



Garden Learning Engagement

LE 3 Developing a model of the “Should We” question of the garden task

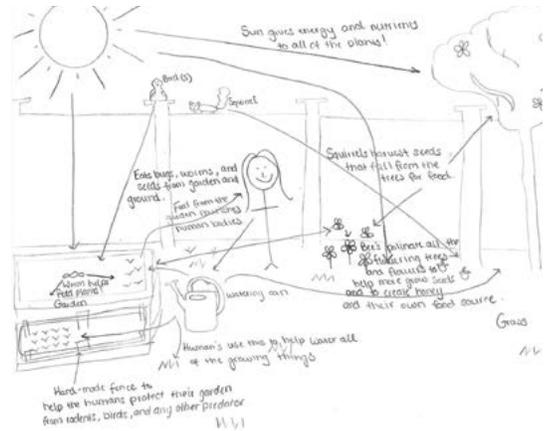
Background

Learners have already drawn their first models of garden relationships- in their own neighborhoods with families and in the garden! Scientists, including gardeners, use models to visualize and understand their observations, to answer questions and make predictions about their observations of the natural world. Models help us visualize the relationships that we observe, and help us make visible relationships that we are not able to observe through sight alone. For example we can use models to show the water cycle, trees taking in sunlight to make food, and worms turning dead garden matter into new soil in our models, even though we are not able to directly observe these things on our walks. A scientific model is dynamic and will change as new information is learned through observations and investigations, including interviews with community members.

Purpose

Now that we have a “Should We” question about a garden task, we need to make a model to help us think more deeply about the things we need to know to help us answer the “Should We” question. Gardeners are constantly gathering new information to inform their decision-making about a “Should We” garden task. Once there is a model, gardeners and learners can ask:

- What do we see from this model about our “Should We” question and garden tasks?
- What do we need to know to help us answer our ‘Should We’ question?” as the next step in their investigation.



For example: In this model of “Should we plant carrot seeds?” the arrows are representing the relationships between species and kinds.

MATERIALS

- » Completed LE 2 Family Tools
- » “Creating a Garden ‘Should We’ question Model” tool
- » Glue, adhesive
- » Crayons, markers, colored pencils
- » Clipboards or hard writing surface to take into the garden
- » Items from the garden such as leaves, flowers, soil, sticks, etc that are ok to pick and glue to their model. Learners will gather these.
- » Small containers to put collected items in

LEARNING GOALS

Learners will...

