Lesson 1
<table>
<thead>
<tr>
<th>Performance Indicators: Lesson One</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking: Describing physical qualities of different seeds</td>
<td>SW point at different qualities of the seeds by matching them to the correct pictures.</td>
<td>SW participate using key words that are familiar to the qualities of each of the seeds</td>
<td>SW give simple sentences describing each of the seeds using 1 or 2 words that describe each seed.</td>
<td>SW participate in an oral conversation about the different qualities of the seeds each seed found with each partner.</td>
<td>SW discuss and explain different qualities they found with each seed to their partners.</td>
</tr>
<tr>
<td>Speaking: Compare and contrast qualities of the seeds</td>
<td>SW point to laminated pictures of the seeds. Example: Pointing to a picture of brown seeds if the seed is brown.</td>
<td>SW use key words such as, smaller, bigger, colors.</td>
<td>SW give simple sentences describing 1 difference and one similarity of the seeds.</td>
<td>SW give 2 sentences describing 2 different similarities and differences they noticed about the seeds.</td>
<td>SW will write a short paragraph in their notebooks explaining all of the similarities and differences they observed with the seeds.</td>
</tr>
<tr>
<td>Speaking: Describe how to organize data on a chart</td>
<td>SW point to where information would go on the chart.</td>
<td>SW identify different parts of the chart.</td>
<td>SW identify one quality of each seed and where it would go on the chart.</td>
<td>SW identify two different qualities of each seed and determine where they go on the chart.</td>
<td>SW explain where each piece of information belongs on the chart and how it can be used.</td>
</tr>
</tbody>
</table>
## Functional and Notional Chart Lesson One

<table>
<thead>
<tr>
<th>Function</th>
<th>Situation</th>
<th>Expressions</th>
<th>Words</th>
<th>Grammar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe</td>
<td>The seeds are: Corn, lima bean, grass, and acorn.</td>
<td>This seed is ________. It feels like ________. It’s color is ________.</td>
<td>Smooth Shiny Black Green Tan Yellow Bumpy Long Short Fat Skinny Round Oval</td>
<td>Adjectives.</td>
</tr>
</tbody>
</table>
Lesson One:
Objectives:
1.06 Observe, describe, and record properties of germinating seeds

Content Objective: SWBAT identify and sort different seeds and their different properties, such as size, shape, color, and texture.
Language Objective: SWBAT become familiar with vocabulary to sort their seeds. The vocabulary is size, shape, color, and texture.
Language Objective: SWBAT describe how they organize the data put into their charts.
Language Objective: SWBAT compare and contrast the qualities of the different seeds they have.
Essential Question: What are the properties of seeds?

Time: One 60-minute period

Content Blast:
Seeds can be found in a variety of places such as in flowers, in trees, or on the ground. Seeds have a variety of properties such as, size, shape, color, and texture. They store food for young plants and are protected by a seed coat. Seed production is dependent upon the type of plant and the size of the seed. Seeds need moisture, air, and warm temperatures in order to grow. When the seeds are in the soil the plants cannot use the energy from the sun so they must depend on the cotyledon to provide them with energy they need in order to grow. Seeds travel in a variety of ways.

Materials:
Per Student:
• Hand lens
• Ruler
• Radish seed
• Corn seed
• Lima bean seed
• Glue/tape
• Example of a chart showing different seeds and their traits
• Pictures of different seeds for ELLs
• Pictures of different vocabulary words for ELLs.

Preparation:
Create a data table and assign seeds to each sample number ahead of time by gluing a sample below each label in column one. For example, corn = Seed 1, radish = Seed 2, etc. Be sure not to tell students the names of the seeds. This will prevent students from mislabeling the samples during the investigation.

- Objectives for the day will be up on the board stating:
  “Today we will be working with seeds! We will be looking for seeds outside, and then doing our best to find all of their qualities!”

- Create word wall with vocabulary on the board for students to have words accessible to use when organizing their data for their seeds. Word wall will contain the words:
  - Size
  - Shape
  - Color
  - Texture
  - Bumpy
  - Round
  - Properties
  - Smooth

Engage: Take a ten-minute nature walk around your school to observe plants. Ask the students how they think the plants started. Have the students collect evidence for their ideas, i.e. pinecones on the ground. Gather the evidence that students find in order to observe more closely in the classroom. Display objectives on the white board for students reading, “We will sort through different seeds today doing our best to identify their different properties. Properties such as: size, shape, color, and texture.” Pictures of different qualities will be hung up around the classroom for ELLs to refer to.

Explore:
- Have students discuss the samples that they found outside. Ask questions that would lead to the discovery that the samples are seeds.
- Provide students with a variety of seeds such as corn, beans, grass, and radish, without telling them the names of each seed. (If these seeds are not available, then others may be substituted.)
• Students will observe each of the four types of seeds using a hand lens and a ruler. They will record their observations in a data table like the one below. Students can either glue or tape the seed samples below the labels in column one of the data table. The data table should be glued into their science notebooks.

