

'Ewa 'Āina Education Initiative

Unit Plan: Hawaiian vs. Modern Food Production - accessible via the following URL <https://cutt.ly/9KgnGu6>

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'Ewa 'Āina Site: Kuhialoko

Detailed Lesson-Project Plan #1

Lesson Title: What is better: modern agriculture/ aquaculture or traditional agriculture/ agriculture?

Essential Unit Questions Addressed: What is modern aquaculture/agriculture and traditional agriculture/ aquaculture?

Educational Standards that the lesson will help students achieve

1.4 Analyze global implications of new and emerging technologies to determine their impacts on NR.

- Compare alternative technologies used in NR to determine their implications and consequences to humans and the environment.
 - Compare and contrast characteristics of different types of technology used in NR by their applications in research, production, or resource management.
- Compare and contrast the impact of conventional, alternative and emerging technologies to determine efficiency in research, production, or resource management.
 - Examine emerging technologies to determine possible impacts on research, production or resource management.
- Analyze how innovation and technological processes impact NR systems.

HĀ framework and/or Hawaiian Culture integrated into this lesson

The class will be researching traditional Hawaiian agriculture and aquaculture techniques. Students will be asked to include Hawaiian mo'olelo and descriptive terms (using 'Ōlelo Hawai'i in context) in their findings.

Materials needed

Supplies: Chromebooks with internet access

Videos, media, lesson presentations/resources

- Video for lesson introduction
<https://www.hawaiinewsnow.com/2021/05/16/hnn-premiere-final-climate-change-documentary-food-system-vulnerabilities/>
- Online Information links to help the students get started with their research.
Modern Agriculture/ Aquaculture
 - Aquaculture Methods and Practices: A Selected Review: (link) <https://www.fao.org/3/t8598e/t8598e05.htm>
 - Modern Aquaculture Deserves a Better Public Image « GAA: (link) <https://www.globalseafood.org/blog/modern-aquaculture-deserves-better-public-image/>
 - National Geographic Aquaculture: (link) <https://www.nationalgeographic.com/foodfeatures/aquaculture/>
 - Fisheries and Aquaculture: (link) https://usaidgems.org/Documents/SectorGuidelines/Fisheries_Final_wGCC_Addition_May12.pdf

Materials needed Cont.

Modern Agriculture/Aquaculture cont.

- Agriculture, Modern: (link) <https://www.encyclopedia.com/science/news-wires-white-papers-and-books/agriculture-modern>
- Precision Agriculture: (link) <https://precisionagriculture.re/types-of-modern-farming-methods/>

Hawaiian Agriculture/ Aquaculture

- Hawaiian Fishpond Studies (link) <https://nsgl.gso.uri.edu/hawau/hawaut99001.pdf>
- Restoring a Hawaiian Fishpond – Hawaii Sea Grant: (link) <https://seagrant.soest.hawaii.edu/restoring-a-hawaiian-fishpond/>
- Project Kāhea Loko - A Teacher's Guide to Hawaiian Fishponds: (link) <https://cutt.ly/yGFYQR3>
- The Kumulipo Revisited - <https://theuniverse.wordpress.com/2020/10/23/ho%CA%BBi-i-ke-kumu-kumulipo-revisited/>
- A Brief History of Hawaiian Agriculture: (link) <https://gingerhillfarm.com/a-brief-history-of-hawaiian-agriculture/>
- Indigenous Polynesian Agriculture in Hawai'i - Oxford Research Encyclopedia of Environmental Science: (link) <https://cutt.ly/vGFIPcX>
- History of Agriculture in Hawai'i: (link) <https://cutt.ly/CGFIHsh>
- The Role of Agriculture in the Evolution of the Pre-Contact Hawaiian State: (link) <https://cutt.ly/7GFILVI>

Student Assessments and Worksheets

- Student Worksheet/Graphic Organizer - Compare and Contrast: (link) <https://cutt.ly/eGFTYsx>
- Discussion and Webpage Organizer: (link) <https://cutt.ly/2GNslRm>

Pedagogy (methods) Used to introduce, teach and close/review lesson

Lesson Introduction

[WATCH: 'Climate for Change' documentary explores Hawaii's food system vulnerabilities](#) (1 hour 42 minutes)

Our delicate balance with food insecurity and the effects on our aina.

Instructional Sequence

Teacher Does	Students Do
Assign student pre-assessment for homework or in-class completion. Link to pre-assessment: Pre-assessment	Students complete a pre-assessment.
<p>Introduction: General class discussion over movie, questions shared in advance.</p> <p><i>Recommended that the teacher pause the movie every (approx.) 15-20 minutes and ask students to discuss questions in pairs</i></p> <p>How did this video make you feel? What questions did the video bring up? What actions do you think we need to do as an island society?</p> <p>Ancient Hawaiians fed the entire island population without imports. How does modern aquaculture and agriculture differ from the traditional methods?</p>	Listen and engage in small group and whole group discussion about video and our food insecurities and how Ancient Hawaiians fed the people on the islands without imports.

Teacher Does	Students Do
Divide class in half and determine optimal cooperative small groups in each half. <ul style="list-style-type: none"> Assign cooperative groups from one half of the class to research modern techniques for both agriculture and aquaculture Assign cooperative groups from one half of the class to research traditional agriculture and aquaculture techniques. 	Students move into groups, determine optimal cooperative work plan and how each member will contribute.
Teacher gives each group a starting list of resources, which may contain links from above and a graphic organizer . (Google Docs or Google Slides may be used instead of an organizer). Remind students that they will be sharing their findings with another group, acting as teachers.	Students start their investigation into their assigned topic. Complete and organize research. Contributions of each student should be labeled with the individuals' initials.
Teacher pairs up cooperative groups so that those who researched modern agriculture/aquaculture techniques are paired with those who researched traditional agriculture/aquaculture techniques	Student groups are provided 15 minutes in which to share the "big ideas" from their research while the other group records them on their individual graphic organizer or Google slides.
Teacher will briefly describe the next learning activity in the unit: students will be asked to reference their research and use what they learned to design an aquaponics system or agriculture system that uses the best of both modern techniques and traditional techniques to reduce Hawai'i's dependence on food imports.	
<p>Closure (Review, formative/summative assessment) At the end of each day (if the lesson spans several days), have each student state something they found interesting. Either website, image, or something they read.</p>	
<p>Accommodations for at least 3 types of diverse learners</p> <p>The webpage graphic organizer helps all students and all learning types. ELL students can switch their computers to their preferred language. Use Closed Captioning on the video for the Hard of Hearing and visual learners.</p>	
<p>Formative Assessment Method/s For This Lesson</p> <ul style="list-style-type: none"> Unit Pre-Test (via Google Forms): (link) https://drive.google.com/file/d/1HdEzSU9E2pxId4HTrxQtU4qoUXjmrFc5/view?usp=sharing Review progress on graphic organizers via whole class and small group teacher guided discussion 	
<p>Explain How This Lesson Relates To the Unit Summative Assessment</p> <p>The lesson is about designing an aquaponics system and/ or agriculture system that uses the best of both modern techniques and Traditional Hawaiian Techniques. This lesson is about gathering the basic information to start the design process.</p>	