

Speaking the Language of Plants: A Unit for Intermediate Third Grade English Language Learners

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Introduction and Objectives

As an elementary school teacher I have often heard the proverb, “Tell me and I forget, show me and I remember, involve me and I understand.” During the past year of teaching, I have honestly asked myself, ‘How are you doing with that?’ The showing part of the proverb has become like second nature as I consistently use pictures, model reading comprehension strategies, and allow sufficient time for guided practice. However, I knew that I could do better on the third part about involvement and move beyond the shallowness of students simply answering the questions that I ask as if the school experience were a ‘search and find the answer the teacher wants’ kind of guessing game. Out of all the units that are taught in elementary English as a Second Language (ESL) classes, I thought that the third grade unit on plants should include more interactive activities with new vocabulary words and feature more experiential learning, including opportunities to grow plants and do experiments with them.

Last year after teaching the introduction to the unit to third graders, one student asked, “Do plants really come from seeds?” At that point I realized just how minimal many students’ experiences with growing plants are. Without these experiences that provide background knowledge, students have tremendous difficulty grasping the concepts of plant growth and adaptation that are a part of the third grade science curriculum.

The other challenge for ESL students, both with and without rich background life experiences, is the level of vocabulary needed to understand the concepts presented in the third grade curriculum. In a study comparing the vocabulary development of fifth and sixth grade native English speakers (EL1) and ESL students, researchers found that,

in the upper elementary years, ESL children continue to have a poorer command of English vocabulary than EL1 children. This is especially noteworthy because these ESL children have been attending school in an English-speaking environment since the beginning of the primary grades.¹

The length of time in US schools is similarly represented among my third graders. Of the 8 third graders that I am teaching this year, only one has been in the United States less than 2 years. The other seven students have been in American schools since kindergarten. When speaking conversationally, they appear to be as fluent as the EL1 students. However, gaps appear in their vocabulary when checking for comprehension of words that an EL1 speaker would comprehend immediately. For example, in a

conversation last year with the third grade students about plants, they knew the words ‘grow’ and ‘leaves’, but not the words ‘bloom’ or ‘roots’.

Without essential vocabulary, the students’ reading is affected both in decoding words and comprehension. “In fact, the reader will only gain benefit (in terms of understanding text) from applying letter-sound correspondences to the printed material if the resulting, decoded word is in the learner’s oral vocabulary.”²

The ESL model in the elementary school where I teach is a pull-out program. Students often miss science concepts because they are pulled out of the regular classroom at that time to attend ESL classes. By teaching to the objectives that are being taught in the regular classroom, the students learn concepts and vocabulary that contribute to comprehension and success in the regular classroom.

Finally, in this unit I hope to validate the students’ experiences with foods that have come from their culture of heritage. The focus here shifts from what the students do not have to what they have - a background full of varying experiences with plants and foods. My students are often very hesitant to share what is different about their heritage, because they don’t want to be looked upon as different or weird. However, when I bring up the differences in culture, then they will usually offer more personal information to share with the class. For example, during this unit last year I asked the students if they ate cactus, because that is one of the salads offered at a popular Mexican restaurant in the area. The ones who vigorously denied doing such a nasty thing intimidated the ones into silence who in fact do eat cactus until I told the students that I personally liked the cactus salad at this particular restaurant. Quite a few examples of varying ‘nasty’ foods, including popular American foods, had to be given to show that each culture has foods that are different, but not distasteful to the ones who have grown up with them.

Rationale

Two broad theories of vocabulary instruction contrast direct instruction and conscious learning with unconscious, incidental acquisition through wide reading. Stephen Krashen’s theories, called the *Input Hypothesis* or the *i+1 hypothesis*, support incidental acquisition of language. In this theory, ‘i’ represents the present level of language and the ‘+1’ represents language “that is just a step beyond that level.”³ Gardner quotes Krashen,

The results of incidental studies suggest that comprehensible input alone can do the entire job for vocabulary and nearly the entire job for spelling.⁴

Indeed, studies have shown that increased reading does promote vocabulary acquisition. Horst conducted a six-week study with adult immigrant ESL students where the students engaged in reading self-chosen, simplified readers. Spada and Lightbown

report that “there was vocabulary growth attributable to reading, even over this short period.”⁵

Gardner cites several studies supporting the conclusion that “the threshold of vocabulary knowledge for adequate reading comprehension is around 95 percent of the words in a given text.”⁶ She also points out that students must develop high-frequency words before developing the vocabulary in specialized content areas. These conclusions have supported the practice of using graded readers and simplified texts. In commenting on Horst’s study, Spada and Lightbown point out, “The benefit of simplified readers is that students are likely to encounter a reasonable number of new words. This increases the likelihood that they can figure out the meaning of new words (or perhaps be motivated to look them up).”⁷

However, the limitation of learning vocabulary incidentally through wide reading is that there are simply too many words to encounter multiple times in order to learn them. Gardner quotes Nation who suggests that,

vocabulary learning from extensive reading is very fragile. If the small amount of learning of a word is not soon reinforced by another meeting, then that learning will be lost. It is thus critically important in an extensive reading program that learners have the opportunity to keep meeting words they have met before.⁸