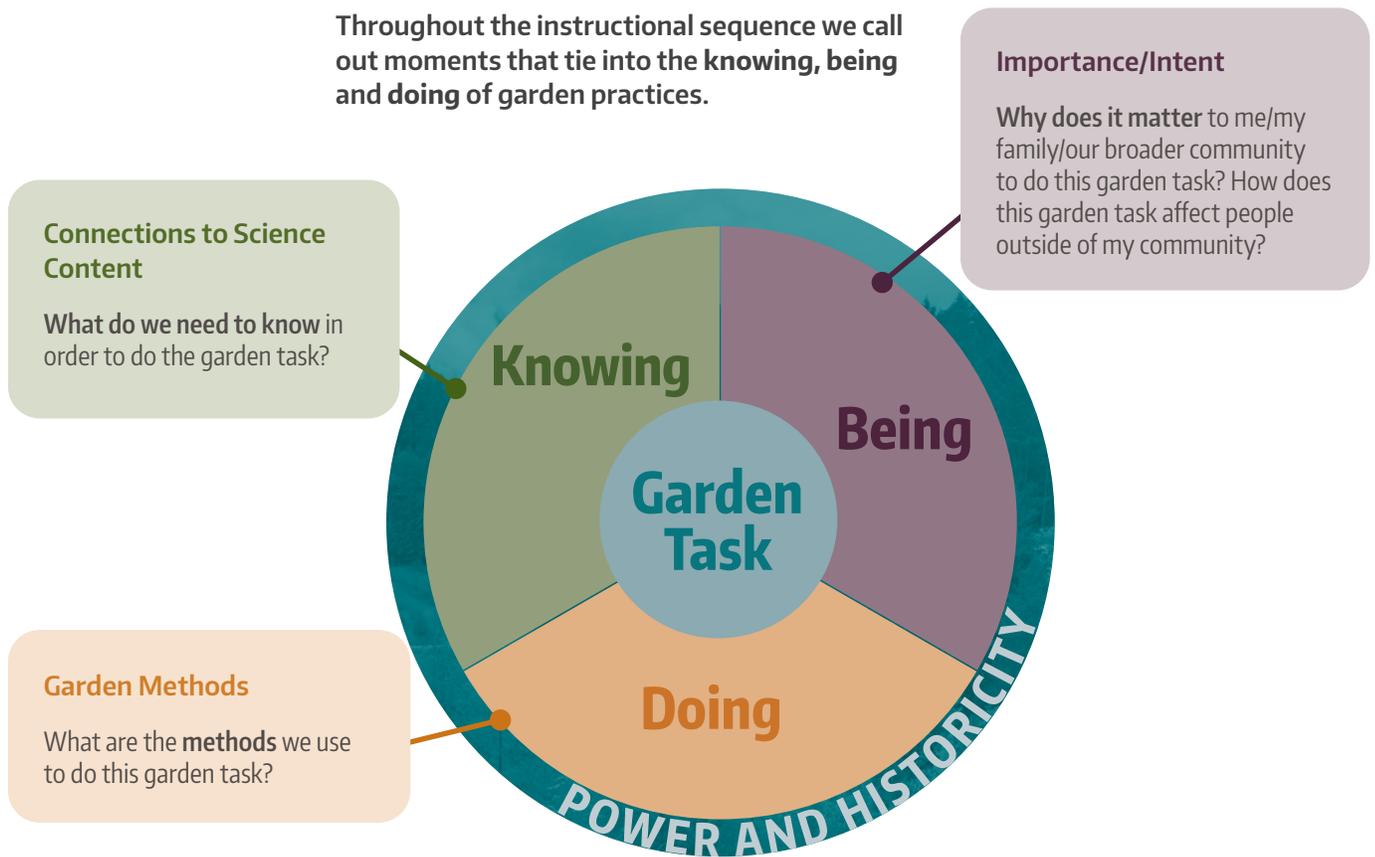
- » Learn how to make a model of a “Should We” question
- » Learn how to develop investigative questions from a model and “Should We” question
- » Learn about relationships in the garden and how they inform questions and investigations
- » Connect with family, learner, and community expertise

Connections to family and community gardening knowledges and practices

Incorporating the information that families and learners provide with the LE 2 Family Tool is an important way to make that knowledge and family culture visible in your garden learning space and programming. Gardening and agriculture is a human practice that has been done for thousands of years, all over the world. There are many ways to grow food, and by incorporating multiple ways of doing so will enrich the program.

Centering Equitable Practices:

- **Encourage learner idea generation, wonderings, questions, comments, and suggestions.** Avoid identifying or judging learners' ideas as right or wrong or off-topic. Instead, ask clarifying questions. Ask how other learners would incorporate whatever was said into ongoing discussions (other learners might have perspective on peers' commentary and questions that you don't). Assume a sense-making stance, and a 'desire to participate' stance, and let those guide your actions as a teacher and facilitator.
- **Provide ways to engage all learners in incorporating family knowledge into their models.** If learners are missing family tools, encourage them to remember and write notes about discussions they have had with their families about the focal phenomenon and "Should We" question(s). Remember that returning family tools is optional and only one way for families to support their child's learning and to incorporate family ways of knowing in the classroom, and it is important to provide multiple ways for learners to share this knowledge.



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Instructional Sequence

Before starting the learning engagement:

- » Collect the LE 2 Family Tools that learners and their families completed. It's ok if not everyone returns theirs in, there will still be great information to share. The important part of the Family Tool is to use family and community knowledge to ground your investigation. Take a look at the models that the families made about the garden task and the “Should We” question. Make a list of the relationships that families mention in their models so that you can include those in the conversation with learners during LE 3.
- » Review the worked example to see pictures of a group model.
- » As learners share their noticings and wonderings from their family walks, let them know that they can share ideas even if they didn't get a chance to complete the model with their families- they still have valuable knowledge to share from their everyday observations around their homes.

TIME

50 minutes



Part 1: Revising a Model of our garden “Should We” Question and Connecting to the Family Tool (30 minutes)

- » Remind the learners of their “Should We” question and garden task.
- » Remind learners that scientists, farmers and gardeners use models to help them visualize their thinking, and add to as they learn more information during investigations. Models help us capture our initial thinking about “who” and “what” is involved in our garden task and how they interact, and we revise and add to our models as we learn more information.
- » Share with learners the initial model drawn on a white board from LE2. Ask learners to share relationships that they included in their family model. Invite learners to draw these on the white board.
 - » **If learners need more time to consider important relationships** use the “Creating a Garden “Should We” question Model” tool. Have learners sit in the garden and draw, sketch or write out important relationships (animal-animal, plant-plant, human-plant, etc). They can include relationships that they worked on with their families.
 - » You can see more about the types of relationships that learners might observe in the Relationships in Socio-ecological Systems Framework.