• Provide language models for students. Such as “This seed feels bumpy.” “This seed is brown, green, yellow, etc.” “This seed is round, oval, oblong, etc.”

  Language Models will be on the board for students:
  This seed feels ____.
  This seed looks ____.
  The color of this seed is ____.
  This seed is ____.

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Size</th>
<th>Shape</th>
<th>Color</th>
<th>Texture</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*PLEASE REFER TO PERFORMANCE INDICATORS:

**Explain:** Have students discuss their findings with the following guiding questions: Questions will be modified for all levels:
1. How many different colors did you see in the seeds?
2. How many different shapes did you find?
3. What are the properties of seeds?
4. How did the seeds feel in your hands?
5. What did you observe about the properties of the seeds?
6. Were the seeds big or small?
7. Did you notice any similarities or differences between the four seed samples?

**Elaborate:** Students will create a Venn diagram like the sample below that will compare the samples that they collected outside to one of the samples that were provided by the teacher.

![Venn Diagram](image)

**Evaluate:** Make sure that students have completely filled in all areas of the data table by identifying the properties color, size, shape, and texture. To extend student thinking, encourage them to discover other ways of observing other properties, i.e. floating vs. sinking, magnetism, and mass.

**Additional Resources:**
www.urbanext.uiuc.edu/gpe/index.html
Materials Needed for Lesson One

Hand Lens

Ruler

Radish Seed

Corn Seed

Lima Bean Seed

Glue
<table>
<thead>
<tr>
<th>Original Lesson</th>
<th>Modified Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>• There were general questions to observe comprehension from all of the students.</td>
<td>• There are modified questions for all levels of ELLs.</td>
</tr>
<tr>
<td>• There were almost no language models for students to answer questions.</td>
<td>• There are language models to help ELLs answer questions.</td>
</tr>
<tr>
<td>• The content and language objectives were not labeled around the room.</td>
<td>• The content and language objectives are clearly labeled in the room in a student friendly manner.</td>
</tr>
<tr>
<td>• There were no performance indicators in the first lesson to determine whether or not the students understood the lesson.</td>
<td>• There are performance indicators that range from beginning ELLs to advanced ELLs.</td>
</tr>
<tr>
<td>• There was no functional notational chart in the first lesson.</td>
<td>• There is now a functional notational chart to refer to.</td>
</tr>
<tr>
<td>• Vocabulary was at a minimum and not realistic to what the students needed to know in order to understand the lesson.</td>
<td>• Vocabulary was added in order for the students to get all of the information they needed to understand the lesson completely.</td>
</tr>
</tbody>
</table>
Lesson 2
### Performance Indicators: Lesson Two

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking: Describing three parts of a seed and why these parts are important to the seed and its growth.</td>
<td>SW point at different parts of the seed made of Velcro</td>
<td>SW identify the three parts of the seeds by name.</td>
<td>SW give one-word answers to questions about parts of the seed. Examples: &quot;What colors did you see?&quot; &quot;How many different parts of the seed did you see?&quot; &quot;Was the wet seed different from the dry seed?&quot;</td>
<td>SW finish the sentences, &quot;The embryo is important because...&quot; &quot;The cotyledon is important because...&quot; and &quot;The seed coat is important because...&quot;</td>
</tr>
<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Words</td>
<td>Grammar</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Describe</td>
<td>The different parts of the seed are, ______, ______, and ______.</td>
<td>The embryo part of the seed is important because ______. The cotyledon part of the seed is important because ______. The seed coat is important because ______.</td>
<td>Embryo Cotyledon Seed Coat</td>
<td>Adjectives.</td>
</tr>
</tbody>
</table>
Lesson Two
Objectives:
1.03 Investigate and describe how plants pass through stages in their life cycle including growth, survival, and reproduction
1.06 Observe, describe, and record properties of germinating seeds

Content Objective: SWBAT identify 3 different parts of a seed: embryo (the baby plant), cotyledon (the food source), and the seed coat (the protective coat).
Language Objective: SWBAT use new vocabulary to describe why the different parts of the seed are important to the seed, and its growth.

Essential Question: What is inside a seed?

Time: One 60-minute period

Content Blast: Seeds are made up of three main parts, the embryo, (the baby plant), the cotyledon, (the food source), and the seed coat, (the protective coating). As the seed grows the embryo will become the roots, stems, and leaves of the plant.

Materials:
Per Student:
• Hand lens
• Ruler
• Soaked lima beans (at least two per student)
• Soaked green beans (at least two per student)
• Water
• Paper towels
• Velcro pictures of each of the parts of a seed
• Seeds from previous lesson

Per Class:
• Container for soaking beans
Preparation:
Bean seeds (lima beans) should be soaked overnight prior to completing this lesson. Teacher should soak double the amount of seeds to ensure that all students will have a seed that shows all of the seed parts.

