

Unit Design Template

Project Title

Video Sleuth #1: The Case of the Mystery Bubbles

Project Designers

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Grade Level/Content Areas

High School/ Science, Reading, Writing, Math, Technology

Project Synopsis/Description

Students will collaboratively provide a theory with valid data for a mystery of bubbling ocean waters off the coast of Nome, in which the community is very concerned due to the effects it may have on the fishing and the safety for the community. Students will use Video Conferencing Equipment (ISDN connection, in which students can communicate via camera and microphone hooked to a television in real-time.) and web based communication (chat rooms, discussion boards) to communicate and collaborate with one another and professionals, in order to peer teach and provide a variety of perspectives for problem solving.

After examining data collected via demonstrations and hands-on experiments performed by the students, they will revise their initial hypothesis, while continuing to research information to provide valid data that is supportive of their theory. Finally, students will present their solution by using multimedia, a web page or a presentation to a panel of community members, geologists and teachers that their theory is “accurate” because it is well supported with valid data. The panel will ask questions of the presenters to ascertain the validity of their theory and data.

Identifying Desired Result

Standards

BSSD Strands	Alaska State Correlation
TE7.5 Can collaborate on the WWW to produce products such as a website, research paper, solving problems, digital storytelling, or exchange info.	(Alaska state technology D.2 Use communications technology to exchange ideas and information)
SC4.11 Evaluates experimental data for validity.	(Alaska State B.1 Use the process of science, these processes include observing , classifying, measuring interpreting data, inferring, communicating, controlling variables, developing models and theories, hypothesizing, predicting, and experimenting)
SC 4.2 Formulates multiple hypothesis based on investigations and questions.	See B.1 Above

Enduring Understanding

Theories include information or data that are valid and supportive of the solution.

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Essential Questions

- What is the difference between a persuasive argument and a tested hypothesis?
- How do you determine whether the solution to a problem, or a hypothesis, is correct and believable?
- What makes a hypothesis believable?
- What makes data believable?
- What is a scientific theory?
- How do scientists solve problems?

Essential Unit Questions

- We have first hand knowledge of sightings of sea serpents in Alaska? How do we know whether there are sea serpents in the ocean or not?
- Would the study of mermaids in Alaska be considered pseudo-science?
- How do we know scientists' information is correct? Should we believe them when they predict weather or explain about what the inside of the Earth looks like? How do you know your answer or solution is correct?
- How do scientists solve problems? How do we find a solution to a problem or question?
- Is there more than one way to solve a problem?
- Is there enough data to always represent a constant solution?

Determining Acceptable Evidence/Assessment Description

Culminating Performance Task

Students will show understanding by presenting their theory orally using supportive and valid data that they will use to persuade peers, community members and scientists of possible solutions to the concern of whether it will harm the fishing and the safety for the community. Students will have the option to present their report as a web page or in V.C. with multimedia support.

Type(s) of understanding this performance emphasizes:

- Explanation Interpretation Application Perspective
 Empathy Self Knowledge

Dipstick Assessments (formative)

- Daily Journal reflections.
- Daily Hypothesis Sheets with supported data and scientific method
- Quizzes: Prompt Based
- Daily 5 minute Interpretation Warm Ups

Informal Observations:

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Discussion Boards
Chats
Participation

Student Self-Assessment:

Students self-assess with a scoring guide based on group work, participation and goals. Self-Assessments and all other group work is done via chats, discussion boards and emails, as well as some initial time on the video conference.

Self Assess Journal using Scoring Guide and write self reflection

Self-Assess Scientific Report using Scoring Guide and write self reflection

Self-Assess Cultural Solutions using Scoring Guide and write self reflection

Self-Assess Problem Solving Abilities using Scoring Guide and write self reflection

Scoring guide:

Task: Scientific Method Report				
Standard	Emerging	Developing	Proficient	Advanced
SC 4.2 Formulates multiple hypothesis based on investigations and questions.	Refuses to attempt to develop questions. Is unable to develop testable questions even with assistance.	Has trouble generating testable questions even when given a general question to develop. Can't develop testable questions from classmates' work. Formulates multiple hypotheses with guidance.	Develops manageable, testable questions from a broad topic. Generates questions that can be tested in response to other students work. Develops multiple hypotheses based on investigations and questions.	Develops testable questions without prompting or direction. Develops testable follow-up questions after completing an investigation. Assists other students in refining their questions.
SC4.11 Evaluates experimental data for validity.	Student does not discuss in their conclusion whether data that was collected is valid.	Student discusses in their conclusion whether data that was collected is valid but does not explain why.	Student discusses in their conclusion whether data that was collected is valid and explains why, pointing out the specific problems of the validity.	Student discusses in their conclusion whether data that was collected is valid and explains specific problems, as well as suggesting experimental improvements to increase validity.
TE7.5 Can collaborate on the WWW to produce products such as a website, research paper, solving problems, digital storytelling, or exchange info.	Student participates in the few chats, discussion boards, web sites, and video conferences by sharing opinions, research, and feedback of other student work. Information used from such resources are not used when writing the	Student participates in the some of chats, discussion boards, web sites, and video conferences by sharing opinions, research. Some or no information from such resources is used, but is not relevant, when writing the	Student participates in the majority of chats, discussion boards, web sites, and video conferences by sharing opinions, research, and feedback of other student work. Some information from such resources are used when writing	Student participates in all chats, discussion boards, web sites, and video conferences by sharing opinions, research, and feedback of other student work. Relevant information from such resources are used when writing