Doing

Gardeners frequently adjust their garden tasks based on new information. Helping students become comfortable with adding/ revising models supports them in this important practice.

Knowing

Identifying who is connected in the garden (water, plants, animals (including humans), soil communities, etc) is an important part of “knowing” about our garden task

Being

It is important to look at our model and notice how Indigenous Sovereignty and Futurity are present in our model. If they aren't present in our model, spend some time as a group discussing how to include them.

» Prompt learners to make connections between the different parts of their models. If time allows have learners share their models with others so they can engage in discussions about garden relationships and how they relate to the “Should We” questions and garden task. For example, you can ask:

- » How are humans a part of this model?
- » How might those things be related? How might they interact? (invite learners to add arrows to show those interactions)
- » Think back to our Histories of Places walk. Which time scales are showing up? How can we add features to our model for each time scale?

Part 2: Expand on the model

Choose one or more of the activities below (20 minutes)

- » **Modeling with natural materials:** Collect 4 or 5 items from the garden to add to your drawn model. Hand out a small container to each learner. Show and tell learners what is ok to pick and gather, and what should be left alone.
 - » For example: “You are invited to pick small leaves off of the arugula plant, but please do not pick the whole plant. Here is how we use our fingers to carefully pick one leaf. Please leave the tomato and squash plants alone. They are still too small to pick from. It is ok to take a few pinches of soil.”
- » **Embodied Modeling:** Act out the relationships in the model by working in small groups, or as one big group. Each learner will play the role of part of the model. Learners act out their role, and also interact with other parts of the model that they have a relationship with. The sun might interact with a plant, who interacts with an insect, and other connections. You could “adjust” the model by adding a component, or removing a part of the model, to see how that would change the relationships.
 - » Before you start the activity, give learners clear guidelines about how we will move our bodies, be aware of others, and use appropriate or no touch.
- » **3-D model building:** Using elements from the garden, outdoor area, or classroom to build a physical model. Find items that represent relationship connections. If you can, build it in a space where it can remain intact during the week of learning, so that you can add to it with the information that you gather.
- » **Wrapping up:** Reflect as a group -- what did we learn by thinking about our model in another way? Did we notice relationships that we hadn't before? Did we add or subtract parts of our model? What other things did we notice?

LE 3 Educator Backpack Field Guide

TIME	
30 min	Revise the model of our garden “Should We” Question
20 min	Modeling Activity
10 min	Wrapping up

Connections to family and community:

- What did we notice on our Family walk that is important to include in our model?
- What are species, kinds, or behaviors that our families think are important that are missing from our model(s)?

Focus on Modeling Relationships: modeling is a powerful tool that supports the sharing of ideas about the relationships between species, kinds, behaviors, places, lands, and waters:

- How might those things be related? How might they interact? (Invite learners to add arrows to show those interactions)
- How can a model make something visible that we don't see, like plants making oxygen?
- Support weblike reasoning: What happens to a bird that eats a bug that feeds on grass sprayed with pesticides?
- How are Indigenous presence and future possibilities represented in our model?

Encourage human connections to ecosystems:

- How are humans part of this model?

Centering Equitable Practices

Encourage learner idea generation, wonderings, questions, comments, and suggestions:

- Avoid identifying learners' ideas as right, wrong, or off-topic.
- Ask clarifying questions.
- Assume a sense-making stance, and a 'desire to participate' stance. Let those guide your actions as an educator.

Provide ways to engage all learners in incorporating family knowledge into their models:

- If learners are missing family tools, encourage them to remember and write notes about discussions they have had with their families about the focal phenomenon and “Should We” question(s).
- Returning family tools is optional and one of many ways families support learning.

Thinking Across Scales:

- What Histories of places do we see in our model? Which ones don't we see? How can we add features to our model for each time scale?
- What will this model look like in 10 years?
- a drawn magnifying glass may represent that a learner wants to “zoom in” on a component or mechanism within the big model (fungi and bacteria that live in compost and soil)

Our “Should We” Question:
