posters can provide a different kind of illustrations. Students can do research on fish, other aquatic organisms, aquatic ecosystems, environmental issues, fishing, or other fish-related issues. [WA: <i>A Whale of an Issue, Aquatic Times, Blue Ribbon Niche, Conservation Messaging, Designing a Habitat, Dragonfly Pond, Facts and Falsehoods, Fishable Waters, Mermaids and Manatees, Something's Fishy Here, To Dam or Not to Dam?, Urban Waterway Checkup, Water Wings, Watered-Down History, What's in the Water? Working for Wildlife</i> , and other activities include research, writing, and speaking skills.]
RI.6.10 (...read and comprehend...nonfiction...)	
W.6.2 (Write informative/explanatory texts...)	
W.6.3 (Write narratives...)	
W.6.4 (Produce clear and coherent writing...)	
W.6.7 (Conduct short research projects...)	
W.6.8 (Gather relevant information...)	
SL.6.1 (Engage effectively in...discussions...)	
SL.6.2 (Interpret information...in diverse media...)	
L.6.1 (Demonstrate command of the conventions...)	
RST.6-8.1 (Cite specific evidence...)	
RST.6-8.2 (Determine the central ideas...)	
RST.6-8.3 (Follow...a multistep procedure)	
RST.6-8.10 (...read and comprehend science...texts...)	
WHST.6-8.1 (Write arguments based on discipline-specific content.)	
WHST.6-8.2 (Write informative/explanatory texts...)	
WHST.6-8.4 (Produce clear and coherent writing...)	

Grade 6 California Common Core Standards in MATHEMATICS Correlations with CAEP

(Depending on what activities teachers do, many other correlations are possible.)

Standard	Notes
6.EE.6 (Use variables...)	Provide students with real or made-up data such as numbers of: <ul style="list-style-type: none"> • eggs laid by a fish • eggs in a school aquarium • eggs that hatch • aquaria in a school • alevin that survive to smolt stage • smolt that make it to the sea • mosquitoes eaten by a fish • fish eaten by an osprey • fish caught by anglers • anglers along a mile of river front • anglers in California [WA: <i>Gone Fishing!, How Wet Is Our Planet?, Where Have all the Salmon Gone?</i>]
6.SP.1 (Recognize a statistical question as one that...)	
6.SP.5 (Summarize numerical data sets...)	

Grade Seven Correlations with CAEP

(LS = Life Sciences, ESS = Earth and Space Sciences,
ETS = Engineering, Technology, and Science (Engineering Design))

Grade Seven NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	Resources can include food, shelter, oxygen, clean water, etc. Relate individual organisms to populations. Discuss how a change in one resource, such as food, affects other organisms in a food chain. Recall the “Oh Trout! activity that we did in the work-shop. [WA: <i>A Whale of an Issue, Blue Ribbon Niche, Designing a Habitat, Edge of Home, Hooks and Ladders, How Wet Is Our Planet?, Migration Headache, Silt: A Dirty Word</i> , and others can help teach this.]
MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	Include interactions within ecosystems such as food chains, and across ecosystems. What people do along stream sides or lakes affects the organisms in the streams and lakes. Siltation and pesticide use (or planting along streams and careful or non use of pesticides) are examples. [WA: <i>Blue Ribbon Niche, Edge of Home, Hooks and Ladders, Migration Headache, Pond Succession, The Glass Menagerie, Where Have All the Salmon Gone?</i>]
MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	When studying food chains/webs, emphasize the foundational importance of abiotic factors such as light, water, and minerals.
MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	[WA: <i>Alice in Waterland, Blue Ribbon Niche, Dam Design, Designing a Habitat, Hooks and Ladders, Migration Headache, Pond Succession, Something’s Fishy Here!, The Glass Menagerie, To Dam or Not to Dam, Urban Waterway Checkup, Water Canaries, What’s in the Air?, What’s in the Water?</i>]
MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	Compare regulations and public education about such things as fishing limits, streamside protection, and introduced species. How can streams be improved to support more or healthier fish? [WA: <i>Dam Design, Designing a Habitat, Dragonfly Pond</i> , and several others can help teach this.]

