Mo`olelo Phenomena Analysis

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HCPS Science Standards Addressed: 1.1 & 1.2

Grade Level: 9-12
Project Time Span: 3 weeks
Goals of the Lesson:
   a. To analyze natural phenomena explained through mo`olelo (legends) from a scientific perspective
   b. To compare these scientific explanations to those provided within the legend

Student Learning Objectives (Benchmarks):
This lesson addresses Grade 9–12 benchmarks for HCPS Science Standards:
1.1 Doing Scientific Inquiry. Students demonstrate the skills necessary to engage in scientific inquiry.
   • Identify and analyze alternative explanations and conclusions and models.  
     (During research, students will compare and contrast scientific explanations of natural phenomena against the explanation provided in the legend, or by supplemental information from a Hawaiian perspective.)

1.2 Living the Values, Attitudes, and Commitments of the Inquiring Mind.
Students apply the values, attitudes, and commitments characteristic of an inquiring mind.
   • Honesty – Acknowledge references, contributions, and work done by others.  (Students will be required to cite a minimum of 3 sources within their research paper.)
   • Critical-Mindedness – Evaluate the logic and validity of evidence, conclusions, and explanations against current scientific knowledge.  
     (In comparison of explanations, students will assess the plausibility/validity of the Hawaiian explanation, against the scientific one.)
   • Objectivity – Evaluate various perspectives and their implications before drawing conclusions.  
     (Through the analysis of alternative explanations, and “Critical-Mindedness”, students should be able to assess both explanations objectively, and determine whether or not both explanations are plausible.)
   • Questioning – Ask questions to clarify or validate purpose, perspective, assumptions, interpretations, and implications of a problem, situation, or solution.  (Students will conjure up questions to test validity of explanations from both perspectives, while finding evidence to support their such explanations.)
• Self-Directed – Use research techniques and a variety of resources to complete a report on a project of one's choice. *(This is the underlying premise of the lesson plan.)*

Resources and Materials:

Books


Website

- The Legends of Kane`ohe

Appendices

- Appendix 1: The Legend of the *Hau* Blossom
- Appendix 2: Origin of Man
- Appendix 3: The Octopus and the Rat
- Appendix 4: Research Paper and Oral Presentation Rubrics

Instructional Procedures:

- Each student will select a *mo`olelo* (legend) that contains some discussion or explanation of a natural phenomenon. *(Almost every *mo`olelo* has two components to it: a moral and a natural phenomenon explanation.)* The teacher could either provide the students with a list of *mo`olelo* to choose from, or ask the students to bring in a *mo`olelo* and assess it for approval. Three examples of *mo`olelo* are given in the appendices.
- Each student will read their legend and identify a natural phenomenon explained/discussed.
- The students will then research the phenomenon from a scientific perspective through books, scientific periodicals, videos, software, and internet.

Examples from “The Legend of the *Hau* Blossom” (Appendix 1)

As noted in the *mo`olelo*, the *kaunaoa* and *pohuehue* plants are wrapped around each other on many beaches.

When students research this from a scientific perspective, they will learn about symbiosis (*kaunaoa* is parasitic).
Alternately, students may choose to research the transport of the *hau* blossom across the ocean.

The relevant science concepts are ocean current directions, density and buoyancy. See “Wings, Wind and Waves” by N. Hayes in this volume for a related lesson on how plants arrived in Hawai‘i.

- Students will compile their research findings into a 4–5 page formal scientific paper.
- They will also presenting their information orally to the class. They may present the information through any mode of lecture, utilizing at least one visual medium (e.g., display board, PowerPoint, diagrams, illustrations, dioramas, other multi-dimensional visuals).

Student Learning Activities:
- Self-guided research
- Research paper
- Oral presentation

Assessment:
- The students will be assessed on their research paper, as well as their presentation in class. A rubric is provided for each section (Appendix 4).

