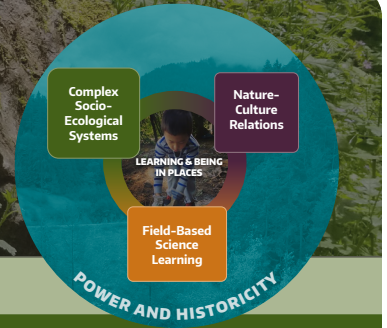


Family Science Learning Engagement



Bundle: Decision Making and Deliberation from Evidence

LE 8 Summarizing and Visualizing Data from your Field-based Investigations

Activity Purpose

Collecting data from field-based investigations is only the first step in doing an investigation. Scientists need to summarize and visualize their data in order to find patterns in the data and make sense of what they found. Sometimes when you've gathered a lot of information, it can be tricky to make sense of it. This is when summary data tables and graphs of your data can really help you see your data. This LE will take you through the steps of summarizing and visualizing your data.

Activity Overview

This activity has 2 parts.

- » **Part 1 (LE 8.A):** Look over the investigations you did in your field-based investigations from LE 7.A. What data did you collect and how can you summarize it?
 - Make some data tables and graphs to help you visualize and find patterns in your data from your field-based investigation.
- » **Part 2 (LE 8.B):** Summarize your findings from your community and media-based research from LE 7.B and LE 7.C.



What can
you do to
support
learning?

- » To begin summarizing and visualizing your data, you might ask:
 - What was the investigation question we were asking? How did that question relate to our "Should We" question?
 - What data did we collect?
 - Look at the Storyline Manual: What kinds of tables and graphs do you think could help us organize our data?
- » To find patterns in the data, you can try asking these questions:
 - Are there patterns in the numbers that we found? For example, did the numbers seem really high or low in certain places or certain times of day?
 - What happens if we compare what we found in this place versus that place?
 - What happens if we compare what we found in the morning versus the afternoon?
 - What happens if we compare what the community member said to what we found on the internet? What happens if we compare what the community member said to what we found in our field investigation?

Connecting with other families

» If you're collaborating with other families, you can compare findings and data! You can also ask another family to look at your data tables and graphs to see what patterns **they** find. Often different scientists will see different patterns in the data, and then this becomes the basis for another investigation!

Disciplinary Core Ideas and Important Phenomena

"Engaging in the practices of science helps students understand how scientific knowledge develops; such direct involvement gives them an appreciation of the wide range of approaches that are used to investigate, model, and explain the world." (NRC Framework 2012, p. 42)

Science Practices Emphasized

- Planning and carrying out scientific investigations
- Analyzing and interpreting data
- Obtaining, evaluating, and communicating information

Key Ideas

Planning and Carrying Out Scientific Investigations

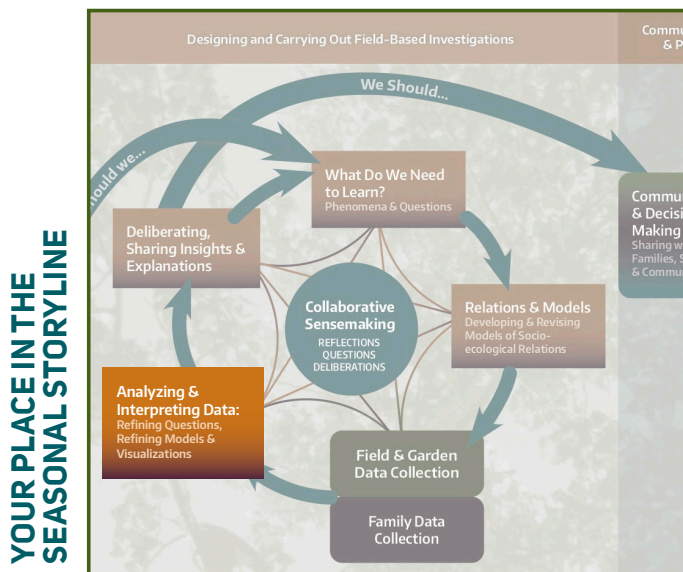
Scientists use investigations to help them answer questions. They carefully plan investigations so that they know what data that they want to collect. It is important to know that scientists don't usually do investigations without a purpose—they are always trying to learn more about something and answer some question.

