Cameo Lakey, Module 13 and CE 13b (Lesson 2)

Lesson by Cameo Lakey *(created 02/06/18 with the CalStateTEACH Lesson Plan Assistant)*

ATTACHED FILES AND VIDEOS

Lakey_Cameo_ScienceInquiryLesson2_SelfEvaluation.docx

GENERAL COMMENTS

I. ESTABLISHING GOALS AND STANDARDS

Subject Area(s)

Science

Central Focus

Make observations and measurements to provide evidence of the rate of erosion by water. Measure the volume of objects, formulate predictions based on cause-and-effect relationships, conduct trials to test a prediction. Write fluidly and legibly in cursive or joined italic, frame a question about a situation, use simple and compound sentences in writing and speaking, use details or experiences to explain information. Engage effectively in a range of collaborative discussions (in groups and teacher-led) with diverse partners on grade 4 topics, building on others' ideas and expressing their own clearly, make comments that contribute to the discussion and link to the remarks of others.

Standards

California Academic Content Standards

Science, Grade 4
Earth Sciences | 5 Waves, wind, water, and ice shape and reshape Earth's land surface. As a basis for understanding this concept:
- Standard 5c: Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).
Investigation and Experimentation | 6 Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- Standard 6b: Measure and estimate the weight, length, or volume of objects.
Investigation and Experimentation | 6 Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- Standard 6c: Formulate and justify predictions based on cause-and-effect relationships.
Investigation and Experimentation | 6 Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- Standard 6d: Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.

English-Language Arts, Grade 4
Writing | 1.0 Writing Strategies | Penmanship
- Standard 1.4: Write fluidly and legibly in cursive or joined italic.
Writing | 2.0 Writing Applications (Genres and Their Characteristics)
- Standard 2.3a: Using the writing strategies of grade four outlined in Writing Standard 1.0, students write information reports: Frame a central question about an issue or situation.
Written & Oral English Language Conventions | 1.0 Written and Oral English Language Conventions | Sentence Structure
- Standard 1.1: Use simple and compound sentences in writing and speaking.
Listening and Speaking | 1.0 Listening and Speaking Strategies | Comprehension
- Standard 1.4: Give precise directions and instructions.
Listening and Speaking | 1.0 Listening and Speaking Strategies | Organization and Delivery of Oral Communication
- Standard 1.7: Emphasize points in ways that help the listener or viewer to follow important ideas and concepts.
Listening and Speaking | 1.0 Listening and Speaking Strategies | Organization and Delivery of Oral Communication
- Standard 1.8: Use details, examples, anecdotes, or experiences to explain or clarify information.
Listening and Speaking | 1.0 Listening and Speaking Strategies | Organization and Delivery of Oral Communication
- Standard 1.9: Use volume, pitch, phrasing, pace, modulation, and gestures appropriately to enhance meaning.
Listening and Speaking | 2.0 Speaking Applications (Genres and Their Characteristics)
- Standard 2.1c: Using the speaking strategies of grade four outlined in Listening and Speaking Standard 1.0, students make narrative presentations: Provide insight into why the selected event or experience is memorable.

Next Generation Science Standards

Science, Grade 4
Science | 4 Earth's Systems: Processes that Shape the Earth
- Standard 4-ESS2-1: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Common Core Standards

English-Language Arts, Grade 4
Writing Standards | Production and Distribution of Writing
- Standard 4: Produce clear and coherent writing (including multiple-paragraph texts) in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)
Speaking and Listening Standards | Comprehension and Collaboration
- Standard 1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4

topics and texts, building on others' ideas and expressing their own clearly. a) Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b) Follow agreed-upon rules for discussions and carry out assigned roles. c) Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d) Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
Speaking and Listening Standards | Presentation of Knowledge and Ideas
- Standard 6: Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation. (See grade 4 Language standards 1 for specific expectations.)
Language Standards | Conventions of Standard English
- Standard 1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a) Write fluidly and legibly in cursive or joined italics. b) Use interrogative, relative pronouns (who, whose, whom, which, that) and relative adverbs (where, when, why). c) Form and use the progressive (e.g., I was walking; I am walking; I will be walking) verb tenses. d) Use modal auxiliaries (e.g., can, may, must) to convey various conditions. e) Order adjectives within sentences according to conventional patterns (e.g., a small red bag rather than a red small bag). f) Form and use prepositional phrases. g) Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.* h) Correctly use frequently confused words (e.g., to, too, two; there, their).*
Language Standards | Conventions of Standard English
- Standard 2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a) Use correct capitalization. b) Use commas and quotation marks to mark direct speech and quotations from a text. c) Use a comma before a coordinating conjunction in a compound sentence. d) Spell grade-appropriate words correctly, consulting references as needed.
Language Standards | Knowledge of Language
- Standard 3: Use knowledge of language and its conventions when writing, speaking, reading, or listening. a) Choose words and phrases to convey ideas precisely.* b) Choose punctuation for effect.* c) Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion).