Gardner conducted a research study of theme-related, fifth grade-equivalent narrative and expository texts in order to find out how often words were repeated. All the words in the texts were categorized as being general, academic, or unique. Of the words in the General High Frequency List, 20.2 % were not repeated between the narrative and expository texts. The conclusion is that with this many words not shared between genres, “it seems difficult to justify the claim that they will eventually do so at the times when the children need them the most (i.e. during grade level reading).”⁹

For children who are learning to read, choosing target vocabulary to explain as it occurs during storybook reading produces greater vocabulary acquisition than readings without explanation of word meanings.¹⁰ Students who do not develop an adequate vocabulary base in the younger grades experience reading difficulty in the later years. In Pullen’s study, the Peabody Picture Vocabulary Test was used to determine students’ vocabulary acquisition. Several studies are cited that “link scores on all editions of the PPVT to later reading achievement.”¹¹

Considering that vocabulary may be learned both unconsciously through wide reading and consciously through direct instruction, both strategies should be incorporated throughout an instructional day. However, direct instruction is used in this unit because intermediate third grade ESL students are often not able to decode or understand the content science words as they encounter them initially in reading. Then they skip over

them unless their attention is brought to the words with assistance to decode and understand the meaning of the words. Additionally, many words are not explained in the regular classroom when most EL1 students already know them. Therefore, direct instruction takes a prominent role in this unit to assist ESL students in vocabulary acquisition.

Strategies for Teaching Vocabulary

Biemiller and Boote quote the National Reading Panel's report (2000), "Unfortunately, unlike work on decoding and spelling, there is no established method of teaching vocabulary in the primary grades."¹² As a result, several choices arise when beginning to teach vocabulary. The first is choosing which words to teach. The authors of the book, *Bringing Words to Life*, suggest thinking of words in categories of three tiers with the first tier being "the most basic words – *clock, baby, happy, walk*, and so on." Examples of second tier words are "*coincidence, absurd, industrious, and fortunate*" which are not as basic but occur frequently. Third tier words are limited to specific domains, such as "*isotope, lathe, peninsula, and refinery*."¹³ Teachers may differ on what could be considered a tier one or two word, but generally speaking, tier one words are much more common than tier two words. I try to choose tier two words that my students may not know. For example, one of my textbooks suggests the words *forgot* and *special* as key vocabulary words, but I would consider those tier one words because my students hear and use those words regularly. Therefore, I would choose different words than the ones suggested by the textbook so that the vocabulary activities focus on less common words, or tier two words, that are essential to the meaning of the story.

Tier Two words are recommended as words for vocabulary study because students may not encounter them conversationally, but need to know the meanings to understand the text they are reading. A helpful way to choose appropriate vocabulary is to determine if students can explain the meaning of the new words with words they already know.¹⁴ For example, I would not choose to focus on the word, *germinate*, if the students don't already know the word *sprout*.

The second decision regarding vocabulary instruction is how many words are appropriate for teaching. One research study compared two groups of students whose teacher explained meanings of words while the class listened to storybooks being read aloud.¹⁵ Approximately half of the students were ESL students. Teachers in Study 1 explained meanings of 12 words a week while reading storybooks aloud and there was a gain of 22% in post-test scores. In Study 2 teachers added to the number of words being explained during the read-aloud time (averaging 21-27.5 words per week) as well as a two reviews and the average gain was 41%.¹⁶ This yielded a greater number of meanings having been learned because a greater number were explained. So not only does this study support the idea of increasing the number of word explanations, but also supports the idea of daily vocabulary review. The number of words that are chosen also depends

on how much interaction the teacher is planning to elicit from the students. Beck et al. chose to use three word explanations per storybook when a lot of student interaction was planned.¹⁷

The final decision is when and how to introduce new words. Two very common strategies for teaching vocabulary are to look the words up in a dictionary or glossary and then write the word in a sentence. Regarding dictionary use, one research study showed that dictionary use among undergraduate students produced higher post-test scores.¹⁸ What about using example sentences? A study of Chinese university students showed that learner-produced written example sentences using the vocabulary words as opposed to teacher-produced example sentences produced higher rates of retention over time. The researchers posit that this was “a result of effective elaboration and the deepened information processing” and furthermore was “more effective since they are uniquely processed in accordance with their own knowledge structure (schema).”¹⁹

After I read these two research articles, I wondered if the research of older English learners could apply to my third grade ESL students. So I had them work in pairs and look up the key words of a story in the glossary at the back of the book. They attempted to form sentences verbally using the new words. The lesson was not very interactive, and at the end of the class when asked to match the words to meanings provided in the text, they could remember less than 50% of the meanings even though simple definitions and pictures were used in the glossary. This was not a lesson I would ever want to repeat! Therefore, I agree with Beck et al that “asking students to look up words in the dictionary and use them in a sentence is a stereotypical example of what students find uninteresting in school.”²⁰

Therefore, the strategies presented below attempt to not only introduce the students to the meanings of new words but, more importantly, to verbally engage the students in thinking about the words in different contexts. Pauline Gibbons says,

It is through talk that much learning occurs. Talk allows children to think aloud, to formulate ideas, to set up and evaluate hypotheses and to reach tentative decisions in a context that is not restricted by the more formal demands of written language.²¹

In the book, *Bringing Words to Life*, the authors suggest creating student-friendly explanations for the selected words and then explain the words as they fit in the context of the story. After asking primary students to give another context where the word may be used, they usually give another example of the word, but in the same context.²² For example, if the context of the word *scent* in the story is the scent of food, then students will usually give examples of other foods that have a scent, but they often need prompting to give examples in another context, such as the scent of perfume or flowers. If the students cannot think of different contexts where the word can be used, then the

teacher can give a choice of two examples from different contexts, “Which has a stronger scent, a skunk or perfume? Which had a stronger scent in the story, the vegetables in the garden or the vegetables cooking in the soup?” To keep the focus while students are sharing their ideas, teachers can tell the students that they will be repeating the word they are discussing and every time you ask, “What’s the word we’re learning?” everyone must say the word.²³

Another strategy is to give examples and non-examples of a word.²⁴ If the word is *harvest*, then the teacher could say, “Flowers, corn, soup, wheat, cereal”. When the examples fit the meaning of the word, then the students either say the word or a phrase with the vocabulary word in it, such as, “Harvest the crop!” The students can either say nothing when the word doesn’t fit the meaning, or you can have them say, “Not!” With ESL students, I would probably have them wait until I counted down three seconds before they could give their response so the ones who need some processing time won’t get cut off before they have time think. If a word is particularly important to the concept of the story, the teacher or the students can write the examples and non-examples on a T-chart. This takes considerably more time and effort, particularly if the students have to come up with the examples, and has been more successful at the end of third grade than it has been at the beginning.

Students need multiple exposures to a new word before the meaning can be retained. To encourage students to look for use of the target words in reading, a picture of the cover of the story or book can be put on a bulletin board with the target words beside it. Then tally marks can be placed beside the word every time it is encountered in subsequent reading. If the word has been on the bulletin board for quite some time and has not gotten any tally marks, then the teacher can ask the students to relate previous words to the story being read. For example, if the contextual meaning of the word *shoots* has not been used again in other books about plants, the students can be asked to find a word that means about the same thing in another story with the word *sprouts*. Another strategy is to put slips of paper in a jar with a vocabulary word written on each one. As the year continues, more words are added to the jar. In a spare minute of time, a student can come up and draw from the jar and use the word in a sentence.²⁵

Using Technology

The use of technology can increase students’ interest in a lesson, but sparking interest alone is not enough to promote greater understanding or retention of the subject matter. In the conclusion of their research, Zheng et al commented,

One of the possible explanations for learners’ low performance in multimedia learning would be that simply using the multimedia without a sound instructional design approach could cause distraction in learning.²⁶

One of the resources that I will use during these lessons is a video clip that is available through our district's subscription to Discovery Education. The use of this resource is not an end in itself. Ideally, it will enhance thinking and interaction as it is incorporated into the overall lesson design. As Zheng et al note, "the instructional role of multimedia became more prominent when an adequate instructional method was included. It became less robust it was used only as a visual tool."²⁷ Students need to have a purpose in viewing multimedia presentations. One way to ensure that students are listening is to alert them to a key phrase or specific information in the presentation and give a thumbs-up when they hear it. If they miss it, then go back and review that portion of the presentation. Questions can be given prior to viewing small portions of the presentation. The idea of the interactive ESL classroom continues throughout planning the use of multimedia.

Responding to Literature

In third grade, the students are expected to find increasingly more information in the texts they read. However, they often don't want to take the time to look at the text to find their answer or check for accuracy. Activities that prompt the students to reference the text promote growth in this skill. For both fiction and non-fiction texts, graphic organizers are helpful for children to organize information. For fiction stories, a simple web can be used to describe character traits or show the main idea and details. Venn diagrams can be used to compare and contrast characters or places in the story. Sequence chains may be completed with students who need practice in recalling the order of events. Students may also write a summary in boxes labeled *beginning*, *middle*, and *end*. There are a great number of graphic organizers at the web site located in the notes.²⁸

Students may interact with fictional texts in many ways. If a fictional story is told in the first person, the students could tell the story from another character's point of view. Students could also work in pairs and plan an imaginary conversation between two characters in the story. Or, they could plan to spend an imaginary day with the main character of the story and tell why they chose the activities they did to fit the interests of the character and their own interests.²⁹

For a non-fiction story the students can list three facts and tell how someone could prove the fact to be true.³⁰ Another area of referencing the text is reading the visual aids that support non-fiction texts. The students could pick three visual aids and write a sentence about what they learned from that feature.³¹

Integrating Science and Writing

Writing in a second language can be a very difficult task. Expecting a lot of content analysis and revisions is beyond the ability of beginning writers. The choice of a writing strategy for elementary ESL students comes from the need for accessibility. One of the

ways that science and writing can be integrated and yet be accessible is through the use of a science journal. One type of journal is called the “Reflection Journal”.³² The students may be asked to make a connection to their own experiences, describe something they observed, compare two different outcomes as a result of applying different variables to growing plants, or explain why they think something happened.³³ Many teachers do not write in this type of student journal but use sticky notes for their comments so that the journal remains personal and child-centered.

Two columns are used for a dialogue journal or a double-entry journal. In the dialogue journal the students write in one column and the teacher or another student responds in the other column. The two columns of a double-entry journal could be “What I Read” and “It reminds me of”, problem and solution, or cause and effect.³⁴

A strategy used during science journal writing of students in Klein’s research project was brainstorming. After using this strategy students were able to generate more verbal statements after writing than before writing showing that the process of writing promotes continued reflection and further communication. The research also showed that some students generated more statements after searching the text during writing.³⁵ Although this may be obvious for the older student, younger students often need encouragement to reference the text for writing ideas.

Vocabulary Activities

Assessing Prior Knowledge

This activity allows the opportunity for self-assessment and also shows the teacher the prior knowledge that students have attained. Students fold a paper in thirds and write the titles of the columns as I Know/Forgot/Don’t Know. The teacher explains that to know a word means that they must be able to describe it or explain it in a sentence. Then each vocabulary word is written on the board and pronounced. The students must write each word under the column that best describes what they know about the word.³⁶

Semantic Activities: Interacting with the Meanings of Words

One way that students may interact with word meanings is to make word Associations.³⁷ For example, if the third grade ESL vocabulary words were *public*, *urban*, *rural*, and *nature*, the teacher could ask, “Which word goes with New York City? Which word or words goes with plants? How do those words go together?” I have found that supplying pictures with the words is essential for success during the first time the students participate in this activity. As their understanding of the vocabulary words deepens, the pictures can be removed. To extend the activity to include writing, give students slips of paper with one vocabulary word written on each one. They take two of

the slips of paper, glue them in their vocabulary journal, and write how the two words go together.

A similar activity is to make a chart of examples and non-examples. Examples of the word *bloom* could be a rose, tulip, and dandelion while the non-examples could be grass, maple trees, and celery. This activity is very difficult for students with limited English unless picture prompts are provided.

The activity called “Have You Ever...” is useful for discussing verbs.³⁸ For example, this activity would be appropriate to use with the verb form of the word, *store*, since third graders learn that roots *store* food. After giving a child-friendly definition, the discussion questions could be, “Have you ever stored something in your closet? Have you ever stored something in your dresser? Has your mom ever stored something in a box?”

Next is “Applause, Applause!” which is conducive to interacting with adjectives. The students’ level of applause indicates whether they would like to be described by the vocabulary word. Then they tell why they would or would not like to be described with that adjective.

In the “Idea Completions” activity the students are given beginnings of sentences that contain the vocabulary word. Then they must supply the ending, or the context, of the sentence.³⁹ For this unit on plants, the stems might be, “The girl picked the bloom because...” or “When I got soil on my shoes I...”

The collaborative crossword puzzle is described as a barrier activity whereby two students either sit with their backs to each other or sit with a folder between them so that they cannot see the other student’s information. This ensures that the students will have to talk and listen to share the information.

Both children have the same basic crossword. The clues have not been given, but all the ‘down’ words have been filled in on one crossword and the ‘across’ words on the other. Working collaboratively, the children must both complete their own crossword from clues made up by their partner. They must not say or spell the words.⁴⁰

Vocabulary Games

The Word Whacker game may be used as a review of a few words or of a cumulative list. First, write vocabulary words all over the white board. Then have two students stand in front of the room with a flyswatter or a rolled up piece of paper. The teacher says or reads a definition of one of the words. If time allows prior to the game, each student may write a definition of one of the words on an index card. Allow several seconds for the students to think, say “Go!” and the students whack the corresponding word.⁴¹

For Vocabulary Tic-Tac-Toe separate the class into two teams. Draw a tic-tac-toe grid on the board and then write one vocabulary word in each of the nine spaces. If a team is able to adequately describe what the word means, their team gets an X or O in that space.

Vocabulary Jeopardy may either be set up in a pocket chart or online at the site www.eslgameworld.com. The game generally lasts too long to keep the attention of third grade students. I prefer to keep the game in a pocket chart so we can play part of a game for a few minutes at the end of a lesson.

Board games may be made into vocabulary games. Make cards with either a vocabulary word or a definition on them. Students must adequately describe what the word means or say the word that matches a definition before they are able to move ahead on the board game. An easy derivation of a board game that could include the whole class is "Race to Win". Draw two rows of five connected squares on the white board. Separate the class into two teams. Put a magnet on the end of each row of squares, one for each team. If members of the team can each consecutively tell the meaning of a word, move that team's magnet to the next square. The team who reaches the end of the row of squares first wins the game.

For Mystery Word write all the vocabulary words on pieces of masking tape and stick one on the back of each student. To make the game accessible for third graders, also write the words on the board. For the most difficult words I also draw a small picture clue. The students must ask questions of their classmates to figure out which vocabulary word is on their back. Intermediate ESL third graders will need to practice forming questions with the definitions before playing the game. They put words on my back first to see how I figure out which word it is. To make it easier, I always start the question with, "Does this word mean?" To inhibit guessing without thinking, they must ask three questions about the meanings of words before they ask if it is a specific word.

Roll the Dice is either a partner game or a team game where six or twelve vocabulary words are numbered on the board and six tasks to do with the word are also written on the board or a reusable chart. First, one die is rolled to identify which task the student must perform with the word. The numbers correspond to six tasks listed on the board. An example of the tasks could be

1. Use the word in a sentence.
2. Give a synonym.
3. Act out the word.
4. Spell the word without looking.
5. Tell whether it's a noun, verb, adjective, or adverb.