Extension:
- If the teacher chooses to limit the *mo´olelo* selections to legends based on their island, or a particular region of that island, the students could take a field trip, and stop at the various places to which their *mo´olelo* refers. At each sight, the students who have legends from that region could share the legend with the class, and discuss the scientific explanation for the phenomenon described in their story. Essentially, it would be an alternative way to present the information, by visiting the backdrops for each *mo´olelo* ’s plots.

Evaluation of Lesson:
- Test it out in a few classrooms, see what kinds of results the students come up with, and then tweak any parameters that need to be adjusted.
Appendix 1: The Legend of the Hau Blossom
(Excerpt from Na Moʻolelo Hawaiʻi o ka Wa Kahiko. Alameida, 1997)

This is the story about Pohuehue and Kaunaoa. They lived near Kahana and loved each other very much. They always went fishing together, played konane (a game like checkers) with each other, and took long walks along the beach.

One day they had an argument. Pohuehue refused to take Kaunaoa to the hula hoʻike (hula show) of her best friend in the village that evening. Pohuehue was angry. He got into his canoe and began to paddle as far as he could out to sea. Before too long, he reached the island of Lanaʻi.

Kaunaoa was very sad. After many years, she thought Pohuehue had forgotten about her. But she waited patiently. She believed that he would return soon.

While on Lanaʻi, Pohuehue built himself a small hale (house) near the beach. One night he had a dream. He saw Kaunaoa swimming at their favorite beach near Kahana Bay. He could see her dark, shining eyes and sweet smile. Then her warm face and smile began to fade away slowly. Pohuehue woke up suddenly. He looked around the hale. He saw nothing. All he heard was the moʻo (lizard) singing a happy tune in one corner of the room.

The next morning, Pohuehue walked toward a grove of hau (a lowland tree with soft wood; native relative of Hibiscus) trees. He began to pick the bright yellow flowers. He gently tossed each flower one by one onto the waves. He watched as they began to drift toward Oʻahu.

The flowers floated directly to Kahana Bay, where Kaunaoa was swimming. She felt a hau blossom gently brush against her cheek. She was startled. As she picked each flower floating toward her, she thought of Pohuehue. Whenever they went to the beach, he would give her a hau flower. She gently touched each flower.

Then calling her ʻaumakua (family god; ancestral guardian) for guidance, she walked along the path of hau flowers until she reached Lanaʻi. She reached the beach just as Pohuehue was leaving in his canoe.

Kaunaoa and Pohuehue’s love for each other was eternal. Today you can find the kaunaoa (a native dodder; parasitic on other plants) and the pohuehue (beach morning glory) wrapped around each other along many island beaches.
Appendix 2: Origin of Man

(Excerpt taken from Sites of O‘ahu. Sterling & Summers, 1978, but original version is Kamakau’s Moʻolelo o Hawai‘i, Chapter 1.)

There on the eastern flank of Mololani, facing the sunrise and near the shoreline, the soil is red earth mingled with very dark bluish black earth. There is where the first man was made. That place was called in the old times Kahakahakea, but in these days it is Pahuna. There Kane drew the image of a man in the soil; he drew the image in the soil after the likeness of the gods, with head, body, arms, and legs, just like themselves in form. When the image was drawn in the soil Kanaloa said, “You will not get your man; you have not the power; I am the person who has power.” Kanaloa therefore made an image of earth just like Kane’s image. Kane and his companions said, “Let your earth become man,” but no man came forth; his dirt figure of a man remained lying there and it turned into stone. Kane then said to his fellow gods, Ku and Lono, “Listen, you two, to my words and to the words I speak in answer and do you two preserve them and listen.” Then Kane said, “Come to life,” “Live,” responded Ku and Lono. Then the dirt became a living man.

