

Macroinvertebrate Manor Extensions

GRADE LEVELS	3 rd - 5 th , Standards for 3 rd - 5 th
SUBJECTS	Life Science, Energy & Matter, Systems, Cause & Effect
DURATION	Preparation: 30-60 minutes Activity: Ongoing
SETTING	Outside or School Yard

Summary

After making your Macroinvertebrate Manor, there are many ways to continue learning about biodiversity and for students to share their knowledge.

Language English

Educator Audience Classroom teachers, homeschool parents, informal educators

Appropriate for: 3rd grade - 5th grade

Subjects: Life Science

Prep Time: 30 minutes

Activity Time: Ongoing

Printable Materials:

Lesson Plan

Objectives

In these activities, students will:

- 1) Share their knowledge with other students through art.
- 2) Continue learning about the biodiversity of macroinvertebrates.

Macroinvertebrate Art Activities

- 1) **Decorate Macroinvertebrate Manor:** Make signs to identify the space for students from other classes and grades. Encourage students to use their creativity to help protect their observation spaces.
- 2) **Macroinvertebrate Drawing or Model-making:** Insects are perfect subjects to draw or make models of. This activity can be linked to identification and classification. Consider using recycled materials for models.

Build a House for Solitary Bees and Ladybugs

Some bees live alone and do not make their home in hives. These bees rarely sting since they are not aggressive and some do not have a stinger at all. Also, some ladybugs stay local during the winter and will hibernate when the weather is cold. The following home would be ideal for these macroinvertebrates.

Yellow jacket wasps may find this home suitable for their needs as well, so students should be careful when handling the house.

Materials:

- A large can (approximately 32oz.) or a 2 L plastic bottle with the top cut off
- Hollow tubes such as bamboo, paper straws, or rolled construction paper.
- String or wire for hanging the house outside

Procedure: (see picture below for reference)

1. For hanging the house, make 2 holes in the bottle or can. One at the bottom and another directly vertical of the first hole near the top of the can or bottle. Thread string or wire through the 2 holes and tie the ends together to make a loop.
2. Place the hollow tubes into the bottle or can, packing them tightly together. Make sure the holes are facing out of the bottle or can.



3. Find a fairly sunny and warm area about a yard above the ground. Hang the house horizontally, tipping the open end slightly downwards to prevent water from collecting in the tubes.
4. Students can check on the house frequently, noting if there are any residents. It is possible for female bees to lay eggs in the hollow tubes. If they do, they will seal the end of the tube to keep the eggs safe until they hatch. If and when the eggs hatch, the first bees emerging will be males, followed by females.

Create a Butterfly Garden

The plants in a butterfly garden can provide food for caterpillars as well as butterflies, and will help increase the biodiversity (and beauty!) of your schoolyard.

Materials:

- Organic compost
- Single flat rock at least 6" wide
- Shallow container (such as saucer) for collecting water
- Variety of plants for nectar and caterpillar food
 - see <http://www.naba.org/ftp/baca.pdf> for plant recommendations for the San Francisco Bay area

Prepare the space:

1. Find a location for the butterfly garden. An ideal place has at least six hours of direct sunlight per day and is protected from the wind.
2. Mix 3-4 inches of compost into soil, loosening the soil to a depth of 8 to 12 inches.

Procedure:

1. Plan a layout for the garden that provides spaces for butterflies to eat, drink and rest. Then, build it to the specifications of your plan.
2. Plant a variety of flowers that bloom in different seasons to provide food year-round for both butterflies and caterpillars. Vary the heights, colors, foliage for cocoons and types of food in patches in your garden.
3. Place a flat rock or two in the sunniest area of your garden to create an ideal place for a butterfly to rest.
4. Arrange shallow containers in open areas to catch rainwater for the butterflies to drink.
5. Students can check the garden frequently, noting if there are any residents. Keep a record of any chrysalis activity and keep track of which plants the butterflies or caterpillars are found on most frequently.

Assessment Ideas

- Continue your observations of Macroinvertebrate Manor to include how the biodiversity has changed with the introduction of new habitats.
- Have students give short tours to younger students of the Manor, using their signs and models that they created to help with identification.

Correlated California Content Standards

Grade Three: Life Sciences, Investigation and Experimentation

- 3.b) Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
- 3.d) Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
- 5.d) Predict the outcome of a simple investigation and compare the result with the prediction.
- 5.e) Collect data in an investigation and analyze those data to develop a logical conclusion.

Grade Four: Life Sciences, Investigation and Experimentation

- 2.c) Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.
- 3.b) Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
- 6.a) Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.

Correlated Next Generation Science Standards

Grade 3

Performance Expectations

- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

DCIs

- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
- LS4.A: Evidence of Common Ancestry and Diversity
- LS4.C: Adaptation
- LS4.D: Biodiversity and Humans

Grade 5: 5-LS2-1 (5-LS2.A)

Performance Expectations

- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

DCIs

- LS2.A: Interdependent Relationships in Ecosystems