

Expanding Ecosystems

Classroom Grant

Meadowlark Elementary

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Application Form

Report Fields

Project Name*

Name of project

Expanding Ecosystems

Amount Requested

Amount requested on application.

\$1,000.00

Grade Level

Please select grade level below.

Intermediate (4-6)

Primary Subject Area

Please select the primary subject area of your grant.

Science

School

Please select your school from the list below

Meadowlark Elementary

Number of Students Served

Please enter the number of students that will be served by this grant.

450

Project Cost

What is the total cost of your project?

\$1,273.96

Statement of Need

Please describe the need for this project. For example, how will this project impact student learning?

Students in elementary schools all over the world are deficient in their knowledge of science. Far fewer students are leaving high school with a passion to pursue a career in the science field. However, I have seen first hand the power of exploratory science. I have seen students identify a problem, devise a research plan to solve the problem, put their research into practice, and analyze results. I have seen all of this completely

without the use of a textbook and in a completely self-motivated fashion. This project is designed to further this joy of science while integrating it into several other subjects.

This project will introduce students to a new style of learning. With the help of the Education Foundation, I have been fortunate enough to implement a fascinating underwater ecosystem in my classroom. 2 years ago, my class completely set up an amazing saltwater reef tank, stocked it with inhabitants, and even performed maintenance on the system after school. I was able to use it to teach almost every aspect of the sixth-grade science curriculum, and integrate it into every subject throughout the year. The students had a tremendous amount of vested interest in the project, and still come and visit their "creation". This year I expanded the project to include a coral propagation tank. I noticed that the students did not have as vested of an interest in this project as the students did the year before. I believe the students were not allowed as much exploratory science because the main tank was already set up. Therefore, I have devised a new project so that next year's students are able to set up an ecosystem from scratch again. Not only will this get students excited to learn about science, but I will then be able to switch between ecosystem projects so that each new class has that same vested interest as the first class did.

This project will impact not only my students' learning, but the learning of all other students in the building. It is not uncommon for a second grade or kindergarten class to tour through the room to check out the ecosystem we currently have set up. This has opened up the opportunities from the students mainly learning for themselves, to teaching younger students as well. Buddy classes and the other sixth-grade class will receive even more exposure to our work. I like to organize an open house in our room where the entire school is invited in for a science exposition covering everything my students have learned throughout the year.

Without the use of a scientific focal point in the form of this proposed project, students are limited to exposure to scientific ideas only through outdated textbooks, and bottled experiments. I can attest to the fact that when students are able to see the direct impact of these difficult science principles, they not only learn more, but they retain information for years to come. So much of the science they have seen has been with guaranteed results. Experiments that come in our current curriculum do not allow for students to see how science is not always concrete. I know the sense of pride my students will get from this project will spark curiosity in the fields of science. It will also spark interest in self-guided research by the students. If I could find a way to teach every subject the way I've been teaching science, I would do so without question. Students need to see that while math and reading are extremely important in their lives, there is a lot of need around the world for people with a strong science background as well. This project will help to show them that.

Primary Goal

Please describe the primary goal of the project and how it blends with School District 2 goals and curriculum.

The goal of this project will be to bring kids in direct contact with science. I aim to tackle at least 4 of the 5 science curriculum areas using this one piece of equipment for this year, and for the years to come. I want to virtually replace our outdated science textbooks, and introduce students to the amazing realm of research, application, and presentation of their own knowledge. The goal is integrate the setting up, observing, and maintaining of the ecosystem into several facets of the sixth-grade curriculum. I plan to target science primarily, but also math, social studies, reading, and writing. As I already target all of these areas, this project will allow me to do it with a hands-on, inquiry-based ecosystem that students will be proud of, and they will be forced to work as one collected group in order to achieve a thriving tropical ecosystem.

Project Description

Briefly identify the major activities and materials involved in your project.

With this project, the students will work independently, in teams, and as a class to design, setup, monitor, and maintain a tropical ecosystem. Within this tropical ecosystem, we will be placing various species of

poison arrow frogs. These frogs pose absolutely no danger to the students, but do provide an awesome way for students to study life cycles, biology, husbandry, and classification of some of the most interesting animals in the world. Students will be able to observe the development of frog eggs, and then see the marvel of the tadpoles' metamorphosis into frogs. Students will understand the life cycle even better as we watch fruit fly larva constantly changing from pupa into adult flies. On top of this, the ecosystem will be teeming with live plants. These plants are unlike plants that students probably see on a day-to-day basis, as they will be truly tropical. Species such as bromeliads, ferns, and tillandsias will give students a wide variety of plants to study within the ecosystem. The students will observe and research how photosynthesis provides food for plants, and how the plants change the oxygen and carbon dioxide levels of their surroundings. The ecosystem will give students a real-life model of their own world around them. This will give them an up-close model of the water cycle, effects of a changing photoperiod, and even an understanding of what pollution can do to an ecosystem.

