

Project Title: **Bringing Enthusiasm and Butterflies to Ecosystem Studies**

Address: Bixby High School
601 S. Riverview

City: Bixby, OK
ZIP: 74008

Contact Name: Kathy Pursley, Bixby High School

E-Mail Address: Kathy Pursley: pursley2@olp.net and kpursley@bixbyps.org

Position/Relationship to Project: 9th grade science teacher, High School Project Teacher

Daytime Phone: Kathy Pursley: 918-366-2222, ext 2424 classroom

School or Organization: Bixby High School, Bixby Public Schools

Evening Phone: Kathy Pursley: 918-XXX-XXXX

School District: Bixby Public Schools

Fax Number: High School: 918-366-2363

Finance Officer/Phone: Sherry McIntyre, Treasurer
Bixby Public Schools
109 N. Armstrong
Bixby, OK 74008

Grade Level(s)/Number of Students Targeted:

High School: approximately 90 high school students per trimester [270 per year]

Working with approximately 100 6th grade students per year

FEI# (tax ID# starting with 73-): #73-6021235_

Name of Grant Applying for: General EE

Bringing Enthusiasm and Butterflies to Ecosystem Studies

Overview:

This proposal is requested to build a butterfly garden at Bixby High School. Students from Bixby's high school will also work with Bixby's Brassfield 5/6 Center students who are proposing a separate grant to create butterfly gardens at that school. This vibrant and beautiful learning environment will be used to create enthusiasm for the study of local ecosystems, life cycles, and the scientific method. Maintaining this microcosm of insect habitat will have the added benefit of instilling a sense of ownership and responsibility. Coming together to share observations and ideas will allow students from both schools to be both researchers and teachers.

Description:

With the supervision of the teachers and visiting experts, students will design a native plant garden to attract the Monarch and Swallowtail butterflies.

The high school students will develop their garden in a raised bed in a sheltered area of the school ground. The high school students will work together with the sixth grade students on their container gardens too. Both age groups will monitor plant needs and butterfly needs by making and recording scientific observations in group journals. These observations will include the number, variety, and life stage of visiting animals; the growth and development of the plants; and the maintenance requirements of the butterfly garden. Measurements of soil pH and moisture will also be made.

Goals and objectives:

The project will provide insights into native flora and fauna, help students develop appreciation for Oklahoma's natural environment and meet the following learning goals established by the district and the Oklahoma Department of Education. Skills included for both age groups are: observing, measuring, classifying, interpreting and communicating information, and inquiry

High School biology's P.A.S.S. (state priority academic student skills) concepts to be covered include **4**, The Interdependence of Organisms (including 4-1 geo-bio-cycles, 4-2 cooperation and competition of organisms) and **6**, The Behavior of Organisms (6-1, how organisms monitor their environments, and 6-2 how organisms respond to each other and their environment through innate or learned behavior to ensure reproductive success.)

These goals articulate smoothly with the learning goals at the sixth grade center of: **4.1** Organisms within an ecosystem are dependent on one another and on components of the environment. Some source of energy is needed for all organisms. Concepts will include ecosystems, food webs and Earth's biomes. –AND- **4.2** In all environments, organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter. Other relationships may be beneficial. Concepts include: ecology and environmental conservation.

The two grade levels will meet together at routine intervals to share and compare observations. Students will work within small groups of both their peers and students from the other building. Conversations will be guided by questions designed to elicit discussions of observations and ideas for future development of the garden.

Local experts will be asked to bring their insights to the groups. Students will be encouraged to use seeds and cuttings to create their own butterfly garden at home.

Students will observe, question, and seek understanding of native plants and animals through frequent interactions with a butterfly garden. Student/teacher and student/mentor interactions will improve understanding and interest by allowing older students to serve as teacher/mentor and model for younger students.

Implementation:

As soon as the grant is awarded, high school biology students will begin to research the life cycle needs of Monarch and Swallowtail butterflies. All students will plan and create the sixth grade's container- and the high school's raised-bed gardens. As soon as weather permits, students will install the gardens and begin planting. Beginning in the spring of 2008, students will begin observing and monitoring the butterfly gardens. High school students will help the sixth grade students set up their container gardens. Sixth grade students will visit the high school garden and make observations. By creating gardens at the two nearby locations, effectively doubling the availability of habitats, students will offer the butterflies a greater chance of finding and reproducing at the sites. Students from both schools, during coinciding class periods, will conduct meetings to plan, share observations, ideas, innovations, insights about the project.

