

MEALWORM LESSON PLAN #2

GRADE LEVEL: Fourth Grade

SCIENCE CONCEPT: This is the second lesson in the mealworm theme. This particular lesson focuses on a food chain, specifically, a mealworm food chain. Students conceptualize the process of predators and foods mealworms need in their habitat.

RELATIONSHIP TO CALIFORNIA SCIENCE CONTENT STANDARDS:

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:

- b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.

LEARNING OBJECTIVES: Student will make a model of a mealworm food chain and label prey and mealworm as producers or consumers and if herbivore, carnivore, omnivore, or decomposer.

EVALUATION IDEAS:

1. **INFORMAL** – Teacher will walk around room and informally assess student’s observations and worksheets.
2. **SUMMATIVE** – Students will make a model of a mealworm food chain.

CONCEPTUAL BACKGROUND – Mealworms can be borrowed from the SJSU SERC lab. It’s important to note harmful exploration activities. In this case the mealworms can die when exposed to too much light or given too much water. Also, the mealworms may not be handled.

Stimuli/Habitat – Information on what moves the mealworm should be known before teaching this lesson. Freezing temperatures and too much light may kill the mealworm. But, cold temperatures, like the refrigerator can slow down the life of a mealworm for months, to a certain point. These insects live in dark places like corners of barns and in areas where their food source lies. For instance, they may live in grain or cereal and in the wild under rocks where there are decaying leaves and sticks and on feces.

Food These insects eat grain, cereal, feces, dead insects, and grasses and are known as decomposers.

Word Wall – for ELL and others the following vocabulary is used. The Word Wall will have the word and a picture of the word.

Producer – an organism that can produce its own food.

Consumers – An organism that gets its energy from eating other organisms.

Herbivore – A consumer that eats plants.

Carnivore – A consumer that eats only animals.

Omnivore – A consumer that eats both plants and animals.

Decomposer – An organism that breaks down dead organic matter into simple chemical compounds, returning nutrients to the environment.

Food Chain – (a picture of the mealworm food chain)

Larva, mealworm, grain, molting, pupa, beetle (keep these up from previous lesson)

LESSON IMPLEMENTATION PLAN:

ENGAGE: To begin this lesson, show the students a movie clip that the teacher will need to make or have made before class. This movie clip is made up of the school's fourth grade teachers dressed in shorts and T-shirts, half of the teachers wearing a handkerchief of one school color and the other half wearing the other school color. As the show starts, "Survivor" music plays and then the principal tells each team that they have one more contest. The scene is like that of "Survivor" with torches and sand and a table. The camera focuses in on each teacher in their funny looking clothes and then back on the principal. The principal then says, for our last contest we will have a meal to eat. She then brings out the mealworms on a plate. The teachers gross out! Each teacher eats (the audience thinks they really eat them. With camera tricks the eating looks real.) the mealworms. One teacher will not eat them (the fun teacher). The strict teacher eats the squiggly worms.

After the clip, bring out the mealworms in their aquarium (habitat). Pass out different colored handkerchiefs to divide the students up into four teams. Ask the students if they are ready for a game of Survivor. After or during the time that they are grossing out, tell them they, too will eat worms, but these worms will be gummy worms. Tell the students that gummy worms are hidden outside in the grass (someone will need to watch over these worms while the class is inside watching the movie clip). Tell the students that they are the predators that will be collecting the mealworms. Explain that they are not to eat the gummies because they will be counted. (To avoid a sugar high at school, they may eat them after school.) Send them off on their five minute hunt.

EXPLORE:

Now tell the students that they are now the mealworms and the predators are going to eat them. First they need to know what animals are going to eat them and where would they be that the animals would eat them.

Send them inside to investigate. But before they investigate, have them predict what animals they think would eat them and why. They will write these predictions in their journal or on a sheet of paper. After they complete their predictions their groups will rotate through four centers. The centers are placed inside of the room. Each student is given a worksheet where answers will be discovered at each site. Each group of students will have 12 minutes at each station to find out who is going to eat them and where they live or if there is anything they can do to avoid being eaten. They will also answer the questions on a worksheet (Lesson 2, Worksheet 1) attached

Station 1 - Books: *Mealworms Life Cycles* by Donna Schaffer, *Mealworms: Raise them, watch them, see them change* by Adrienne Mason, and *A field Guide to the Beetles* by Richard E. White

Students will read these books to find answers to their questions to make notes

Station 2 – Movie Clip:

<http://magma.nationalgeographic.com/ngexplorer/0309/guideflicks/index.html>

Hit play and then take the quiz (about food chains, predators, herbivores, consumers..)

If time, <http://www.kidsknowit.com/interactive-educational-movies/freonline-movies.php?movie=Food%20chains>

Click play

Station 3 – Internet Websites:

<http://insected.arizona.edu/mealinfo.htm>

<http://www.allaboutworms.com/what-do-mealworms-eat>

(may also want to put a webquest in here)

Station 4 – Observation and Pre-project:

Students will observe mealworms and start design of their project. They may just finish cutting the box and making a clay figure out of the mealworm.

EXPLAIN: Ask the students what they thought. Ask them questions they had and what they discovered. Clear up any misconceptions and review the worksheet.

ELABORATE: In their journals or on a separate piece of paper, the students will draw a food chain of the prey they chose and the food they select. They must also label if it is a producer, consumer, carnivore, omnivore, herbivore, or decomposer. They must also place the mealworm in its habitat.

