

**World Conservation Congress 2016
Hawaii Resource Bank**

In September 2016, the International Union for Conservation of Nature [IUCN World Conservation Congress](#) (WCC) will be held in Hawaii. This Resource Bank provides teachers with a starting point for locating resources relevant to the themes of IUCN and WCC, including biodiversity, food and water security, and climate change.

The Resource Bank is separated into two sections. First, is a set of online collections of teaching resources applicable to the themes of IUCN and WCC, many of which are based in the context of Hawaii. Second is a list of grade-specific lessons, with highlighted connections to the Next Generation Science Standards (NGSS) Practices of Science and Engineering (Practices), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs), and the Common Core State Standards (CCSS). Note that many of the lessons are aligned to older sets of standards, but are still applicable when viewed through the lenses of NGSS and CCSS.

Resource Collections		
<u>Title and Link</u>	<u>Grade(s)</u>	<u>Description</u>
General Information About WCC and IUCN		
World Conservation Congress	General Audience	Conference website for the 2016 WCC in Hawaii
International Union for Conservation of Nature	General Audience	IUCN Website
Hawaii & Pacific Resources		
Kokua Hawaii Foundation Aina in Schools	K–5	Lessons and resources for school-based garden programs, with components including garden-based learning, waste reduction, agricultural literacy, and nutrition education.
NOAA's Sea Earth Atmosphere Curriculum	3–5	Elementary marine science curriculum developed by the National Oceanic and Atmospheric Administration, with a focus on Hawaii and the Pacific.
Project Aloha Aina	3–7	Project-based, place-based units developed by the Native Hawaiian Education Council in partnership with Ka Haka 'Ula O Ke'elikōlani College of Hawaiian Language, University of Hawai'i at Hilo. Units include wetlands, ahupuaa, streamlife, conservation, and coral reefs.
Navigating Change	4–5	Grade 4–5 lessons based on the Northwestern Hawaiian Islands developed by the Native Hawaiian Education Council in partnership with the Ka Haka Ula O Keelikolani, College of Hawaiian Language, UH-Hilo.
PRISM Curricula	K–8	Lessons developed by UH Hilo's Tropical Conservation Biology and Environmental Science Program and Education Department and Hawaii Island K-8th grade schools focused on the Hawaiian marine and terrestrial environments, and living Hawaiian culture.

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Ohia Project Curriculum	K–8	Lessons developed by the Moanalua Gardens Foundation (MGF), along with Bishop Museum and the Hawaii Department of Education, based on conserving Hawaii’s natural environment.
Pīkoi ke Kaula Kualena	K–12	Place-based lessons developed by University of Hawaii at Manoa faculty and Hawaii teachers relevant to traditional ecological knowledge and sustainability.
Polynesian Voyaging Society Hokulea Curriculum and Activities	K–12	A variety of activities related to traditional Polynesian Voyaging and the Worldwide Voyage of the Hokulea and Hikianalia.
Water for Life	K–12	Resources developed to help teachers and students understand the importance of access to and management of fresh drinking water on Pacific Islands.
Project Kahea Loko	4–12	Lessons with an emphasize on mālama i ka ‘āina (to care for the land), conserving cultural and natural resources, restoration and maintenance of historic fishponds.
Hoike o Haleakala	9–12	A Maui-based multidisciplinary, environmental science education curriculum designed to help students establish and deepen connections to the land and culture.
General Resources		
Climate Literacy & Energy Awareness Network	K–12	Hundreds of reviewed resources aligned to climate and energy literacy topics.
National Energy Education Development (NEED) Project	K–12	Curriculum resources developed by NEED, with topics including alternative energy sources, climate change, and energy in society.
NGSS@NSTA Earth and Human Activity Lessons	K–12	Lessons curated by the National Science Teachers Association (NSTA) to align to the NGSS Core Idea ESS3: Earth and Human Activity. Topics include
NGSS@NSTA Biological Evolution: Unity and Diversity Lessons	K–12	Lessons curated by the National Science Teachers Association (NSTA) to align to the NGSS Core Idea LS4: Biological Evolution: Unity and Diversity. Topics include natural selection, adaptation, and biodiversity and humans.