6. Guess my word. The student does not show or tell the other students which word is being described. The student must continue describing until another student can guess it.

Then the die is rolled again (for six words or two dice if there are twelve words) to identify which numbered word they must use.

Integrating Plants and Culture

Each culture is unique in the types of food that are commonly grown and eaten. While ESL students quickly become Americanized in their eating habits, they often have limited exposure to the vocabulary of foods. For example, most of my students are familiar with the names of common fruit in American stores as well as the words, *salad*, *carrots*, or *tomatoes*. However, they generally don't know what the words are for *lettuce*, *cucumber*, *celery*, or *squash* even though these vegetables are sold in the school cafeteria.

In addition to learning the vocabulary of the culture in which they are now living, they may also be able to tell the names of different types of vegetables that are eaten in their own homes. However, the teacher needs to have some prior knowledge of the culture of the students in the classroom, because they often don't know the names of the vegetables they are eating at home, or are shy about saying the name of the vegetable in their own language. A visit to the Latino or Asian market is highly recommended for the teacher to learn the names of the vegetables. The simple act of bringing in foods from other cultures validates the students' heritage and prior knowledge. Suddenly the students are the ones who are the experts and not the ones who are lacking in knowledge. Children become very engaged when they see something new in the classroom.

If it is not possible to bring in food from other cultures, students could use pictures printed from the Internet to make charts of different fruit and vegetables from different cultures. Another way for students to share their knowledge is to create a diorama. They can plan what will go in their representation of a garden, attach the name of each plant on a straw, find or draw pictures of their vegetables, and then display their work in a box.⁴²

Parents may be asked to send in recipes that are representative of their heritage for a multi-cultural cookbook. The students can illustrate it and share it with their regular classroom teachers and classmates.

Lessons and Activities

Pre-Assessment and Activity One (1-2 days) – What Part Do You Eat?

1. Assess prior knowledge of vocabulary with the Know/Forgot/Don't Know chart described above.

2. Assess prior knowledge of the names of plant parts (flower, stem, leaves, roots, seeds) by having the students copy a simple picture from the board and label it. The assessment will determine how much time is spent on reviewing these terms. Most of my intermediate students know four out of five of the terms.
3. The students will read and discuss the book, *Plants on My Plate*.⁴³
4. Show pictures of different types of vegetables from America. This may easily be accomplished by designing a PowerPoint presentation. Students enjoyed trying to figure out the names of the vegetables by letter clues that were displayed with the photograph. The students tell what part of the plant the vegetable is and whether the vegetable could be purchased in the school cafeteria.

American	Mexican	Asian	Brazilian
potato, turnip	jicama – a Mexican potato, texture of water chestnuts, can grow to 50 pounds	water chestnuts	cassava yams sweet manioc manioc flour
		edamame (edible soybean)	Brazilian pine nuts; pinhao
squash	chayote – a white to pale green gourd	sesame – one of the most grown crops	rice and beans
cucumber	Mexican Gherkin	baby corn	
sweet peppers	red and green chile peppers	mushrooms: Enoki, white and brown buna shimeji	
		water bamboo shoots	
		bean sprouts	
peas (in the pod)		snow peas	
cabbage, lettuce	nopales – leaves from the nopal cactus	Bak choy (or any kind of Asian cabbage)	
green beans		beans (8+ kinds in Asia); bean sprouts	

Activity 2 (4 days) – Food and Cultural Heritage

Based on the discussion of vegetables and plant parts in Activity 1, the students will create a web graphic organizer of vegetables grown in America. In the middle of a piece of chart paper, draw a circle. The circle will contain the title of the web and a simple map of the United States. Each student will draw a vegetable and write several sentences about it on a paper plate. These plates will be glued to the graphic organizer and connected to the middle circle with a piece of yarn. For homework, the students will ask a relative to write the names of four vegetables or fruit that come from their country of

heritage. They are encouraged to ask for the names to be written in their native language and in English, if possible.

Each student will individually complete a similar web on a piece of chart paper. The middle circle will contain the title of their web and a small map of their country. Each paper plate will depict a fruit or vegetable drawn by the student with a minimum of three written sentences. One of the sentences must tell what part of the plant is represented. Language objectives for this lesson will be based on previous writing on the American vegetables web. For example, practice with correct subject and verb agreement is usually needed since sentences such as “These is carrots” are commonly produced.

Activity 3 (3 days) – Environmental Factors and Plant Growth

On the first day, students will identify how different factors in the environment affect plant growth as depicted in the book, *The Tiny Seed*.⁴⁴ Write the word *environment* on the board and discuss what the word means.

During this lesson, only the first half of the book will be read aloud. It shows how seeds only grow with the right amount of heat, light, water, or soil. After each page of text is read aloud, students will fill in the corresponding part of the chart found in the appendix.

In the next lesson, students will participate in the activity on the Discovery Education website called “Getting to Know Plants”.⁴⁵ The key vocabulary word is *minerals*. The student must click on a picture of a plant and then click and drag pictures of the elements that the plant needs - sun, water, minerals, air, or a bumblebee. The students will record the information from the activity on a paper folded the long way down the middle. They will draw a flower, stem, leaf, roots, and seeds in one column going down the paper. Then they will cut a line under each picture so that one picture may be folded back at a time. On the inside of the folded paper they will write which elements that part needs for the plant to grow.

