Teacher Work Sample

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1. Learning Context:

    School district: Box Elder School District
    Name of school: Mountain View Elementary
    Title 1 school? Yes

Demographics of school:

    Who Attends: About 372 students attend Mountain View. 23% of students are part of an ethnic/racial minority. Less than 10% of students are English language learners. Over half of the students (58%) are living in a lower SES household. About 20% of students have diagnosed disabilities. 17% of the students are chronically absent. There is a 17% mobility risk at Mountain View.

    In other words, most of the students at Mountain View are white/Caucasian, with over half of them coming from a lower socio-economic status. There are very few students who are English language learners, chronically absent, diagnosed with a disability, and/or have a high possibility of mobility.

    Leadership Style: Mountain View is a Leader in Me school. They teach the students the seven habits from Sean Covey’s *The 7 Habits of Happy Kids*. Those habits are, be proactive, begin with the end in mind, put first things first, think win-win, seek first to understand, then to be understood, synergize, and finally, sharpen the saw. The students repeat these habits on a weekly basis as a whole school. They also have a focus habit of the month each month which they repeat daily. Students are expected to take an initiative and be in control of their own learning.

    Parent/Community Involvement: Parents are encouraged to be involved in their student’s education and are always welcome in the classrooms. Mountain View has implemented the Watch Dogs program. This program invites fathers of the students to come and be part of the classroom in order to provide positive male role models for the students. In addition, a company that recently went in in Brigham City (Niagara Bottling Co.) has apparently adopted Mountain View. They have run several fund raisers to support the school. Most
recently, they presented Mountain View with school supplies that had been donated by the staff of Niagara.

**Mountain View’s School-wide Discipline Plan:** Mountain View appears to have a very positive behavior centered discipline plan. They celebrate students who are examples of good behavior during the morning announcements. These students are called “super ‘stangs” (Mountain View’s mascot is a mustang). The “super ‘stangs” then get to go pick out of the prize box in the office. The teachers are also given some principal’s pride tickets. These go to students who are going above and beyond what is expected of them. These students get to have pizza with the principal, Mr. Day. The teachers are also given a limited number of “golden tickets” to give to students who are going even further above and beyond. These students get to have a lunch of their choice with Mr. Day.

In addition to these behavior incentives, students who do not follow expectations may receive a pink slip at the discretion of the teachers. Students are required to bring the slip home for their parents to sign and bring back. Other consequences may be administered based on the behavior exhibited. At the end of the month there is a school wide activity for all of the students who have not received a pink slip that month. As a school, Mountain View tries to focus on the good students are doing more than on the bad.

**Physical Environment:** Mountain View was originally built based off of a school in California where the classrooms opened directly outside with no hallways inside. The school then went back and build hallways that were protected from the elements. Next a few new classrooms were built on to the school to make room for all of the students. The school is kept very clean. Classes are rewarded daily for keeping the lunch room, and their classrooms clean. It’s obvious that Mountain View values cleanliness.

**Grade level:** 1st grade

**Learning environment:**

**Attendance:** Most of the students are present in class daily. Two students, Layla and Riley (twins) are consistently late. They tend to arrive 10 to 15 minutes late. Eric is chronically absent from class. The rest of the class is generally present.

**Classroom Management Plan:** Mrs. Willoughby has instituted a pin system in her room. The students start out the day in the middle of the pin chart. There are four spaces above and four spaces below for students to move their pins. Throughout the day students are invited to move their pins up any time they are meeting or exceeding expectations. Once a student reaches the top of the chart, they receive a leader ticket which is put in a school wide drawing. The drawing takes place weekly. Students who are drawn out may choose a prize from the box. If students are not meeting expectation, or are exhibiting and inappropriate behavior they are invited to move their pins down. Once students reach the third space from the bottom they lose recess time. The second space from the bottom is more lost recess time, and once students reach the bottom space they receive a pink slip and a visit to the principal’s office.

**Seating Arrangement:** Students are seated at desks. The desks are arranged in rows. In each row the students have an “elbow partner”. The partners’ desks are close together. Each row has three pairs of desks with the exception of the last (fourth) row. The fourth row only has three students and all three of their desks are pushed together. The students who struggle
(Layla, Riley, Star, Jenny) are paired with a student whose abilities are slightly higher than theirs (not the highest students in the class). Most students are paired with another student whose ability level is similar or slightly lower/higher than their own.

**Level of Student Engagement in Learning:** Students seem excited to learn and participate during class. Students are expected to complete all of the work given in class before they may do other activities. The majority of students seem happy to learn and complete the tasks that are given.

**Level of Safety for Learning:** Students seem genuinely happy when they come into the classroom in the mornings and throughout the day. All student answers are taken when asking questions during discussion. Incorrect answers are dealt with in a sensitive manner so as to create a safe/open environment for the students. Students also seem generally open and more than willing to talk with Mrs. Willoughby and/or the student teacher (me) when they feel that they have a problem that needs to be dealt with. Overall, the learning environment seems very open and safe for the learners.

**Subject matter of lessons:** The Plant Life Cycle

**Total number of students:** 21

**Students with special needs and short explanation of the needs:**

- **With IEPs:** No Students with IEP’s in this class

- **Students who receive speech/language services:**
  - Jenny is an ELL and receives language services daily for about 30 minutes.
  - Norton has a speech impairment and receives speech services three days a week for 20 minutes. Norton has an audible speech impairment, however this does not seem to affect his learning during class, nor his social life during the day.