• Objectives for the day will be up on the board stating:
  “Today we will get to open a seed and find what's inside! There are three separate parts to each seed. Can you find all three parts?”

• On the board there will be pictures made of Velcro of each part of the seed with it's scientific name (embryo, cotyledon, and the seed coat) underneath it. Then, below the scientific name there will be a simpler term for each one, (the baby plant, the food source, and the protective coat). Students will be able to compare all of these parts of the seed to their own lives. Each human starts off as a baby, then needs food to stay alive, and then needs clothing to be protected from the elements of the earth.

Engage: Ask the students about the properties of the dry bean seeds from the previous lesson. Pose the question, “What do you think the bean seed would look like if it was soaked in water overnight?” Teacher can compare when students remain in the bathtub too long to the outcome of the seeds being soaked.

Explore:
• Each student will receive a wet bean seed on a paper towel. The students will use a hand lens and a ruler to observe and record the properties of the soaked bean seed in their science notebook.
• The teacher will pose the question, “Do you think that this seed looks the same on the inside as it does on the outside?” Allow students 5-10 minutes to investigate the inside of the seed using the tools provided.
• Once all students have had an opportunity to open their seeds, have them share their discoveries with the class. This activity should lead to a discussion of the seed parts including, seed coat, embryo (baby plant), and cotyledon (food source). If all students were not able to identify these three parts, then give
them another soaked seed. Have them try again allowing students to share successful methods for dissection.

- After all students have seeds that show the parts, they should draw and label their dissected seeds in their science notebooks.

Sample Diagram

*PLEASE REFER TO PERFORMANCE INDICATORS:

**Explain:** The students will engage in a discussion by answering the following guiding questions:

1. What changes did you notice between the dry and wet seeds?
2. Was the wet seed the same as the dry seed?
3. Did you find all three parts of the seed?
4. What did the seed look like in the inside?
5. Is the inside of the seed what you expected it to look like?
6. How many parts were in the seed?
7. What do you think is the purpose of each part?
8. Can you compare the different parts of the seed to parts of your body?
9. What colors did you see while opening the seed?

These questions should lead to a discussion of them seeing a baby plant inside the seed. Discuss what a baby needs to grow. Answers should be food, water, and protection. Ask students where they think this baby plant is getting these things. Once they have identified the white, fleshy part as the food source then present the vocabulary words for each part (embryo, seed coat, and cotyledon).

**Elaborate:** The students will be given a soaked green string bean seed in order to compare the major parts of the seed that were found
in the lima bean seed. They should recognize that the beans contain the same parts. Students will draw and label the parts of the green string bean seed in their science notebooks.

**Evaluate:**
Students should be able to identify the three parts of a seed using the appropriate vocabulary as well as the function of each part in their science notebooks.
Materials Needed for Lesson Two

Hand Lens

Ruler

Soaked Lima Bean Seeds

Soaked Green Beans

Bowl of Water

Paper Towels
Three parts of a germinating seed

![Diagram showing the embryo, endosperm, and seed coat of a germinating seed.]

Seeds from the previous lesson:

- Radish Seed
- Corn Seed
- Lima Bean Seed
<table>
<thead>
<tr>
<th>Original Lesson</th>
<th>Modified Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In the original lesson there were three language objectives and one content objective.</td>
<td>• In the modified lesson there is only one content objective and only one language objective. The reason behind this is to simplify the lesson so that the students aren’t overwhelmed with information.</td>
</tr>
<tr>
<td>• There were no visuals around the room in the first lesson</td>
<td>• In the modified lesson there are visuals on the board for the students as well as a word wall with vocabulary words they need.</td>
</tr>
<tr>
<td>• The content and language objectives are not visually shown for the students to see.</td>
<td>• In the modified lesson the content and language objectives are posted up on the board in a student friendly manner for the students to have access to.</td>
</tr>
<tr>
<td>• There were general questions generated for all of the students to answer.</td>
<td>• There are modified questions ranging from beginning ELLs to advanced students.</td>
</tr>
<tr>
<td>• There were no performance indicators in the first lesson to determine whether or not the students understood the lesson.</td>
<td>• There are performance indicators that range from beginning ELLs to advanced ELLs.</td>
</tr>
<tr>
<td>• There was no functional notational chart in the first lesson.</td>
<td>• There is now a functional notational chart to refer to.</td>
</tr>
</tbody>
</table>
Lesson 3
## Performance Indicators: Lesson Three