For the final lesson the students will conduct an experiment with a sunflower seed. The students will think of different ways that they could conduct experiments by altering one environmental factor of temperature, light, water, or soil. Record the ideas on the white board or chart paper. Students will plant sunflower seeds in transparent plastic cups. Write the date it was planted on the outside of the cup. Students decide how they will experiment with their sunflower plant and write about it in their science journal. During each subsequent lesson, students will complete a chart in their science journal that contains drawings and measurements of the plants as they grow.

Activity 4 (2-3 days) – Planting

The key words for this activity are charcoal, pebbles, moss, moist, closed environment, dew, and germinate. Students will make a terrarium out of a 2-liter soda bottle. Cut the top half of the bottle off so that it can become a lid for the terrarium. The students first put in pebbles for drainage of water, ½ inch of activated charcoal to filter the water to prevent rotting, sphagnum or Spanish moss to keep the soil from settling down into the pebbles, and soil on top. Using only soil would be adequate, but using the other materials allows the students to encounter more vocabulary and concepts. Plant 6-8 seeds or a couple seedlings of slow-growing plants. After the seeds have germinated, pull all but the two strongest plants. Discuss how the terrarium is an example of the water cycle. The students will write directions about how they made a terrarium.

I was able to buy a small aquarium from a thrift store at a reasonable price. We will fill the aquarium half full with the same materials as the terrariums. The students will plant carrot and radish seeds by the sides of the aquarium so they can see the roots forming. The students will write the name of the seed on craft sticks to stick in the ground to show where we planted each type of seed.

The website Learn NC includes a lesson plan called “Seed Race” where students separate the different types of beans in a 14-bean soup seed mix.⁴⁶ They each pick four beans of four different types and stick them to four pieces of double-sided tape. Tape them to the side of a quart-size plastic bag with a soaking wet paper towel inside. Label the seeds as Sample 1, Sample 2, Sample 3, and Sample 4. Tape the plastic bags to a window or under a light source such as a lamp. The students predict which seed will germinate first and explain the basis of their prediction. They will keep a germination chart to check off the day when each seed germinates.

Another suggestion from Learn NC is to plant half of a potato. The students can contrast how the inside of a potato looks different from the inside of a seed. Potatoes take 70-90 days to produce more potatoes.

Activity 5 (3-5 days)

The book, *Ugly Vegetables*, by Grace Lin is great book to lead into discussions about perceptions of cultural differences, both of one’s own cultural heritage as well as others’ perceptions and responses.⁴⁷ The story is about a girl who is very excited when the family garden sprouts plants, but then is disappointed when she thinks that the neighbors’ flower gardens are much prettier than their Chinese vegetables. Her attitude changes when several neighbors follow the scent of her mothers’ Chinese vegetable soup and want to trade their flowers for a bowl of soup.

Before seeing the book, the students will be told about how the girl is embarrassed by the Chinese vegetables that her mother is growing. Then I will tell them about how I was embarrassed in elementary school when I felt different from all the other students. Some

students may feel comfortable sharing an experience of their own at this point. Then we will discuss appropriate responses when they hear others speaking a different language. Students often ask others who speak a different language to say something in that language. However, most students don't want to speak in their home language at school for fear of being laughed at or others mimicking the way they sound. They need to reflect on how this response can be hurtful. The students will be prompted to share and then practice appropriate ways to respond showing interest without laughing. Then they will practice appropriate responses when hearing an audio file of Grace Lin's mother saying the names of the vegetables in Chinese. This can be found online at Grace Lin's website.⁴⁸

This website also has pictures of Chinese vegetables that are in the story. This is an appropriate time to introduce the idea, "It's not weird, it's just different." For this activity, they imagine what they could say if they saw someone eating a hairy-looking vegetable. Instead of saying, "Yuck!" they could ask, "How does it taste?" or perhaps try tasting it themselves. I will bring in kiwi fruit for them to practice using appropriate responses.

To close this first lesson, the students will write in their journals about a time they felt different from everyone else, a time they learned about something different from another culture, or a time they tried a new food.

During the next lesson, the students will be introduced to the new vocabulary of the story. First, they will learn to read the adjectives that describe the vegetables, *icky*, *lumpy*, *fuzzy*, *wrinkled*, *prickly*, *curled*, and *plain*. Discuss how the author uses the adjectives to show how the girl feels about the vegetables. The names of the flowers that the neighbors grow are *petunias*, *peonies*, and *poppies*. The students will practice how to use syllables to decode these words, but will not focus on any other details about these words since they only need to understand that they are flowers. The focus on meaning will be with the words *magical*, *aroma*, *scent*, *breaths*, *interested*, and *recipe*. Students will practice reading the sentences where these words are found in the book and using the context to figure out the meaning. The students may play the "Roll the Dice" vocabulary game to practice these words.

Then they will look at the pictures and identify the characters' feelings and how they change as the story continues. Then they will listen to the story being read aloud, pausing to promote visualization, predicting, and describing what is happening in the story.

