

## **Lesson Plan**

### **What Kind of Food Do Caterpillars Like Best?**

Terri Potter Grade 1 – Science Cassidy Elementary

#### **Objectives**

- Students will be introduced to scientific procedures and learn that simple scientific questions can be investigated through observations combined with scientific information.
- Students will learn to use evidence (e.g., observations, data) from scientific investigations and scientific knowledge to develop reasonable explanations.
- Students will learn how to design and conduct a simple scientific investigation and will communicate (e.g., draw, graph, write) designs, procedures, observations, and results of the scientific investigation.
- Students will be able to explain the investigation and answer questions from other students and adults.

#### **Kentucky Learner Goals and Academic Expectations**

2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.

2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.

#### **Context**

This lesson is an introduction for first grade students to scientific procedure and methods. It builds on students' prior knowledge of caterpillars and on information previously taught on the life cycle of the butterfly. This lesson is also used not only as a science lesson, but also focuses on interactive writing and reading fiction and non-fiction text.

#### **Materials**

Book: *The Very Hungry Caterpillar* by Eric Carle

Large Post-It poster size paper; individual white boards, magna doodle, wipes and markers; four large plastic containers (about 18" x 24"- clean), one large bag or head of washed red cabbage, green cabbage, leaf lettuce, and spinach; 4-10 new student paint brushes, paper towels, cabbage loopers (about 100) divided into four or more separate cups; index cards and markers.

#### **Procedures**

(Ideally, the book, *The Very Hungry Caterpillar* would have been read aloud to the children at least once before this lesson begins. This initial reading gives the students familiarity with the story and allows them to better focus on the specific questions being asked by the teacher during the second reading. Also, the life cycle of the butterfly, as a science concept, would already have been introduced and studied, allowing all students to be familiar with the research subject.)

Gather students together for a large group reading of *The Very Hungry Caterpillar* by Eric Carle. Ask students what they remember from the first reading of the story. Tell them that when we read the book this time, they should pay close attention to everything that the caterpillar eats during the story. Read the story and question the students about what the caterpillar ate, what things made him feel bad or good, and what kinds of things do the students think real caterpillars eat. Ask them what they think caterpillars like best. Write their suggestions on the board.

Explain to students that scientists ask themselves these kinds of questions all the time and then design experiments to help them figure out the answers to these questions. Tell the students that today we are going to be scientists and design an experiment to find out the answer to our question about what kind of food do caterpillars like best.

Tell the students that the first thing scientist always do is write down their question and all of the information they find out, so that they won't forget anything important and also so that if someone else wants to do the same experiment, they will know exactly how to do it. Pass out individual white boards, markers and pens to all students. Choose one student to be the lead writer on the Post-It paper (the teacher writes on a Magna-doodle board or another white board – facing the class). The teacher writes the word **Question** on the Post-It paper and asks the students what is it that we want to know about caterpillars? Use interactive writing to write out question (teacher calls on students to help spell or sound out words, all students are writing the information on their own individual white boards while the lead student writes the information on the Post-It paper).

Explain to students that when scientists do experiments to find out the answer to a question, they always have a guess themselves as to what the answer to the question might be. Sometimes the scientist's guess is correct and sometimes it's not correct, but by doing the experiment the scientist always learns new information. Tell the students that scientists have a big, important word for this kind of a guess and it's called a hypothesis. Have the students repeat the word several times and write the word **hypothesis** on the Post-It paper. Tell the students that you have brought in four different kinds of food that the caterpillar might like (red cabbage, green cabbage, spinach and leaf lettuce). Write the words on the large white board. Ask the students to vote/guess which of these foods they think a caterpillar would like best. Tally the votes and use the most popular for the hypothesis, (ex. We predict that our caterpillars will prefer to eat green leaf lettuce.). Write the hypothesis on the Post-It using the interactive writing method. Clean up boards, collect writing materials and have students go back to their tables.

### **Experiment:**

This experiment was designed for 16-20 students sitting at four different tables (one caterpillar container for each table). More or fewer containers could be used depending on the number of

students in the class. Explain to the students that scientists are always very careful to not contaminate their experiments. Explain the word contamination and how that might affect our experiment (i.e. the caterpillars might get our germs, get sick and not eat their food – even though it might be their favorite food). Because of contamination concerns we all need to wash our hands well and keep our materials clean. Everyone washes their hands.