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speaking:</strong> Describing what a seed needs to grow</td>
<td>SW point to different items on a chart. Example, “Where does the plant get its food from?” The student will point to soil. “Where does the plant get its light from?” The student will point to the picture of a sun.</td>
<td>SW participate using key words that are listed on the word wall. For example, water, oxygen, soil, and sunlight.</td>
<td>SW give simple sentences describing what the seeds need in order to grow using words from the word wall. There will also be sentence structures up on the board. “The seed needs____.” And the ss will chose from water, oxygen, soil, and sunlight.</td>
<td>SW participate in an oral conversation about what the seeds need in order to grow and be healthy. The teacher will have sentence structures up on the board for the students.</td>
</tr>
<tr>
<td><strong>Writing:</strong> Record the changes students see on a daily basis with planted seeds</td>
<td>SW point to different examples that are on the white board of different stages of the seeds.</td>
<td>SW use key words written in their journals from the word wall describing what they see as the seed grows.</td>
<td>SW give 1 simple sentence using words from the word wall.</td>
<td>SW write 2 sentences describing what they see in the growing seeds using words from the word wall.</td>
</tr>
</tbody>
</table>
### Functional and Notional Chart Lesson Three

<table>
<thead>
<tr>
<th>Function</th>
<th>Situation</th>
<th>Expressions</th>
<th>Words</th>
<th>Grammar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe</td>
<td>The seeds needs: Water, Oxygen (air), Soil (food), Sunlight</td>
<td>This seed is growing a lot, a little, tall, not a lot, fast, slow, etc.</td>
<td>Water, Oxygen, Soil, Sunlight, Reproduction, Growth, Survival, Centimeters, Inches</td>
<td>Adjectives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This seed has more sunlight than this because ________.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I’ve watered my seed _______ times.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

✓
Lesson Three:

Objectives:

1.03 Investigate and describe how plants pass through stages in their life cycle including growth, survival, and reproduction

.06 Observe, describe, and record properties of germinating seeds

Content Objective: SWBAT observe and record the changes the planted seeds have made within a nine-day window.

Language Objective: SWBAT tell what a seed needs to grow.

Language Objective: SWBAT record the changes they see on a daily basis with planted seeds.

Essential Question: What does a seed need to grow?

Time: One 60-minute period, daily observational follow-ups of ten minutes each for nine days

Content Blast: Seeds germinate when they have water, sunlight, and oxygen. Usually, the root emerges first, which helps the plant absorb water. Next, the stem and leaves will come out. The leaves will turn green and begin to produce their own food through the process of photosynthesis.

Materials:
Per Student Group:
- Plastic cups
- Soil (one cup)
- Water
- Ruler
- Soaked seeds from lesson two

Per Class:
- From Seed to Plant by Gail Gibbons

Process Skills: Observe, Communicate, Predict
Preparation: The teacher should soak the lima bean seeds in water overnight prior to teaching this lesson.

Engage: Read the book, From Seed to Plant by Gail Gibbons as an introduction to what a seed needs in order to grow. While reading the book the teacher should have models of each stage that the beans take while growing up on a white board. While reading about each stage the teacher will point to each stage and describe what is going on. After reading the book, the teacher will show the students some lima bean seeds and some full-grown lima beans. Students will have a discussion with partners about what they think the seeds need in order to grow. Teacher will pair beginning ELL’s with more advanced students for support. The teacher will monitor what each pair of students is saying and asking questions that will start conversation. There will be a word wall that has all of the vocabulary words listed around it that they have worked on throughout the entire unit. There will also be language models listed on the board to get students minds flowing. For example: “I think the seed needs water because...” “The seed needs to be in the sunlight because...” “I think the plant will take _____ to grow.” The objective for the day will be up on the white board stating: “Today we will be planting our seeds! We will work together for the next week and watch our seeds grow. What do you think the seeds need in order to grow and be strong?”

Explore:
*Show students the soaked seeds. Compare them to the dry lima bean seeds that they observed in Lesson 1.
  For beginning ELL’s: Have beans from the previous lesson next to the dry beans and ask questions such as:
  Do they feel different?
  Is it because these sat in water?
  Which do you think will grow better?
*Also have visuals for the beginning ELL’s to point to in case there is a student who isn’t speaking yet.
  • Divide the students into pairs. Give them the soaked seeds, one plastic cup, and one small cup of soil.
  *Teacher will model all of these steps in order for the students:
    • Place about an inch of soil in the bottom of the cup.
    • Put the seeds in the soil.
• Add water, but make sure students don't drown the seeds. Add just enough to moisten the soil.
• Put the cups in one spot in the classroom. Ask the students about the light source. Have the students observe and record their observations for five days including qualitative data (color and shape) and quantitative data (height in centimeters, number of leaves, etc).

<table>
<thead>
<tr>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
</tr>
<tr>
<td>Labeled Illustration of Plant</td>
</tr>
</tbody>
</table>

*PLEASE REFER TO PERFORMANCE INDICATORS:

**Explain:** Ask the students the following questions:
1. What happened to the seeds?
2. Did any seeds grow differently than others?
3. Why were they different?
4. What did you notice first about the seeds when they started to grow?
5. Does the growing seed remind you of anything?
6. Have you ever planted anything at home?
7. What does the seed need to grow?