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Grades K-1

Grade	Lesson Information	NGSS Practices	NGSS DCI(s)	NGSS CCC(s)	CCSS Connections
K	<p>Build an Anchialine Pond</p> <p>Students build models of anchialine pond organisms and habitats. Part of a larger unit on anchialine ponds.</p>	<p>Developing and Using Models</p> <p>Obtaining, Evaluating, and Communicating Information</p>	<p>LS2.A Interdependent Relationships in Ecosystems</p>	<p>Systems and System Models</p> <p>Structure and Function</p>	<p>CCSS.ELA-LITERACY.SL.K.6 Presentation of Knowledge and Ideas</p>
K	<p>Humans on Earth</p> <p>A short video explaining relationship between human needs and the use of natural resources, as well as solutions for preserving them.</p>	<p>Obtaining, Evaluating, and Communicating Information</p>	<p>ESS3.C: Human Impacts on Earth Systems</p>	<p>Cause and Effect</p>	<p>CCSS.ELA-LITERACY.SL.K.6 Presentation of Knowledge and Ideas</p>
1	<p>Hoary Bat</p> <p>Students observe and describe bat characteristics, and compare bat wings to bird wings. Part of a larger unit on Ahupua`a.</p>	<p>Obtaining, Evaluating, and Communicating Information</p> <p>Constructing Explanations and Designing Solutions</p>	<p>LS1.A: Structure and Function</p> <p>LS4.C: Adaptation</p>	<p>Structure and Function</p>	<p>CCSS.ELA-Literacy.SL.1.1 Comprehension and Collaboration</p>
1	<p>Hawaii's Rocky Shores: Hidden Animals</p> <p>Students test their hypotheses on how well different materials could provide protection for animals that live along Hawaii's shorelines. Part of a larger unit on Hawaii's Rocky Shores.</p>	<p>Analyzing and Interpreting Data</p> <p>Constructing Explanations and Designing Solutions</p> <p>Engaging in Argument from Evidence</p>	<p>LS1.A: Structure and Function</p>	<p>Cause and Effect: Mechanism and Explanation</p> <p>Structure and Function</p>	<p>Math.Content.1.MD.C.4 Represent and interpret data.</p>

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Grades 2–3

Grade	Lesson Information	NGSS Practices	NGSS DCI(s)	NGSS CCC(s)	CCSS Connections
2	Sandy Shores: Crustacean Critters Students discuss what crabs need to survive and observe crustacean structures and functions. Part of a larger unit on Hawaii's Sandy Shores	Asking Questions and Defining Problems Obtaining, Evaluating, and Communicating Information	LS1.A: Structure and Function LS1.C: Organization for Matter and Energy Flow in Organisms	Structure and Function Patterns	CCSS.ELA-Literacy.SL.2.1 Comprehension and Collaboration
2	Let's Reduce Reuse Recycle Students explore ways to reduce, reuse, and recycle, including maintaining and observing worm bins.	Planning and Carrying Out Investigations Analyzing and Interpreting Data Constructing Explanations and Designing Solutions	LS2.A: Interdependent Relationships in Ecosystems ETS1: Engineering Design	Energy and Matter: Flows, Cycles, and Conservation Cause and Effect: Mechanism and Explanation	CCSS.Math.Content.2.MD.A.1 Measure and estimate lengths in standard units. CCSS.ELA-Literacy.SL.2.1 - Comprehension and Collaboration
3	Invasive Animals and Their Impact Students participate in a simulation and describe how traits of animals allow them to be invasive. Part of a unit on Hawaii's Invasive Animals .	Engaging in Argument from Evidence	LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.C: Adaptation	Structure and Function Cause and Effect: Mechanism and Explanation	CCSS.ELA-Literacy.SL.3.6 Presentation of Knowledge and Ideas
3	Solar Energy : Engineer a Solar Water Heater (Lesson 4) Students design and test a solar water heater. Part of a larger unit on solar energy.	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions	PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer ETS1: Engineering Design	Energy and Matter: Flows, Cycles, and Conservation Cause and Effect: Mechanism and Explanation Systems and System Models	CCSS.Math.Content.3.MD.A.2 Solve problems involving measurement and estimation

