

Habitat Assessors: Summarizing, Organizing and Analyzing Data

Activity Overview

Students learn to take raw data they collected in a habitat (see Habitat Detectives activity) and organize it into something useful and meaningful.

Objectives

Students will:

- Understand the process of turning raw data into meaningful information by summarizing, organizing, and analyzing it.
- Understand how to look at information quantitatively, spatially, and seasonally.
- Develop a meaningful seasonal representation of food availability using a wheel of the year
- Understand the seasonal times of plenty and hunger in a habitat
- Understand that helpful actions can result from accurate data collection and thoughtful analysis

Subjects Covered

Science, Math

Grades

3 through 12

Activity Time

This indoor activity requires about 30 minutes for counting tallies and summarizing and organizing the information. Another 30 minutes is needed to put the information on a wheel of the year, reflect on the resulting insights, and analyze its meaning.

Season

Early Winter (following the Habitat Detectives activity in the Fall)

Materials

Pencils, colored pencils, paper, large wheel of the year* (including months)

State Standards

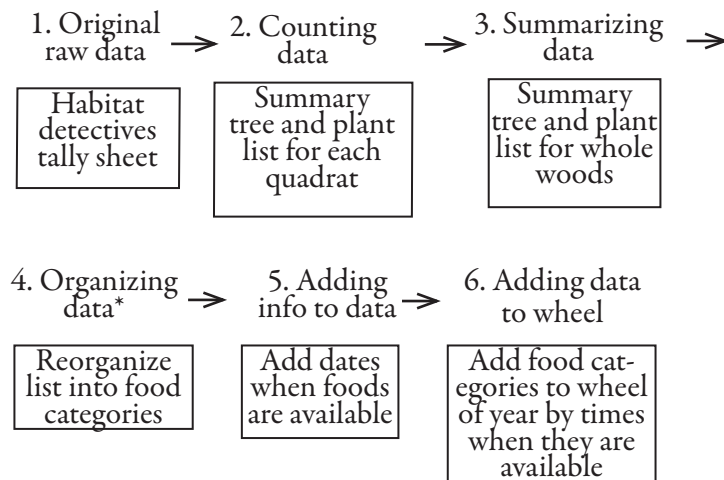
Science:

Use scientific vocabulary & themes (C.4.1)

Background

This activity depends on the preceding Habitat Detectives activity, which furnishes the raw data this activity will use.

The flow chart of the process of this activity



* This is where the previous Spring's flower inventory becomes useful, especially if bloom times have been recorded.

This activity uses data collected outdoors in a habitat like a woods (or a schoolyard) and transforms it into meaningful information which can be used to plan a habitat improvement project (see Habitat Enhancers activity). It is not intended as a stand alone activity, but rather as part 2 of a 3 part series. If the habitat is large, this process will begin with multiple Habitat Detectives tally sheets, each one corresponding to an area of the woods. This activity is best accomplished in early Winter, so that the Habitat Enhancer activity can use late Winter/early Spring for planning the mid-to-late Spring outdoor project.

Activity Description

Step 1: Counting the Raw Data

Students begin the process of making meaningful information by counting the tallies on the Habitat Detectives worksheets. Large habitats may have many tally sheets; small habitats may have only one.

Step 2: Summarizing and Organizing the Raw Data

It is important at this point to discuss how best to organize the information. The data appears to be a simple list of trees, shrubs, plants, and shelters. It will be helpful if the list can be further organized by food categories. It could look like this:

Habitat Assessors: Summarizing, Organizing and Analyzing Data (cont.)

Ask questions, plan investigations, make observations, predictions (C.4.2)

Select multiple information sources (C.4.3)

Use data to answer questions (C.4.5)

Communicate results (C.4.6)

Support conclusions with logic (C.4.7)

Ask new questions (C.4.8)

Identify questions using available resources (C.8.1)

Identify data and sources to answer questions (C.8.2)

Use inferences and observations (C.8.4)

Use knowledge, models, and theories to explain results (C.8.5)

State learning from investigations (C.8.6)

Explain data & conclusions (C.8.7)

Evaluate questions, hypotheses, conclusions (C.8.9)

Discuss results (C.8.10)

Identify further questions (C.8.11)