California English Language Development Standards

Listening and Speaking, Grades 3-5
Strategies and Applications | Intermediate ELD level | Comprehension
- Standard : Ask and answer instructional questions with some supporting elements (e.g., "Is it your turn to go to the computer lab?").
Strategies and Applications | Intermediate ELD level | Comprehension
- Standard : Listen attentively to stories and information and identify important details and concepts by using both verbal and nonverbal responses.
Strategies and Applications | Intermediate ELD level | Comprehension and Organization and Delivery of Oral Communication
- Standard : Make oneself understood when speaking by using consistent standard English grammatical forms and sounds; however, some rules may not be followed (e.g., third-person singular, male and female pronouns).
Strategies and Applications | Intermediate ELD level | Comprehension and Organization and Delivery of Oral Communication
- Standard : Participate in social conversations with peers and adults on familiar topics by asking and answering questions and soliciting information.

Writing, Grades 3-5
Strategies and Applications | Intermediate ELD level | Organization and Focus
- Standard : Produce independent writing that is understood when read but may include inconsistent use of standard grammatical forms.
English-Language Conventions | Intermediate ELD level | Capitalization, Punctuation, and Spelling
- Standard : Produce independent writing that may include some inconsistent use of capitalization, periods, and correct spelling.
English-Language Conventions | Intermediate ELD level | Sentence Structure, Grammar, and Spelling
- Standard : Use standard word order but may have inconsistent grammatical forms (e.g., subject/verb agreement).

Technology Standards

NETS (National Educational Technology Standards), Grades K-12
NETS for Students | 6. Technology Operations and Concepts
- Standard a: Students understand and use technology systems.

Grade/Level

4

Content Objective

Fourth grade students will show their deepened understanding of how erosion by water works by conducting experiments to answer a question developed within small groups and sharing their discoveries to their class members. Students will individually write at least three things they learned about erosion by water from their experiments and one question they still have on a sheet of paper.

75% of the class will meet the objective.

Academic Language Demands

The academic language students will be strengthening will be erosion, sediment, deposition, experiment, prediction, and data. The language demands to be reinforced will be engaging in collaborative discussion, talking about the outcome of an experiment, and sharing ideas with group members. Students will understand the vocabulary and demonstrate their ability to perform the language demands through stating what they have previously learned about erosion, saying the vocabulary terms out loud; completing their own experiments in small groups; collaborating, using academic language, and sharing ideas with group members; writing down their findings; sharing their findings with the class; and writing about what they have learned.

II. LEARNING ABOUT STUDENTS

Class Information

- Total Number of students: 29
- Number of boys: 14
- Number of girls: 15
- African American: 3
- Caucasian: 15
- Hispanic/Latino Americans: 9
- Two or More Races: 2
- English Language Learners: 1 (Spanish) [Overall: Intermediate | Listening: Intermediate | Speaking: Early Advanced | Reading: Beginning | Writing: Early Intermediate]
- CELDT RFEP students: 1 (Portuguese) [Overall: Early Advanced | Listening: Early Advanced | Speaking: Advanced | Reading: Advanced | Writing: Early Advanced] (RFEP in May 2017)
- Special Needs: IEPs - 9 (Speech - 2 , Health related - 7) | 504 - 1

III. MAKING ADAPTATIONS

Adaptations

Wait Time, Grouping, Preferred Seating, Other Resources

Adaptation Details

Students who did not turn in permission slips to be videotaped will still be taught the lesson; however, they will be placed in a single group for completing the experiments and will be seated/materials will be provided to them accordingly so that they will not be shown in the video. English Learners (ELs) will be provided with a sheet of paper with vocabulary terms, definitions of each term, and visuals to accompany the vocabulary words; I will model expectations; they will be grouped with, and will perform discussions with, English fluent students for scaffolding; they will be provided with sentence frames for completing the assessment and self-reflection; and I will listen to their verbal responses to what they observed/learned and the deeper questions they have so that I can assess both their writing as well as their verbal responses for assessment of their understanding of the content. For speech students, I will provide them with the time they need to formulate verbal responses and they will be in groups with students who are not in speech during verbal discussions for scaffolding. The student with the 504 plan will be allowed to take extra time if needed in order to finish their work. I will also walk the room while students are completing activities in order to assist any struggling students, to make sure students are on task, and to provide them with questions that will challenge them to think deeper into their inquiry experiments.

