

Steps to prepare the Monarch Butterfly habitat and carryout investigation

Kit contents:

1. Plastic box with lid with one strip of balsa wood attached to the top of the box. **Please note:** when you set-up your habitat, it will sit on one of its long sides, thus the wood strip is the “top” of the box.
2. Two – 4 compartment pill boxes. These are the larvae food trays. One will have its lids still attached.
3. One – single compartment pill box with hole in it. This is the nectar feeder for your butterflies.

Items you will need:

1. glue gun or double sided sticky tape
2. cotton balls
3. red sharpie to color “flower” on nectar feeder
4. ingredients to make nectar recipe
 - a. Nectar recipe
 - i. Mix 4 parts water and 1 part sugar – heat in microwave to dissolve sugar. Store in refrigerator.
5. Three late 3rd instar or early 4th instar Monarch Larvae from Monarch Watch – www.monarchwatch.org. **PLEASE NOTE:** The only way to order larvae for this special project is to email Monarch Watch at monarch@ku.edu.

Directions for kit preparation: Please clean the pill boxes with soap and water prior to loading the larvae food into these containers. Wipe out the inside of your habitat with a clean, moist cloth. This will help keep down bacteria growth within your habitat. Please have students wash their hands before handling any kit components. Butterfly larvae are susceptible to human germs.

1. **Order your Monarch Larvae** – You must order your Monarch Larvae in order to start your experiment. You will need to email Monarch Watch at monarch@ku.edu. They will let you know how long it will take to get your larvae. If they have the correct age in stock it should only take a day or two. Once you receive your larvae you will want to “load” them into your habitat right away. First you will need to fill your food trays
2. **Care of your Monarch Larvae**
 - a. When you receive your Monarch larvae kit from Monarch Watch it will include the following:
 - i. 6 larvae
 - ii. 1 cup full of diet to be transferred to your pillbox food trays in your classroom kit.
 - iii. 3 finishing cups for your extra larvae with food already in the cups.
 - b. When you are ready to “load” your habitat:**
 - c. Fill the two clean pillboxes with the food mixture.
 - d. Close the lids on the pill box that still has lids.
 - e. Using either a glue gun or double sided sticky tape, attach both food trays to the back of the plastic habitat. Please see picture below for tray location and orientation in the habitat. The food tray without a lid should be on the left and the second food tray should be on the right. Make sure the second food tray is oriented so that the lids open out towards the right side of the box.
 - f. Take the single pill compartment that will be used for the nectar feeder and color a red flower around the hole.
 - g. Using either a glue gun or double sided sticky tape, glue the nectar feeder onto the back of the habitat about 1.5” to the right of the food trays. The feeding hole of the nectar feeder should be about 1.5”-2” down from the top of the box. Please see photo below. **Please note:** The nectar feeder should be oriented so that the lid of the feeder opens down towards the bottom

of the box. **Please note:** You will not add nectar to the nectar feeder until the butterflies begin to emerge from the chrysalis.

4. Add the Monarch Larvae

- a. Carefully add 3 – early 4th instar Monarch larvae to your habitat using a small paint brush or other small tool. Be careful not to damage the larvae. They are very fragile. You can place the larvae directly onto the food. Close the habitat.

When your butterflies are ready to emerge, mix the butterfly nectar.

- b. Make the butterfly nectar according to the directions above.
- c. Moisten a cotton ball with the nectar and then place inside of the nectar feeder. The cotton ball needs to be saturated but not dripping with nectar.
- d. Cover the remaining nectar and place in the refrigerator. You should change your cotton ball every two days. This will prevent mold from growing in your nectar.

5. Investigation

- a. After you have loaded your butterfly habitat, it must be placed in the dark for approximately 80-90 hours and left at ambient temperature.
- b. After that time take your habitat out of the dark and provide a lighting system so the organisms are given light on a 12 hour on 12 hour off light cycle. See the general tip sheet on suggested lighting. You should also expose the second set of food by opening the pill box lids.
- c. If you are able to provide a temperature of 25 degrees Celsius, that is optimum. Temperatures below 22 degrees Celsius will significantly slow the development of your larvae.
- d. Once the butterflies emerge and have dried their wings, carefully add the cotton ball of nectar to the nectar feeder.

6. Observations

- a. Follow the observation guideline outlined in the teacher's guide.

Figure 1: Classroom habitat