For Advanced Students:
Students will draw the seed and the plant and write a detailed paragraph about what the seed needed in order to grow.

For beginning ELL's:
Students will draw a picture of what they see, and write a short sentence describing the picture.
“I see a small sprout coming out of the dirt.”
“I see that the plant is showing its leaves.”
"The leaves are green."
"The leaves are yellow."

**Elaborate:** Discuss what would happen if the sprouts were moved into a garden.

For elaboration the students will be put into pairs and the teacher will walk around the room doing an individual short lesson. The teacher will have a picture of a vegetable garden that has many vegetables growing in it. The teacher will ask the students if they think that their seeds would be able to grow as big as the plants are in the garden. The teacher will explain to the students that if their beans were planted in a garden they would have more room to grow and the beans would grow taller and bigger. Having the visuals will help students understand that the big plants would not be able to grow in such a small cup, they need more room to grow and get bigger.

**Evaluate:** Check the students' notebooks for accuracy of what a seed needs in order to grow. Ask students to pretend that they are going to be in charge of planting their own garden. Have them write about what they would need to consider when planting. Students should include information about light, water, soil, and air in their explanations.

Additional Resources:

*How a Seed Grows* by Helene J. Jordan
Materials Needed for Lesson Three

- Plastic Cups
- Bag of Soil
- Watering Can
- Ruler
- Soaked Lima Bean Seeds
- Soaked Green Beans
Book:

FROM SEED TO PLANT
BY GAIL GIBBONS

ISBN-10 number: 0823410250
<table>
<thead>
<tr>
<th>Original Lesson:</th>
<th>Modified Lesson:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In the original lesson there were three language objectives and only one</td>
<td>• In the modified lesson I took away one of the language objectives because I didn't</td>
</tr>
<tr>
<td>content objective.</td>
<td>think it was important enough to have as an objective.</td>
</tr>
<tr>
<td>• In the original lesson there was no partner work in between students.</td>
<td>• In the modified lesson I took an opportunity where the teacher would be doing all of</td>
</tr>
<tr>
<td></td>
<td>the work and talking and turning it into a turn and talk with partners.</td>
</tr>
<tr>
<td>• In the original lesson there was not any modeling done by teacher.</td>
<td>• In the modified lesson I added in an opportunity for students to ask questions.</td>
</tr>
<tr>
<td>• In the original lesson there was not much sheltered instruction.</td>
<td>• In the modified lesson I found a few places where it was necessary to have sheltered</td>
</tr>
<tr>
<td></td>
<td>instruction.</td>
</tr>
<tr>
<td>• There were general questions generated for all of the students to answer.</td>
<td>• There are modified questions ranging from beginning ELLs to advanced students.</td>
</tr>
<tr>
<td>• There were no performance indicators in the first lesson to determine whether or not the students understood the lesson.</td>
<td>• There are performance indicators that range from beginning ELLs to advanced ELLs.</td>
</tr>
<tr>
<td>• There was no functional notational chart in the first lesson.</td>
<td>• There is now a functional notational chart to refer to.</td>
</tr>
</tbody>
</table>
Checklists
Write the page numbers and any other identifying features to identify those parts of your lessons that employ the following strategies.

<table>
<thead>
<tr>
<th>SHELTERED STRATEGIES</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Contextualize Lesson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.A. Build and Activate Background Knowledge</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I.B. Develop Vocabulary</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I.C. Use extensive Visuals, Realia, Manipulatives, &amp; Gestures</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I.D. Model (Instructions, Processes)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I.E. Create Opps. To Negotiate Meaning/Check Understanding</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>II. Make Text Comprehensible</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>II.A. Intentional Use of Graphic Organizers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.B. Modify Written Text</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III. Make Talk Comprehensible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.A. Pace Teacher's Speech</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>III.B. Use of Listening Guides</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>III.C. Use of Word Walls</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>III.D. Frame Main Ideas</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>III.E. Check for Understanding</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>IV. Engage: Opportunities for Output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV.A. Use Teacher Questioning and Response Strategies</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>IV.B. Practice Instructional Conversations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V. Engage at Appropriate Language Proficiency Levels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V.A. Use questions appropriate for language proficiency levels in conversations, activities, and assessments</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>VI. Give Students Voice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI.A. Challenge students to produce extended talk</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>VI.B. Model Language for Oral and Written Production</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>VI.C Use Group/Pr. Work to Elicit Student Talk; Students as Researchers</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Original Lessons
Lesson One: Seeking Out Seeds

Objectives:
1.06 Observe, describe, and record properties of germinating seeds

Content Objective: SWBAT identify and sort different seeds and their different properties, such as size, shape, color, and texture.

Language Objective: SWBAT become familiar with vocabulary to sort their seeds. The vocabulary is size, shape, color, and texture.

Language Objective: SWBAT recognize what the purpose of a chart is. SWBAT describe how they organized a graph.

Essential Question: What are the properties of seeds?

