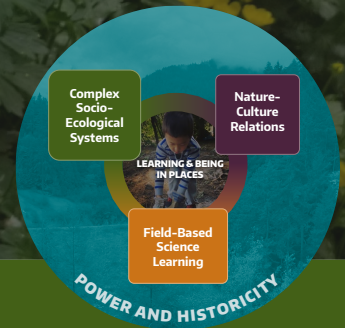




Family Science Learning Engagement



LE 6.A Observing and Modeling Specific Relationships

Activity Purpose

In this activity, your family will take a walk and observe specific types of relationships, like animal-animal relationships, plant-to-plant relationships, and human-plant relationships. Once you've observed and identified relationship types, you will select one (or more!) and create an initial model of your thinking about the relationship(s) you chose.

Activity Overview

This is a two-part activity.

- **Part 1:** Go on a neighborhood walk, and see how many different types of relationships you can observe. Then you can use the table on page 2 of the activity sheet to document the details. Remember that you can create your own tables on blank sheets of paper or in a journal.
 - NOTE: If you have gone on other walks, like those described in LEs 1.A, 2.B, 3.A, 3.B, and 4.B, for example, you can use observations from those walks too!
- **Part 2:** Pick several relationships you observed and create an initial **model** of those relationships and their possible interactions.
- Extension activities ideas are included on pages 5 and 6 of the activity sheet.



What can you do to support learning?

- If family members need help thinking about different types of relationships, you might prompt them to look for a few of the relationship types mentioned in the chart on pages 1-3 of the activity sheet. Once you identify some relationship types, your family can ask questions like:
 - How do you think that plant-plant (or animal-plant, human-animal, etc.) are connected? What do you think is happening in these relationships?
 - Why do you think these relationships are important and for whom? Do you think these relationships change when the seasons change? If so, how? Why?
- The initial model that your family constructs in Part 2 of this activity is a way of explaining the relationship(s) you observed. It will show how your family thinks the things involved in the relationship are connected and why. If family members need help with modeling, you can ask them to start by drawing who and what is involved in the relationships. Then you can prompt them to start to show how they are connected, and ask them to think about why they are connected in those ways.

Connecting with other families

- » Share your observations about relationships and initial models with other family members and friends. Agree to take another “relationships walk” to see if you find other types of relationships (maybe this will inspire you to add to your initial models and/or revise them!). Then reconnect with family and friends to keep sharing.

Disciplinary Core Ideas

“Scientists use models...to represent their current understanding of a system (or parts of a system) under study, to aid in the development of questions and explanations, and to communicate ideas to others...”
(National Research Council, 2012, p. 57).

Science Practices Emphasized

- Developing and Using Models

Key Ideas

Relationships in Socio-Ecological Systems

There are many types of relationships within and across systems. These relationships include predator-prey, helping or hurting, causal relationships (X causes Y to happen), among others. Research demonstrates that even young learners begin to understand causal relationships among organisms and natural components within a system.

Modeling

Working with models helps scientists and science learners visualize their thinking and better understand the kinds, relationships, behaviors, and various scales being explored. Scientific models are dynamic and change based on new information learned through investigations of phenomena, discussions and deliberations with others like family and community, and media of various types.



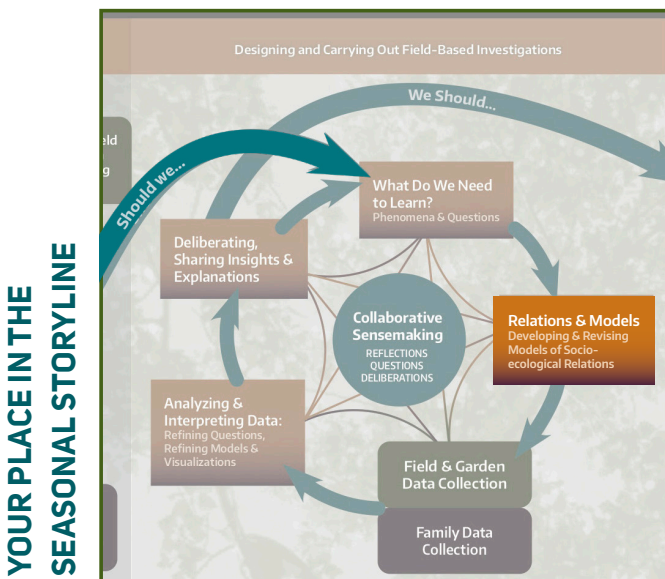
CONNECT TO OTHER ACTIVITIES

- Learning Engagement 3.B: Taking a Focused Walk Together: Relationships



LEARNING IN PLACES FRAMEWORKS TO CONSIDER

- Modeling Socio-Ecological Phenomena
- Relationships in Socio-Ecological Systems





Observing and Modeling Specific Relationships

Part 1: Taking a Neighborhood Walk to Observe Relationships

Take a walk in your neighborhood and see if you can find examples of some of the relationships listed in the chart. Then draw or write about the relationship(s) you observed. Don't worry if you do not observe all of these relationship types. The point is to document the relationships you do observe. (If you have gone on other walks as part of LEs 1, 2, 3, and 4, you can use your observations from those walks too.)