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	scientific method report,. There is no final presentation.	scientific method report,. Presenting of the final report is done via a paper report to their own class.	the scientific method report,. Presenting of the final report is done via a submitted html and/or an oral presentation in a video-conference.	the scientific method report,. Presenting of the final report is done via a submitted html and an oral presentation in a video- conference.
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Planning Learning Experiences and Instruction

Knowledge and skills students need in order to reach unit goals and complete culminating task successfully?

<p><i>Students need to know:</i></p> <ul style="list-style-type: none"> • Know what a hypothesis is. • Know what the scientific method is. • Know what validity means. • What data is 	<p><i>Students need to be able to</i></p> <p>(*Star skills that require practice):</p> <ul style="list-style-type: none"> • Know how to use chat rooms, discussion boards, and video conference and search engines. • Knows how to determine if data are valid. • Knows how to write and revise a hypothesis. • Know how to analyze data
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Resources

<p><i>Teacher resources:</i></p> <p>www.dho.com Anti Gravity Demo</p>	<p><i>Student resources:</i></p> <p>http://www.kigluaitadventures.com/webquest/intro1.html</p>
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Accommodations

Students will be paired in classroom and as distant partners to accommodate all varied abilities. Students who excel in particular areas will be asked to present to small or

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large groups of students within the classroom and to other classrooms using videoconference or I-sight technology, Quicktimes or some other multimedia presentations. Students who struggle with topics will be paired with a student-teacher, or use available software or student resources.

Planning Learning Experiences and Instruction

<i>Sequence of Teaching and Learning Experiences</i>	<i>Timeline</i>
Daily Journal Entries and 5 Minute Interpretations	Daily
1. How do we know scientists' information is correct? Present Lesson on Validity. Determine validity of DHMO website using guide and introduce essential questions with vocabulary permanent display on board.	Week 1, Day1
2. Present lesson on hypothesis and scientific method. Students use "Anti-Gravity" lab to practice scientific method and hypothesis writing using Journal Entry.	Week 1, Day 2
3. Present lesson on scientific method and valid data. Students use "Anti-Gravity" Lab to practice evaluating valid data and writing parts of the scientific method entry. (conclusion, data, procedures, hypothesis)	Week 1, Day 3
4. Students practice writing well supported conclusions for their report of the "Anti-Gravity" using journal entry.	Week 1, Day 4
5. Complete writing the conclusion and present while other students question their conclusion.	Week 1, Day 5
6. Video Sleuthing: Students work with students to solve a mystery using hypothesis an valid data in cooperative groups from different locations. Use of videoconferencing, chat rooms, discussion board and emails. Use multimedia to present report or web form to submit the report to be published. (See culminating task)	Week 2
7. Solutions, Solutions: Students share cultural stories that show examples of problem solving. (Use multimedia to share story)	Week 3 , Days 1-3

Description of All Other Tasks:

(Week 1) Explain: Daily Journal Entry (Blog) that will focus on writing and rewriting hypothesis, self reflecting, answering prompts, and asking questions, as well as considering the 6 straits of writing.

(Week 1) Interpret: Daily 5 minute worksheets in which students will choose or vote (or categorize) on the best hypothesis, the best supportive data, the most persuasive argument for a given prompt.

(week 2) Application: Students complete a scientific method report that incorporates collected data and information from observations made from teacher directed demonstrations and hands-on experiments and readings completed and shared during

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and outside the video-conference. Students will share their report via web page and presenting it during a video-conference. A final agreement and consensus will be made about the most likely and well supported solution to the mystery via a web-based survey and discussion board, in which professional geologists will be asked to participate in.

(Week 2/3)Perspective: Students will investigate other methods of problem solving and hypothesizing within their culture by completing a survey or researching and telling a cultural story. In addition, Chat rooms and discussion boards will be used to share and review different perspectives on solutions, while encouraging students to ask questions and justify of others work.

Week 3 Empathize: Students will be asked to solve a problem from their daily life and will be asked to present this problem in the form of a mystery or sleuth in web page format.

(Week 3)Self -Knowledge: Students will be asked to reflect on their own problem solving abilities and determine when they are successful and why in a scientific report. Students will track their method for solving problems and collect data to determine if their method results in valid solutions. Questions the students will consider are what is the evidence that the solution or answer is effective? How could you measure that? How did you come to that solution? Is the solution valid?

Author Reflections

Why is this a good unit?

This unit is a good unit because it motivates students to want to learn. In addition it places students in the position of being responsible for their learning experience, while building strong inquiry skills.