

Cameo Lakey, PBL Science Obs Event

Lesson by Cameo Lakey (created 09/23/18 with the CalStateTEACH Lesson Plan Assistant)

ATTACHED FILES AND VIDEOS

[Lakey_Module19_Science_DataandObservations_Worksheet.docx](#)

[Lakey_Module19_Science_Assessment.docx](#)

[Lakey_Module19_Science_EL_Assessment.docx](#)

[Lakey_Cameo_Module19_PBLScience_Lesson_enc.mp4](#)

GENERAL COMMENTS

I. ESTABLISHING GOALS AND STANDARDS

Subject Area(s)

Science

Central Focus

Students know environmental stress can affect the growth and development of plants. Analyze data obtained from testing different soil types to determine which soil type has the properties that are best suited for growing bean plants, measure length with appropriate tools, and write or draw observations. Organize presentations to maintain a clear focus. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

Standards

California Academic Content Standards

Science, Grade 2

Life Sciences | 2 Plants and animals have predictable life cycles. As a basis for understanding this concept:

- Standard 2e: Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants. *Investigation and Experimentation | 4 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 4b: Measure length, weight, temperature, and liquid volume with appropriate tools and express those measurements in standard metric system units. *Investigation and Experimentation | 4 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 4d: Write or draw descriptions of a sequence of steps, events, and observations. *Investigation and Experimentation | 4 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 4g: Follow oral instructions for a scientific investigation.

English-Language Arts, Grade 2

Listening and Speaking | 1.0 Listening and Speaking Strategies | Organization and Delivery of Oral Communication

- Standard 1.5: Organize presentations to maintain a clear focus. *Listening and Speaking | 1.0 Listening and Speaking Strategies | Organization and Delivery of Oral Communication*
- Standard 1.6: Speak clearly and at an appropriate pace for the type of communication (e.g., informal discussion, report to class).

Next Generation Science Standards

Science, Grade 2

Science | 2 Structure and Properties of Matter

- Standard 2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

Common Core Standards

English-Language Arts, Grade 2

Writing Standards | Production and Distribution of Writing

- Standard 4: With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in standards 1-3 above.)

Writing Standards | Range of Writing

- Standard 10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Speaking and Listening Standards | Comprehension and Collaboration

- Standard 1: Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a) Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b) Build on others' talk in conversations by linking their comments to the remarks of others. c) Ask for clarification and further explanation as needed about the topics and texts under discussion.

Speaking and Listening Standards | Presentation of Knowledge and Ideas

- Standard 6: Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification. (See grade 2 Language standards 1 and 3 for specific expectations.)

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.

California English Language Development Standards

Listening and Speaking, Grades K-2

Strategies and Applications | Intermediate ELD level | Comprehension

- Standard : Ask and answer instructional questions by using simple sentences.

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 K-2

Strategies and Applications | Early intermediate ELD level | Organization and Focus, Evaluation and Revision

- Standard : Write one to two simple sentences (e.g., "I went to the park").

English-Language Conventions | Early intermediate ELD level | Capitalization

- Standard : Use capitalization to begin sentences and for proper nouns.

English-Language Conventions | Early intermediate ELD level | Punctuation

- Standard : Use a period or question mark at the end of a sentence.

Grade/Level

Content Objective

Second grade students will show their understanding of how plants grow in different soil types by writing whether a plant in a certain soil type did or did not grow and how they know this on a sheet of paper.

73% of the class will meet the objective.

Academic Language Demands

The academic language students will be strengthening includes prediction, observation, measure, height, and conclusion. The language demands to be reinforced will consist using the vocabulary terms orally, sharing thoughts and ideas orally with a partner and with the whole group, presenting information to the class, collaborating with others, following oral directions, responding to justifying/extending questions, and writing their conclusions. Students will understand the vocabulary and demonstrate their ability to perform the language demands by students sharing information with a partner (what their prediction is), with their group members (discussing the observations, data, and conclusions), and with the whole class (presenting their conclusions to the class); writing observation notes, a conclusion based on their observations, and what they learned about how plants grow in other soil types from listening to the presentations of others; discussing how the outcomes of different groups were the same and how they were different, participating in a think-pair-share to self-evaluate their learning, and sharing orally what they learned from the observations and discussions within the lesson.

