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BACKGROUND:

CONTEXT:

This unit is designed to focus on helping students become aware of and strengthen their sense of belonging, sense of responsibility, sense of excellence, sense of aloha, sense of total well being, and sense of Hawaii (all BREATH outcomes from Nā Hopena Aʻo). The purpose of this unit is to allow opportunities for students to explore their own sense of place on their island of Kauaʻi, in the community of Waimea and in the place of Waimea High School. It is important to keep in mind that this unit is very specific to the state of Hawaiʻi, the island of Kauaʻi, town and ahupuaʻa of Waimea on Kauaʻi, the people of Waimea, and Waimea High School. The learning experiences in this unit also allow for each student to develop a sense of responsibility for their island, community, and school by discovering their role in their place. That being said, this unit is highly modifiable to fit other places as necessary since the enduring understandings may hold value in multiple places across the globe. Helper text will be added at a later date (TBD) to assist with place-based modifications.

The design of this unit and individual lessons pushes the boundaries of traditional school structures and teaching and learning spaces. Not all of the lessons in this unit are able to be taught in the intended way, as most of our current public education systems do not allow for it. This is intentional; it is an example of the teaching and learning spaces and experiences that I, as the designer of the unit and as a teacher, feel are more valuable than the traditional school structure.

IMPORTANT CONSIDERATIONS:

The teaching and learning experiences designed for this unit do not fit well with the current public school structure. Because the traditional education structure dominates most teaching and learning spaces today, this unit and its lessons tend to ride the line between what teachers and students are used to and what educational experiences could be. Many lessons will not be able to work with siloed classes, traditional bell schedules, and strictly on-campus learning. All lessons have some component of learning where students develop relationships with the community and learn from professionals beyond their teachers. Some require off campus field trips, while others invite the community into the school. These non-traditional experiences are designed to happen about every 2 weeks or so. The U.S. Department of Education rules and regulations may not allow for that many "out of classroom field trips" so frequently. Another important thing to point out is that this unit was designed for educational experiences beyond the current COVID-19 restrictions of large gatherings, sharing of food, and sharing of materials, and does not consider or plan for social distancing, mask wearing, etc. If these lessons are to be taught while COVID-19 restrictions and protocols are in place, all lessons will require modification. Helper text will be added at a later date (TBD).

GRADE LEVEL & COURSE:

This unit is not designed for a specific class or grade level. Based on my current role as a high school biology teacher and my background within the sciences, the unit has a tendency to lean more on science as the guiding content area and lens in which everything is explored. However, the unit is highly modifiable for any core content area (english, history, math, science) if necessary. Elective options like art, band, digital media, languages, theater, etc. have not yet been explored in this unit design. You will also notice that there are standards addressed from a variety of content areas and grade levels. The purpose

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of the wide range and levels of standards is for many reasons: 1) students come in at various reading, writing, and comprehension levels and need the space to build on their prior knowledge, 2) real world skills and application cannot be developed through only one content area. I will be teaching and continuing to develop this unit in my 9th grade biology class. The purpose of creating this broad unit structure is to allow for modification in the shift towards interdisciplinary and/or transdisciplinary education at any grade level. Helper text will be added at a later date (TBD) to assist with grade level and content area modifications.

SUGGESTED TIME OF YEAR:
This unit can generally be implemented any time during a school year. The estimated length of time is about 20 weeks (see Learning Plan, p. 10, for more information). Because this unit is developed in Hawaiʻi which has a mild climate with slight variations, modification may be necessary for other places especially for outdoor activities. Helper text will be added at a later date (TBD) to assist with these modifications.

However, if you are intending to do the intertidal field trip to study the limu species and measure water quality at the exit of a watershed, then that field trip must be done when the tides are lower than normal (in Hawaiʻi, this typically starts mid third quarter and goes through the fourth quarter which is about February to May; in other places with intertidal zones, this timing might be different). Not all places will have an intertidal zone to experience this type of field trip, and therefore will be supplemented with alternative experiences at a later date (TBD).

COMMUNITY PARTNERS:
There are many community partners that can (and should) be involved in the design, creation, and implementation of this unit. Community partners that may be beneficial to contact are the education/outreach sector of DLNR, local businesses or organizations that focus on watersheds, land or water management/conservation/restoration, and/or sustainability. Suggestion is check to see if your school has an established community partner list and use the contact from there first. Another option might be to see if any teachers have already established a working relationship with people, organizations, or businesses within the community who focus on the previously listed things.