- **English language learners:**
  - Jenny is the only English Language Learner in the class. She receives language services daily for about 30 minutes. She speaks English very well. If one didn’t know that Spanish was spoken in her home, it would be easy to assume that English is her first language. However, Jenny can get easily frustrated during math when she doesn’t understand what is expected of her. Therefore, it is important that clear instructions are given and extra clarifications when needed in order to avoid any frustrations for Jenny.

- **Gifted and talented:**
  - Jordan and Bridger are the two students in the class who are considered gifted and talented. Bridger attended kindergarten at a dual immersion school. Originally he may have been interested in the dual immersion program, but he now attends Mountain View. Jordan and Bridger are both high achievers in the class. They are always willing to participate in class discussions and answer questions. They often finish their work quickly and need extra extensions to challenge them.

**Other (e.g., 504 plans--please specify):**
Star does not have an IEP or any other required services, however, she does seem to have significant difficulties in the class. She is clearly the lowest achieving student in the class. She struggles with her number sense, and has the lowest reading level in the class. Star goes to a math intervention group daily for about 30 minutes.

Layla and Riley also attend the math intervention group daily for about 30 minutes. These students do not have IEP’s or other plans, however, they qualify for math intervention because their scores are consistently lower that the rest of the students in the class.

**Students’ prior knowledge for these lessons:** The students have little prior knowledge of the life cycle of plants. No known understanding of photosynthesis, germination or pollination, etc. Most students seem to have a basic understanding that plants need water and soil to grow. Not much understanding past this.

**Students’ background and interest for these lessons:** Students seem excited to plant their seeds and watch them grow. Since the students don’t get daily science lessons, they are excited for the change in their schedule.

**How did your knowledge of these students and assessment of their prior knowledge inform your lesson planning?**

Because the students have little knowledge of the technical terms/plant life-cycle vocabulary I need to be sure that I explicitly teach the vocabulary in the lessons. Since the students are excited for the unit, I need maintain that excitement while I’m teaching so that the students continue their excitement to learn about plants.

2. **Focus Students:**

Pick two focus students from whom you will collect artifacts and whose learning you will analyze in greater detail. One student should be one who needs strong support and the other should be one who needs less support. Provide a short description of the students you have chosen in terms of what you know about each student’s prior learning, academic ability, and personal background. Discuss how your knowledge of the students informed your approach to teaching the students.

**Description of student 1**

**Prior learning** – Student 1 (S1) knows that plants must need water to grow, and that they grow and die, but she has little plant knowledge beyond that.

**Academic ability** – S1 did not attend kindergarten, so she is a year behind the rest of the students academically. She has little number sense, and is in the lowest reading group. She struggles with work that has been assigned and often needs continual support to complete tasks.

**Personal background** – S1’s parents are not together. She has missed school for several days to a week at a time when she is with her dad. She can get frustrated and obstinate when she feels a task is too hard for her. She may write nonsense down to just be done with the work. She may refuse to complete the task.

**Other relevant characteristics** – S1 is a happy student when she comes into class in the morning. She seems to enjoy interacting with other students.
Influence of all of these characteristics on your teaching – Based on this information, I plan on teaching much of my lesson in close proximity to S1. This will help me to gauge when she is understanding what I am teaching and when I need to clarify more. I will also be able to monitor her work so that I can see when she needs additional support. I will make an extra effort in positive reinforcement to encourage S1 to continue working even when the work becomes challenging to her.

Description of student 2 Focus student 2: Jenny is generally excited to learn. She is an English language learner, however, she speaks English very well. It appears that English is her first language when holding a conversation with her. Jenny does well in class, and seems to enjoy learning and helping others. She may need some support when learning new vocabulary so explicit instruction may be required to support her learning.

Prior learning – Student 2 (S2) has a basic understanding of the life-cycle of plants. Plants need water, and dirt. They grow, and they have flowers, they need seeds. S2 has little knowledge of terminology/vocabulary such as germination, photosynthesis, chlorophyll, etc.

Academic ability – S2 is an average student. She does well in most tasks given during class. She genuinely desires to do well in school. S2 works hard to complete her assignments and she seems to enjoy learning. S2 is an English language learner, however, she seems to do very well compared to her non English language learner peers.

Personal background – S2 is always happy to be at school. She seems to enjoy learning. When S2 is challenged or doesn’t understand a task, she can become frustrated to the point that she has a difficult time completing the assignment and may even cry. Overall, she genuinely does want to learn and complete her work correctly.

Other relevant characteristics – Socially, S2 is a friend to everyone. She works hard and enjoys helping other students when given the chance.

Influence of all of these characteristics on your teaching – Based on this information I will be sure to explain any procedures clearly to be sure she understands any new vocabulary and tasks. I may also give her the opportunity to support students who may need additional support. I will be sure to monitor her work so that I know she understands. As I monitor S2’s work, I will also know when I should move on because she is one of the average students. She can help me in my pacing so that I can be sure to challenge the class, push the lower students, and continue to keep the higher students engaged.

3. Lesson Plans. Provide 3-5 lesson plans that represent a unit of study that is based on the Utah standards for the subject(s). Each lesson should include the following:
Lesson Title
1. Planting – What do plants need to grow?