EVALUATE:

- a. **Informal** – The teacher will walk around the room and read the student’s journals/papers and listen to them talk to one another.
- b. **Summative** - Students will then make a model of a food chain, using any predators of the mealworm and any food the mealworm eats. They will make the predators out of clay and add food to the box. Then, if they finished their clay mealworm, they will place the mealworm in the food chain and explain if it is herbivore, carnivore, omnivore, decomposer, producer/consumer. A sample will be shown.

Rubric

Mealworm Lesson 2 – Mealworm Food Chain

Pass	Not Pass
The first animal is a predator of mealworm.	The first animal is not a predator of mealworm.
The second animal in the Food chain is the mealworm.	The second animal in the food chain is not the mealworm.
The third object in the food chain is something the mealworm eats.	The third object in the food chain is not something the mealworm eats.
Writes that the mealworm is a decomposer and consumer.	Writes that the mealworm is a decomposer and consumer.

DIFFERENTIATION PLANS:

Behavioral for Student A – For the student who constantly touches others or other objects prohibited, either by harsh force or gently, modifications are in place. A chart of check marks will be tallied for proper behavior of not touching others. If the student keeps their hands to themselves, they will receive a check for the two hour period. Time will be lengthier as time progresses and marks are achieved. After 5 days, student may be rewarded full recess or five minutes of extra play time. The student will also be given a material that the student can touch while learning. Sometimes these students just need to touch something and the object may fill that need. The clay project should help this child’s need to constantly touch.

Cognitive for Student B – For the slower learner, there are multiple ways of learning this lesson. This lesson is introduced by playing in a game of finding the worms. The student also works in groups with other students to discover the answers. If needed, a lesson review will be sent home prior to the lesson.

Cognitive for Student C - The gate student is engaged through different and fun activities and may share their knowledge in the setting of a group. This student may also explore further than the others on the websites and in the books provided. A series of questions is also made to challenge and motivate.

Affective for Student C – There may be a student that has difficulty with death and the eating. Take the standpoint that this is what animals need to do to live or they won't exist. Go into detail about how their teeth are made to eat certain things and make it more science. Check on the student and talk with the parent beforehand.

Language for Students E,F, G- The teacher will be modeling activities, students will be discussing questions in groups, there will be a word wall with pictures, using their bodies for movement and touch should explain the predatory process and food web. The journal/paper drawing and model constructed also should help the student conceptualize the food chain. **Student E**, beginning Language Learner, will have the lesson plan before class starts so that he/she may review with the ELL teacher before class. This learner is also paired with another higher leveled Language Learner in a group that contains English only students. **Student F**, an intermediate learner, will also receive the lesson plan prior to the class to review with the ELL teacher. The teacher will also monitor to ensure understanding. A language dictionary is also available for use. **Student G**, The student who speaks a different language other than Student E and F and speaks English almost proficiently will use the same word wall and receive an outline of the lesson prior to class. Information should be understood because of the amount of modeling in the plan.

LIST OF MATERIALS:

Mealworms from SJSU Science Lab

Movie Clip of School Teachers Survivor – made by teacher

Materials needed – 4th grade teachers in T-shirts and shorts, different colored handkerchiefs, mealworms on a plate, movie camera, torches, principal

Mealworm Meal – gummy worms, baggies for worms to be placed in while on grass

Books - *Mealworms Life Cycles* by Donna Schaffer, *Mealworms: Raise them, watch them, see them change* by Adrienne Mason, , and *Afield Guide to the Beetles* by Richard E. White, *Beetles and How They Live* by Dorothy Hinshaw Patent and Paul V. Shroeder pages 52 - 56

Video clip – <http://magma.nationalgeographic.com/ngexplorer/0309/guideflicks/index.html>
<http://www.kidsknowit.com/interactive-educational-movies/freonline-movies.php?movie=Food%20chains>

Computers in classroom and list of internet sites:

<http://insected.arizona.edu/mealinfo.htm>

<http://www.allaboutworms.com/what-do-mealworms-eat>

and any webquest if you so chose in this section

Worksheets – Lesson 2, Worksheet 1 and Lesson 2, Worksheet 2 (attached)

Journals/paper and pencil

Clay, dried leaves (4 per child), Cheerios and oats, cereal boxes (1 for each child)

References

Darkling beetle/mealworm information. (1997). Collaborative data, Center for Insect Science Education Outreach, University of Arizona, Tucson, AZ. Retrieved from <http://www.insected.arizona.edu/mealinfo.htm>

Fluker's mealworm biology guide. (2011). Retrieved from http://www.flukerfarms.com/PDFs/Flukers_Mealworm_Biology_Guide.pdf

Patent, D. H., Schroeder, P. C. (1978). *Beetles and how they live.* New York, NY: Holiday House

Preston-Mafham, K. (1998). *Bugs, beetles, spiders, snakes.* New York, NY: Knickerbocker Press

White, R. E. (1983). *A field guide to the beetles.* Boston, MA: Houghton Mifflin Company

Children's books:

Himmelman, J. (2001). *A Mealworm's life.* Danbury, CT: Children's Press

Mason, A. (2001). *Mealworms: raise them, watch them, see them change.* Buffalo, NY: Kids Can Press Ltd

Schaffer, D. (1999). *Mealworms: life cycles.* Mankato, MN: Capstone Press