Brassfield and high school students will make routine observations of the number, variety and behavior of insect and other animal visitors to the gardens. Students will document and research life stage (egg, larva, butterfly) and size with both words and pictures. Students will perform care of the plants as needed. Students will use MicroSoft Xcel to create graphs of collected data about insect numbers and kinds, plant growth and soil conditions.

Visiting expert(s) will provide additional insights into the needs of both the native flora and fauna. These may include guest speakers from the OSU Extension Service, local growers of native plants (ex. "Wild Things"), and the State Department of Wildlife.

The project is expected to continue through the use of biennials, perennials and re-plantings of annuals. Students will prepare and present posters and/or reports of their findings which can be shared through the Department of Environmental Quality with other teachers at other schools. As the project continues, other funding sources will be sought to implement additional goals that include creating videos of butterfly behavior and life cycles and garden monitoring techniques.

Although the project is designed to meet the needs of 6th grade and high school biology science curriculum, the butterfly gardens will be available for use by other subjects and grade levels at Bixby.

Evaluation

A report will be completed and submitted to DEQ concerning the funds expended and the degree to which the listed goals were fulfilled. The report will cover goals of

- (1) installing the gardens;
- (2) informational meetings to share ideas and to observe insects and plants;
- (3) identifying, measuring and reporting insect, plant and soil data;
- (4) student data journaling; and
- (5) creating insect/plant interaction and insect life cycle reports/posters.

Project teachers will develop:

activity participation grading rubrics,
discussion questions,
instructions and student surveys.

Timeline for Implementing

Bringing Enthusiasm and Butterflies to Ecosystem Studies

Date	Activity
November 2007	Grant proposal submittal
December 2007	Grant approval notice
December 2007/January 2008	Order and obtain supplies
December 2007	Begin student literature search on insect life cycles and plant requirements
January 2008	Submit proposals to additional sources for funding grant expansion including videography
January/February 2008	Prepare seed sprouting activities
February – April 2008	Guest speaker presentations (as available to be scheduled)
February – March 2008	Prepare and plant garden bed and containers
March 2008- May 2008	Begin observations and care of garden growth and insect activity
May 2008	Students complete poster/reports
June/July 2008	Teachers perform maintenance and care of gardens
August 2008	New groups of students begin garden observation and care
October 2008 or as specified	Report of grant activities to DEQ
November 2008	Students complete poster/reports of fall garden observations
Fall-Winter 2008	Videography report preparation (depending on additional funding)

Budget

Item	Cost per unit *	unit amount	Number of units	Total
Landscape fabric liner	\$59.00	1 roll	\$1.00	\$59.00
Landscape timbers	\$4.00		33	\$132.00
Top soil	\$2.00	40lbs/bag	80	\$160.00
Plant seeds	\$3.00		8	\$24.00
Plant seeds	\$4.00		7	\$28.00
shipping for seeds	\$12.00			\$12.00
Landscape stakes/nails for timbers				\$10.00
Garden hose	\$9.00		2	\$18.00
Mister	\$10.00		1	\$10.00
garden hoe	\$9.00		2	\$18.00
Hand Trowel	\$3.00		4	\$12.00
Hand Cultivator	\$3.00		2	\$6.00
Shovel	\$5.00		2	\$10.00
tax	exempt to school			
			Total	\$499.00

List of possible plants for the garden

Joeye weed	seeds	nectar	1pkgs/\$4	4.00
Cardinal flower	seeds	nectar	1/\$4	4.00
Lemon mint	seeds	nectar	1/\$4	4.00
Wild Bergamot	seeds	nectar	1/\$4	4.00
Queen Anne's Lace	seeds	host	1/\$3	3.00
Sulfer Cosmos	seeds	nectar	1/\$3	3.00
Tickseed	seeds	nectar	1/\$3	3.00
Purple Cone Flower	seeds	nectar	1/\$3	3.00
Ox-eye sunflower	seeds	nectar	1/\$3	3.00
Pot marigold	seeds	nectar	1/\$3	3.00
American basketflower	seeds	nectar	1/\$3	3.00
Gayfeather	seeds	nectar	1/\$3	3.00
Bronze fennel	plants	host	1/\$4	4.00
Dill	plants	host	1/\$4	4.00
Parsley	plants	host	1/\$4	4.00
			subtotal	52.00
			s&h	12.00
			total	64.00