Subject and grade Level
Science, Plant life-cycles
1st grade

Approximate time
About 50 minutes

Rationale for methods
I’m planning on teaching this lesson using both direct instruction and inquiry. I will directly instruct the students on how to plant their seeds. I will do this so that each student will have the opportunity to observe a plant go through its entire life cycle. Otherwise, the students might plant their seeds in a way that they might not grow (i.e. planting the seeds too deep, watering them not enough, or too much, etc.). I want my students to have the opportunity to watch their plant pass through each phase in the life cycle, therefore, I will teach them exactly what they need to do when planting.

I will, however, also give them the opportunity to participate in some inquiry based learning. I will ask the students what they feel plants need in order to live. We will then place some extra seeds in various situations (no light, sunlight, and no water). This part of the lesson will be in the form of structured inquiry. I will guide students to the question and some procedures, but I will not provide them with the answer. Based on Kimberly Lott in her explanation of inquiry based learning in Fire Up the Inquiry, when students are given the opportunity to participate in inquiry type lessons they learn to take their learning into their own hands and become more invested in their learning than they do when they participate in “cookbook labs” (labs where they’re given all of the information).

Content standards
- Science 1.1.1a. Observe using senses, create a hypothesis, and focus a question that can lead to an investigation.
- Science 1.1.1.d “Deciding what data to collect and how to organize, record, and manipulate the data.”
- Science 1.1.1.e “Drawing conclusions. Analyzing data, making conclusions connected to the data or the evidence gathered, identifying limitations or conclusions, identifying future questions to investigate.”
- Science 1.4.2a. Make observations about living things and their environment using the five senses.
- Science 1.4.2b. identify how natural earth materials (e.g., food, water, air, light, and space), help to sustain plant and animal life.
- Science 1.4.2c. Describe and model life cycles of living things.
- RL1.2 Retell stories, including key details, and demonstrate understanding of their central message or lesson.
**Academic language/vocabulary objectives**

1. **The language skill** – Students will need to be able to verbalize their observations. They will also need to be able to analyze what they see and summarize their observations in the form of comments and class discussion.

2. **The discipline-specific vocabulary**
   - Scientist
   - Botanist
   - Journal
   - Observation
   - Seed Coat
   - Embryo (baby leaves)
   - Food storage (endosperm)
   - Germinate
   - Prediction
   - Vermiculite
   - Diagram
   - Dissect

**Required materials, resources, and technology**
- Brassica Rapa seeds
- Grow light and PVC pipe frame (to hold the light above the plants)
- Soil
- 4-packs or other containers to plant the seeds in
- fertilizer (to provide nutrients for the plants)
- vermiculite (to keep the top of the soil moist)
- popsicle sticks (for labeling)
- student seed journals (for recording observations, and taking notes on the parts of a seed) (see additional attachments for seed journals)
- lima beans that have been soaked in water (for dissecting and analyzing the parts of a seed)

**Lesson objectives**
- By using the senses when dissecting the lima bean in addition to teacher instruction, students will be able to successfully identify the seed coat, the food (endosperm), the baby leaves, and root when given a diagram of a seed.
  - See Utah common core science 1.4.2a
- Given the class discussion, students will be able to express their predictions in relation to what will happen to the four plants in different conditions in drawing/illustrated form.
  
  o See Utah common core science 1.1.1a
- Given direct instruction, students will be able to draw a diagram to describe how to plant a brassica rapa seed.
  
  o See Utah common core science 1.1.1d
- Given the instructions and diagram drawn on the board, students will be able to retell the process of planting a seed.
  
  o See Utah common core R.L.1.2

**Instructional Procedures**

- *Today we are going to become scientists. Class, does anybody know what a scientist is?*
  - Possible student answers: “Someone who does experiments.”, “Someone who knows science.” Etc.
  
  - Add to students answers if they don’t mention a scientist is someone who asks questions and tries to learn the answers.

- *Today we are going to become a special kind of scientist. We’re going to become botanists!*

- Write “botanist” on the board for students to see the word. Say: A botanist is a scientist who studies plants. So everybody put on your botanist hat so that we can begin studying plants!

- *We are going to start by looking at the different parts of a seed. Please open your seed journals to the first page.*

  - We may want to hold a journal up as an example to show the students what page they need to be on.

- *This is a diagram that shows the different parts of a seed. A diagram is just a scientific picture that helps us to see different parts of something.* You may want to write the word diagram on the board.

- *There are four important parts to a seed that botanists need to know. The first part is the outside part of the seed. It helps to protect the seed. It’s kind of like something we wear when it’s cold outside that helps protect us. Does anybody have any idea what it might be called? Students answer: “A coat!”*

- *That’s right! Seeds wear coats too! The outside part of the seed is called the seed coat. Write seed coat in the box that points to the outside part of the seed everybody. Use wait time to give students time to write it in. If you need to know how to spell seed coat, look in the box at the bottom of your page. It’s the first word in your word bank.*

- *The next part of your seed we are going to label is the root. Seeds haven’t grown any roots yet, but they have a part that will become the roots. This part is the straight part right here. Hold the diagram up and point to the box above the seed coat box. Give students time to write root in the box. Take this time to monitor S1. Be sure she is doing well and provide additional support if needed.*

- *Next we need to label the baby leaves. These baby leaves will be the first leaves you will see when your plants start to grow. We call these baby leaves the embryo. Write embryo on the board and then next to it write baby leaves.*
- **Look at your diagram and see if you can find what part of the seed might be the embryo or the baby leaves.** Students should be able to figure out that leaves belong in the top left box in the diagram. *That’s right, that top left box is pointing to the baby leaves or the embryo.* Label that box leaves. Wait time...