Grade Seven NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	When studying food chains/webs, emphasize the foundational importance of abiotic factors such as light, water, and minerals. [WA: <i>Blue Ribbon Niche</i>]
MS-LS1-7: Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	
MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	Students can study various fish ladder designs, how hatcheries raise fish, fish farming, regulations on commercial fishing equipment, etc. [WA: <i>Dam Design, Dragonfly Pond, Net Gain- Net Effect, Something’s Fishy Here, To Dam or Not to Dam, Urban Waterway Checkup, Where Does Water Run?</i>]

Grade Eight Correlations with CAEP

(LS = Life Sciences, ESS = Earth and Space Sciences,
ETS = Engineering, Technology, and Science (Engineering Design))

Grade Eight NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
<p>MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.</p>	<p>Students can do research on human populations of various areas such as California, U.S.A., N. America, the world. Discuss finite vs. infinite and renewable vs non-renewable resources.</p> <p>[WA: <i>A Whale of an Issue, Alice in Waterland, Blue Ribbon Niche, Dam Design, Dragonfly Pond, Fishable Waters, Hooks and Ladders, How Wet Is Our Planet?, Migrating Headache, Net Gain – Net Effect, Something’s Fishy Here!, Water Works, Watered-Down History, Whale of a Tail, What’s in the Air?, What’s in the Water?</i>]</p>

Grade Eight NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
<p>MS-LS4-4: Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals’ probability of surviving and reproducing in a specific environment.</p>	<p>Include both physical traits such as coloration, musculature, eyesight, etc. and behavioral traits such as wariness, ability to learn, migration, and mating behaviors.</p>
<p>MS-LS4-6: Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.</p>	<p>[WA: <i>Hooks and Ladders</i>]</p>
<p>MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p>	<p>It may be possible to involve students in real-world projects such as streamside restoration or creek cleanups. Students can investigate such things as fish ladder designs, alternatives to damming rivers, and fishing tackle.</p> <p>[WA: <i>Dam Design, Dragonfly Pond, Migration Headache, Net Gain – Net Effect, Something’s Fishy Here! To Dam or Not to Dam, Urban Waterway Checkup, Water Canaries</i>]</p>

**Grade Eight CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations
with CAEP**

(Depending on what activities teachers do, many other correlations are possible.)

Standard	Notes
RI.8.10 (...read and comprehend...nonfiction...)	Use the CAEP as a topic of written and oral discussion. Videos and posters can provide a different kind of illustrations.
W.8.3 (Write narratives...)	
W.8.4 (Produce clear and coherent writing...)	
W.8.7 (Conduct short research projects...)	
W.8.8 (Gather relevant information...)	
SL.8.1 (Engage effectively in ...discussions...)	
SL.9.2 (Analyze the purpose of ...diverse media...)	
L.8.1 (Demonstrate command of the conventions...)	
RST.6-8.1 (Cite specific evidence...)	
RST.6-8.2 (Determine the central ideas...)	
RST.6-8.3 (Follow...a multistep procedure)	Students can do research on fish, other aquatic organisms, aquatic ecosystems, environmental issues, fishing, or other fish-related issues. [WA: <i>A Whale of an Issue, Aquatic Times, Blue Ribbon Niche, Conservation Messaging, Design a Habitat, Dragonfly Pond, Facts and Falsehoods, Fishable Waters, Mermaids and Manatees, Something's Fishy Here!, To Dam or Not To Dam, Urban Waterway Checkup, Water Wings, Watered-Down History, Whale of a Tail, What's in the Water?, Working for Wildlife</i> and other WILD Aquatic activities can help teach research, writing, and speaking skills.]
RST.6-8.10 (...read and comprehend science...texts...)	
WHST.6-8.1 (Write arguments based on discipline-specific content.)	
WHST.6-8.2 (Write informative/explanatory texts...)	

**Grade Eight California Common Core Standards in MATHEMATICS
Correlations with CAEP**

No apparent simple correlations	
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High School Correlations with CAEP

(LS = Life Sciences, ESS = Earth and Space Sciences,
ETS = Engineering, Technology, and Science (Engineering Design))

NGSS Performance Expectations with STRONG Correlations with CAEP	
Performance Expectations	Notes
HS-LS1-2: Develop and use a model to illustrate the hierarchal organization of interacting systems that provide specific functions within multicellular organisms.	Students can study fish anatomy and compare it to other groups, including mammals/humans.
HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.	Scales can range from a deep pool in a stream to a stretch of stream to the whole stream, to the stream/ocean ecosystem. Students can also study streamside ecosystems. [WA: <i>A Whale of an Issue, Eat and Glow, Fishable Waters, Gone Fishing, Sea Turtles International, The Glass Menagerie, Water Canaries, Whale of a Tail, Where Does Water Run?</i>]
HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems at different scales.	
HS-LS2-6: Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.	
HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.	Be sure to include invasive/introduced species. [WA: <i>A Whale of an Issue, Eat and Glow, Fishable Waters, Gone Fishing, Sea Turtles International, The Glass Menagerie, Water Canaries, Whale of a Tail, Where Does Water Run?</i>]
HS-ESS2-2: Analyze geoscience data to make the claim that one change to the Earth’s surface can create feedbacks that cause changes in other Earth systems.	Examples can include stream bank erosion, siltation (and its causes), landslides, availability of suitable gravel sizes for survival of eggs and alevin, and stream side development. [WA: <i>Watershed, Where Does Water Run?</i>]
HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.	Include not only past changes but current and ongoing changes.
HS-ESS3-3: Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.	Include not only fish populations but populations of predators such as seals and also forests. [WA: <i>A Whale of an Issue, Fishable Waters, Sea Turtles International, Water Canaries, Whale of a Tail, Where Does Water Run?</i>]
HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	Include both aquatic and terrestrial resources. [WA: <i>A Whale of an Issue, Dam Design, The Glass Menagerie, Whale of a Tail, Where Does Water Run?</i>]

NGSS Performance Expectations with MODERATE Correlations with CAEP	
Performance Expectations	Notes
HS-LS1-3: Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Include not only mechanisms within individual organisms but also environmental feedback mechanisms such as availability of food and suitable habitat.
HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	The standards imply that all human impacts are negative....Remind the students that we can have positive impacts too.
HS-LS4-6: Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.	[WA: <i>A Whale of an Issue, Dam Design, Fishable Waters, Sea Turtles International, The Glass Menagerie, Water Canaries, Whale of a Tail, Where Does Water Run?</i>]
HS-ESS3-5: Analyze geosciences data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.	Include both freshwater and marine systems.
HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	Include human population, including not only food but space, material, and water needs. Also “wants” such as relatively inexpensive farmed fish. [WA: <i>A Whale of an Issue, Dam Design, Sea Turtles International, Whale of a Tail</i>]
HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down in to smaller, more manageable problems that can be solved through engineering.	Salmonid-related issues such as fish farms, hatcheries, dams/fish ladders, fishing regulations (sport and commercial), and stream management/restoration are appropriate topics. [WA: <i>A Whale of an Issue, Dam Design, Facts and Falsehoods, Sea Turtles International, Water Canaries, Whale of a Tail, Where Does Water Run?</i>]
HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.	
HS-ETS1-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.	

Grades 9 – 10 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP (Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.9-10.1 (Cite...textual evidence...)	Use the CAEP as a topic of written and oral discussion. Videos and posters can provide a different kind of illustrations.
RI.9-10.8 (...evaluate the ...claims in a text...)	
RI.9-10.10 (...read and comprehend...nonfiction...)	Students can do research on fish, other aquatic organisms, aquatic ecosystems, environmental issues, fishing, or other fish-related issues. [WA: <i>A Whale of an Issue, Aquatic Times, Conservation Messaging, Facts and Falsehoods, Fishable Waters, Living Research: Aquatic Heroes and Heroines, Sea Turtles International, Whale of a Tail, Where Does Water Run? Working for Wildlife</i> and other WILD Aquatic activities can help teach research, writing, and speaking skills.]
W.9-10.1 through W.9-10.10 (All writing standards)	
SL.9-10.1 through SL.9-10.6 (All S & L standards)	
L.9-10.1 through L.9-10.6 (All language standards)	
RST.9-10.1 through RST.9-10.10 (All Reading Standards for Literacy in Science and Technical Subjects)	
WHST.9-10.1 through WHST.9-10.10 (All Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects)	

Grades 11 - 12 CA Common Core Standards in ENGLISH/LANGUAGE ARTS Correlations with CAEP (Depending on what activities teachers do, many other correlations are possible.)	
Standard	Notes
RI.11-12.1 (Cite...textual evidence...)	Use the CAEP as a topic of written and oral discussion. Videos and posters can provide a different kind of illustrations.
RI.11-12.7 (Integrate...multiple sources...)	
RI.9-10.10 (...read and comprehend...nonfiction...)	Students can do research on fish, other aquatic organisms, aquatic ecosystems, environmental issues, fishing, or other fish-related issues. [WA: <i>A Whale of an Issue, Aquatic Times, Conservation Messaging, Facts and Falsehoods, Fishable Waters, Living Research: Aquatic Heroes and Heroines, Sea Turtles International, Whale of a Tail, Where Does Water Run? Working for Wildlife</i> and other WILD Aquatic activities can help teach research, writing, and speaking skills.]
W.9-10.1 through W.9-10.10 (All writing standards)	
SL.9-10.1 through SL.9-10.6 (All S & L standards)	
L.9-10.1 through L.9-10.6 (All language standards)	
RST.9-10.1 through RST.9-10.10 (All Reading Standards for Literacy in Science and Technical Subjects)	
WHST.9-10.1 through WHST.9-10.10 (All Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects)	

High School California Common Core Standards in MATHEMATICS Correlations with CAEP
Depending on the mathematics classes that students are in, correlations may be possible.