Where we went for our walk: _____

The temperature is: _____ *The time of day is:* _____ *The weather is:* _____

The season is: _____

Part 1.A: Put a star or a checkmark next to each type of relationship you observed out on your walk.

	Animal-Animal		Animal-Plant
	Animal-Human		Plant-Plant
	Plant-Human		Animal-Natural Kind (for example: water, rock, sun, air)
	Plant-Natural Kind (for example: water, rock, sun, air)		Human-Natural Kind (for example: water, rock, sun, air)
	Human-Human		Other?



Part 1.B: Draw or Write about the Relationship(s) You Observed

Type of Relationship You Observed	Draw and/or Write about the Details	What questions and wonderings do you have?



Part 2: Modeling a Specific Type of Relationship

One reason scientists use models is to help them make their thinking visible so that they can better explore their ideas.

Pick several relationships that you observed, and create an initial model of those relationships. *The point of your model is to capture your initial thinking about how the “who” and “what” you observed interacts.*

- How are they connected, and why might they be connected in those ways? Who benefits and why?
- How might any of this be impacted by the season, the temperature, the time of day, the weather, etc.?

If you want to look at some examples of initial models, check the example guide. If you want to keep revising your model, consider revisiting what you’ve done in LEs 1-5 to look for other relationships (or parts of them) that you might add to your initial model, and/or do activities in LEs 1-5 that you haven’t yet done with an eye toward revising your initial model.

Create your initial model on the next page (or on a blank sheet of paper). Use drawings, diagrams, words, arrows, and/or other symbols to help you express your ideas about the relationships you observed.



Our Family's Initial Model





Extension Activities:

- **Add another type(s) of relationship you observed to your initial model.** For example, maybe your family chose to model an animal-animal relationship that you observed, but you also noticed that one (or both) animals were in relationship with a plant. You can continue to add to your model so that it represents the range of relationships you saw. Then you can discuss the following types of questions:
 - Why do you think these relationships are important and for whom?
 - What do you think is happening in these relationships?
 - Do you think these relationships change when the seasons change? If so, how? Why?
- After you have these types of discussions, are there other things you want to add to your initial model (like changes in the relationships you modeled over time, or because of the seasons, for example)?
- **Find out more about some of the connections and relationships** you might have observed and modeled by talking to other people, reading books and magazines, watching videos, and finding online resources.
 - **Learn some new ideas!** See the chart on page 7 to learn about some example types of interactions between and among organisms in ecosystems. If you observed relationships among plants, animals, and/or humans, these types of interactions might apply. Did you notice any of these interactions when you were making observations? If so, did you represent them in your initial model? If not how could you revise your initial model to capture the specific type(s) of interaction(s) you observed? (NOTE: these types of interactions do not apply to relationships involving natural kinds.)
 - **Symbiosis, Competition, Mutualism, Commensalism, Predation, Parasitism, & Amensalism**
- Continue to go outside and make observations of relationships that you included in your initial model. Then, **revise your model to incorporate new information** that you've learned (from observations and from any other sources you have consulted). This will allow you to track your family's thinking over time.
 - How has your thinking changed?
 - How has it stayed the same?
 - What more did you learn and how does your revised model show that?



Example Interactions among Organisms in Ecosystems

Example Type of Interaction	Description
Symbiosis	Symbiosis is when two or more separate organisms live together in a long-term, intimate association, typically each benefiting from the relationship.
Competition	Competition takes place when two (or more) organisms struggle for the same resources in an environment. Resources include things like food, water, shelter, light, and territory. For example, woodpeckers and squirrels often compete for the same holes in trees to build their nests.
Mutualism	Mutualism is an interaction between two (or more) organisms where each organism benefits from the interaction. For example, plants and pollinators (like bees and butterflies) both benefit from their interaction. Bees get nectar and pollen from plants and plants get help reproducing because bees spread pollen from flower to flower.
Commensalism	Commensalism is an interaction between two (or more) organisms where one organism benefits from the interaction while the other organism(s) is neither harmed or helped by the interaction. For example, tree frogs often use plants for protection (so the frogs benefit but the plants are not harmed or helped).
Parasitism	Parasitism is an interaction between two organisms where one organism (the parasite) feeds off of the other organism (called the host). For example, fleas are parasites that live off of the blood of some animals like dogs, cats, and rabbits.
Predation	Predation is when one organism eats another organism. For example, lions (predators) eat gazelles (called prey). Owls (predators) eat mice (prey).
Amensalism	Amensalism is a routine interaction in which the presence of one species has a negative effect on another. For example, a herd of elephants walking across a landscape may crush fragile plants.