Ask questions, build hypotheses, design investigations (C.12.1)

Identify issues, questions, research; design & conduct investigations (C.12.2)

Evaluate data (C.12.3)

Choose & evaluate data collection methods (C.12.4)

Use explanations & models to describe results (C.12.5)

Present results (C.12.6)

Find patterns and cycles in earth's changes (E.4.6)

Explain earth's cycles using observation (E.8.8)

Discover how organisms meet their needs (F.4.1)

Find connections among living and non-living things (F.4.4)

Show organism's adaptations (F.8.2)

Understand an organism's behavioral adaptations (F.8.7)

Trees producing seeds: Maples - #, Elms - #, Hop hornbeam - #

Trees producing nuts: Oaks - #, Hickories - #

Trees & shrubs producing fruit: Black cherry - #, Highbush cranberry - #
Dogwood - #, Serviceberry - #

Brambles producing berries: Black raspberries - #, Blackberries - #,
Gooseberry - #

Mushrooms: - #

Flowers (nectar): - #

Sedges (seeds): - #

Shelters: Dens in logs and ground - #, Dens in trees - #, Nests in trees - #,
Brush piles - #, Nest boxes - #

Problems noticed: Buckthorn, Honeysuckle, Garlic Mustard

If the place being studied is large, it is useful to have a list like this for each main area, because the information is useful not only quantitatively but also spatially (for example, invasives may be present in only one specific area).

Now the numbers generated by counting tallies can be added to the list(s).

Once the numbers are added, it is time to collectively look at the information presented so far. Does it look like a lot of food and shelter? Is a diversity of food and shelter available? Are any food categories noticeably scarce? Are there spatially related abundancies/scarcities? Can you brainstorm why this might be? Where are the problem invasives?

The big picture at this point will give some idea about the quantity and location of food resources in the habitat.

Step 3. Re-organizing the Data

The next step is to move conceptually from food resources to actual foods, and add the dimension of time. Transform the list of food sources into a list of foods and dates they are available. For example, the list might look like this:

Open water in pond	mid-March to September
Tree Buds	February
Leaves	mid-April to frost
Seeds (trees & sedges)	mid-May to frost (box elder seeds in February)

Habitat Assessors: Summarizing, Organizing and Analyzing Data (cont.)

Show organism's place in ecosystems (F.8.8)

Explain survival and population growth of species (F.8.9)

Understand species changes & diversity (F.12.6)

Investigate cooperation & competition (F.12.7)

Infer changes in ecosystems (F.12.8)

Investigate how matter and energy are used to sustain an organism (F.12.11)

Math:

Use reasoning abilities (A.4.1, A.8.1, A.12.1)

Communicate mathematical ideas (A.4.2), logical arguments (A.8.2, A.12.2)

Connect mathematical learning with other subjects (A.4.3)

Analyze non-routine problems (A.8.3)

Analyze non-routine problems & arrive at solutions (A.12.3)

Source

Georgia Gómez-Ibáñez,
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* Wheels available at
www.partnersinplace.com

Nectar	late April to frost
Berries & Fruit	mid-June to December
Nuts	August through Winter
Mushrooms & Fungi	year round
Active insects	late April to frost
Larval/dormant insects	year round
Prey creatures	year round

Step 4: Analyze the Data Seasonally using the Wheel of the Year

Now it is time to translate the information collected onto a wheel of the year.

- Assign a meaningful color to each food category (the wheel will be easier to “read” if contiguous rings have contrasting colors).
- Add enough rings to the wheel so that each food category has its own ring.
- Label each ring with its food.
- Create start/stop lines to help students who are coloring the food rings.
- Students color in the rings.
- Now it is the time for the Aha! moment. Hang the wheel up so every one can see it in its entirety. The colored areas indicate food availability. The white areas indicate times of scarcity. The wheel allows students to see this clearly. This is a moment when students achieve a deeper understanding, suddenly and collectively. Each food has its season. The times of plenty and the times of hunger come and go as the seasons flow around the circle of the year. It is a powerful moment for students.
- This circle too needs its center. Color-coded images of foods (that correspond with the rings) make a good center for this wheel of the year.



Fig. 6 Using the Wheel of the Year to analyze data seasonally: food availability.