IV. ANALYSIS OF STUDENT LEARNING

Assessment

Formative

Description of Assessment

Students will be given a sheet of lined paper in which they will be required to write at least three things they learned about water erosion from completing their experiments across the two lessons and at least one deeper question that they developed from today's experiments. Students will be directed to write this in at least three complete sentences and will have the option to include a drawing to illustrate each thing they learned.

V. PROCEDURE

Prerequisite Background Knowledge/Skills

Students must know how to understand and follow both verbal and visual directions and expectations, how to write legibly and in complete sentences, how to complete a job which has been assigned to them, and how to find measurements using a ruler and a measuring cup. Students must additionally have a basic understanding of how erosion by water works, developed from the previous inquiry lesson.

Materials

Technological Materials:

- Computer
- SMART Board

Experiment Materials:

- soft sand
- potting soil
- gravel
- rocks
- plastic containers
- measuring cups
- rulers
- water
- pouring containers
- plastic spoons
- buckets
- any additional materials needed to assist in conducting experiments based on their specific questions

Other Materials:

- Experiment Worksheets
- Lesson Objective
- rags (for clean up)
- plastic sheets (for preventing messes)
- green, red, and yellow cups
- lined paper
- sentence frames (for self-assessment)
- vocabulary sheet and sentence frames (for EL student)

INSTRUCTIONAL STRATEGIES

Open

LINKS TO PAST LEARNING:

1. I call on students to share what they learned about erosion by water in the last inquiry lesson and type it onto the computer, which will be projected onto the whiteboard by the projector.

STATE THE OBJECTIVE:

2. Using a sheet of paper on the whiteboard, we read the lesson objective together as a class.

3. We also read the vocabulary words together, which will be written on the whiteboard.

WHAT THEY WILL BE LEARNING:

4. I tell the students that today they will be learning more about water erosion by conducting experiments in order to discover an answer (or answers) to the question their group selected from the previous inquiry lesson and that they will be sharing what they learn/discover to the class.

Body

GUIDED PRACTICE:

1. Using the SMART Board, I show the students the question each group selected.

2. I give the students several minutes to brainstorm with their group members and share their ideas on how they could set up their initial experiment to obtain the answer to their question. During this time, I will walk the room and talk to each group in order to listen to their ideas and provide them with assistance.

MODELING:

3. After the students brainstorm, I will model to the students my expectations of them while performing their water erosion experiments. I will model how they will log their data on their worksheets, how they will ask for assistance/ask questions, the jobs of each group member, and how to cleanup after each experiment.

4. Students will be instructed to complete at least two water erosion experiments in relation to their chosen question within the time frame with their groups and will also be instructed on how to fill out their worksheets (to complete the data collection and outcome sections with their group and the prediction, observation/what they learned, and deeper question(s) sections on their own). Students will be told that they are still expected to think about and write down additional questions based on the experiment outcomes, even though this will be the last experimentation lesson for erosion by water.

INDEPENDENT PRACTICE:

5. I project a count down timer on the board (for 15 minutes).

6. I start the timer and students complete their experiments and fill out the group and independent sections of their worksheets.

7. After the time is up, I will give the groups a few minutes to develop what information they will present to the class based off of their question and observations/discoveries.

Close

WHAT THEY LEARNED:

1. Each group presents their observations/discoveries to the class.

ASSESSMENT:

2. Students will be given lined paper where they are to write at least four things they learned about erosion by water from their experiments across the two lessons and at least one deeper question they developed from today's experiments.

SELF-EVALUATION:

3. Students will be provided with sentence frames to share how they think they performed during the lesson and why. [see attachment: Lakey_Cameo_ScienceInquiryLesson2_SelfEvaluation]

~END OF LESSON~

VI. ANALYSIS AND REFLECTION

Analysis and Reflection

The parts of the lesson I felt were effective included having the students share what they learned about water erosion from the first lesson, providing students with a list of variables they can change in their experiments, students performing their experiments while I walked the room to assist, observe, and ask questions, and the addition of allowing them to draw an illustration to accompany their assessment responses. The assessment from the first inquiry lesson showed me that I needed to explicitly show the students how I expect them to respond to what they had learned from the lesson (being specific with what they learned and not giving me opened ended responses such as "I learned how water erosion works"). Thus, when the students were sharing what they learned during the beginning of the lesson, I would change their responses to show them what I was looking for until the students were able to respond with specific things that they learned on their own (such as "I learned that pouring the water instead of dripping it caused more water erosion to happen"). Providing the students with a list of variables they can change within their experiments to assist them also had a positive impact on their experiments. I was impressed with what some of the groups were doing (such as one group placed rocks around dry soil with a mixture of wet materials in between and above the rocks in order to prevent erosion from taking place). I once again had great dialogue with the students as I walked the room to observe them and ask them questions behind their thinking and decisions, I felt they had improved on being more specific and thoughtful with their explanations. Several of the students took advantage of being able to draw an image to accompany what they had learned about water erosion, which also assisted me in understanding their thought process, especially with those who are low in writing. Additionally, having the EL student explain what he learned to me verbally and then having him write these down greatly assisted me in understanding his knowledge of the concept, which I otherwise would not have known just by looking at his writing alone.