UNIT OVERVIEW:
All places change over time. Changes are the result of natural events, or caused by human actions. Waimea, on the island of Kauaʻi, is just one example. There are more people, the land has changed from natural disasters and urbanization, and water has been diverted and polluted. These things have impacted the surrounding community. Content in this unit includes moʻolelo of Waimea, watersheds, ahupuaʻa, water quality, restoration, conservation, sustainability, and interdependence.

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STAGE 1:

It is important for students to know and understand their place and to be aware of their sense of place. When students are aware of their sense of place, they can be more aware and thoughtful about how their actions affect their environment. The focus of this unit is on the watershed that Waimea High School is in with the purpose of bringing awareness to the changes that the community has observed and experienced over the years and for the youth of the community to start thinking about whether or not this is a healthy watershed and what could improve its health.

UNIT PLAN TITLE: Past, Present, and Future: Designing for a Sustainable Waimea

ESSENTIAL QUESTION:
How does my sense of place influence my actions in conserving, restoring, and/or sustaining my place?

DRIVING QUESTIONS:
- What is this place called Waimea, who represents the Waimea community, and how can we care, respect & appreciate this place?
- What is my sense of place, belonging, and responsibility at Waimea High School and in the surrounding community?
- What is your role within your ahupuaʻa and how does that affect and guide your actions within a watershed?
- How is a watershed impacted by human actions, and what is my role in taking responsible action to conserve, restore, and/or sustain a watershed?
- What do I need to do to increase awareness of issues and advocate for positive change in my place?
- How can I engage my school and community in their awareness of their place, and local conservation, restoration, and sustainability efforts?

ENDURING UNDERSTANDINGS:
Students will understand…
- What is sense of place and how they can be aware and reflective of their own
- How their sense of place affects and guides their actions
- How human impacts affect the health of the watershed
- There are many perspectives to hear and consider before taking an action
- What their responsibility is in conserving, restoring, and sustaining a place and its resources for future generations

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STANDARDS ADDRESSED:

Science	Technology	Engineering	Mathematics	Social Science

NGSS

MS-ESS3-3 Earth and Human Activity: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

HS-LS2-6 Ecosystems: Interactions, Energy, and Dynamics: 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-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS-LS4-5 Biological Evolution: Unity and Diversity: 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.

HS-ESS3-3 Earth and Human Activity: Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

NHES

Interpersonal Communication: Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.

Advocacy: Students will demonstrate the ability to advocate for personal, family, and community health.

CTE HCPS III

TECHNOLOGICAL DESIGN: Design, modify, and apply technology to effectively and efficiently solve problems
CTE.6.1.1 Develop a process to invent a product or procedure to meet a need or improve upon an existing technology

CTE.7.1.1 Apply the design process through a set of methodical steps for turning ideas into useful and ethical products and systems

CTE.7.1.2 Assess a product or solution for possible modifications

ISTE

Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

Innovative Designer: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

Global Collaborator: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

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NGSS

MS-ETS1-1 Engineering Design: 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.

HS-ETS1-2 Engineering Design: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.*

HS-ETS1-3 Engineering Design: 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.

CCSS Math

CCSS.MATH.PRACTICE.MP1: Make sense of problems and persevere in solving them.

CCSS.MATH.PRACTICE.MP2: Reason abstractly and quantitatively.

CCSS.MATH.PRACTICE.MP3: Construct viable arguments and critique the reasoning of others.

CCSS.MATH.PRACTICE.MP5: Use appropriate tools strategically.*

CCSS.MATH.PRACTICE.MP6: Attend to precision.*

CCSS.MATH.PRACTICE.MP7: Look for and make use of structure.*

CCSS.MATH.PRACTICE.MP8: Look for and express regularity in repeated reasoning.*

CCSS ELA

Key Ideas and Details:
CCSS.ELA-LITERACY.CCRA.R.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

CCSS.ELA-LITERACY.CCRA.R.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

CCSS.ELA-LITERACY.RST.11-12.2: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Craft and Structure:
CCSS.ELA-LITERACY.CCRA.R.6: Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas:
CCSS.ELA-LITERACY.CCRA.R.7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

CCSS.ELA-LITERACY.CCRA.R.8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

CCSS.ELA-LITERACY.CCRA.R.9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

CCSS.ELA-LITERACY.RST.6-8.8: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

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CCSS.ELA-LITERACY.RST.11-12.7: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

CCSS.ELA-LITERACY.RST.11-12.9: Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Text Types and Purposes:
CCSS.ELA-LITERACY.CCRA.W.2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

CCSS.ELA-LITERACY.CCRA.W.3: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details and well-structured event sequences.