II. LEARNING ABOUT STUDENTS

Class Information

- Total Number of students: 19
 - Number of boys: 8
 - Number of girls: 11
 - African American: 4
 - Caucasian: 9
 - Hispanic/Latino Americans: 4
 - Two or More Races: 2
 - English Language Learners: 1 (Spanish) [Overall: Intermediate | Listening: Intermediate | Speaking: Intermediate | Reading: Early Intermediate | Writing: Early Intermediate]
 - Special Needs: IEPs - 5 (Speech - 1 , Health related - 4)
 - 504s - 0
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III. MAKING ADAPTATIONS

Adaptations

Wait Time, Grouping, Other Resources

Adaptation Details

I will approach the the English Learner (EL) student first while walking the room to provide feedback in order to provide them with assistance/direction as needed since this student can lose focus easily. This student will be provided with a differentiated assessment (see attachment Lakey_Module19_Science_EL_Assessment) which will consist of them filling in a sentence frame, writing a simple sentence, completing a drawing, and doing an oral portion with me. This student will be partnered with an English fluent student and will work with a group of English fluent students for scaffolding.

The speech student will be provided with the time they need to formulate verbal responses and they will be partnered and grouped with students who are not in speech during verbal discussions for scaffolding.

Throughout the lesson, I will be providing students with feedback and assistance where needed, especially to the students who I know loose focus or become frustrated easily.

IV. ANALYSIS OF STUDENT LEARNING

Assessment

Formative, Informal

Description of Assessment

Students will be provided with a paper with a sentence frame (see attachment Lakey_Module19_Science_Assessment) in which students will need to pick a soil type from one of the other groups (not the soil type they observed in their group) and write whether the seeds within that soil type did or did not grow and how they know this. (i.e. The seeds in the paper did not grow because the plants could not grow through the paper.)

The English Learner (EL) student will receive a differentiated assessment (see attachment Lakey_Moduel19_Science_EL_Assessment) in which they will need to fill in the sentence frame and then write the complete sentence on their own (in which this sentence will not include the "why" portion because I will do this portion of the assessment orally with the student). The student will also draw a picture of the plant to support their sentence.

V. PROCEDURE

Prerequisite Background Knowledge/Skills

Students must know how to draw using pencils and crayons, have a general understanding of how to measure length using a ruler, how to share their ideas orally with a partner and orally talk about what they have learned, and how to present their findings to the class.

Materials

Technological Materials:

- Computer
- ELMO Projector
- Microphone

Other Materials:

- lesson objective
 - data/observation worksheets
 - assessment
 - pencils
 - erasers
 - plants in five different soil types (potting soil, soft sand, gravel, rocks, paper)
 - rulers
 - magnifying glasses
 - crayons
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INSTRUCTIONAL STRATEGIES

Open

LINKS TO PAST LEARNING:

1. I have students share the prediction they developed from our previous lesson with their group partner (Do you think the seeds will grow in your soil type? Why?). Using equity sticks, I then call on a few students to share their prediction to the class.

STATE THE OBJECTIVE:

2. Using a sheet of paper on the whiteboard, we read the lesson objective together as a class. "Students will show their understanding of how plants grow in different soil types by writing whether a plant in a certain soil type did or did not grow and how they know this on a sheet of paper." (73% of the class will meet the objective)

WHAT THEY WILL BE LEARNING:

3. I tell the students that today they will be learning if the bean sprouts were able to grow in the five different soil types (potting soil, soft sand, gravel, rocks, paper) by performing observations and drawing conclusions.

Body

MODELING:

1. Using the ELMO Projector and the worksheet (see attachment Lakey_Module19_DataandObservations_Worksheet) I model how to draw a picture of the plant on the "After" side, how to measure the plant, and how to write notes. Note: The students completed the drawing, height, and notes parts in the "Before" section during the previous lesson

GUIDED PRACTICE:

2. The students then draw a picture of, measure, and write notes on their plant by working together in their groups.

3. Students will then discuss their conclusions based on their data/observations with their group members and plan their presentation of their findings to the class.

4. Groups will then present their observations/conclusions to the class at the front of the room using the microphone and ELMO Projector. As students present, I ask them questions to deepen their critical thinking and for them to make connections (i.e. What observations show that the plant did not grow?)

5. We discuss how the outcomes for each group's soil type was the same and how they were different.

MODELING:

6. Using the ELMO Projector, I model how to complete the sentence frame section (conclusion) at the bottom of their worksheet.

INDEPENDENT PRACTICE:

7. Students will then complete this section on their worksheet on their own.

Close

ASSESSMENT:

1. I give students directions on completing the assessment and then students complete the assessment. Students will be provided with a paper with a sentence frame in which students will need to pick a soil type from one of the other groups (not the soil type they observed in their group) and write whether the seeds within that soil type did or did not grow and how they know this. (i.e. The seeds in the paper did not grow because the plants could not grow through the paper.) The EL student will receive a differentiated assessment in which they will need to fill in the sentence frame and then write the complete sentence on their own (in which this sentence will not include the "why" portion because I will do this portion of the assessment orally with the student). The EL student will also draw a picture of the plant to support their sentence.

STUDENT SELF-EVALUATION:

2. I lead the students in a think, pair, share, where they will physically show me how well they understand the material (they will move to either the back of the room [meaning "I do not understand the material and I am still very confused"], to the middle of the room [meaning "I understand the material, but there still are parts I am unsure of], or the front of the room [meaning "I understand the material and I am confident with it"]). The students will then pair with someone in their group and will take turns sharing why they chose that part of the room with their partner. I will then call on a student from each group to share what they and their partner had to say.

WHAT THEY LEARNED:

3. I call on volunteers to tell me one thing they learned from the observations and discussions.

~END OF LESSON~

VI. ANALYSIS AND REFLECTION

Analysis and Reflection

The parts of the lesson I felt were effective included the partner sharing, group collaboration, and the group presentations. Throughout our Phenomenon Based Learning (PBL) lessons, the students have been able to collaborate with group members and thus, learn how to use positive language and the ability to compromise in order for all group members to be satisfied. The students know that they need to try and solve problems with their group members first before asking me to help them. The first few lessons did involve several disputes and upset students, in which I needed to guide them on how to work through them. During this lesson, I was very proud with all of the groups because they each were able to successfully plan out their presentations without me needing to step in and assist in solving any disagreements. There were also a few groups who planned everything out on their own and did not need any support from me. This was the second time the students have performed group presentations to the class and I feel that the students are improving and that the activity was great practice for them on their presentation skills. They still need guidance at times and some students need positive support due to them feeling nervous, but I was happy with how the presentations turned out.

The changes I would make to my instruction to better support student learning includes collecting materials from the students after they have used them instead of the materials remaining at their desks and having students partner share first prior to having our discussion about how the outcomes were the same and how they were different. For the prior lesson where we put the bean sprouts in the five different soil types, there were not too many students who would get distracted by the materials. However, during this lesson, I had to take away several rulers and magnifying glasses from students who were playing with them (even though I told them my expectations on using these materials before the lesson and told them that they would be taken away if the students were to play with them). The problem did not primarily arise until after the students were finished with these materials, so it would be best to collect these materials from the students after they are finished using them in order to alleviate students from getting distracted in the future. For the discussions we have had, I feel that the discussions tend to go better when I have the students share their ideas with partners first, thus, this is something I want to incorporate into my lessons prior to each discussion.

My objective goal was for 73% of the class to successfully pick a soil type from one of the other groups and write whether the seeds within that soil type did or did not grow and how they know this. 81% of the class (or 13 out of 16 students [3 students were absent]) successfully completed the assessment. (see application/next steps below for what I would do with this information)

Application/Next Steps

For the completion of the assessment, two of the students picked their own group's soil type instead of picking another group's soil type. For these students, I am going to pull them to the side during morning work and will let them know that they did not pick a different soil type and will give them the opportunity to orally tell me if a different soil type did or did not grow and why and will then have them write this down. The third student did not finish his description as to why the seeds in paper did grow (this student had written "because the plant is"). I will also pull this student to the side during their morning work and will ask this student why he did not finish it (since the students were given time to finish the assessment after the lesson was over) and I will have the student orally tell me why the plant did grow and then will have him finish writing the incomplete sentence.

Overall, the assessment showed me that the class is getting better at being more descriptive and specific with their answers (several students used the specific change in height for their reasons why [i.e. the plant was 0 inches tall and is now 3 inches tall]) but many of the students still need further practice with this (several of the students had written things such as "because the plant was taller" for their reason why, which is correct, but I want them to be able to use specific data).

For the completion of the self-reflection, 13 out of 16 students showed that they understand the material, 1 out of 16 students showed that they are in between understanding the material and needing more help with it, 1 out of 16 students showed that they need more help with the material, and 1 out of 16 students showed that they do not understand the material at all (though, upon speaking to this student, it was discovered that he does understand the material, but he just needs more help). Based on these results as well as the assessment results, the class is ready to move out of the topic of plants and are ready to move into the topic of animals and their life cycles while a few of the students will need extra practice on how environmental factors effect plant growth in order for them to be more confident with, and further understand, this material.