The changes I would make to my instruction to better support student learning includes telling the students my expectations of how they are to behave while cleaning up. Modeling the clean up process to the students assisted them in understanding how they were to clean up and where to place everything once it was clean; however, my site mentor went to check on the students who went to rinse out the containers in the restroom and found the girls playing around in the bathroom. Because of this, I would proceed to instead have one boy and one girl go to rinse out the containers at a time and will also take the time to tell them my expectations of how they are to behave (what I want to see them doing and what I do not want to see them doing).

My objective goal was for 75% of the class (or about 19 out of 25 students) to complete two experiments exploring into the deeper question each group developed from the first inquiry lesson (including predicting/recording data/recording observations/and developing deeper questions for each experiment) and to be able to tell me three things they learned about water erosion across these lessons in writing in complete sentences (with the option to also draw an illustration) and one deeper question they have about water erosion. 85% of students (or 24 of 28) successfully completed two experiments and filled out the required information for each experiment. 78% of students (or 22 of 28) wrote and optionally drew three things that they learned about water erosion in complete sentences and one deeper question that they still have. (see application/next steps below for what I would do with this information).

I was able to tell which students mastered the content and inquiry objectives through a combination of assessing if there was any growth from the first lesson in how the students responded to my questions (i.e. why did you choose to do this?), observing how each student collaborated with the other members in their group (and seeing if those who were having problems with others during the first lesson were able to show better teamwork during this lesson), observing how students chose to set up their experiments based off of the question they were exploring, and comparing their responses between the first lesson and this lesson concerning what they learned about water erosion.

The results of my focus on inclusive practices consisted of observing students illustrating the thinking processes of observing, measuring, predicting, and experimenting; cooperative learning strategies through the application of a hands-on approach which included discussing and completing experiments together, performing specific jobs to help their group, and deciding on how to approach and experiment on a chosen deeper question; accommodating ELs by providing them with sentence frames and having them verbally explain to me their thinking and what they learned before they write it; accommodating visual learners by allowing them to include a drawing with their written descriptions; learning about and overcoming the special classroom management challenges of providing students with the materials they need to successfully complete experiments, allowing students to perform their experiments in a space that would cause the least amount of cleanup (on desks where they can be wiped off, with table cloths on top of them to make spill clean up easier, and providing them with towels if they need to wipe up anything), assigning each student a job in order for the experiment process to run more smoothly, modeling to the students how to complete their data worksheets and the experiments, and directing the students on how to clean up after the experiments have been completed; the assessments that were implemented in the lesson included observations, communicating verbally with students (asking them to explain their thinking), project-based activity (students perform experiments), an informative assessment of having students write about what they learned, and presentations where groups share their discoveries.

Application/Next Steps

For the completion of the experiments portion, the four students who did not successfully achieve this objective did so because they failed to turn their worksheets in. The students are generally directed by my site mentor to hold onto unfinished work and not turn it in until it has been completely finished, so they may have assumed as much with me. I will talk to these four students to see if this was the case with them and I will make it clear to the students during my future lessons that I expect all students to turn in their work the day of my planned lessons (especially since I need their work in order to complete the reflection sections of my LPAs).

For the completion of the assessment, the six students who failed to meet this objective because five of them are still struggling with being specific and descriptive with their responses and one of them failed to turn it in. I will also talk to the student who did not turn it in as I said I would do so above with the students who did not turn in their experiment worksheets (especially since this student did not turn in both of these items). I would also like to have a small group intervention with the five students and work through an activity with them where they first practice on being descriptive verbally and then transfer this to their writing. Additionally, it would be a good strategy for me to also listen to the verbal response of one of the students and talk to her about what she had written since I found her writing difficult to comprehend.

From the self-reflections, 4% of the class felt that they had learned nothing on water erosion from this lesson (this was from the students who were absent during Monday's lesson), 38% of the class felt this helped them to understand how water erosion works, but there are still aspects of it they can strengthen or learn more of, and 58% of the class felt that this lesson was very beneficial and they understand a whole lot more about water erosion and are no longer confused about it. A number of the students highlighted how much they enjoyed being able to perform hands-on activities instead of just listening to me lecture to them or them having to just complete a worksheet.

I felt these two sequential inquiry lessons were effective overall because I was able to see where the students were struggling with the content and where I could improve in my teaching from the first lesson and took the time to clarify and assist students where they were struggling and implement new strategies within my teaching during the second lesson and saw a great improvement within student performance overall.