Put a plastic container on each table. Discuss with the students how the caterpillars will need some moisture in the container to help them live and something to give them traction on the slippery surface of the container. Let students lightly dampen a few paper towels and lay them in each container. Discuss with the students the importance of doing more than one replicate in an experiment and the need for random order.

The students then label four index cards at each table with the names of the vegetables, mix the cards, and then randomly place a card in each corner of the plastic container. Divide up the vegetables and let students place each vegetable on the appropriate card in each container. Discuss with the students how we will place the caterpillars in the center of each container in order to make sure they are the same distance from each vegetable, so that the caterpillars are not just eating the closest vegetable. Remind students that we will not be touching the caterpillars with our hands to insure that we will not contaminate the experiment. Give each table a cup of the caterpillars (at least 25 caterpillars in each cup) and a small new paintbrush.

Demonstrate to the students how to gently push the caterpillars out of the cup and into the center of the container. Explain to the students that we will write down our observation (data – explain the word) at three different times – at 5 minutes, 2 1/2 hours and at 24 hours. Explain that this is important because the caterpillars might taste the vegetables first and then go back to the one they like the most. The teacher draws a graph on another sheet of Post-It poster paper with the individual groups on one side and the individual vegetable on the other. Each table will count the number of caterpillars on each vegetable and record their findings on the graph for each time interval. Using the caterpillar totals and group observation of the caterpillar damage done to each vegetable, a preference food will be identified.

After the 24 hour data has been taken and a preference food identified, the students will come back together as a group to write up the rest of their experiment using interactive writing. Pass out white boards, wipes and markers. Choose a lead student to continue writing on the Post-It paper. Tell students that scientists always include a list of the materials they used in an experiment in case they want to do the experiment again or one of their friends wants to do it. Write the word **materials** on the Post-It paper. Ask the students to remember what kinds of materials we used in order to do our experiment. List the materials the students mention, remind them of any other materials they may have forgotten.

Explain to the students that a science experiment is a lot like a recipe and that it needs to be done in the same way each time for it to turn out the same way. It is important that each step be done in the correct order. Write the word **Steps (or Method)** on the Post-It paper. Ask the students to remember exactly what we did in the experiment. Help them to get all of the steps in the correct order and remind them of why we did certain things (contamination, multiple replicates, random order, and data collection).

Ask students what we learned from our experiment. Write the word **conclusion** on the Post-It paper and have the students write down their conclusions for the experiment. Finally, ask the students if our original hypothesis was correct. Discuss the reasons for why or why not it was correct, what things might have affected our experiment, what kinds of things could we do differently if we did the experiment again. Review each of the highlighted scientific terms and their meanings with the students (i.e. **hypothesis** – a scientist's best guess). Remind students of how a graph can show information in a way that is easy to see and understand. Together make a graph of our data.

### **Student Assessment**

Ask students to turn to a partner and explain to that partner what our question was and what did we do in our experiment to help us find out the answer to our question. The partner's job is to help fill in any missing information that the first student may have left out of their explanation. After the first student finishes their explanation, the second student gets their turn to explain the experiment and the first student can fill in any missing information. Students will be expected to orally discuss and explain the procedures for this experiment to a peer or to the teacher. Students will be able to explain what is meant by the scientific terms of hypothesis (a scientist's best guess), materials (the things a scientist uses to do an experiment), steps/methods (what a scientist does during an experiment) and conclusion (what a scientist finds out from doing an experiment).

### **Lesson Extension/Follow Up**

All of the Post-It poster materials can be reduced in size on a copier and bound together in a book format. The original Post-It posters can be laminated and hung in the classroom for "reading around the room" time. Individual copies can be sent home for at-home reading or to share with family members. This project can be done collaboratively with another First Grade Class; those children evaluate "performance" on the different foods by confining groups of caterpillars on one of the same four vegetables used in the Preference Tests and measuring their weight gain over 4 days. The classes then meet to compare their findings.