Teacher: Rachel, Elie, Shannon S, Wendy, Sandra
Grade/Subject: 3rd Grade Science

Title of Experience/Topic: Building a Garden

Problem (framing words + person + action + audience):

There is an empty patch of land on school grounds that needs filling. The principal would like to put this land to use, and has come to your class asking for you to design a plan to create a space where animals and plants can live together. How can we as a class create an outdoor space where plants and animals can live together?

- Relevant to students
- Addresses real-world problem
- Allows for multiple solutions

Time Frame: (number of sessions and length of sessions)
3 weeks, 14 sessions consisting of 60-90 minutes, and half day at Botanical Garden

Content Standard(s):

Science Standard(s):
Concept 2: Scientific Testing (Investigating and Modeling)
PO 3: Conduct simple investigations (e.g., related to plant life cycles, changing the pitch of a sound, properties of rocks) in life, physical, and Earth and space sciences.

Strand 4: Life Sciences
Concept 3: Organisms and Environments
PO 3. Explain the interrelationships among plants and animals in different environments: • producers – plants • consumers – animals • decomposers – fungi, insects, bacteria

Math Standard(s):
3.MD.C.7
Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

3.MD.C.8 Measurement and Data
Solve real-world and mathematical problems involving perimeters of plane figures and areas of rectangles, including finding the perimeter given the side lengths, finding an unknown side length. Represent rectangles with the same perimeter and different areas or with the same area and different perimeters.
ELA Standard(s):

3.SL.1 Comprehension and Collaboration
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others’ ideas and expressing their own clearly.

3.RL.1 Key Ideas and Details
Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

3.RI.3 Reading Standards for Informational Text
Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

3.RI.4 Reading Standards for Informational Text
Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.

3.W.2 Text Types and Purposes
Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
  a. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
  b. Develop the topic with facts, definitions, and details.
  c. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.
  d. Provide a concluding statement or section.

3.W.4 Production and Distribution of Writing
With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.

3.W.7 Research to Build and Present Knowledge
Conduct short research projects that build knowledge about a topic.

ELP Standard(s):

WRITING
Standard 5, LI-1: recording and organizing information, observations or questions on a topic of student interest from one or two sources (experiment, textbook, guest speaker, video, Internet, interview, podcasts, etc.) for report/research purposes.

READING,
Standard 4: LI-29: interpreting information from functional documents for a specific purpose

LISTENING & SPEAKING
Standard 1: LI-8: responding to social conversations by rephrasing and repeating information, asking questions, and expressing one’s thoughts.

Standard 1: LI-5: responding to academic discussions by asking questions and sharing one’s view on facts, ideas and/or events using academic vocabulary.
Content Language Objective (Language Function + Content Stem + Supports\(^1\)):
Students will be able to...

Students will use language of problem solving to identify the characteristics of how plants and animals live together by using measurement tools, research and group collaboration.

**Sub-Objectives:** (SWBAT)

**BOTANICAL GARDEN FIELD TRIP**

SWBAT correctly define vocabulary words that are taught prior to this lesson
SWBAT research and read about different plants and animals
SWBAT research the relationship between plants and animals in small groups
SWBAT collaborate with small groups to find facts on plants and animals
SWBAT take notes on plants they study in class
SWBAT take notes on plants they research
SWBAT complete a graphic organizer comparing and contrasting the relationship between plants and animals
SWBAT orally explain the relationships between plants and animals
SWBAT identify which plants can be planted and grown in Arizona and work in small groups to select plants for the garden
SWBAT identify which plants can live in harmony with animals (not harmful to animals)

SWBAT correctly use a ruler or other measurement tools independently
SWBAT measure side lengths of a shape
SWBAT correctly find the perimeter of a shape
SWBAT multiply numbers correlated to side lengths of a given shape
SWBAT correctly find an unknown area given two numbers to multiply
SWBAT correctly find measurements provided a ruler or tool to measure with

SWBAT produce interview questions for employees at Botanical Garden
SWBAT ask interview questions to employees at Botanical Garden
SWBAT record information collected while on field trip
SWBAT research facts on plants

SWBAT identify harmful vs non-harmful plants to animals and humans
SWBAT discuss their opinions and ideas with peers on the information they collected from the Botanical Garden (notes they took and their answers from their interviews)
SWBAT ask and answer questions to and from peers
SWBAT identify which animals to consider when choosing a plant
SWBAT elaborate, explain, and provide evidence as to why they chose specific plants
SWBAT conclude which plants are able to be planted in garden

SWBAT outline their letter to the principal
SWBAT produce a piece of writing in a letter to the principal explaining which plants they want planted and why

---

SWBAT work with peers in small groups to measure the garden that is going to be planted.

**Materials:**

- Computers
- 5 Informational books on plants and animals
- 2 Graphic Organizers per student (one for interview and one for observations)
- Notebooks to write down information or facts found
- Manipulatives to get an idea of what they are doing (i.e. making a model of a garden)
- Rulers
- Pencils
- Sentence stems for the language of problem solving
- Sentence stems to guide them for their debate

*YouTube video for introducing the topic [Plants & Animals surviving together](#)*