When the first man was made, the gods took the house name Hale-kou (House of kou wood) which they made, and there the first man lived; but the woman was not made. The man observed how his shadow followed his body going outside the house and coming into the house, and he ran to the beach of Nu’upia and Oneawa and found to his surprise that his shadow stuck to him. Now when this man had fallen asleep, as he awakened suddenly a pretty woman was at his side and he thought it was his shadow that was sticking to his side and that God had changed his shadow into a wife for him. He therefore gave her the name of Keakahulilani (the shadow made of heaven). This means that God had turned the soil of the earth into man. In various genealogies we often find other names given to this man; in some genealogies he is named Kumuhonua, in others Kulipo, in other again, Kumuuli, and in some Hulihana.
Appendix 3: The Octopus and the Rat  
(Excerpt taken from Ka Lei Ha`aheo. Hopkins, 1992)

Long ago, an `iole (rat) lived with its family on the island of Mokoli`i (currently known as Chinaman’s Hat). One day, he wanted to go to Kane`ohe. He got a canoe, and paddled to Kualoa. Upon his arrival, he fastened the canoe to a coconut tree, and continued on to Kane`ohe. But, the canoe was not fastened properly. So, upon his return from Kane`ohe, the canoe was lost at sea. What a big mess! The rat sat down and began to cry aloud. His crying was heard by a kindhearted he`e (octopus). The he`e asked him, “Hey, what’s your problem?” And the `iole replied, “My canoe is gone; perhaps it was lost to the sea, because I probably didn’t fasten it well. I can’t return to Mokoli`i, because I can’t swim.” The soft-hearted he`e replied, “Don’t worry; perhaps I can help you. Climb on top of my head, and I’ll take you home.” As the `iole rested upon his head, the he`e started to head towards Mokoli`i. The `iole was full of fear, but the he`e called out to him, “Relax! Don’t be afraid! I am definitely a local in these waters.” Afterwards, they arrived at Mokoli`i. The `iole descended from the top of the he`e’s head, and said to him, “I am deeply appreciative of your bringing me here. There is a gift for you upon your head,” and the `iole quickly headed towards the uplands. The he`e felt above his head, and he received excrement. The `iole excreted on top of the he`e’s head because, he was so afraid. The he`e was livid! From that time on, if a leho (cowrie shell) was seen by the he`e, he would reach out for it because, he thought, it was indeed the `iole. The people of the Pacific make a thing called the “luhe`e” (octopus lure) with a rock and a cowrie shell (as well as a stick or barbs, even). With this, the he`e has been caught by the people because, the luhe`e resembles the `iole.
### Appendix 4
Research Paper Rubric

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<th>Description/Details</th>
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<td><strong>Organization</strong></td>
<td>• Introduction/Thesis&lt;br&gt;• Body/Supporting Evidence&lt;br&gt;• Conclusion&lt;br&gt;• References</td>
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<td><strong>Content</strong></td>
<td>• Validity – Citation&lt;br&gt;• Objective – Both perspectives equally represented</td>
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<td><strong>Grammar</strong></td>
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<td><strong>Style</strong></td>
<td>• Appeals to/Engages Audience&lt;br&gt;• Formality (addresses mature audience)&lt;br&gt;• Objectivity (3rd person stance)</td>
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<tr>
<td><strong>Use of References</strong></td>
<td>• Quotations or paraphrasing evident in piece&lt;br&gt;• Quotations/paraphrases properly cited&lt;br&gt;• Bibliography/Work Cited references properly listed and formatted (MLA format)</td>
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### Oral Presentation Rubric

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<td><strong>Visuals</strong></td>
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<td><strong>Organization</strong></td>
<td>• Clean Cut – boarders clearly defined, with straight lines&lt;br&gt;• Formatting – Sequential; systematic</td>
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<td><strong>Aesthetics</strong></td>
<td>• Creative – multi-dimensional,&lt;br&gt;• Attractive – appealing, stands out</td>
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<td><strong>Oral</strong></td>
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<td><strong>Projection</strong></td>
<td>• Voice can be heard clearly from back of room&lt;br&gt;• Maintains control – not yelling/straining voice</td>
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<td><strong>Clarity</strong></td>
<td>• Voice does not tremble or fade-out&lt;br&gt;• Words are not mumbled or spoken under one’s breath</td>
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<tr>
<td><strong>Pronunciation</strong></td>
<td>• Appropriate pauses between syllables&lt;br&gt;• Each vowel/consonant stressed properly</td>
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Total Score = ________