PROGRAM OVERVIEW

“From Worm to Beetle: A Class Project” is a unique and innovative project that provides students with a hands-on experience that will not be forgotten. This project not only addresses several science objectives but writing, reading and math objectives as well. Each student takes responsibility for the mealworms and conducting several experiments while watching the mealworms develop through its life cycle. Over sixty percent of the students in the two classes that took part in the project are on free or reduced lunch and their opportunities to observe, explore and care for living creatures of their own is limited. This project allows for those students to have ownership of several mealworms and document their growth and changes.

Students will focus on the mealworms life cycle and be able to compare it to the life cycle of a butterfly through the use of a bridge map in addition to several other activities. During this two week project the students will demonstrate appropriate knowledge of a mealworm’s life cycle, how their mealworm reacts to different experiments as well as a better understanding of the mealworm itself and be assessed based on the included rubric.

This project was implemented in two different first grade classes in a title one school that did not meet AYP last year. Both classes have eighteen students of varying abilities including a total of four children identified as ESOL and six students who are substantially deficient. One of the two classes is an inclusion classroom with three of the students being served in exceptional education. The progress monitoring scores for the students involved with this project improved greatly in the area of life sciences. All of the children were able to participate in this whole group project with minimal accommodations specific to each child and did not require any additional space or facilities.

“From Beetle to Worm: A Class Project” could easily be adapted to different grades within the elementary level with minimal modifications to the writing, reading, and math components.

OVERALL VALUE

“From Worm to Beetle: A Class Project” provides students to freely explore the behaviors and growth patterns of a living creature close up and personally. Every child’s initial response to the mealworm is different, but at the completion of the project ninety-nine percent of the children will handle their mealworms, pupas, and/or beetles with ease and care.

Not only was this project a fantastic opportunity for students to truly understand the life cycle of mealworms, but it also provides children with a much more tangible knowledge of other animals life cycles as well. Every day of the project, each student was excited and enthusiastic about being able to see, hold and explore their own mealworms.

LESSON PLAN TITLES

- Introduction to the Worms
- Life Cycles
- Gummy Worms
- Experiments
- Observations

MATERIALS

“Diary of a Worm” by Doreen Cronin, plastic cups, raw oatmeal, mealworms, student journals, T-Chart, large Rubbermaid container, sentence strips, life cycle picture cards, “The Very Hungry Caterpillar” by Eric Carle, caterpillars, gunny worms, gummy worm worksheet, rulers, magnifying glass, water dropper.

ABOUT THE DEVELOPERS

Theresa Benedetti has a Master’s degree in Exceptional Education and is also certified in Elementary Education. For the first eight years of her career she taught in a variety of ESE settings. She has taught first grade at Caldwell Elementary school for 5 years.

Megan Higgins has an Early Childhood Degree from the University of Akron in Akron, Ohio. She also has her reading endorsement. She has been at Caldwell Elementary School for five years teaching, Kindergarten, Third Grade and currently first grade.

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For further information contact...
**SUBJECTS COVERED**
Reading, Writing, Science

**GRADES**
First, but can easily be adapted to other elementary grades

**OBJECTIVES**
1. Students will make comparisons between what is real and what is make-believe about worms based on a fictional story.
2. Students will begin to orientate themselves with mealworms.
3. Students will recall relevant vocabulary and describe it accordingly.

**SUNSHINE STATE STANDARDS**
LA1.1.6.1. The student will use new vocabulary that is introduced and taught directly. LA 1.1.6.5. The student will relate new vocabulary to prior knowledge.
LA1.4.2.1. The student will write in a variety of informational/expository forms.
SC.1.N.1.3. The student will keep records as appropriate of investigations conducted.

**MATERIALS**
- “Diary of a Worm” by Doreen Cronin
- plastic cups
- raw oatmeal
- mealworms
- student journals
- T-Chart
- large Rubbermaid container

**VOCABULARY**
- mealworm
- habitat

**DIRECTIONS**
Read the book “Diary of a Worm” to the class and lead the class in a discussion about what worms can really do and what was make believe. During this discussion, complete the T-Chart that is labeled “real/make-believe.” After the discussion and filling out the T-Chart, let the students know that they will get to observe and experiment with their very own worms. Pass out the students' journals and have them write and draw a prediction of what a mealworm is.

Once they are finished, hand out one cup per child with their name on it and pour oatmeal into the cups about an inch thick. Place two mealworms into each cup and let the children watch as the mealworms burrow into the oatmeal. Allow students five to ten minutes to have some free exploration time with the worms. Then collect the cups of worms and place them into the Rubbermaid container. Refer back to the T-Chart and point out that mealworms live in dirt or earth. Explain that where animals live is called their habitat and that the mealworms’ habitats are in piles of rocks and leaves. For the experiment though, the mealworms’ habitat will be a cup of oatmeal.

