Example Constructivist Lesson Plans

for the book *How Children Learn: A Constructivist Approach to Children*

Kindergarten/early elementary Lesson Plan Sequence for Science Unit: Living and Nonliving (by Angelica Blanchette)

**Situate the Lessons**

This lesson sequence takes students through a science unit on living and nonliving. This unit of study sets the stage for scientific thinking by guiding students to recognize criteria for living and nonliving and use the criteria to classify objects. This critical thinking lays the foundation for deductive reasoning, which is integral to the scientific method. Developing the concept of living and nonliving prepares students for evaluative thinking as they explore in future science units, such as gardening to examine life cycles, experimenting with simple machines, or using the senses to make observations.

**Science Vocabulary:** living, nonliving, grow, reproduce, move, breathe, react

**Objectives**

By the end of this lesson sequence students will be able to:

- Identify criteria for living and nonliving.
- Apply living and nonliving criteria to evaluate unfamiliar items.

**Lesson 1**

**Initial Experience: Presenting the Challenge**

Present students with an assortment of images and invite them to discuss whether the item in each image is living or nonliving.
Allow students to categorize items without intervening to make corrections. Most categorizations are likely to be correct; however, an explanation of why may be lacking or absent. Prompt students by asking why as they sort the items. Keep a list of key words and phrases students use.

Observe student groups for:

- Application of prior knowledge. (What is known? What is unfamiliar?)
- Evaluation of images. (What thinking skills are used effectively? What thresholds are revealed?)

Challenge: Selection of images with varying levels of familiarity and ambiguity with respect to living/nonliving criteria can create degrees of differentiation for the initial sort. Some students may be challenged by working with a collection of less familiar items, such as deep sea giant tube worms (view images and read aloud select information from an online source such as http://www.seasky.org/deep-sea/giant-tube-worm.html).

Support: Provide the images already sorted into living and nonliving categories, but do not reveal what the categories are. Ask students why they think the items are in each group and whether any items do not seem to fit.

Call students together, and revisit the images they were just discussing. Invite students to share their thinking and discuss with each other the following question: How do you know if something is living or nonliving? Refer to the list of key words and phrases students used during the initial experience to generate and guide discussion. Write Something is living if it... on chart paper/the board and record a list of student thoughts. The generated list may include ideas such as:

- Can walk.
- Gets bigger [*Connect to related vocabulary: grows].
- Has a face.
• Has a brain.
• Talks.
• Etc.

Next, provide formative feedback and begin addressing misconceptions by choosing one image everyone is confident is alive, such as a mouse. Tell students their task is to find the things all living things have in common. To do this, they will check the list with several images of living things. Put a check if the criterion applies and cross off criterion they realize does not fit as each living thing is evaluated. For example for mouse, *Talks* would be crossed off. Continue with additional images of items you know will help refine the list.

*Take the opportunity to connect to and explain unit vocabulary as it relates to the discussion and to initiate understanding about items with ambiguous characteristics (e.g., how a tree moves to face the sun, how a fish breathes with gills not lungs, etc.).

**Lesson 2**

**Gradual Release: Read Aloud** (primarily teacher guided)

Tell students they will get to do some research to see if their *Something is living if it...* list has all the criteria for what makes something living. They will research by learning from books and a song about living and nonliving.

Use the playful rhyme to engage students as you read aloud *Do You Know Which Ones Will Grow?* by Susan Shea. As criteria is presented for what makes something living, confirm or add to the *Something is living if it...* list.

After researching with this read aloud the list should include the following criteria: grow, reproduce, move, breathe, react, and need food/water.
Support: Provide icons for each criterion to support the list and vocabulary with images. The icons may be used to facilitate future activities, such as matching to vocabulary, sorting new items, and creating a checklist for students to use in their science journals.

Learn, sing, and dance with this Living and Nonliving Things song by Amanda Ellis: [http://www.youtube.com/watch?v=Z_aAkuK_8nQ](http://www.youtube.com/watch?v=Z_aAkuK_8nQ)

Tell students good researchers use more than one source and invite them to check their *Something is living if it...* list with the criteria from the Living and Nonliving Things song.

