Goal(s): Student will

- increase knowledge about the Scientific method (driving questions, hypothesis and data collection).
- increase knowledge about values and how they relate to collaboration, science, and self.
- develop knowledge about the "Bowl of Light." (Optional Extension Activity)

Unit I
Relating to Science
Lesson #6

Standards:

- Science 1, 3
- Language Arts 1-2, 4, 6
- Math 11,13
- Health 4-5
- GLO 1-5

Topic	Task/Activity	Materials/Time	Notes
Entry	• Ask Ss to share with three others what they know and what they still need to know about the People Patterns Project.	Homework	
Review	• Invite Ss to identify questions they need to know about the People Patterns Project. • Ask Ss to identify where they might locate the answer after each question is asked. • Review project guide sections I - III making sure these steps are completed. **NOTE:** *Make sure investigations are simple, with the **goal** of leading Ss through the steps of the scientific method.*	People Patterns Project Guide	
Preview	• Display OH # 1.1 and connect to today's 3 topics: 1. Form a hypothesis 2. Collect data (what to collect and how to document) 3. Vaules	Unit Overview OH #1.1	
Developing a Hypothesis	• Ask Ss to think then share with a partner what they know about the word "hypothesis." • Display OH #6.1 and introduce definition of hypothesis. • Reiterate key points about **hypotheses**: 1. They are **educated guesses** based on what someone already has learned. 2. The goal is to **find out truth**, which may or may not match hypothesis; important NOT to change hypothesis to match research findings. 3. Hypothesis must be **testable** (e.g., finding out if it is accurate).	A Hypothesis Is OH #6.1 Est: 5-7 minutes	

Topic	Task/Activity	Materials/Time	Notes
Developing a Hypothesis continued	• Distribute Hypothesis Handout #1. • Display OH #6.2 while simultaneously discussing the four main ideas (generate, write, review, and form). • Display OH #6.3 and describe the homework example as one model of possible thinking behind the scientific method: 1. driving question guides research 2. choice of research might be based on values 3. relationship between what we value and protocols • Work with Ss to take notes on vocabulary words in their project guide (page 1) to clarify major concepts.	A Hypothesis is.. Handout #1 Forming a Hypothesis OH #6.2 Driving Question OH #6.3 People Patterns Project Guide Est: 10 minutes	
Creating Hypothesis	• Display OH #6.4 and discuss the hypothesis, question, and data collection form for one example. **OPTION:** Formulate your own relative example. • Invite Ss to form triads and brainstorm a group hypothesis and how they might collect data. • Ask for spokespersons from each to share their ideas (making sure of do-ability). • Guide Ss in finalizing a hypothesis that can be easily tested.	Hypothesis OH #6.4 Est: 10 minutes	
Data Collection	• Review the three components of data collection: 1. Accuracy and clarity 2. Simplicity 3. Specific questions for the information you need • Ask Ss to form pairs and review project guide for steps just discussed.	Est: 2-4 minutes	
Values Definition	• Segue to values by inviting Ss to review the Community of Learners Values Poster and asking them to share how values were demonstrated during prior triad activity. • Display OH # 6.5 and discuss definition of values (principles, standards, morals, ethics, ideals, what people believe are guiding protocols for living). • Explain that kupuna (grandparent, elder) in many cultures, including Hawaiian, help children learn about values.	Values OH #6.5	

Topic	Task/Activity	Materials/Time	Notes
Values Definition continued and Video	• Invite 2-3 Ss to give an example of being supported by grandparents. • Ask Ss to form pairs to answer the following questions: 1. How might values relate to the work of scientists (guide career choices as well as daily work)? 2. Why might protocols, be guided by our values or beliefs? • Introduce *The Mana'o of Nā Kūpuna* – a video made of some elders sharing what they think are important values to learn. • Ask Ss to listen for the values shared by these elders. • Conduct a brief discussion about the video. • Inform Ss they will watch the same video again next session.	*The Mana'o of Nā Kūpuna* Video (11 mins.) Est: 10-15 minutes	
Homework Part 1	• Explain homework assignment while referring to the wall-chart or OH #6.6 – 6.7. **WHAT:** 1. Data Collection Form draft **HOW:** 1. Review People Patterns Project Guide. 2. Develop at least one form to collect data. 3. Bring form to class.	Wall-chart or OH #6.6-6.7	
Homework Part 2	**WHAT:** Value Cards. **HOW:** 1. Obtain copy of values cards. 2. Cut out cards. 3. Locate an adult and take turns sharing a real life experience for each values card. 4. Write or draw one example on the back of each card and paper clip the cards together.	Value Cards (one set per S) Est: 5-10 minutes	