Once again, have the students open their journals and guide them in drawing and defining the vocabulary terms: mealworm and habitat. On the next page have the students name their mealworms and describe the habitat they are in at school.

**EVALUATION/ASSESSMENT**
The teacher will review the students' journal entries to ensure that they have included the prediction, the definitions, and the names and habitat description of their mealworms. Using the rubric the teacher will grade the students work.

★★★★
**SUBJECTS COVERED**
Science, Reading, Writing

**GRADES**
First, but can easily be adapted to other elementary grades

**OBJECTIVES**
1. Students will sequence and label the life cycle of a mealworm.
2. Students will compare the life cycle of a mealworm to the life cycle of a butterfly.
3. Students will recall scientific vocabulary and use it appropriately.

**SUNSHINE STATE STANDARDS**
LA 1.1.6.5. The student will relate new vocabulary to prior knowledge.
LA1.1.7.6. The student will arrange events in sequence.
LA1.4.2.1. The student will write in a variety of informational/expository forms.
SC.1.N.1.1. The student will raise questions about the natural world, investigate them in teams through free exploration, and generate appropriate explanations based on those explorations.

**MATERIALS**
- mealworms in the cups of oatmeal
- sentence strips
- student journals
- life cycle picture cards
- “The Very Hungry Caterpillar” by Eric Carle
- live caterpillars

**VOCABULARY**
- life cycle
- egg
- larva
- pupa
- beetle
- adult

**DIRECTIONS**
The teacher will read the book, “The Very Hungry Caterpillar” to the class. Then they will lead the class in a discussion about the life cycle of a butterfly and the life cycle of a mealworm using the life cycle picture cards. Hand out the students’ journals and have them write and draw a picture of the phase of the life cycle their mealworms are in. The teacher will then show the students some caterpillars for the students to use in comparison with their mealworms.

Once completed, the students may get their cup of mealworms to have some free exploration time. During this time, the teacher asks each student what phase of the life cycle their worms are in and how their mealworm compares to a caterpillar. After ample time of free exploration of the mealworms, the teacher returns the cups to the Rubbermaid container. Students are once again directed back to the life cycle of the mealworm and how it compares to the life cycle of a butterfly. Hand out one sentence strip to each student and have them draw a bridge map on it. With the teacher guiding the students, have them draw and label the mealworms’ life cycle on the top and the butterfly’s life cycle on the bottom.

**EVALUATION/ASSESSMENT**
The students’ correct completion of the bridge map will demonstrate their understanding of the concepts taught during this lesson. The teacher will review the students’ journal entries to ensure that they have included the current phase of their mealworm and the answers to the given questions. Using the rubric the teacher will grade the students work.

Upon completion of the bridge map, students will respond to the following questions in their journal:
1. How are the mealworm and butterfly’s life cycles different?
2. What will be the next phase your mealworm will be in?
3. How is your mealworm the same/different from a caterpillar?

2011 - 2012 IDEA CATALOG OF EXCELLENCE
**SUBJECTS COVERED**
Math, Science, Writing

**GRADES**
First, but can easily be adapted to other elementary grades

**OBJECTIVES**
1. Students will measure and record the lengths of the gummy worm.
2. Students will note any changes their mealworms have made and record those changes.

**SUNSHINE STATE STANDARDS**
MA.1.G.5.1. The student will measure by using iterations of a unit and count the unit measures by grouping units.
SC.1.N.1.1. The student will raise questions about the natural world, investigate them in teams through free exploration, and generate appropriate explanations based on those explanations.
LA.1.4.2.1. The student will write in a variety of informational/expository forms.

**MATERIALS**
- gummy worms (one per student)
- gummy worm worksheet
- mealworms in the cups of oatmeal
- student journals
- rulers (one per student)

**VOCABULARY**
- measurement
- centimeters

**DIRECTIONS**
The teacher will pass out the gummy worm worksheet, rulers and gummy worms to the students. The teacher will guide the students through the completion of the worksheet.

Once finished, the students will get their mealworms and engage in free exploration of the mealworms. During this time, the teacher will talk with each student about any changes their worms may have made, including if any have shed their skin or moved into a different phase of the life cycle.

After an appropriate amount of time, the students will get their journals and answer the following questions:

1. How has your mealworm changed?
2. How are your mealworm and the gummy worm the same/different?
3. What is something neat you have observed about your mealworm?

**EVALUATION/ASSESSMENT**
The teacher will review the students' journals to see that they have completely answered the questions. Using the rubric, the teacher will grade the students work.