Harvest the unit vocabulary words from the *Something is living if it...* list, and create a word list to post in the room for reference throughout the remaining lessons.
Have students copy the word list into their science journals and include a quick sketch to illustrate some of the words.

Support: Students who are still developing the fine motor skills needed for fluent writing may cut and paste word cards into their science journal. The word cards can be traced instead of copied and coordinated images can be provided and matched instead of sketched.

Challenge: For each vocabulary word, students may select from a collection of images of various living and nonliving things and write or dictate a sentence about the item using the vocabulary word.

Lesson 2 Cross-curricular Connections: In language arts, students may work with the unit related vocabulary. Depending on each student’s literacy development, have students identify letters/sounds in the words, identify words by beginning letter/sound, or rebuild simple sentences including the words. Students could also construct their own sentence, with an appropriate level of support, for each vocabulary word in their science journal. Coordinate with the physical education teacher to have students list a wide variety of living things that move in different ways and provide the opportunity to move their bodies in the ways listed.

Lesson 3

Gradual Release: Vocabulary Focus (shared responsibility between teacher and student)

Work with the related vocabulary by sharing a living/nonliving story. Have the story posted with vocabulary highlighted and track the text as you read it aloud to help students follow along. For example:

Once upon a time, there was a cute little race car. The race car was yellow with blue stripes. She was friends with many living things, like a horse and
a sunflower, and her driver of course. She wondered if she was a living thing too. Her friend the horse was very wise and said he would help her figure it out. Horse asked if she could move, because all living things move. Race car said, “Oh yes, I can move very fast!” Horse said, “But doesn’t your driver make you move? Can you move on your own?” “Well, no,” replied race car. Horse explained that race car can react to her driver by moving when the driver uses the controls, but she does not move on her own like a living thing does. Horse asked race car if she could breathe. Race car said she can make exhaust, but she does not take in air like her driver and horse do with their lungs. Race car asked if there was anything else living things do. Horse said that living things grow and reproduce. Race car hung her head and sighed, “I don’t get bigger or make new race cars.” Horse said that living things need food and water, too. Race car perked up and said hopefully, “Well, I do need gas, that’s like food.” Horse said, “Yes, that is like food, but to be a living thing you need to do all those things, and you don’t move, breathe, grow, or reproduce.” Race car started to cry because she wanted to be a living thing, too. Horse leaned in close and said, “Race car, don’t cry, nonliving things are just as special as living things. In fact, I have a wonderful friend who is nonliving and I like her just the way she is.” Race car asked, “Who?” “You!” answered horse, and the friends enjoyed the rest of the sunny afternoon together.

Invite students to come up to the story, identify a highlighted vocabulary word, and explain what it means, until all the words have been reviewed.

Then refer to the list of words and have students create their own living/nonliving story by taking turns to add lines to the story and incorporating the vocabulary until all the words have been included. Record the dictated story to post in the room or publish on the class website.

Support: Use the initial living/nonliving story as a structure for the student version by creating blanks for students to complete instead of composing their own entire lines for the story (i.e., Once upon a time, there was a _____.). Composing a story
about a living thing and how it demonstrates each criteria for living will be less complex than the sample story in this lesson.

Lesson 3 Cross-curricular Connections: In the interest of time, students may compose a living/nonliving story within language arts instruction instead.

Lesson 4

Gradual Release: Science Journal Sort (shared responsibility between teacher and student)

Read aloud *Is It Living or Nonliving?* By Rebecca Rissman. Prompt students to confirm information on their *Something is living if it...* list as you read and engage in evaluative thinking about living/nonliving as the text explores diverse items from various habitats.

Next, invite students to try out their evaluative thinking in their science journals. Have them open up to two clean pages and label one page *Living* and the other *Nonliving*. Then pass out a page with images of various living and nonliving items in squares to be cut out and sorted into the living and nonliving categories.