- **We only have one word left in our word bank, I wonder what we might put in that last box...** students will answer “food!”. *That’s right! The rest of the seed is going to be the food that helps the seed to start growing. That food is also called the endosperm.* Write endosperm on the board. Next to it write the word food.

- **Write the word food in that last box. Once you have written this down, we can begin to dissect our own seeds so that we can find all of these parts in actual seeds!**

- **We are going to use an actual seed to help us learn the different parts of seeds.** Show students one of the lima beans that have been soaked in water.

- **This is a seed. We usually call these seeds lima beans. Have any of you ever heard of a lima bean?** Give students the chance to respond yes or no. *Now, even though this is a seed, when I use this seed, I usually don’t plant it, I eat it! Some seeds can be eaten! Can anyone think of any other seeds that you might eat?* Possible student answers: sunflower seeds, pumpkin seeds, any kind of bean, etc.

- **We aren’t going to plant this seed today, but we aren’t going to eat it either. We’re going to dissect it! That means we are going to take it apart and look at the different parts in a seed.** You may want to write the word dissect on the board.

- **When you are finished writing the words in each of the boxes you may get a paper towel, and a lima bean and take them back to your seat. Once you have your lima bean, see if you can find all four parts that we just talked about in your seed.**

- Give students the time to dissect their seeds on their own (about 5 minutes).

- **We are going to study a special kind of plant called a brassica rapa plant.** You might want to write this on the board as well. Explain that *brassica rapa plants come from the mustard family. This means that this plant may look like the plant that is used to make mustard.* Class, what color is mustard? Students will all answer “Yellow!” if mustard is yellow, and this plant is related to the mustard plant what color do you think it’s flowers might be? Students should all answer again, “yellow!”.

- **It’s important that we plant our seeds very carefully so that they will grow well. I wonder what kind of things a plant might need in order to grow...** use wait time to give students some time to think about what they think a plant might need.

- **What do you think a plant might need?** Possible student answers: water, food, dirt, etc. Guide the students by saying *I wonder what would happen to a plant if it didn’t get something it needs...* wait time...

- **What do you think might happen?** Possible student answers: “It will die”, “It won’t grow”, etc.

- **Since we are plant scientists or botanists, let’s do some experiments to find out what would really happen!**

- **First we need to plant our seeds. I will show you how to plant your seeds and then you will each plant your own seeds.**
Draw a rectangle on the board. Write soil at the bottom of the rectangle. First we are going to put some soil in the bottom of our four packs. These are what we are going to plant our seeds in. Hold up one of the four packs. After a little soil, we are going to give our plants some fertilizer which is kind of like vitamins for our plants. Some of you might take vitamins to help your bodies grow healthy and strong. We give plants vitamins or fertilizer to help them grow well too! Draw two or three little circles about ¼ of the way from the bottom. Write fertilizer off to the side and draw an arrow pointing to the circles.

Next we will put more soil in. Draw a line about 2/3 of the way to the top. Now we will put our seeds in! Draw three or four tiny circles to represent the seeds. Write seeds off to the side and draw an arrow pointing to them.

Next, we will put in one more sprinkling of soil, and then on top we are going to put some vermiculite. Write soil on top of the seeds, and then write vermiculite on top of the soil. Press the soil down lightly.

Vermiculite is a funny word, isn’t it? Vermiculite is this special mixture that we put on top of the soil to help our plants stay wet.

Now that I’ve told you how to plant your seeds I wonder if you could guide me through one.

- Next? “Put in the fertilizer.”
- Next what? “More soil!”
- Next? “Add the seeds!”
- Next? “More soil and then the vermiculite!”
- And finally? “Press it down!”
- Once you are finished take a popsicle stick write your name on it and put it down the side of your four pack.

As the students guide you through the process you just explained, actually follow their directions as an example so that they can visually see the process.

Since we only have a small table with all of our materials, only a few of you can come to the back to plant your seeds at a time. So while some of you are planting the rest of you will be writing down some notes in your seed journals. Look at the second page in your journals. This page has four boxes. In each of these boxes you need to write your predictions about what is going to happen to the seeds when we do different things to them. The first box is where you will draw a picture of what you think will happen to your plants. We are going to plant your plants, water them and give them light. So in this box, you will draw what you think might happen in this box.

Next, the box you are going to draw a picture of what you think will happen to a plant if we don’t give it any water, but it still gets sun light.

Next, this box will be for the plant that gets water but no light. We’re going to keep this plant in our closet. Draw a picture here of what you think this plant might look like.

Finally, the last box is for the plant that will get no water and no sun. Draw what you think might happen to this plant.

As the teacher you will plant these four experimental plants and label them using the popsicle sticks.
- Release the students to fill in the boxes and begin planting at this point. Monitor to be sure the students understand what they are going to put in each box. Provide additional support when needed (especially for S1). Also monitor S2 to help you gauge whether your explanation was adequate. If S2 did not understand, take a moment to clarify any additional instructions to the students.

