

### **Life Cycle Analysis: Study of Butterfly Metamorphosis**

The following activity was planned around the life cycle standard for second graders. The butterfly kit was purchased at Toys R Us and includes a cage, instructions, and code for five free caterpillars. The caterpillars arrived in a vented cup in a very small larva stage. This activity is the second life cycle specimen we have studied following the *Drosophila* Life Cycle.

This lesson plan was designed for a second grade class with 18 students. The lesson takes place over one to two science periods to explain the entire life cycle/compare to other life cycles, but time should be allotted to check the stage of metamorphosis and complete a video diary every day if possible.

#### **Materials:**

- Insect Lore Live Butterfly Garden Set (Real Butterfly Hatching Kit)
- Five Caterpillars (Code from Kit)
- iPad (or Diary of Some Type)
- Life Cycle Poster and Handouts
- Dissection Microscopes

#### **Activity:**

First, we discussed as a group what the students knew about caterpillars. Most of them knew they turned into butterflies and some mentioned a cocoon. I followed up with a short talk about butterflies/moths and the differences so the students would use the work chrysalis instead of cocoon. We compared the stages of the life cycle to the *Drosophila* life cycle which was fresh on their minds since they just finished studying vials of *Drosophila*. I told the students that the small caterpillars would get much bigger over the next week, and we planned when we expected the chrysalis to form and butterflies emerge.

The students monitored the changes using their iPads as a daily diary recording device. This process allows for a visual, as well as a written tool for the students to monitor changes. We talked about the changes on days I was there, and the students also like to compare the life cycle to frogs and humans. I compared the molts to the caterpillars getting bigger and needing new clothes to fit.

Once the caterpillars make their chrysalises and emerge, the students needed a lot of explaining about the extra dye ejection so they will not be scared about the butterflies' safety. The butterflies can be studied in the cage for no more than ten days. We talked about the colors and anatomy, and we also looked at other species on the internet to compare colors and patterns. The butterflies were fed sugar water each day by placing it on flower petals that were replaced daily in the bottom of the cage.

On day nine, we took the butterflies to the Greenway for their release. We also had eggs in the cage which helped solidify the entire life cycle since we started with caterpillars. We were now able to look at the chrysalises, molts, and a butterfly that never emerged from its chrysalis. The students drew what these specimens looked like through the microscope on a handout sheet. If time permits, the students can make a power point with images they collected through the metamorphosis.