Challenge: Invite students to select a pair of new items, one living and one nonliving, to exchange with a partner. The partner will try to identify which one is living and which one is not. Students may try to make the choices tricky! Students may bring items from home (with parameters) or work with images.

Lesson 4 Cross-curricular Connections: Students may use the images they have practiced sorting to create living/nonliving patterns in mathematics. Coordinate with the art teacher to have students categorize a variety of examples of art as
living or nonliving (e.g., a painting, a garden, a stone sculpture, a sculpted shrub, jewelry, a dance, etc.).

Lesson 5

Gradual Release: Discovery Walk and Collage (student’s work more independently to apply knowledge)

If the technology is available, take students on a discovery walk around school (inside and out) with a camera. Have students work with a partner to identify items that are living or nonliving. Take pictures of the items for students to use to create a living collage and a nonliving collage after the discovery walk. Allow student pairs to present their collages to the class, and remind them to use the unit vocabulary words and refer to the characteristics of living and nonliving, both ideally posted for reference. You may record the presentations to post on a class website to share with families.

Alternative: Provide an assortment of magazines for students to search through for pictures of various living and nonliving things. Cutouts from the magazines can then be used instead of pictures for the collage and presentation tasks.

Support: Instead of allowing for unlimited images, set a goal, such as five living and five nonliving items.

Challenge: Have student pairs switch picture collections with each other to create their collages.
Extension: Invite a buddy class to view the collages and ask the students questions about the images in their collages. Students work with their partner to answer the questions related to their own collage.

Lesson 6

Evidence of Deep Learning: Realizing the Change (assessment)

While students work at learning centers with activities to reinforce newly acquired knowledge, pull individuals to complete the cumulative assessment task. Learning centers may include a computer based activity such as: [http://www.sciencekids.co.nz/gamesactivities/plantsanimals.html](http://www.sciencekids.co.nz/gamesactivities/plantsanimals.html).

For each student, present three items, one at a time, that have some ambiguous characteristics with respect to living and nonliving, such as an image of a cartoon character, cut dried flowers, an image of fire, goo, a mushroom, a worm, etc. Have students individually categorize their three items and describe their evaluation for each.

Support: If students struggle to work from memory of the characteristics of living and nonliving, encourage them to use resources from the previous lessons: vocabulary lists, notes in their journals, etc. Student use of resources is more true to real world problem solving. However, some automaticity with the characteristics of living and nonliving is ultimately desired. Include observational notes with the assessment record regarding student need for and effective use of instructional resources to complete the assessment. If automaticity is not demonstrated, reinforce the characteristics when opportunities to discuss living and nonliving arise in subsequent units.

*Goo: To make goo, combine cornstarch and water at approximately a 2:1 ratio. Rolled up sleeves and a work area similar to what you would prepare for an activity using shaving cream (e.g., letter formation practice) is recommended. Extend exploration with goo, perhaps in a subsequent unit when discussing
reactions is relevant, by conducting this experiment: http://www.youtube.com/watch?v=wPz9uIM5oXY.

**Assessment Chart** (for record keeping during Evidence of Deep Learning activities)

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<thead>
<tr>
<th>Vocabulary</th>
<th>Student A</th>
<th>Student B</th>
<th>Student C</th>
<th>Student D</th>
<th>Student E</th>
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<td>nonliving</td>
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<td>need water</td>
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<td>Accurate categorization of items as living/nonliving</td>
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<td>Appropriate use of vocabulary in description of evaluations</td>
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**Alternate Assessment** (to be read aloud to students)

1. True or False: Living things reproduce. __________
2. Which word means to change when something happens:
   a. move
   b. react
   c. grow
   d. reproduce
3. Two Part Question:
   a. Is a (name an ambiguous item) living or nonliving? __________
   b. Finish the sentence: I know it is living/nonliving because __________.
4. True or False: Nonliving things grow. __________

5. What do all living things need:
   a. food
   b. soil
   c. sunlight
   d. oxygen

6. Which word means to become larger:
   a. react
   b. breathe
   c. move
   d. grow