For the third lesson, the students will read the story, or parts of the story, with a partner. Then they will complete a Venn diagram comparing and contrasting the vegetable garden with the flower garden.

If time permits for additional activities, Grace Lin's website has a link to the story in play form and also has suggestions for planting a Chinese vegetable garden.

Culminating Activity (2 days)

As I go around the school picking up ESL students to come to class, other students often ask if they can come, too. So for the culminating activity, each student will be encouraged to invite one or two friends to ESL class. The ESL students will prepare for their guests by making a list in their journals of things they could show or tell about their plants or about what they learned. Then they will write a note to the teachers of their friends notifying them of the time of our activity and requesting their friends' presence. Fruit and vegetables could be served as an appropriate snack.

Notes

¹ Maureen Jean and Esther Geva. "The development of vocabulary in English as a second language children and its role in predicting word recognition ability." *Applied Psycholinguistics* 30 (2009): 175

² Pullen, Paige, Elizabeth D. Tuckwiller, and Timothy R. Konold. "A tiered intervention model for early vocabulary instruction: the effects of tiered instruction for young students at risk for reading disability." *Learning Disabilities Research & Practice* 25.3 (2010): 110

³ Lightbown, Patsy M., and Nina Spada. *How Languages Are Learned*. Third Edition ed. Oxford: Oxford University Press, 2006: 37.

⁴ Gardner, Dee. "Vocabulary input through extensive reading: A comparison of words found in children's narrative and expository reading materials." *Applied Linguistics* 25.1 (2004): 3.

⁵ Lightbown and Spada, *How Languages Are Learned*: 146.

⁶ Gardner, "Vocabulary input": 4

⁷ Lightbown and Spada, *How Languages Are Learned*: 146.

⁸ Gardner, "Vocabulary input": 6.

⁹ Ibid: 25.

¹⁰ Biemiller, Andrew, and Catherine Boote. "An effective method for building meaning vocabulary in primary grades." *Journal of Educational Psychology* 98.1 (2006): 46

Pullen, "A tiered intervention": 112.

¹¹ Pullen, "A tiered intervention": 115.

¹² Biemiller and Boote, "An effective method.": 44.

¹³ Beck, Isabel L., Margaret G. McKeown, and Linda Kucan. *Bringing Words to Life*. New York: Guilford Press, 2002: 8.

¹⁴ Ibid: 16.

¹⁵ Biemiller and Boote, "An effective method": 56.

¹⁶ Ibid: 54.

¹⁷ Beck, *Bringing Words to Life*: 50.

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- ¹⁸ Kojic-Sabo, Izabella, and Patsy M. Lightbown. "Students' approaches to vocabulary learning and their relationship to success." *Modern Language Journal* 83. 2 (1999): 176-192.
- ¹⁹ Baicheng, Zhang. "Do example sentences work in direct vocabulary learning?" *Issues in Educational Research* 19.2 (2009): 1-15.
- ²⁰ Beck, *Bringing Words to Life*: 13.
- ²¹ Gibbons, Pauline. *Learning to Learn in a Second Language*. Portsmouth: Heinemann, 1991: 27.
- ²² Beck, *Bringing Words to Life*: 52.
- ²³ Ibid: 54.
- ²⁴ Ibid: 56-57.
- ²⁵ Ibid: 69.
- ²⁶ Zheng, R. Z., W. Yang, D. Garcia, and E. P. McCadden. "Effects of multimedia and schema induced analogical reasoning on science learning." *Journal of Computer Assisted Learning* 24 (2008): 480
- ²⁷ Ibid
- ²⁸ <http://www.eduplace.com/graphicorganizer/index.jsp>
- ²⁹ Kellaher, Karen. *Independent Reading Response Booklets*. New York: Scholastic, 2004: 11
- ³⁰ Ibid: 50.
- ³¹ Ibid: 39.
- ³² Schifini, Alfredo et al. *Avenues. Level D, Vol. 1 Teacher's Edition*. Carmel: Hampton-Brown, 2004: S11
- ³³ Klein, Perry D. "Elementary students' strategies for writing-to-learn in science." *Cognition and Instruction* 18.3 (2000): 321
- ³⁴ Schifini, et al. *Avenues*: S11
- ³⁵ Klein, "Elementary students' strategies": 341-342
- ³⁶ *Tennessee Academic Vocabulary: A Guide for Tennessee Educators*. http://jcschools.net/tutorials/vocab/academic_vocab-aug09.pdf, (2009): 6
- ³⁷ Beck, *Bringing Words to Life*: 44.
- ³⁸ Ibid
- ³⁹ Beck, *Bringing Words to Life*: 45.
- ⁴⁰ Gibbons, Pauline. *Learning to Learn in a Second Language*: 40
- ⁴¹ *Tennessee Academic Vocabulary*: 7
- ⁴² Schifini, et al. *Avenues*: T98B.
- ⁴³ Smith, Cathy. *Plants on My Plate*. Singapore: National Geographic Society, 2005.
- ⁴⁴ Carle, Eric. *The Tiny Seed*. New York: Aladdin Paperbacks, 2001.
- ⁴⁵ <http://discoveryeducation.com/>
- ⁴⁶ <http://www.learnnc.org/lp/pages/4108>
- ⁴⁷ Lin, Grace. *Ugly Vegetables*.
- ⁴⁸ http://www.gracelin.com/content.php?page=book_uglyveg&display=activities

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students at risk for reading disability." *Learning Disabilities Research & Practice* 25.3 (2010): 110-123.