All materials and tools priced at:

LOWE'S OF BIXBY, OK #1532
 11114 SOUTH MEMORIAL DRIVE
 BIXBY, OK 74008
 (918) 369-8844
 Fax: (918) 369-8895

Seeds priced from:

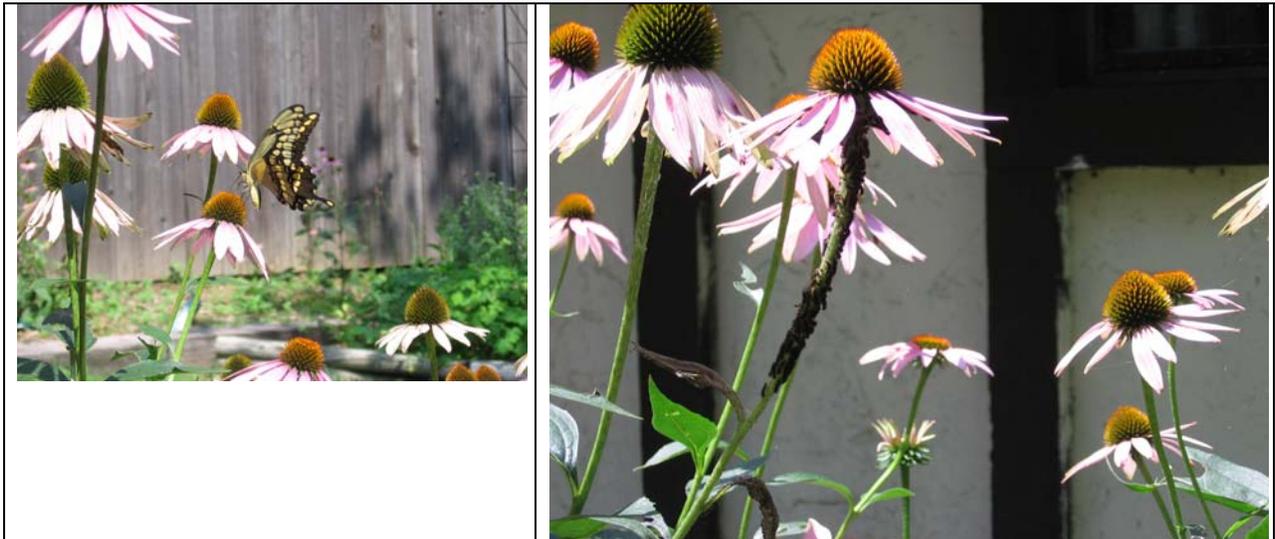
Holland Wildflower Farm
 P.O. Box 328
 Elkins, Arkansas USA 72727
 Orders: (800) 684-3734, Fax: (479) 643-2622
 Customer Service: (479) 643-2622 Questions/Problems
 Web price list: http://www.hollandwildflowerfarm.com/pricelist_full.pdf
 Email: hwildflowerfarm@yahoo.com

Designated Area for Project



Area Designated for Butterfly-way Garden at Bixby High School.

This southern exposure, sheltered from the north wind and intense west sun, is perfect for a sunny patch of flowers butterflies would love to visit.



Left: Swallowtail nectaring on purple coneflower. Right: Caterpillar nursery on purple coneflower. Picture these and many more in barren space above.

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Dr. Kyle Wood, Superintendent
(918) 366-2200
<http://bixbyps.org>

Department of Environmental Quality
Attn: Environmental Quality Education Committee

To Whom It May Concern:

I support the grant proposal by Kathy Pursley, High School Biology teacher. The grant will cover cooperative learning activities between the High School biology students and the Brassfield 5/6 grade center's sixth grade science students in Ms. Christa Askins' classes.

The proposed use of school grounds has been clearly outlined and will prove beneficial as a learning tool for many classrooms as well as be esthetically pleasing. Water use to support these learning gardens is an acceptable expense.

Travel between the two schools for the benefit of both classes will not be a concern as both schools are within walking distance of each other. Currently, Brassfield 5/6 students walk to the High School to use the auditorium for plays and assemblies.

The long-term benefits of hands-on, interactive learning for the students should far outweigh any additional cost to the school. The life lesson of responsibility for such an undertaking, as well sense of pride and accomplishment will ultimately benefit Bixby's community at large.

Sincerely,

Bryan Frazier

Bryan Frazier
Principal
Bixby High School
(918)366-2234