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Grades 4–5

Grade	Lesson Information	NGSS Practices	NGSS DCI(s)	NGSS CCC(s)	CCSS Connections
4	<p>Catching the Wind: Number of Blades/Blade Size (Lesson 4)</p> <p>Students investigate the effects of turbine blade variables on the amount of energy produced by a windmill. Part of a larger unit on wind energy.</p>	<p>Planning and Carrying Out Investigations</p> <p>Analyzing and Interpreting Data</p> <p>Constructing Explanations and Designing Solutions</p>	<p>PS3.A: Definitions of Energy</p> <p>PS3.D Energy in Chemical Processes and Everyday Life</p>	<p>Energy and Matter: Flows, Cycles, and Conservation</p> <p>Cause and Effect: Mechanism and Explanation</p>	<p>CCSS.Math.Content.4.MD.A.1 Solve problems involving measurement and conversion of measurements.</p> <p>CCSS.ELA-Literacy.RI.4.3 Key Ideas and Details</p>
4	<p>Alternative Energy Earth Scientist</p> <p>Students obtain and present information regarding the value and uses of geothermal energy.</p>	<p>Constructing Explanations and Designing Solutions</p> <p>Obtaining, Evaluating, and Communicating Information</p>	<p>PS3.B: Conservation of Energy and Energy</p> <p>Transfer</p> <p>ESS3.A: Natural Resources</p>	<p>Energy and Matter: Flows, Cycles, and Conservation</p>	<p>CCSS.ELA-Literacy.W.4.4 Text Types and Purposes</p>
5	<p>Invasive Species</p> <p>Students learn about invasive coqui frogs and salvinia ferns by reading narratives and work to develop solutions to address invasive species in Hawaii.</p>	<p>Constructing Explanations and Designing Solutions</p> <p>Obtaining, Evaluating, and Communicating Information</p>	<p>LS2.A: Interdependent Relationships in Ecosystems</p> <p>ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World</p>	<p>Cause and Effect: Mechanism and Explanation</p> <p>Stability and Change</p>	<p>CCSS.ELA-Literacy.RI.5.3 Key Ideas and Details</p>
5	<p>Bottle Biology Terrarium</p> <p>Students construct a soda bottle terrarium and observe and describe this ecosystem.</p>	<p>Analyzing and Interpreting Data</p>	<p>LS2.A: Interdependent Relationships in Ecosystems</p> <p>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</p>	<p>Energy and Matter: Flows, Cycles, and Conservation</p> <p>Systems and System Models</p>	<p>CCSS.Math.Content.5.MD.B.2 Represent and interpret data.</p> <p>CCSS.ELA-Literacy.SL.5.4 Presentation of Knowledge and Ideas</p>

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Grades 6–8 (Middle School)

Grade	Lesson Information	NGSS Practices	NGSS DCI(s)	NGSS CCC(s)	CCSS Connections
Middle School (MS)	<p>Fishing for the Future</p> <p>Students examine their families' seafood consumption habits and construct an argument for the conservation of seafood resources. Part of a larger unit on ocean exploration.</p>	<p>Asking Questions and Defining Problems</p> <p>Engaging in Argument from Evidence</p>	<p>ESS3.A: Natural Resources</p> <p>ESS3.C: Human Impacts on Earth Systems</p> <p>LS1.B: Growth and Development of Organisms</p>	<p>Cause and Effect: Mechanism and Explanation</p> <p>Stability and Change</p>	<p>CCSS.Math.Content.5.MD.B.2 Represent and interpret data.</p> <p>CCSS.ELA-Literacy.SL.5.4 Presentation of Knowledge and Ideas</p>
MS	<p>Habitable Planet Population Simulator</p> <p>Students use an interactive simulation to explore the relationships between organisms in an ecosystem.</p>	<p>Analyzing and Interpreting Data</p> <p>Using Mathematics and Computational Thinking</p>	<p>LS2.A: Interdependent Relationships in Ecosystems</p> <p>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</p>	<p>Patterns</p> <p>Systems and System Models</p>	<p>CCSS.Math.Practice.MP.4 Model with mathematics</p>
MS	<p>Design a Preserve (Student Handouts)</p> <p>Students act as natural resource managers to design and manage a nature preserve for Native Hawaiian plants and animals.</p>	<p>Analyzing and Interpreting Data</p> <p>Developing Models</p>	<p>ESS3.C: Human Impacts on Earth Systems</p> <p>LS4.D: Biodiversity and Humans</p>	<p>Energy and Matter: Flows, Cycles, and Conservation</p> <p>Systems and System Models</p>	<p>CCSS.ELA-Literacy.SL.6.2 Comprehension and Collaboration</p>

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Grades 6–8 (Middle School)