**Adaptations/accommodations**

There is only one English language learner in the class, however, first graders are all still gaining a mastery of the English language, so they may all be considered ELLs. Be sure to write the vocabulary words on the board, and define them clearly. You may want to repeat the definition of the words every time you use the word (i.e. “Today we are going to be botanists, or plant scientists.” “As plant scientists, or botanist we are going to use our senses…” etc.). Monitor all of the students to be sure they are using the vocabulary correctly during discussions, and in their journals.

There are a few gifted students in the class. I expect these students to finish before the other students. When they are finished instruct them to turn to the next page in their journals. Explain to them:

- **On this page you will draw a diagram showing how you planted your seeds. This picture will help you remember how you did it. Remember to label the different parts of your diagram. Once you have drawn the diagram, there are some lines you may use to write some sentences explaining how to plant your seeds.**

S1 is an at risk student. Monitor her as well as a few other students (Layla, and Riley) who are at risk. Provide additional support when needed. Watch to be sure they understand what to draw in each of the boxes. You may not require that they draw the diagram or write an explanation on how to plant their seeds on the next page.

**Assessment**

Pre-assessment:
- Discuss with the class what they know about plants. You may want to take some notes on a board, or big paper for the class to see what they know about plants so that they can compare later.

Formative Assessments:
- Listen as the class directs you in how to plant the seeds to be sure they understood the process.
  - See Utah common core RL1.2
- Monitor the students as they dissect the lima beans. Ask various students to identify different parts of the seed.
  - See Utah common core science 1.4.2a

Summative Assessments:
- Collect their seed journals to see that they have all correctly labeled the parts of a seed.
- Collect the seed journals to assess whether students were able to express their predictions in the form of drawings on page two in their journals
  - See Utah common core science 1.1.1a
- Collect the seed journals to see that students were able to draw a diagram to describe how to plant a brassica rapa seed (optional extension for gifted and fast finishing students)
  - See Utah common core science 1.1.1d

Lesson Title
2. A Plant’s Life-Cycle – Germination

Subject and grade Level
Science, the life cycle of a plant
1st grade

**Approximate time**
About 50 minutes

**Rationale for methods**
This lesson will be in the form of structured inquiry. I will guide students to the question and some procedures, but I try to guide them to the answers so that they might discover them on their own. Based on Kimberly Lott’s explanation of inquiry based learning in *Fire Up the Inquiry*, when students are given the opportunity to participate in inquiry type lessons they learn to take their learning into their own hands and become more invested in their learning than they do when they participate in “cookbook labs” (labs where they’re given all of the information).

**Content standards**
- Science 1.1.1a. Observe using senses, create a hypothesis, and focus a question that can lead to an investigation.
- Science 1.1.1.d “Deciding what data to collect and how to organize, record, and manipulate the data.”
- Science 1.1.1.e “Drawing conclusions. Analyzing data, making conclusions connected to the data or the evidence gathered, identifying limitations or conclusions, identifying future questions to investigate.”
- Science 1.4.2a. Make observations about living things and their environment using the five senses.
- Science 1.4.2b. Identify how natural earth materials (e.g., food, water, air, light, and space), help to sustain plant and animal life.
- Science 1.4.2c. Describe and model life cycles of living things.

**Academic language/vocabulary objectives**
List the academic language students must know or learn in order to engage with the content and meet the learning objective. There are two types of academic language you should describe:

1. **The language skill** – Students will need to be able to verbalize their observations. They will also need to be able to analyze what they see and summarize their observations in the form of comments and class discussion.

2. **The discipline-specific vocabulary**
   - Germinate
   - Sprout
   - Baby leaves/seed leaves

**Required materials, resources, and technology**
- Plants that students planted in first lesson
- Experimental plants teacher planted in first lesson
- YouTube video showing a time-laps of a mung bean germinating
- Student’s seed journals

**Lesson objectives**

- Given the class discussion, students will be able to define the word germinate/sprout in sentence form.
  - See Utah common core science 1.4.2c
- After being shown the time-laps students will be able to draw an example of what a seed looks like when it is germinating.
  - See Utah common core science 1.1.1 and Utah common core science 1.4.2c
- After the class discussion, students will be able to explain three things seeds need in order to germinate.
  - See Utah common core science 1.4.2c

**Instructional Procedures**

- Today we are going to talk about what seeds need in order to start growing. There is a special word that we use to describe when a seed starts growing. Write germinate on the board.
- When a seed wakes up and starts to sprout or starts to grow, it’s called germination. The seed starts to germinate or starts to grow. We can use the word germinate or sprout to explain when a seed starts to grow. You may want to write the word sprout on the board next to germinate.
- Class, what word could we use when a seed wakes up and starts to grow? Students should answer, “sprout” or “germinate”.
- Explain to students that since we’ve planted our seeds they’ve had a chance to germinate or “wake up”.
- Seeds will stay dormant, or asleep until they’re woken up! You may want to write the word dormant on the board. Remember, dormant is when the seeds are asleep still.
- What kinds of things do you think would wake up your seeds? Possible student answers: water, sun, light, dirt, fertilizer. Make a list of the student ideas on the board. Include ideas that may not be correct.
- Show the students the video of the mung beans germinating time laps. Tell them that you are going to ask them to explain what they observed.
- You may want to play the video more than once. You may want to incorporate some movement at this point by inviting students to move along with the mung beans.
- Have the students turn to their elbow partners to explain what they saw.
- Start a conversation with the class about the observations they have made as their plants have grown. Invite the students to make comparisons between the plant that has not been watered and their plants. (i.e. theirs grew and the other one did nothing). Explain that a seed needs certain conditions in order for it to germinate or wake up and start growing.
Ask the students to think about what they think might help plants grow the best. Think about which of our plants is growing the best. What kinds of things have we given that plant?