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.

Analyzing and Interpreting Data

Often, people think that collecting data is the end of an investigation. But there is an important step of analyzing and interpreting data that requires looking over all of the data collected to see what patterns emerge. Often, the type of table or graph you make will help show different patterns. Interpreting what the patterns mean is another important part of an investigation.



CONNECT TO OTHER ACTIVITIES

- LE 6.B.2: Asking investigation questions related to your "Should We" question
- LE 7.B: Conducting community-based research
- LE 7.C: Conducting Book and Internet Research
- LE 9: Connecting to "Should We" Questions

LEARNING IN PLACES FRAMEWORKS TO CONSIDER

- Relationships in Socio-Ecological Systems



Summarizing and Visualizing Your Field-Based Data



Now that you've collected your data using the various tools in LE 7A, the next step is to summarize it so you can see patterns in it. No matter which field-based tool you used in LE7A, summarizing and visualizing your data is always the next step. This part involves making a chart or graph that will help you see patterns in your data. This is an important step, because you have many choices of how you visualize your data, and this will affect what patterns you see. If you look at our *Storyline manual*, you'll be able to see an example of how you can summarize and visualize your data to see patterns in it.

Some helpful steps to take are:

1. Talk over the investigation question that you asked and the field based data you collected to explore that question. Did your investigation question explore one place, across places, or across time?
2. Think about how to summarize your data in a way that would help you explore your question, as we did in the example in the *Storyline Manual*.
3. Make some data tables or graphs to help you visualize patterns in your data. Be creative with how you visualize your data! There are many ways that you can make tables or graphs to summarize what you found!
4. Talk over some of the patterns you see. What is your evidence for those patterns? What are you wondering about now?

Materials you'll need:

1. All of the data from your field-based investigations (see LE 7.A)
2. Some paper and markers to make graphs and tables
3. The *Storyline Manual* in case you need help knowing where to start!

Below are some prompts to guide your thinking. You can either use these or make your own!



STEP 1: What was your field-based investigation question from LE7.A? Did your investigation question explore one place, across places, or across time?

STEP 2: Think about how to summarize your field-based data in a way that would help you explore your question, as we did in the example in the Storyline Manual. Below are some blank data tables and graph axes to help you get started!

(blank data table)



(Blank graph)



STEP 3: Some questions for your family to talk about:

1. What patterns do you see?
2. What evidence do you have for those patterns?
3. What are you wondering about now?

Summarizing Your Data from Your Community-Based Research

Now that you've done your community-based research and your research on what people already know about your "Should-We" question, it's time to summarize your community-based data!



Some helpful steps to take are:

1. Talk over the investigation question that you asked.
 - a. What Information did you get from your community-based research? What did the community member(s) help you to understand about your topic?
 - b. What information did you get from your research on what people already know about your "Should We" question?
2. Think about how to summarize your community-based data in a way that would help you explore your question. There are some data tables below to help you.
3. Be creative with how you visualize your data! You can make a word cloud, or even draw a picture, make a timeline, or maybe even a map. There are all sorts of ways to visualize what you've learned from your research so far!
4. Talk over some of the patterns you see. What is your evidence for those patterns? How do these patterns compare with what you found in your field-based research?

Materials you'll need:

1. All of the data from your community-based investigations and research into what people already know.
2. Some paper and markers to tables, maps, etc.
3. The *Storyline Manual* in case you need help knowing where to start!

Below are some prompts to guide your thinking. You can either use these or make your own!



STEP 1: What was your field-based investigation question from LE7.A? Did your investigation question explore one place, across places, or across time?

STEP 2: Think about how to summarize your data in a way that would help you explore your question, as we did in the example on the previous page. Below are some blank data tables and graph axes to help you get started!

data source (community member or research from other sources)	What are some themes or patterns that we’re seeing from this data source?



Some questions for your family to talk about:

1. What patterns do you see?
2. What evidence do you have for those patterns?
3. What are you wondering about now?
4. Compare across your field-based investigations and your community-based and other research and respond to the following question. Are all of the patterns telling you the same thing about what decision to make around your “Should We” question? Or, are some of your data telling you one thing and other data are telling you something else?