Schifini, Alfredo, Deborah Short, Josefina V. Tinajero, Erminda Garcia, Eugene E. Garcia, Else Hamayan, and Lada Kratky. *Avenues. Level D, Vol. 1 Teacher's Edition*. Carmel: Hampton-Brown, 2004.

Zheng, R. Z., W. Yang, D. Garcia, and E. P. McCadden. "Effects of multimedia and schema induced analogical reasoning on science learning." *Journal of Computer Assisted Learning* 24 (2008): 474-482.

Resources for Students

Blackaby, Susan. *Plant Packages*. Minneapolis: Picture Window Books, 2003.

The book shows where seeds develop and then how they travel. The process of growing a pumpkin is depicted.

Buckley, Marvin. *Corn*. Singapore: National Geographic Society, 2001.

A flow-chart would be an appropriate reading comprehension activity to complete after reading about how corn is planted, harvested, and made into different products. (221 words)

Carle, Eric. *The Tiny Seed*. New York: Aladdin Paperbacks, 2001.

The life cycles of seeds are depicted after they have fallen into different habitats. Students could make predictions about what next in the life cycle based on the change in environment.

Garcia, Mary. *Plants*. Washington D.C.: National Geographic Society, 2006

This book for emergent readers is organized according to the parts of a plant with photographs showing how the parts look differently on various plants.

Gibbons, Gail . *Farming*. Carmel: Hampton Brown, 1988.

Inside and outside chores are shown for each season of the year on a farm. The last three pages illustrate different types of farms. (582 words, lexile 350)

Graham, Pamela. *Peanuts*. Singapore: National Geographic, 2001.

The process of planting, harvesting, and transporting peanuts is clearly shown in photographs. (149 words)

Ignacio, Fred. *Crops*. Carmel: Hampton Brown, 2000.

The process of planting, harvesting, and making products from six different crops is featured in this book. Students may compare and contrast the different crops to promote reading comprehension. (516 words)

McMillan, Bruce. *Growing Colors*. New York: Harper Collins Publishers, 1988.

The only text in this book is a color word for each photograph, but the photographs are great for showing how vegetables and fruit come from different parts of the plant.

Pether, Leslie. *Cactuses*. Singapore: National Geographic Society, 2001

This is a helpful book for comparing and contrasting different types of cactuses. (237 words)

Quintana, Juan. *Farmer's Market*. Carmel: Hampton Brown.

This book has one sentence on a page and is appropriate for beginning readers of English. (38 words)

Smith, Cathy. *Plants on My Plate*. Singapore: National Geographic Society, 2005.

This early reading book has one or two sentences on a page. Each pair of pages has vivid photographs showing which part of the plant is being eaten. (101 words)

Stewart, David. *How a Seed Grows Into a Sunflower*. New York: Children's Press, 2008.

The life cycle of a sunflower plant is depicted in clear illustrations.

Taylor, Miles. *Food Comes From Farms*. Singapore: National Geographic Society, 2005.

This early reader is appropriate for novice and beginning English readers. The book shows how four products in a boy's lunch came from different types of farms. (75 words)

Resources for Teachers

Beck, Isabel L., Margaret G. McKeown, and Linda Kucan. *Bringing Words to Life*. New York: Guilford Press, 2002.

Guidelines about how to pick and present new vocabulary words are discussed. Strategies are presented to increase student involvement and thinking about words both inside and outside of the classroom

Beck, Isabel L., Margaret G. McKeown, and Linda Kucan. *Creating Robust Vocabulary*. New York: Guilford Press, 2008.

Detailed explanations are given about how to choose words for instruction and interact in conversation and activities to promote deeper thinking about word meanings. The “Menu of Instructional Activities” in Appendix A of this book is a helpful summary of ideas for planning.

Block, Cathy C., John N. Mangieri. *The Vocabulary-Enriched Classroom*. New York: Scholastic Inc., 2006.

The process of vocabulary development is explained with research-based strategies to improve instruction for specific groups such as struggling readers, English language learners (chapter 7), and gifted students.

<http://www.stormthecastle.com/terrarium/soda-bottle-terrarium.htm>

This website gives directions for making a soda bottle terrarium as well as many other types of terrariums.

<http://www.learnnc.org/lp/pages/4108>

LEARN NC is a program of the University of North Carolina Chapel Hill Education Department. The website above connects to a group of 10 excellent lesson plans called “Plants and Trees”. Accommodations for LEP students are included for each lesson plan and a multiple-choice assessment is included at the end with suggestions for assessment accommodations.

Appendix

Name: _____

The Tiny Seed

written and illustrated by Eric Carle

How did the seeds move to different places?

	What happened to the seed?	What was the change in the environment? temperature, water, light, or soil
First Seed	The seed flew higher than the others.	The temperature was too hot.

Second Seed	It landed on an icy mountain.	
Third Seed		There was too much water.
Fourth Seed		It was too hot and there wasn't enough water.
The Weed	The weed grew much faster and caused another plant to die.	