- Make a list on the board with all of the ideas that the students come up with. Point out that some things plants really need so that they can grow. Erase any of the ideas that are not necessary for the plants to grow, leaving only light, air, food, and water.
- Think out loud with the class as you discuss the different things you’ve written on your list. Guide the class as you point out that the plant in the closet didn’t have any light but it still germinated. Erase light. Do similar guiding observations to erase any other words seeds might not need in order to germinate.

- Go over the quiz in their seed journal together.
  - Read the first question as a class. Class, what does it mean to germinate? If you remember what it means to germinate, write it down on the first two lines in your seed journal on page 4. Wait time... Take this opportunity to monitor S1 and S2. S1 may need additional support at this time. You could give her a model sentence to copy if needed. S2 can help you to know when most of the students are ready to move on.
  - Read the next question as a class. Remember the mung beans? Draw a model of them in this box. Use wait time similar to the previous question.
  - Read the last question as a class. We just talked about the things plants need to help them wake up, or germinate. Look at what’s left on our list. Write down what a seed needs in order to germinate.

Adaptations/accommodations

The lower level students, including S1, Layla, and Riley, may need model sentences to copy for questions one and three on the quiz. Have these sentence frames prepared for them to use.

There is only one English language learner in the class, however, first graders are all still gaining a mastery of the English language, so they may all be considered ELLs. Be sure to write the vocabulary words on the board, and define them clearly. You may want to repeat the definition of the words every time you use the word (i.e. “Today we are going to be botanists, or plant scientists.” “As plant scientists, or botanist we are going to use our senses...” etc.). Monitor all of the students to be sure they are using the vocabulary correctly during discussions, and in their journals.

The gifted students and fast finishers may complete the extension activity in their journals on page three. On this page they will draw a model of what their plant looks like. Then they will write one to two sentences explaining their model.

Assessment

Pre-assessment was done in the first lesson of the unit.

Formative Assessments:
  - Listen to student responses as you teach to be sure students are able to understand what the word germinate means.
    - Utah common core science 1.4.2
Summative Assessments:
- Collect student journals to see that they were able to define the word germinate, successfully draw a model of a mung bean germinating, and list three things a plant needs to germinate.
  - See Utah common core science 1.4.2c, and Utah common core science 1.1.1

**Lesson Title**
3. A plant’s life cycle – Plant parts and functions
Subject and grade Level
Science – Plant life cycle
1st grade

Approximate time
About 50 minutes

Rationale for methods
This lesson will be in the form of structured inquiry. I will guide students to the question and some procedures, but I try to guide them to the answers so that they might discover them on their own. Based on Kimberly Lott’s explanation of inquiry based learning in *Fire Up the Inquiry*, when students are given the opportunity to participate in inquiry type lessons they learn to take their learning into their own hands and become more invested in their learning than they do when they participate in “cookbook labs” (labs where they’re given all of the information).

Content standards
- Science 1.4.2a. Make observations about living things and their environment using the five senses.
- Science 1.4.2b. identify how natural earth materials (e.g., food, water, air, light, and space), help to sustain plant and animal life.
- Science 1.4.2c. Describe and model life cycles of living things.

Academic language/vocabulary objectives
1. The language skill – Students will need to be able to verbalize their observations. They will also need to be able to analyze what they see and summarize their observations in the form of comments and class discussion.

2. The discipline-specific vocabulary
   - Root
   - Leaf
   - Nutrients
   - Stem

Required materials, resources, and technology
- Celery stalks that have been soaked in water with red food coloring
- Student’s seed journals

Lesson objectives
- Given the class discussion, students will be able to define the different three different parts of a plant.
  o See Utah common core science 1.4.2
**Instructional Procedures**
- Write the words root, stem, and leaves on the board and say, **today we are going to learn about the parts of a plant. These are the three parts we need to talk about. We are going to learn what the purpose of each of these parts is.**
- This first part of the plant is a root. Ask the students what they think the roots of a **plant might do.** Pull one of the brassica rapa plants out of the four pack and let the students look at the roots.
- **What do you think the roots of the plant do?** Student answers: “hold the plant down”, etc.
- Not only do the roots hold the plant in place, they also suck up any water and nutrients from the soil. Remember from the first lesson that nutrients are like vitamins for plants.
- **What do the roots do class?** Student answers “Hold the plant in place and suck up water and nutrients.”
- **Next we have the stem of a plant.** Pull the celery out of the water. We’ve been soaking this stem in some red water. Does anyone recognize this stem? It’s a vegetable that we eat. Students: “celery!”
- That’s right! Look at what this celery did when we had it in the red water. Break the celery so that the students can see the red lines. **What do you think the stem of a plant does?** Student answers: “It sucks up the water”.
- That’s right! The stem acts like a straw sucking up the water from the roots along with the nutrients. You can see that it sucked up the red water here. Take the celery around for the students to see.
- The stem also holds the plant up tall.
- **Class, what does the stem do?** Students answer: “Holds the plant up tall, and sucks like a straw!”
- **Last we have the leaves.** The leaves are the part of the plant that makes food for the plant. In the next lesson we are going to learn more about this process. For now you just need to know that the leaves make food for the plant. What do the leaves do? Students answer, “make food!”.
- **Okay, students look at your seed journals.** Find the lesson three quiz on page 8. Number one asks you to think about vegetables we eat. It has carrots, celery, and lettuce. What parts of the plant do you think each of those vegetables might be? Let’s start with carrots. **Does anybody know how carrots grow?** Student answers: “I know carrots grow underground!” That’s right, so what part of the plant are they? Student answers: “the roots!”
- **Next let’s think about the celery...** Student answer: “we learned that celery is a stem!”
- **Finally, what about lettuce?** Student answer: “lettuce looks like a leaf!”
- That’s right! Draw lines from the vegetable to the part of the plant it is.
- Read questions 2-4 and answer them on your own. If you need to remember how to spell a word, you can look on the board. Our vocabulary is all written up here.
Adaptations/accommodations