Topic	Extension Activity - Task/Activity	Materials/Time	Notes
Bowl of Light Optional Extension Activity	• Write the word **LIGHT** on the board and invite Ss to think about the term and what it means to them. • Call on Ss for their ideas. • Explain that they can see that light may mean different things to different people or cultures. • Share some examples – people love summer because there is so much sunlight; light from a candle brings feeling of calmness. • Invite Ss to locate ObLogs and brainstorm words, actions and/or feelings they associate with LIGHT *(est. 2 minutes).* • Invite Ss to form groups of 4 and round-robin share their list of ideas. • Monitor sharing to capture a few examples. • Write examples of what was heard and explain that the variety of responses demonstrates the importance of studying about light and its ***physical properties*** (i.e., light waves, energy from light, how rainbows are made, and how light feeds us). • Share more examples, if needed, of what light might represent to people and cultures (i.e., light bulb means bright thought; sun designs represent joyfulness; and that indigenous cultures have traditions around the sun. • Display OH #6.8 and ask Ss to think about what they see. • Introduce the concept of *Bowl of Light* from the Hawaiian culture (shared by a family on Molokai) and how it is connected to light. They believe there's a "bowl of light" in everyone. (clarify figurative nature of this and many Hawaiian stories) • Share some examples of the symbolic representation such as the golden arches for McDonalds, the symbol of the Red Cross, etc. • Display OH #6.9 while simultaneously reading the three questions. • Ask Ss to listen to an excerpt from the book <u>Tales from the Night Rainbow</u> entitled the "Bowl of Light" explaining that you will be asking them to draw what they understood from the story.	ObLogs A bowl – est. 10-14" diameter A flashlight to fit in bowl (beam light upward) 30 plus stones (smooth ili'ili stones work well) OPTIONAL: <u>Tales from the Night Rainbow</u> by: Pali Jae Lee and Koko Willis OH# 6.8 Bowl of Light Connecting to the Bowl of Light OH #6.9	

Topic	Task/Activity	Materials/Time	Notes
Bowl of Light Continued	• Read story aloud. • Distribute copies of "Bowl of Light" and ask Ss to read as partners. • Demonstrate Bowl of Light concept by displaying a large bowl, preferably with some form of a light inside of it. • Place small stones (pōhaku) next to the bowl and pose the following question to Ss: • *What might cause a Pōhaku (stone) to be placed into your or another person's Bowl of Light?* • Invite Ss to place a stone into the bowl when they share an appropriate answer (e.g., name-calling, fighting, swearing, bullying). • Ask Ss to **think** and then discuss the meaning of the author's statement *"If he continues to put stones...he will become a stone."* • Ask Ss to share what they observed as stones covered the light. Clarify analogy (i.e., feel heavy, can't perceive well). • Ask Ss to **think-first** and then share what they might do to remove stones from someone else's Bowl of Light. • Invite Ss to remove a stone each time they share an appropriate answer (i.e., saying something nice, including them in an activity, apologizing, helping them out). • Ask Ss to identify what might currently be in their own bowl of light and how they might remove the stones.	Bowl of Light Story Worksheet Est: 20-30 minutes	

Topic	Task/Activity	Materials/Time	Notes
Homework for Optional Extension Activity	• Explain homework assignment while referring to the wall- chart or OH # 6.10. **WHAT:** Bowl of Light story. **HOW:** 1. Reread Bowl of Light story. 2. Create questions. 3. Locate a bowl and some stones to use when reading story. 4. Locate a person to interview. 5. Talk story using questions on worksheet. 6. Complete worksheet notes about your conversation. Option: Find a bowl and set in your home to symbolize the Bowl of Light or create a bowl using paper mache, clay, coconut, etc.	Wall-chart or OH # 6.10 Est: 5 minutes	