**EVALUATION/ASSESSMENT**  ★ ★ ★

2011 - 2012 IDEA CATALOG OF EXCELLENCE
SUBJECTS COVERED
Science, Math, Writing

GRADES
First, but can easily be adapted to other elementary grades

OBJECTIVES
1. Students will complete a variety of experiments on their mealworms.
2. Students will appropriately use science and math tools.
3. Students will record the findings of their experiments.

SUNSHINE STATE STANDARDS
SC.1.E.5.3. The student will investigate how magnifiers make things bigger and help people see things they could not see without them.
SC.1.N.1.3. The student will keep records as appropriate of investigations conducted.
MA.1.G.5.1. The student will measure by using iterations of a unit and count the unit measures by grouping units.
LA.1.4.2.1. The student will write in a variety of informational/expository forms.

MATERIALS
- mealworm experiment worksheet
- ruler
- magnifying glass
- water dropper
- mealworms in the cups of oatmeal
- student journals

VOCABULARY
- experiment
- dropper
- magnifying glass

DIRECTIONS
Have the students get their mealworms and a copy of the mealworm experiment handout. The teacher will guide the students through the different experiments listed on the worksheet. If there are students whose mealworms have both turned into pupas, the teacher will supply that child with a third mealworm so that they may participate in the experiments. Upon completion of the experiments, pass out the students’ journals and have them describe three of the experiments they just did and their results.

EVALUATION/ASSESSMENT
The students’ completion of the experiment worksheet will be evaluated as well as their journal entries will be graded using the rubric.

★ ★ ★
SUBJECTS COVERED
Science, Writing

GRADES
First, but can easily be adapted to other elementary grades

OBJECTIVES
1. Students will make observations of their mealworms to determine if any changes have occurred.
2. Students will use scientific vocabulary in their recordings of the mealworms life cycle stage.

SUNSHINE STATE STANDARDS
LA1.4.2.1. The student will write in a variety of informational/expository forms.
SC.1.N.1.3. The student will keep records as appropriate of investigations conducted.
SC.1.N.1.1. The student will raise questions about the natural world, investigate them in teams through free exploration, and generate appropriate explanations based on those explorations.

MATERIALS
• mealworms in the cups of oatmeal
• student journals

VOCABULARY
✓ larvae
✓ pupa
✓ adult
✓ shed

DIRECTIONS
On the days that the students are not involved in the other 4 lessons, they may get their cup of mealworms and be allowed some free exploration time with them, recording their findings of the day as well as the answers to any questions the teacher may ask.

★★★
## Materials Budget

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<th>SUPPLIER</th>
<th>ITEM DESCRIPTION</th>
<th>COST</th>
<th>QUANTITY</th>
<th>TOTAL COST</th>
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<td>Walmart</td>
<td>clear plastic 9 oz. Solo cups</td>
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Subtotal $198.66

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Teacher’s Name: **Theresa Benedetti**

Teacher’s Name: **Megan Higgins**

School: **Caldwell Elementary School**
<table>
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<th>Participation</th>
<th>0 points</th>
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<tbody>
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<td>I did not participate at all.</td>
<td>I participated in 1 of the 3 activities.</td>
<td>I participated in 2 out of the 3 activities.</td>
<td>I participated in all of the activities.</td>
<td>I participated in all of the activities and helped out others when needed.</td>
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<tr>
<td>The mealworm stages- bridge map</td>
<td>I cannot name the 4 stages of the mealworm.</td>
<td>I can name 1 of the 4 stages of the mealworm.</td>
<td>I can name 2 of the 4 stages of the mealworm.</td>
<td>I can name 3 stages of the 4 stages of the mealworm.</td>
<td>I can name ALL 4 stages and in the correct order.</td>
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<td>Life cycle Experiment book</td>
<td>The book was incomplete.</td>
<td>I completed 1-2 out of the 5 experiments.</td>
<td>I completed 3 out of the 5 experiments.</td>
<td>I completed 4 out of the 5 experiments.</td>
<td>I completed the experiment book.</td>
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<td>Journal/ observations</td>
<td>The journal was incomplete. The entries were messy.</td>
<td>I completed 1-2 out of the 6 journal entries. I used some of the vocabulary.</td>
<td>I completed 3 out of the 6 journal entries. I used some of the vocabulary.</td>
<td>I completed 4-5 out of the 6 journal entries. I used some of the vocabulary.</td>
<td>Journal was completed. I used all the vocabulary correctly taught (habitat, egg, larvae, pupa, beetle).</td>
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<td>0-2 Points U</td>
<td>2-4 Points D</td>
<td>5-7 Points C</td>
<td>8-10 Points B</td>
<td>11-16 Points A</td>
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