Time: One 60-minute period

Content Blast:
Seeds can be found in a variety of places such as in flowers, in trees, or on the ground. Seeds have a variety of properties such as, size, shape, color, and texture. They store food for young plants and are protected by a seed coat. Seed production is dependent upon the type of plant and the size of the seed. Seeds need moisture, air, and warm temperatures in order to grow. When the seeds are in the soil the plants cannot use the energy from the sun so they must depend on the cotyledon to provide them with energy they need in order to grow. Seeds travel in a variety of ways.

Materials:
Per Student:
- hand lens
- ruler
- radish seed
- corn
- bean
- grass
- glue/tape
- Example of a chart showing different seeds and their traits
- Pictures of different seeds for ELLs
- Pictures of different vocabulary words for ELLs.
**Process Skills:** Classify, Observe, Communicate, Predict, Infer

**Preparation:**
Create a data table and assign seeds to each sample number ahead of time by gluing a sample below each label in column one. For example, corn = Seed 1, radish = Seed 2, etc. Be sure not to tell students the names of the seeds. This will prevent students from mislabeling the samples during the investigation.

**Engage:** Take a ten-minute nature walk around your school to observe plants. Ask the students how they think the plants started. Have the students collect evidence for their ideas, i.e. pinecones on the ground. Gather the evidence that students find in order to observe more closely in the classroom.

**Explore:**
- Have students discuss the samples that they found outside. Ask questions that would lead to the discovery that the samples are seeds.
- Provide students with a variety of seeds such as corn, beans, grass, and radish, without telling them the names of each seed. (If these seeds are not available, then others may be substituted.)
- Students will observe each of the four types of seeds using a hand lens and a ruler. They will record their observations in a data table like the one below. Students can either glue or tape the seed samples below the labels in column one of the data table. The data table should be glued into their science notebooks.

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Size</th>
<th>Shape</th>
<th>Color</th>
<th>Texture</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This seed has a round shape. This seed has a green color. This seed has a round shape. This seed has a green color. This seed has a round shape.
Seed 3

Seed 4

**Explain:** Have students discuss their findings with the following guiding questions:
1. How many different colors and shapes of seeds did you find? (L1-L5)
2. What are the properties of seeds? (L4-L5)
3. What did you observe about the properties of the seeds?
4. Did you notice any similarities or differences between the four seed samples?

**Elaborate:** Students will create a Venn diagram like the sample below that will compare the samples that they collected outside to one of the samples that were provided by the teacher.

![Venn Diagram for Corn]

**Evaluate:** Make sure that students have completely filled in all areas of the data table by identifying the properties color, size, shape, and texture. To extend student thinking, encourage them to discover other ways of observing other properties, i.e. floating vs. sinking, magnetism, and mass.

**Additional Resources:**
www.urbanext.uiuc.edu/gpe/index.html
<table>
<thead>
<tr>
<th>Performance Indicators: Lesson One</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking: Describing physical qualities of different seeds</td>
<td>SW point at different qualities of the seeds by matching them to the correct pictures.</td>
<td>SW participate using key words that are familiar to the qualities of each of the seeds.</td>
<td>SW give simple sentences describing each of the seeds using 1 or 2 words that describe each seed.</td>
<td>SW participate in an oral conversation about the different qualities of the seeds.</td>
<td>SW discuss and explain in an oral presentation to the class about different qualities they found with each seed.</td>
</tr>
<tr>
<td>Writing: How a chart is used.</td>
<td>Color in a chart and trace over the words they will use to describe the qualities of the seeds.</td>
<td>Label the chart that they will use to organize the information about the seeds.</td>
<td>Label the chart they will use and point to the words on a word bank that they will be using to fill out the chart.</td>
<td>Create a chart and fill it out completely with all of the vocabulary they learned about the different qualities of the seeds.</td>
<td></td>
</tr>
</tbody>
</table>

Add:
- Describe how to graph
- Compare and contrast

Hence:
This earlier stage ELLs can put together the chart if you provide (design) support.
## Functional and Notional Chart

<table>
<thead>
<tr>
<th>Function</th>
<th>Situation</th>
<th>Expressions</th>
<th>Words</th>
<th>Grammar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe</td>
<td>The seeds are: Corn, lima bean, grass, and acorn.</td>
<td>This seed is _______. It feels like _______. It's color is _______</td>
<td>Smooth, Shiny, Black, Green, Tan, Yellow, Bumpy, Long, Short, Fat, Skinny</td>
<td>Adjectives.</td>
</tr>
</tbody>
</table>
Tina Tenreiro
Lesson Two: Bean-y Babies
Grade Level: Third Grade

Objectives:
1.03 Investigate and describe how plants pass through stages in their life cycle including growth, survival, and reproduction
1.06 Observe, describe, and record properties of germinating seeds

Content Objective: SWBAT identify 3 different parts of a seed: embryo (the baby plant), cotyledon (the food source), and the seed coat (the protective coat).