There is only one English language learner in the class, however, first graders are all still gaining a mastery of the English language, so they may all be considered ELLs. Be sure to write the vocabulary words on the board, and define them clearly. You may want to repeat the definition of the words every time you use the word (i.e. “Today we are going to be botanists, or plant scientists.” “As plant scientists, or botanist we are going to use our senses...” etc.). Monitor all of the students to be sure they are using the vocabulary correctly during discussions, and in their journals.

The struggling students, including S1, Layla, and Riley may need additional support to complete the quiz. Monitor them to be sure they are able to connect the vegetable to the part of the plant it is. Monitor them when they are reading questions 2-4. You may need to read the questions with them. Remind them that the words they need are written on the board.

The gifted students may finish this quiz quickly. Require them to complete question number five. If they need additional extensions, the may draw a model of their plant on the next page in their journal and include two to three sentences explaining their model.

Assessment

Pre-assessment was done in lesson 1.

Formative Assessments:
- Listen during the class discussion to be sure that students are all responding and are providing correct responses to questions about the parts of the plant.
  - See Utah common core science 1.4.2

Summative Assessment:
- Collect the student’s seed journals to be sure they answered questions 2-4 correctly. These questions related to the purposes of each part of a plant.
  - See Utah common core science 1.4.2

4. Reflection and evaluation of lessons, including analysis of assessment data.

Analyze student learning:

Performance of student 1:

Student 1 generally needed additional support during each lesson. I was able to monitor her while teaching using proximity. When she needed help, I was able to provide quiet private correction and/or guidance. Overall, with the additional support I was able to provide for her she has done well in the unit. She struggled with identifying the seed parts at first, but with additional support, she was
successful. She needed additional support again as she drew her predictions. I re-read each box to her one at a time as she drew out her predictions.

She struggled to understand what germinate meant during lesson 2 initially. After we watched the video on the mung beans sprouting another student made a comment about how the seeds looked like they were waking up. This seemed to help S1 because she for question number one, she responded “wake up the seed” almost immediately after the student made the comment.

Again, during lesson 3, student 1 needed additional support to complete her quiz. I re-read the questions with her and helped her to remember what each plant part’s function was various times.

During lesson 2 all of my students had time to draw a model of their plants. Student 2 drew a fun picture of a flower with a smiling face on it. This was one area I would be sure to modify next time. When I introduce the model drawing I would give my students an example of what a model draw is by looking at a plant, and thinking out loud. (i.e. This plant has three leaves, I’m going to draw those three leaves. This plant doesn’t have any flowers yet, so I’m not going to draw any of those. Hmm…sometimes when I draw for fun I like to put faces on my plants. My plant doesn’t actually have a face, so I don’t think I’m going to draw that on here). I would be sure to explicitly explain that as scientists we need to try to make our drawings look as much like the real plant as we can. I think this would have helped student 1 in her model drawing.

I feel that over all student 1 was successful in this unit. She did need substantial support from me, however. To modify this, I might try inviting the students to work together in pairs to complete the tasks. I would need to be sure that the pairs are made by ability level. I would pair student 1 with another student who struggles, but is a little higher than her to see if that helps. I wouldn’t pair her with a high achieving student because I wouldn’t want her to copy answer. I want to challenge her, and if students are paired with another student with a similar ability level they are more likely to work together and be challenged.

**Performance of student 2** during these lessons, based on your assessment data. Provide detail about the quality of the student’s work or provide a quantitative summary of his/her performance. Discuss the student’s misunderstanding or errors as well as how you will modify instruction to improve student performance. Include a sample of this student’s work, if possible.

Overall, student 2 did well throughout all three lessons. I was able to monitor her to see if there were ever any misunderstandings. Anytime there were misunderstandings, I addressed them to the whole class because if she misunderstood, it was likely that more students did as well. The only time this occurred was during lesson 2 when all of the students had an opportunity to complete the extension activity, model drawing their plants. Student 2 drew a nice picture with her, and her plants all pink and colored. This picture was fun, and unfortunately many students drew pictures like this. Next time I will be sure to explicitly explain to all the students what I expect when we draw models of our plants (see example of think aloud model drawing in the performance of student 1).

Other than this, student 2 did very well in the unit. I would change very little based on her performance.

**Analyze teaching effectiveness:**

- What did you do differently than what you originally planned? Why?
Originally I planned to teach lesson one all in one day. I ran out of time and had to teach the other half of the lesson the following day. This happened again with lesson three.