*Online resources for School Gardening [here](#) (funding & other resources)*

*[Academic Tool Kit click here](#)*

*School Gardening Resources [here, interactive app to design garden space](#)*

<table>
<thead>
<tr>
<th>Vocabulary taught prior to the experience (Background):</th>
<th>Vocabulary developed during lesson:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment, Interdependent, Measurement, Relationship, Roots, Leaves, Flowers, Stem, Seed, Fruit, Vegetable, Development, Soil, Sunlight, Planter, Garden Bed, Temperature</td>
<td><strong>Interrelational</strong>&lt;br&gt;<strong>Perimeter</strong>&lt;br&gt;<strong>Area</strong>&lt;br&gt;<strong>Multiplication</strong>&lt;br&gt;<strong>Array</strong>&lt;br&gt;<strong>Rectilinear</strong>&lt;br&gt;<strong>Producers</strong>&lt;br&gt;<strong>Consumers</strong>&lt;br&gt;** Decomposers**&lt;br&gt;<strong>Fungi</strong>&lt;br&gt;<strong>Bacteria</strong>&lt;br&gt;<strong>Exposure</strong>&lt;br&gt;<strong>Compost</strong></td>
</tr>
</tbody>
</table>

**Academic Conversation:**

What language function will students have the opportunity to practice? How will this language be explicitly taught? How will this language be applied and practiced?

**Students will have the opportunity to practice the language of problem solving. The language will be explicitly taught through sentence stems.**
The first thing we would do is say to students “we have a lot of different problems in our lives, but we can use the language of problem solving to help us.”

Students will turn and talk with a partner/group about problems they see at school
We will make a list as a class on the board.
We will use sentence stems after we identify the problems and practice using them as a class.
The teachers will pick 1 from the board and model the problem they have at school using the sentence stem.
The teachers will come up with a solution and model it using a sentence stems.
Students will choose and discuss 1 problem they are having at school and talk about it with a shoulder partner and how they think it can be solved.

Sentence stems and graphic organizers will be provided to students to help build their academic conversations

Sentence Stems
Language of describing the problem:
In order to solve this problem we must first...

Sentence Stems
Language of problem solving:
I believe ______ because ____________.
I agree with this statement because ____________.
I disagree with this statement because ____________.

Establish the Problem:
How will prior knowledge be accessed? How will the problem be introduced to students? How will students inquire about the problem (optional planning tool attached) How are students using language (reading, writing, listening, and/or speaking) and how are they being supported?

Day 1 (opening)

Students will start by watching a short video about plants and animals surviving together.
Upon completing the video, students will reflect on the following questions and share with a partner using “turn and talk”.

In this discussion we will ask students:
“Does anyone have plants outside of their house like the ones from the book A Guide to Plants and Animals in the Sonoran Desert?”
“What kind?”
“Where else do you see these plants at?” (outside home, park, school, etc.)
“Have you seen any types of animals around any of these plants?”
“What kind of animals have you seen?”
By asking these questions, we will be activating their knowledge and get their brains thinking of what kinds of plants and animals they’ve been exposed to in relation to the plants they have been exposed to.

As a class, make a chart of all the plants that students have been exposed to and their animals

Problem Statement: Principal will come to classroom and announce: There is an empty patch of land on school grounds that needs filling. The principal would like to put this land to use, and has come to
your class asking for you to design a plan to create a space where animals and plants can live together. How can we as a class create an outdoor space where plants and animals can live together?

Next, we will introduce our upcoming field trip to the Botanical Garden

Class will take a field trip to Botanical Garden in order for students to see and explore the different kinds of plants grown in Arizona in order to build their own garden.

Students will do their own exploring while at the Botanical Garden

After the field trip we will have a class discussion on what was learned.

Students will create their own interview questions for a guest speaker.

Creating the Experience:
How will students work together to develop and present solutions? How are students using language (reading, writing, listening, and/or speaking) and how are they being supported?

Prior to Instruction: Students will be taught the language of problem solving.

Explain to students that they will become gardeners who understand which type of plants and animals can live in harmony in the same environment. Tell them that they will work in small groups to create an environment where plants and animals can live together. Each group will be responsible for composing questions that will later be asked to a guest speaker. Each group will also be responsible for generating their own research on different plants that are safe to be around. Announce to the class the problem statement.

Students will break into groups of four and generate two-three questions, using the language of problem solving. The questions will be used to ask a guest speaker from the Botanical Gardens about which plants are able to live with animals under the same environments using the knowledge that they learned at Botanical Garden.

Examples of questions that can be asked:

- Which cacti can survive in Arizona?
- How do we know if a plant is safe to survive here?
- What plants should be planted according to the different seasons?
- What role do seasons play in deciding what plants to choose?

Students will then interview the guest speaker. Guest speaker will provide several examples of plants that are safe to be planted in school environments and are not harmful to humans or animals.

After guest speaker, students will work in their small groups to collect more research on what resources are needed in order for plants and animals to live together and survive in the same environments.

Students will read material about what plants can be grown in each season/time of the year. Guide students in a discussion about different plant types as they pertain to specific seasons.
Students will have a debate and share ideas of what plants they want planted and backup their claims with support and evidence.

Students will design a garden box and will be able to choose which plants they would like to have planted in the school garden.

Class will come to a consensus of what plants will be planted in the school garden.

Students will be using language of problem solving when writing a letter to the principal, creating interview questions, and having a class debate of which plants are chosen for the garden. Students will be working in groups for each activity, and will be provided with sentence stems, checklists, and when they are researching they may utilize an audio reader to read the information to them.

| Evaluate: When and how will you use formative and summative assessments to measure student progress and learning (content and language)? |
| Formative assessments: |
| - Student observations of plants at Botanical Garden |
| - Collection of graphic organizers |
| - Discussions/debate |
| - Collection of interview questions |

| Summative assessment: |
| - Completion of model of garden presented to principal |
Problem:

How will students inquire about the problem?

What skills do students need to present the solution?