Production and Distribution of Writing:
CCSS.ELA-LITERACY.CCRA.W.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Research to Build and Present Knowledge:
CCSS.ELA-LITERACY.CCRA.W.7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

CCSS.ELA-LITERACY.CCRA.W.8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

Comprehension and Collaboration:
CCSS.ELA-LITERACY.CCRA.SL.1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

CCSS.ELA-LITERACY.CCRA.SL.2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-LITERACY.CCRA.SL.3: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas:
CCSS.ELA-LITERACY.CCRA.SL.4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

CCSS.ELA-LITERACY.CCRA.SL.5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

HCSSS
Gathering and Evaluating Sources:
Inquiry Standard SS.9-12.2.2: Gather relevant information from credible sources representing a wide range of views, and note any inconsistencies in the information

Communicating Conclusions:
Inquiry Standard SS.9-12.4.2: Present arguments and explanations that reach a range of audiences using print and oral technologies (e.g., posters, essays, letters, debates, speeches, reports, maps) and digital technologies (e.g., Internet, social media, and digital documentary)

Taking Informed Action:
Inquiry Standard SS.9-12.5.2: Analyze the origins of a problem or issue and explain the challenges and opportunities

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faced by those trying to address it

Inquiry Standard SS.9-12.5.4: Create an action plan to address a solution to the problem or issue and demonstrate substantive evidence of implementation*

Inquiry Standard SS.3-5.5.2: Explain different ways students could work individually or in collaboration with others (e.g., other students, teachers, community and/or global organizations) to address local, regional, or global problems or issues and predict possible results of their actions

Inquiry Standard SS.3-5.5.4: Show evidence of taking individual or group action on one or more problems or issues

Nā Hopena Aʻo, STEMS², and beyond
Nā Hopena Aʻo Strengthened Sense of Belonging, Responsibility, Excellence, Aloha, Total Well Being, and Hawaiʻi **STEMS²** Moʻolelo, Makawalu, Aʻo, Sense of Place, and Advocacy

STANDARDS ASSESSED:

Science	Technology	Engineering	Mathematics	Social Science

HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ETS1-3 Engineering Design: 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.

Inquiry Standard SS.9-12.4.2: Present arguments and explanations that reach a range of audiences using print and oral technologies (e.g., posters, essays, letters, debates, speeches, reports, maps) and digital technologies (e.g., Internet, social media, and digital documentary)

CRITICAL SKILLS AND CONCEPTS:
Skills:
- Testing water quality (temperature, pH, salinity, turbidity, etc)
- Collecting data through research and experimentation
- Evaluating validity and reliability of information; realizing multiple perspectives
- Analyzing (compare/contrast) information from multiple sources
- Write/demonstrate evidence based explanation of problem
- Propose a solution/improvement
- Advocating for increased awareness and/or change
- Mutual collaboration with others (eg. peers, family members, teachers from all content areas, community partners, kūpuna, professionals)

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Concepts:
- Sense of place
- Responsible, informed decision making
- Awareness and understanding of multiple perspectives
- Open minded learning from nontraditional sources (ie. observations or kilo)
- Restoration
- Conservation
- Sustainability
- Interdependence

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STAGE 2:

By lesson 5 in this unit, students will have explored the moʻolelo of their place in Waimea and added to those stories with their own interpretations and experiences. Students have also become more aware of and continued to develop their sense of place in their community, whether it be in the state of Hawaiʻi, on the island of Kauaʻi, within their respective communities and neighborhoods, and/or at Waimea High School. In the defining of their sense of place, students have come to explore their role and responsibility in their place as well, using the ahupuaʻa system as a guide. The concept of a watershed is introduced, in addition to how human actions affect watershed health. The following authentic assessment task asks students to process the information learned and experiences they have had to create an example of a healthy watershed and design a solution for one issue they feel strongly about.

AUTHENTIC PERFORMANCE TASK:

Many things have changed in Waimea over the years. The area is more populated, the landscape has been altered with urbanization, the water has been diverted and polluted. The Waimea River watershed is not the healthy place it once was.

Advocacy & Innovation Project: Each student makes a model of a health watershed (including land features, water source and flow, plants, animals, and humans). Compares/contrasts that model with our Waimea watershed. Identifies a problem within our watershed that they want to focus on learning more about and developing a solution for it. The real world product will vary. Examples may include: environmental impact statement, organizing an advocating event or work day, designing an innovation, creating a space to share information or education, etc. All products will also be presented at a Sustainability Fair/Showcase at the end of the unit.