Language Objective: SWBAT use new vocabulary to describe why the different parts of the seed are important to the seed, and its growth.

Essential Question: What is inside a seed?

Time: One 60-minute period

Content Blast: Seeds are made up of three main parts, the embryo, (the baby plant), the cotyledon, (the food source), and the seed coat, (the protective coating). As the seed grows the embryo will become the roots, stems, and leaves of the plant.

Materials:
Per Student:
• hand lens
• ruler
• soaked lima beans (at least two per student)
• soaked green beans (at least two per student)
• water
• paper towels
• Velcro pictures of each of the parts of a seed
• Seeds from previous lesson

Per Class:
• container for soaking beans
**Preparation:**
Bean seeds (lima beans) should be soaked overnight prior to completing this lesson. Teacher should soak double the amount of seeds to ensure that all students will have a seed that shows all of the seed parts.

• Objectives for the day will be up on the board stating:
  “Today we will get to open a seed and find what’s inside! There are three separate parts to each seed. Can you find all three parts?”

• On the board there will be pictures made of Velcro of each part of the seed with its scientific name (embryo, cotyledon, and the seed coat) underneath it. Then, below the scientific name there will be a simpler term for each one, (the baby plant, the food source, and the protective coat). Students will be able to compare all of these parts of the seed to their own lives. Each human starts off as a baby, then needs food to stay alive, and then needs clothing to be protected from the elements of the earth.

**Engage:** Ask the students about the properties of the dry bean seeds from the previous lesson. Pose the question, “What do you think the bean seed would look like if it was soaked in water overnight?”
Teacher can compare when students remain in the bathtub too long to the outcome of the seeds being soaked.

**Explore:**
- Each student will receive a wet bean seed on a paper towel. The students will use a hand lens and a ruler to observe and record the properties of the soaked bean seed in their science notebook.
- The teacher will pose the question, “Do you think that this seed looks the same on the inside as it does on the outside?” Allow students 5-10 minutes to investigate the inside of the seed using the tools provided.
- Once all students have had an opportunity to open their seeds, have them share their discoveries with the class. This activity should lead to a discussion of the seed parts including, seed coat, embryo (baby plant), and cotyledon (food source). If all students were not able to identify these three parts, then give
them another soaked seed. Have them try again allowing students to share successful methods for dissection.

- After all students have seeds that show the parts, they should draw and label their dissected seeds in their science notebooks.

Sample Diagram

*Model*

**Explain:** The students will engage in a discussion by answering the following guiding questions:
1. What changes did you notice between the dry and wet seeds?
2. Was the wet seed the same as the dry seed?
3. Did you find all three parts of the seed?
4. What did the seed look like in the inside?
5. Is the inside of the seed what you expected it to look like?
6. How many parts were in the seed?
7. What do you think is the purpose of each part?
8. Can you compare the different parts of the seed to parts of your body?
9. What colors did you see while opening the seed?

These questions should lead to a discussion of them seeing a baby plant inside the seed. Discuss what a baby needs to grow. Answers should be food, water, and protection. Ask students where they think this baby plant is getting these things. Once they have identified the white, fleshy part as the food source then present the vocabulary words for each part (embryo, seed coat, and cotyledon).

**Elaborate:** The students will be given a soaked green string bean seed in order to compare the major parts of the seed that were found in the lima bean seed. They should recognize that the beans contain...
the same parts. Students will draw and label the parts of the green string bean seed in their science notebooks.

**Evaluate:**
Students should be able to identify the three parts of a seed using the appropriate vocabulary as well as the function of each part in their science notebooks.

For ELL - Worksheet will be provided w/ vocabulary. SW glue pieces to appropriate spot on the sheet.

**Performance Indicators: Lesson Two**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
</table>
| Speaking: Describing three parts of a seed and why these parts are important to the seed and its growth. | SW point at different parts of the seed made of Velcro | SW identify the three parts of the seeds by name. | SW give one word answers to questions about parts of the seed. Examples: "What colors did you see?" "How many different parts of the seed did you see?" "Was the wet seed different from the dry seed?" | SW finish the sentences, "The embryo is important because..." "The cotyledon is important because..." and "The seed coat is important because..." | SW discuss and compare the different parts of the seeds and why they are important to the seeds.

Review language objective with the students to confirm that they have met the objective. This can be confirmed by asking questions like, "What are the 3 parts of the seed?" & "Why are these parts so important?"
<table>
<thead>
<tr>
<th>Function</th>
<th>Situation</th>
<th>Expressions</th>
<th>Words</th>
<th>Grammar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe</td>
<td>The different parts of the seed are,</td>
<td>The embryo part of the seed is important because</td>
<td>Embryo Cotyledon Seed Coat</td>
<td>Adjectives.</td>
</tr>
<tr>
<td></td>
<td>_____, and _____</td>
<td>_____</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The cotyledon part of the seed is important</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>because</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>_____</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The seed coat is important</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>because</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>_____</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tina Tenreiro
Lesson Three: Sprouting Lima Bean Seeds
Grade Level: Third Grade

Objectives:
1.03 Investigate and describe how plants pass through stages in their life cycle including growth, survival, and reproduction
.06 Observe, describe, and record properties of germinating seeds

Content Objective: SWBAT observe and record the changes the planted seeds have made within a nine-day window.
Language Objective: SWBAT tell what a seed needs to grow.
Language Objective: SWBAT record the changes they see on a daily basis with planted seeds.

