Holdenville Education Foundation
P.O. Box 641 ◇ Holdenville OK 74848
info@hef4ourkids.com

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Grants to Teachers Application

Cover Page

Please use a typewriter or word processor to complete the application.
Submit in the format listed below.

Date: March 19, 2009

Grant Title: "Fast Plants"

Grant Applicant: Silvia McNeely

School: Holdenville High School

Grade Level(s): 8th and other Life Sciences (Botany)

Content Area: Science

Total Dollar Amount Requested: $850.20

Signature of Grant Applicant

Signature of Building Principal

Please mail applications to: Holdenville Education Foundation
P.O. Box 641
Holdenville OK 74848
Attn: Teacher Grants Committee

If you have any questions or need further assistance, please contact Shellie Gammill at 379-5483

Funded

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1. **What is the major educational need this grant address?** The major educational need is to allow students to explore a scientific fact and/or concept by engaging in a genuine scientific inquiry. This project, "Fast Plants", allows the learners to visualize changes on a daily basis, right in front of their eyes. A "Fast Plant" investigation can provide students with a hands-on experience that generates evidence for understanding biological concepts at all levels. For example, this project can be used to inquire about:

- ecology, environment, and interactions between abiotic and biotic factors
- energy and nutrient cycling
- genetics simulations
- genetics, variation, heredity, and evolution
- germination
- growth and development in plants
- life cycle in flowering plants
- physiology
- plant growth simulation
- reproduction
- brassica butterflies

This project reinforces the more than half of the pass objectives listed, that we as educators are required to teach. In according to state regulations, students are expected to be able to use critical thinking skills within a lab setting. This innovative, kinesthetic approach will help internalize basic concepts regarding to the scientific process.

2. **How many pupils will be affected by this project, both directly and indirectly?** Approximately 90 immediate students will be affected, but not limited to, for the high school sciences will have access to this equipment and supplies to investigate deeper biological concepts regarding to botany. Lesson plans will be available for the upper level sciences upon request. Hopefully, this project will ignite an interest in science within the younger learners, so they would possibly venture into more science based classes in their future academia.

3. **Describe your grant methods, materials, and objectives.** To fulfill the following Oklahoma PASS objectives in science, the following standards will have a sample activity.

- **Process Standard 1: Observe and Measure**

Observe/measure plants. Students draw plants, record height and note stem/leaf color. Each student is responsible for completing and handing in the data sheet. Group will have two students responsible for watering and two students responsible for recording observations.

- **Process Standard 2: Classify**

Students will remove parent plants (P1 and P2) from student growing systems. Teachers maintain parent plants separately for classification purposes. .They will identify the type of variation that is seen among the plants, for example they will compare their fast plants with other plants such as those produces from the mustard seeds.

- **Process Standard 3: Experiment**

Students will take their extra parent plants and place them into dark canister that will be exposed to three different light spectrums and predict which color will draw them (tropism-light stimulation).

- **Process Standard 4: Interpret and Communicate**

Student will collect data on a daily basis and in the conclusion of this project will create a data chart along with a graph showing the comparison between other lab members. Then they will evaluate their data and develop reasonable explanation and/or predictions on questions that I, the instructor, will present to the learners.

- **Process Standard 5: Inquiry**

Student will use systematic observations, make accurate measurements, and identify and control variables when doing the activity dealing with tropism. (The activity where the learner will be placing parent plants within the canister that have the 3 different color of light entering within.) They will formulate and evaluate explanations by examining and comparing evidence, pointing out statements that go beyond evidence, and suggesting alternative explanations.

- **Standard 3: Diversity and Adaptations of Organisms**

Students will consider details of internal and external structure of the plant and their survival by pollinating their specimen with dehydrated bees. Students will do the following: observe pollen under a microscope, observe the parts of the flower (male and

female reproductive organs)/bee anatomy, will witness how the pollen will cling to the stigma and participate in the development of new seeds.

The Wisconsin Fast Plant seed Challenge: Exploring Life Cycles Kit - Students can grow plants through an entire life cycle in only 40 days while tending, observing, and measuring their plants. Learn what a plant needs to properly produce healthy seeds. Kit is designed for use by up to 32 students and contains everything you need to complete the activities including seed, an automatic watering system, planting units, pollination materials, plant stakes, pot labels, fertilizer, activities, and growing instructions booklet. Automatic watering system provides sufficient water to last for three to four days. Kit is reusable.

Full-Size Mobile Light Cart: This mobile light cart features three fixed shelves, 1" square aluminum tube construction, four 22" x 11" plant trays per shelf (total of 12 trays), and 3" wheels. It is easy to assemble and is easily transported from class to class. Overall dimensions: 74" H x 53" L x 23" D; 23" between shelves. It requires one light fixture per shelf. This cart will hold 96 plants specimens. This lighting system is required in order for the growth of the plants to be rapid.

Light Fixtures for Full-Size Mobile Light Cart: These lights have knobs on each end for easy height adjustment. Features all white aluminum body, on/off switch, three-wire grounded 48" cord, lower operating temperatures, enclosed ends, and a three-wire convenience receptacle. Can be timer operated. Two 40 watt wide-spectrum lamps included. 48" L x 15" W x 2" H. These light fixtures will be attached to the mobile cart.

4. **Time Schedule:** The time of implementation will be within the first part of the second semester of the school year. Specifically, toward the end of January of 2010 and this project will last approximately 3 to 4 weeks. Other teachers who wishes to use these materials will schedule throughout the school year.

5. **Detailed Budget Request:**

   Wisconsin Fast Plants Seed Challenge: Exploring Life Cycles Kit: Will need 3 sets, since one kit will only provide for 32 students. *$68.25for each kit* ***(total: 204.75)***

   Full-Size Mobile Light Cart: This cart will hold approximately 96 plants specimens. It will become easy when transport from class to class. The *cost is* **$218.25**

   Light Fixtures for Full-Size Mobile Light Cart: Will be needing 3 sets at 106.25, one set for each shelve (and there are three shelves) ***total: 318.75***

   The shipping and handling for all of these items will be **$103.45**; however the consultant informed me that this price could increase within the next 60-90 days due to fuel cost. Therefore I am requesting an additional $5 dollars to cover the expense if needed.

6. **Evaluation:**

   The methods that I will be using to measure and evaluate student success, is through the concept of "project based assessment". My students will be required to present their journals with all of their daily observations and recorded data. They will exhibit their findings through the means of charts, graphs, drawings and evaluation statements. In addition, they will have written evaluations produced by the instructor. Finally, the state test "OCTT" will also be utilized in determining the success of this project.