How to Build a Butterfly Habitat

by

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RESOURCES

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ACKNOWLEDGMENTS
The authors gratefully acknowledge the support of Bobby R. Alford, M.D., Jeffrey P. Sutton, M.D., Ph.D., William A. Thomson, Ph.D., Jeanne L. Becker, Ph.D., and Kathy Major, B.A. We especially acknowledge the valuable contributions of Louis Stodieck, Ph.D., BioServe Space Technologies; Mary Ann Hamilton, Curator, Butterfly Pavilion; and Kenneth Werner, Gulf Coast Butterflies.

Butterflies in Space is supported by National Space Biomedical Research Institute through NASA NCC 9-58, and by Houston Endowment Inc., and the Howard Hughes Medical Institute.

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Butterfly Habitats

In preparation for the flight experiment, butterfly eggs will be placed into the space habitat. To closely match the experiment protocol, obtain Painted Lady eggs from one of the suppliers listed below. In addition, larvae food will have to be obtained as a separate item. Painted Ladies also can be purchased as larvae, which are shipped from suppliers, usually with adequate food supplies. Larvae will be received in one of the early instar stages, perhaps as small as one centimeter in length. Whether you obtain eggs or larvae, your animals may be a few days ahead of or behind the flight experiment. Your students will need to determine the variation to accurately compare their butterflies to those on the ISS.

Painted Lady butterfly eggs, larvae and food are available from a number of companies, including the following suppliers.

- Insect Lore, www.insectlore.com
- Carolina Biological Supply Company, www.carolina.com
- Ward’s Natural Science, wardsci.com
- Simply Butterflies, www.simplybutterflies.com

Types of Habitats
We provide instructions for two different classroom habitats. The “Box Habitat” is a clear plastic box that closely models the dimensions and conditions of the habitat on the ISS. Use this design if you wish to maintain conditions that are similar to those experienced by the space butterflies.

MAINTAINING CULTURES
Butterfly Larvae Food
When you prepare the habitats, distribute the larvae food evenly among the food containers. If you obtain eggs, do not place them directly on the food or the eggs will not hatch. Follow the instructions that come with the eggs. If you obtain larvae, use caution not to harm them while transferring food to the compartments. Place the feeding tray and the larvae inside the habitat.

Inserting the Larvae
Carefully place the larvae on the food compartments inside the butterfly habitat.
habitat. A small paintbrush can be used to gently push the larvae on to the food. Begin daily observations.

Adult Butterfly Nectar
Three or four days after the larvae have pupated, prepare artificial nectar for the adult butterflies using the following formula.

- 1 ounce of sugar
- 4 ounces of water
- 2 pinches of salt

Boil the water, and then add the sugar and salt. Stir to dissolve sugar and salt. Allow to cool completely. Moisten cotton balls with this mixture and place them in the two outer food compartments. Replace compartment lids.

Butterfly Care and Feeding
It is simple to care for Painted Lady butterfly larvae, pupae and adults. Allow larvae to live on the commercial food until they create their pupae. The pupae (also called chrysalises) will be dormant for seven to ten days, during which time they should not be disturbed. When a butterfly is ready to emerge from its pupa, the pupal casing will become transparent and the wings will be visible. The butterfly then will begin to push on the pupal casing, causing it to break open along seams. Within two to five minutes, the butterfly should be free from its pupa. With hemolymph (circulatory fluid, or “blood” of arthropods) pumping through its veins, the butterfly will stretch out and straighten the wings. The wings will be sufficiently hard and ready for flight in two to eight hours. The butterfly also will cleanse its body by releasing a large amount of reddish waste, called meconium.

Adult Painted Lady butterflies usually feed 12–24 hours after emergence. They will require a liquid diet of artificial nectar. Use the formula above to create nectar for your habitat. Butterflies also will do well with juicy fruits, such as orange slices and sports drinks. However, these are not being flown in the space experiment and should not be used with your specimens. Adult Painted Lady butterflies have a relatively short lifespan of one month or less.

SAFETY
Always follow all district and school laboratory safety procedures. It is a good idea for students to wash their hands with soap and water before and after any science activity.

### Box Habitat

**MATERIALS FOR ONE HABITAT**
- Clear plastic box, item number 079-C (7-7/16" x 5-5/16" x 3-34"). Order from Pioneer Plastics (sold by case, 18 per case) at 800-951-1551 or www.pioneerplastics.com.
- Clear or white 7-day medicine organizer, 6" x 1.25" x 1" (available at most pharmacies)
- Drill (or nail and pair of pliers, see Item 3 below)
- Prepared larvae food and nectar (see “Maintaining Cultures,” p. 11)
- Red permanent marker

**PROCEDURE**
1. No modification of the box is necessary.
2. Cut off the Monday–Friday lids of the medicine organizer.
3. Drill 1/8-inch holes through the Sunday and Saturday slots of the organizer (to hold nectar). OR, hold the nail with a pair of pliers and heat the nail with a candle flame. Push the heated nail through the center of the Sunday and Saturday lids. The plastic will melt around the nail and cool to form a hole. Using the marker, draw a red circle around each hole.
4. Place the modified medicine organizer with food on the bottom edge of the box (see “Maintaining Cultures,” p. 11) and stand the box on its side, as shown above.
5. Place the habitat in an area where it will not be disturbed. It may occasionally be necessary to move or open the box, so it should not be fixed permanently to a shelf or counter top.

**HUMIDITY**
If the air in your classroom is dry during the experiment, add an additional portion cup with a moistened cotton ball to the habitat. Remoisten the cotton ball as it dries out.
Clamshell Habitat

MATERIALS FOR ONE HABITAT
- Clear, hinged “clamshell” take-out food container, 8” x 8” x 3” (approximate), available from most grocery stores with salad bars or bakeries. If you wish to make more than one habitat, clamshell food containers are available to purchase in larger quantities (such as Reynolds Easy-Lock Hingeware, item number REY2647) from online vendors.
- 4 clean individual portion cups (such as those used to hold ketchup in restaurants) and 2 lids
- Distilled water
- Prepared larvae food and nectar (see “Maintaining Cultures,” p. 11)
- Hot glue gun and glue
- Pair of scissors
- Plastic report cover
- Red permanent marker
- Sheet of cardboard (see Item 2, below)

PROCEDURE
1. No modification of the box is necessary.
2. Make a simple base out of cardboard to hold the box upright on its hinged side. OR, allow students to invent a support for the habitat using cardboard, wood blocks, clay, etc., held together with hot glue or tape, as appropriate.
3. Cut a 1” x 6.5” strip of plastic from the report cover. It will serve as the base for the portion cups.
4. Use a hot glue gun at a low temperature to attach the portion cups to the base.
5. Punch small holes (about 1/8-inch diameter) in the center of the two portion cup lids. Draw a ring around the holes using the red marker. (Adult butterflies will be attracted to the red color for feeding.) Place the lids on the two “end” portion cups after each is filled with nectar (see “Maintaining Cultures,” p. 11).

HUMIDITY
If the air in your classroom is dry during the experiment, add an additional portion cup with a moistened cotton ball to the habitat.