Essential Question: What does a seed need to grow?

Time: one 60-minute period, daily observational follow-ups of ten minutes each for nine days

Content Blast: Seeds germinate when they have water, sunlight, and oxygen. Usually, the root emerges first, which helps the plant absorb water. Next, the stem and leaves will come out. The leaves will turn green and begin to produce their own food through the process of photosynthesis.

Materials:
Per Student Group:
• Plastic cups
• soil (one cup)
• water
• centimeter ruler
• soaked seeds from Lesson One

Per Class:
• From Seed to Plant by Gail Gibbons

Process Skills: Observe, Communicate, Predict
Preparation: The teacher should soak the lima bean seeds in water overnight prior to teaching this lesson.

Engage: Read the book, From Seed to Plant by Gail Gibbons as an introduction to what a seed needs in order to grow. After reading the book, the teacher will show the students some lima bean seeds and some full-grown lima beans. Have a discussion about how they think the beans go from seed to plant. There will be a word wall that has all of the vocabulary words listed around it that they have worked on throughout the entire unit. The objective for the day will be up on the white board stating: “Today we will be planting our seeds! We will work together for the next week and watch our seeds grow. What do you think the seeds need in order to grow and be strong?”

Explore:
- Show students the soaked seeds. Compare them to the dry lima bean seeds that they observed in Lesson 1.
- Divide the students into pairs. Give them the soaked seeds, one plastic cup, and one small cup of soil.
- Have students place about an inch of soil in the bottom of the cup.
- Put the seeds in the soil.
- Add water, but make sure students don’t drown the seeds. Add just enough to moisten the soil.
- Put the cups in one spot in the classroom. Ask the students about the light source. Have the students observe and record their observations for five days including qualitative data (color and shape) and quantitative data (height in centimeters, number of leaves, etc).

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Day 1</th>
<th>Day 3</th>
<th>Day 5</th>
<th>Day 7</th>
<th>Day 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*PLEASE REFER TO PERFORMANCE INDICATORS:

**Explain:** Ask the students the following questions:
1. What happened to the seeds?
2. Did any seeds grow differently than others?
3. Why were they different?
4. What did you notice first about the seeds when they started to grow?
5. Does the growing seed remind you of anything?
6. Have you ever planted anything at home?
7. What does the seed need to grow?

For Advanced Students:
Students will draw the seed and the plant and write a detailed paragraph about what the seed needed in order to grow.

For beginning ELL's:
Students will draw a picture of what they see, a short sentence describing the picture.

**Elaborate:** Discuss what would happen if the sprouts were moved into a garden.

**Evaluate:** Check the students' notebooks for accuracy of what a seed needs in order to grow. Ask students to pretend that they are going to be in charge of planting their own garden. Have them write about what they would need to consider when planting. Students should include information about light, water, soil, and air in their explanations.

**Additional Resources:**
How a Seed Grows by Helene J. Jordan
### Performance Indicators: Lesson One

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking: Describing what a seed needs to grow</td>
<td>SW point to items on a chart. Example, &quot;where does the plant get its food from?&quot; The student will point to soil.</td>
<td>SW participate in a simple conversation using words from the word wall.</td>
<td>SW participate in an oral conversation about what the seeds need in order to grow and be healthy.</td>
<td>SW write a detailed paragraph about what the seed needs in order to grow.</td>
</tr>
<tr>
<td>Writing: Record the changes students see on a daily basis with planted seeds</td>
<td>SW point to different examples that are on the white board of different stages of the seeds.</td>
<td>SW use key words written in their journals from the word wall describing what they see as the seed grows.</td>
<td>SW give 1 simple sentence describing the growing seeds using words from the word wall.</td>
<td>SW write 2 sentences explaining what they see in the growing seeds using words from the word wall.</td>
</tr>
<tr>
<td>Function</td>
<td>Situation</td>
<td>Expressions</td>
<td>Words</td>
<td>Grammar</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------</td>
<td>---------------------------------------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Describe</td>
<td>The seeds needs: Water, Oxygen (air), Soil (food), Sunlight</td>
<td>This seed is growing _______.</td>
<td>Water, Oxygen, Soil, Sunlight, Reproduction, Growth, Survival, Centimeters, Inches</td>
<td>Adjectives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This seed has more sunlight than this because _______.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I've watered my seed _______.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>