Real world processes include:
- Collect information about the place and problem from knowledgeable sources (peers, family members, community, kūpuna, historians, professionals, etc.).
- Use personal experiences and knowledge to evaluate the place, problem, and potential solutions
- Study to understand and value alternative ways of knowing and multiple perspectives
- Propose an idea of improvement to a community partner to begin the process of taking responsible and research-backed action
- Share ideas and findings with the community and/or public

AUTHENTIC AUDIENCE:

The audience will be the Waimea residents and the community that are be directly and indirectly impacted by the human actions that cause our watershed problems and could benefit (or have ideas, suggestions, and feedback) for our research-backed projects of change.

Audiences will depend on the problem that students select. Students will be working with an established group of community partners throughout this unit, so they will all serve as an authentic audience. These projects will also be presented at the Sustainability Fair/Showcase on the Waimea High School campus in collaboration with the Natural Resources, Engineering, and Culinary Academy students. This Sustainability Fair/Showcase will be open to the public.

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OTHER EVIDENCE:
- Journal/Notebook Activities:
  - Thoughts/ideas scratch pad*
  - Notes from activities, presentations, guest speakers, videos, etc.*
  - See-Think-Wonder activities
  - KWL charts
  - Think-Pair-Share activities
  - Research notes/worksheets
  - Individual Reflections
- Community Circle Sharing & Class Discussions
- Prediction models, revising models, Final models
- Story of Waimea Project*
- On-campus Improvement Project*
- Ahupuaʻa Role & Responsibility Activity
- Community Meeting Activity
- Human Actions-Impacts Chart
- Awareness Project*

*Students have choice in the format of these formative assessments.

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STAGE 3:

Students learn best through hands-on and minds-on activities where they are put in the driver seat of their own learning. Students also thrive in learning experiences that are beyond the classroom, both physically and mentally. Many students like working collaboratively, while there are others that prefer to work individually. Students perform best when they know and understand how their learning experiences connect and relate to the real world and they can create real world products. Each of the following lessons include both in and out of class experiences that allow students to explore the place around them. Students will be asked to complete several self-driven projects within these lessons that connect back to their place, their responsibilities, and their values. Students will work both individually and collaboratively to process, discuss, and create, as well as provide feedback to each other.

LEARNING PLAN:
Total estimated/suggested length of Unit: About 20 weeks (80 minute class periods, every other day)

LESSON	# of days	TOPIC	OBJECTIVES	STANDARDS ASSESSED
1	8	Story of Our Place: Waimea	➢ Describe their place/community in detail and how they belong to that place ➢ Explain how and why people see things differently ➢ Collect information from oral, written, and practical sources ➢ Evaluate the validity and accuracy of various sources of information ➢ Synthesize thoughts, ideas, and accurate information into a clear story of a place	ISTE Knowledge Constructor CCSS.ELA-LITERACY.CCRA.W.3 CCSS.ELA-LITERACY.CCRA.W.6
2	7	Defining Sense of Place	➢ Explain their sense of belonging and identity in their family, school, and community ➢ Describe their awareness of place ➢ Explain how their sense of place is connected to their sense of responsibility ➢ Evaluate pros/cons of improvement actions ➢ Create an evidence-based improvement plan ➢ Share information in a clear way, both orally and written	MS-ETS1-1 CCSS.ELA-LITERACY.CCRA.SL.5
3	6	Watershed & Ahupuaʻa	➢ Articulate what they know and want to know ➢ Communicate vital information clearly and effectively ➢ Collaborate effectively with other ➢ Compare and contrast two things	HS-ESS3-1 NHES Interpersonal Communication NHES Advocacy
4	9	Human Impacts on a Watershed	➢ Communicate with community partners effectively ➢ Collect information and clarify it by asking questions	ISTE Creative Communicator CCSS.ELA-LITERACY

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			➢ Sort vaguely similar things into categories ➢ Identify cause and effect relationships ➢ Explain the same information from multiple perspectives ➢ Create a planning timeline by setting periodic goals ➢ Synthesize information from multiple sources to create awareness in an effective and accurate way	.CCRA.R.6 CCSS.ELA-LITERACY.CCRA.W.5
5	13	Conservation, Restoration, and Sustainability	➢ Create a theoretical model, revise it, and finalize the model to explain information clearly ➢ Compare and contrast two things ➢ Collect information from various sources ➢ Use personal experiences and knowledge to evaluate information ➢ Understand and value alternative ways of knowing and multiple perspectives ➢ Propose an idea to begin the process of taking responsible and research-backed action ➢ Share ideas and findings with the community and/or public	HS-LS2-7 HS-LS4-6 HS-ETS1-3