

STEM Bites

TODAY'S EXPLORATION: Natural History

Overview:

Create a science journal and use it to record observations of living things, objects, and natural phenomena discovered during an outdoor treasure hunt. Contribute what you find to increase ecological knowledge and the capacity of scientific communities.



Next Generation Science Standards (NGSS):

Grades: K-20

Practice: OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Discipline: LIFE SCIENCES and EARTH & SPACE SCIENCES

Materials:

- Required: journal, forms, or sketchbook to record observations and relevant details
- Optional:
 - Internet for identification guides and to contribute data to science projects
 - Camera
 - Measuring tape, ruler, or common object (ex. penny) to document size and distance
 - Thermometer, moisture gauge, wind gauge
 - Magnifying glass, hand lens, binoculars, microscope

Investigation:

1. Choose a neighborhood, park, pond, refuge, or other outdoor area for your treasure hunt, and a route to thoroughly explore it.
2. Start your treasure hunt by recording information about the treasure hunt including: your name, date, location of the route, amount of cloud cover, air temperature, how hard the wind is blowing or gusting, and the amount and type of precipitation (snow, rain, hail, mist).
3. While exploring your chosen route, look for items on the list of treasures.
4. For each observation of a treasure, record information about the characteristics of it and the location where you found it including: the category of treasure, time of day, and location on the route, in addition to, the species or type of treasure, number of individuals, and specific characteristics of the treasure and site of the observation.

5. Draw, take a picture, or mark the location of each observation on a map to identify the context of the treasure, and use an object like a ruler or penny to create a reference scale for the observation. *Take only pictures and be careful not to disturb the treasures or sites where you found them.*
6. Propose an explanation for the location of the organism or environmental attribute.
7. Test the explanation by repeating the treasure hunt at least 3 more times at the same location, on the same route, and at a similar time of day.
8. Reiterate as necessary at different times of the day and in different weather conditions to confirm, revise, or develop a new explanation.
9. Identify the organisms to species and submit your observations on a regular basis through community science sites using eBird (<https://ebird.org>), Budburst (<https://budburst.org>), iNaturalist (<https://www.inaturalist.org>), and projects on SciStarter (<https://scistarter.org>).

Product or Artifact Possibilities:

- Scientific nature journal.
- Pictures and records documenting the abundance and distribution of organisms and associations with environmental attributes.
- Data that can be contributed to community science projects and enable advancements in scientific research.

Guiding Questions:

1. Where and when did you see the most individuals of one type of treasure?
2. Where and when did you see the greatest species richness (diversity of organisms) or type of treasures?
3. What do you think caused the phenomenon to occur?

What Are We Discovering?

1. How past and current environmental conditions influence the abundance and distribution of species, the composition of communities, and the persistence of refugia.
2. How to increase scientific knowledge and engage in solutions-based thinking.

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