I also had planned to explain more about the predictions with the students, and I wanted to revisit them more. However, because of time, I wasn’t able to revisit our predictions.

Overall, my biggest struggle was fitting in what I planned in the given time slot. This was difficult because science was always left for the last part of the day and was only fit in when there was time. During lesson 2 we ended up with more time than I planned, so we were able to complete more activities, but the other two lessons did not have as much time.

I did not originally plan to replay/revisit the mung bean video, however the students really enjoyed it, so we revisited it a few times during lesson 2 and 3 as well as during other parts of the day. We were able to incorporate some movement as the students modeled the plants. I could see that the students really enjoyed this, and so I did revisit it a few times.

• What worked?
  o My students really responded well to my lesson on germination. They enjoyed the mung bean video. It really helped them to visualize a process that actually takes many days. This was a good technology tool that I would definitely use again.
  o Teaching using proximity really helped my focus student. She does need additional support often, so it was helpful when I was near her to see when she did need that support.

• What didn’t work? Why do you think it didn’t work?
  o The students didn’t understand the model drawing very well when they all had time for it during lesson 2. Many of them drew smiling/unrealistic pictures of flowers. I failed to model for them what a model drawing should be like. If I had done a better job explaining what I expected, they would have done better as a whole.

• How would you modify the unit based on the focus students’ performance?
  o I would be sure to explain the model drawing better. I would use a think aloud process to help them understand what to draw.
  o I might also try pairing my students based on ability levels to see if they can work together to complete the tasks. Student 1 needed substantial support. I might try partner work to see if that might reduce the support she needs from me.

• In what other ways would you modify the unit in the future? Why? What would you do differently in the future?
  o I would practice teaching the unit more so that I know how much time each part takes. This would help me to understand how much time I will need to teach
each section. I would then know how much time I would really need for each
section of the lesson.

- I might try giving students time during journaling to draw their models of their
  plants and write a few sentences about what the plants look like. This would
give more students time to write about science than just the gifted students. I
feel that given this opportunity students will be able to learn more about the life
cycle of the plants as they think about what their plants look like on a daily
basis.
My Seed Journal

Name: ____________________
Parts of a Seed

Scientist: __________________________

Word Bank
seed coat  root  leaves  food
my plant predictions
This is what I predict will happen to our plants...

The plant with water and sun will...

The plant with no water and sun will...

The plant with water and no sun will...

The plant with no water and no sun will...
How to Plant Brassica Rapa Seeds
QUIZ #2

1. What does *germinate* or *sprout* mean?

2. Draw a seed sprouting. Label the parts.

3. Name or draw 3 things a seed might need to sprout.
QUIZ #3

1. Draw a line from the vegetable to the plant part.
   Carrots  Stems
   Celery    Leaves
   Lettuce  Roots

2. What part of the plant makes the food?
   ________________________________
   ________________________________
   ________________________________

3. What holds the plant up and carries water and food to the plant?
   ________________________________
   ________________________________
   ________________________________
   ________________________________
4. What holds the plant to the ground and sucks up water from the soil?

5. Draw your plant and label the stem, leaves, and roots.
Life of my Plant Day _____
My Plant Predictions

This is what I predict will happen to our plants...

- The plant with water and air will grow.
- The plant with no water and air will not grow.
- The plant with water and no air will grow.
- The plant with no water and no air will not grow.
Life of my Plant Day

They have: smaller

Plants can grow with...
QUIZ #2

What does **germinate** or **sprout** mean?

**Water**  \( \rightarrow \)  **Wake up**

**the seed**

Draw a seed sprouting. Label the parts.

Name or draw 3 things a seed might need to sprout.

**Water**  \( \rightarrow \)  **Air**  \( \rightarrow \)  **Warmth**
Lesson 3: Plant Parts and Functions
Quiz

Name ____________________

1. Draw a line from the vegetable to the plant part.
   - Carrots to Stems
   - Celery to Leaves
   - Lettuce to Roots

2. What part of the plant makes food?
   Leaves

3. What holds the plant up and carries water and food to the plant?
   Stems

4. What holds the plant to the ground and sucks up water from the soil?
   Root

5. On the back of this page, draw your plant and label the stem, leaves, and roots. Now color your
Parts of a Seed

- Leaves
- Root
- Seedcoat

Word Bank:
- Seed coat
- Root
- Leaves
- Food
my plant predictions

This is what I predict will happen to our plants...

The plant with water and sun will...

The plant with no water and sun will...

The plant with water and no sun will...

The plant with no water and no sun will...
QUIZ #2

1. What does *germinate* or *sprout* mean?
   - They wake up the Seed.

2. Draw a seed sprouting. Label the parts.
   - [Drawing of a seed sprouting with labels for parts]

3. Name or draw 3 things a seed might need to sprout.
   - Water air warmth
Life of my Plant Day

I have baby leaves.

They are cute. They are cool.
Lesson 3: Plant Parts and Functions

Quiz

Name ____________________________

1. Draw a line from the vegetable to the plant part.
   - Carrots
   - Celery
   - Lettuce
   - Stems
   - Leaves
   - Roots

2. What part of the plant makes food?
   Leaves

3. What holds the plant up and carries water and food to the plant?
   Stem

4. What holds the plant to the ground and sucks up water from the soil?
   Root

5. On the back of this page, draw your plant and label the stem, leaves, and roots. Now color your picture!
Life of my Plant Day 18

- Leaves
- Stem
- Root