Grade	Lesson Information	NGSS Practices	NGSS DCI(s)	NGSS CCC(s)	CCSS Connections
MS	<p>What is the Future of Earth's Climate?</p> <p>Through a sequence of five interactive activities, students analyze data to understand relationships between environmental factors and global climate change.</p>	<p>Analyzing and Interpreting Data</p> <p>Developing and Using Models</p>	<p>PS1.A: Structure and Properties of Matter</p> <p>ESS3.D: Global Climate Change</p>	<p>Stability and Change</p> <p>Cause and Effect: Mechanism and Explanation</p>	<p>CCSS.Math.Practice.MP.4 Model with mathematics</p> <p>CCSS.Math.Content.5.MD.B.2 Represent and interpret data.</p> <p>CCSS.ELA-Literacy.SL.6.2 Comprehension and Collaboration</p>
MS	<p>Save Our Water!</p> <p>Students explore issues related to surface and groundwater in Hawaii and create an action plan for restoring and protecting these water sources.</p>	<p>Asking Questions and Defining Problems</p> <p>Constructing Explanations and Designing Solutions</p>	<p>ESS2.C: The Roles of Water in Earth's Surface Processes</p> <p>ESS3.C: Human Impacts on Earth Systems</p>	<p>Energy and Matter: Flows, Cycles, and</p> <p>Cause and Effect: Mechanism and Explanation</p>	<p>CCSS.ELA-Literacy.SL.6.2 Comprehension and Collaboration</p>
MS	<p>Atmospheric Pollution and Global Warming. Pohina I Ka Uahi (Hazy with Smoke)</p> <p>Students determine sources of air pollution and the relationship of air pollution to climate change, then explore how historical insights from Hawaiian language newspapers could guide solutions to future climate change related issues.</p>	<p>Planning and Carrying Out Investigations</p> <p>Analyzing and Interpreting Data</p> <p>Using Mathematics and Computational Thinking</p> <p>Engaging in Argument from Evidence</p>	<p>ESS2.D: Weather and Climate</p> <p>ESS3.C: Human Impacts on Earth Systems</p> <p>ESS3.D: Global Climate Change</p>	<p>Patterns</p> <p>Cause and Effect: Mechanism and Explanation</p> <p>Stability and Change</p>	<p>CCSS.Math.Content.5.MD.B.2 Represent and interpret data.</p> <p>CCSS.ELA-Literacy.SL.7.2 Comprehension and Collaboration</p> <p>CCSS.ELA-Literacy.SL.7.5 Presentation of Knowledge and Ideas</p>

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Grades 9–12 (High School)

Grade	Lesson Information	NGSS Practices	NGSS DCI(s)	NGSS CCC(s)	CCSS Connections
High School (HS)	Aquaponics A framework for a unit in which students examine ecosystems and sustainability through a quarter-long project. The outline provides ideas and flexibility for individual teachers and schools.	Planning and Carrying Out Investigations Analyzing and Interpreting Data Constructing Explanations and Designing Solutions Developing and Using Models	PS1.B: Chemical Reactions LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems	Energy and Matter: Flows, Cycles, and Conservation Systems and System Models	CCSS.Math.Content.HSS.IC.B.5 Make inferences and justify conclusions from sample surveys, experiments, and observational studies CCSS.Literacy.ELA-9-10.SL.4 Presentation of Knowledge and Ideas
HS	UN Climate Council Students act as members of the United Nations Climate Council to identify and address the major factors associated with climate change.	Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information	ESS3.C: Human Impacts on Earth Systems ESS3.D: Global Climate Change	Cause and Effect: Mechanism and Explanation Patterns Stability and Change	CCSS.Math.Practice.MP.2 Reason abstractly and quantitatively CCSS.Math.Practice.MP.4 Model with mathematics
HS	Engineering Desalinator STEM Unit Through a sequence of lessons, students develop a definition of potable water, then design and test water desalinators.	Analyzing and Interpreting Data Constructing Explanations and Designing Solutions Developing and Using Models Planning and Carrying Out Investigations	ETS1: Engineering Design PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer	Cause and Effect: Mechanism and Explanation Energy and Matter: Flows, Cycles, and Conservation	CCSS.Math.Content.HSS-ID.A.2 Summarize, represent, and interpret data on a single count or measurement variable CCSS.ELA-Literacy.RL.9-10.1 Comprehension and Collaboration

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					CCSS.ELA-Literacy.SL.9-10.4 Presentation of Knowledge and Ideas
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Grades 9–12 (High School)

Grade	Lesson Information	NGSS Practices	NGSS DCI(s)	NGSS CCC(s)	CCSS Connections
HS	Population Explosion Students use a computer model to manipulate variables to determine factors that impact population size over time.	Analyzing and Interpreting Data Using Mathematics and Computational Thinking	LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems LS2.C: Ecosystem Dynamics, Functioning, and Resilience	Cause and Effect: Mechanism and Explanation Systems and System Models	CCSS.Math.Practice.MP.4 Model with mathematics
HS	Calculating Biodiversity in the Real World Students calculate and compare biodiversity in two different local environments.	Analyzing and Interpreting Data Using Mathematics and Computational Thinking	LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.D: Biodiversity and Humans	Scale, Proportion, and Quantity Patterns	CCSS.Math.Practice.MP.2 Reason abstractly and quantitatively CCSS.Math.Practice.MP.4 Model with mathematics CCSS.ELA-Literacy.W.9-10.2 Text Types and Purposes