To achieve this high level of learning, I will need a standard 75-gallon fish tank with glass tops and a stand to set it on. We will model the back to look like real rocks out of Styrofoam and cement. On the bottom of the tank, we will use a hydroton base, topped with an eco-mix of soil, sand, and leaf fibers. To achieve a true tropical environment, the ecosystem will need full spectrum lighting in the form of a T-5 lighting strip. To maintain a rainforest-like atmosphere, we will use a misting machine to water plants and frogs throughout the day. This will make up the main ecosystem. All that is left to add at that point is live plants and live poison arrow frogs. I estimate being able to have at least 15-20 plants, and around 8-10 frogs.

To setup the ecosystem, the students will need to provide the needed research to determine what parameters are correct for the desired outcome of the tropical environment. They will need to discover what temperature our tank will need to be, what humidity is best, and how to put our materials together. Even more, students will need to research which species of plants are best suited for this humid environment. The students will also need to choose the species of arrow frogs they wish to put into our rainforest. They will need to be sure the species can all cohabitate, and come to an agreement of which species will thrive the best in our tank. All of this requires the use of technology and written references to find useful and credible information. Students will constantly be practicing their research skills throughout this project. They will also be constantly presenting the information they've found.

Because this project will be on a budget, students will also be working on budgeting their spending for their frogs and plants. This is just the beginning of how math will be integrated into the project. I fully intend to incorporate the graphing of water parameters in the tank, and the charting of the changes in humidity throughout the day, week, and month. This project will also spread into the language arts in forms of creative writing, poetry, and several expository text assignments stemming from students' research. With the new presence of the Common Core Curriculum, this project will offer the launching point for most all of the student-inquisition learning, increased levels of research, typing, and presenting. I will use the frog enclosure as my link between our old curriculum, and the high demands of the Common Core.

Professional Development

If your project includes professional development how will it improve student performance?

This project does not require any specific professional development courses. However, I am a constant student, and read several articles and books on this subject every year. I also have extensive experience with this type of ecosystem, which will help guide me through this process. I have long had a passion (and even a career) in animal husbandry and herpetology. Through this hobby, I have learned many of the scientific principles I teach to my students on a daily basis. Therefore, this is the reason I want to expand my love of science and ecosystems in the classroom. I have attached a couple of the systems that I have designed for my own personal hobby. The ecosystem I plan to set up in my classroom will be very similar to these.

Project Timeline

When will you implement your project?

This project will start within the first month of the 2013 school year. Students will begin their research immediately with hopes of getting the enclosure set up by Thanksgiving. This will give several weeks for vegetation to grow in, and the ability for students to monitor the ecosystem's parameters. During this time, students will also begin getting an ample supply of fruit fly cultures ready to feed the frogs. Then, we should be able to put frogs into the tank before the winter break. By the end of the year, we will have a completely thriving tropical ecosystem. I will leave the ecosystem set up throughout the next school year when the class focus will return back to the underwater ecosystem project. The following year, the students will start this project all over again. This cycle should be able to continue for several years.

Plan for Evaluation

How will you evaluate student outcomes for your project?

The end evaluation for this project will ultimately be the success of our ecosystem. If by the end of the year, the ecosystem is thriving with a lush growth of tropical plants, and healthy arrow frog specimens that have either begun the reproductive cycle, or who have already produced offspring, I will know our project has been a success.

However, to get to this point, I will be providing several group sets of research questions that students will need to research in groups and present their findings to the class. I also plan to conduct mini-lectures on the several scientific concepts the students have been introduced to. Assessments will come in the form of written essays, multiple choice questions, and group presentations.

Along with these, each student will have and maintain a science notebook. Within these science notebooks, students keep track of their research and lecture notes. These will be graded on the students' understanding of the scientific concepts we've discussed.

Project Budget

Please identify other funding sources if applicable. You may either type or attach a budget.

The attached budget shows the needed funds for the entire project. The budget does go over the max amount of \$1,000, but I am willing to pay the rest of the \$274.00 if awarded this grant. I believe it is worth it to achieve the results I know are possible. If any further funds are needed, my classes in the past have organized bake sales, applied for other grants, and I've even received funds from the Meadowlark PTA for the original portion of this ecosystem project. I thank the Education Foundation for the opportunities they provide educators!

ExpandingEcosystemsBudget.xlsx

Supervisor Approval*

I have received approval from my supervisor to apply for this grant.

yes

Attachment 1

Please attach any photos, pages from catalogs, or other documents below. This is completely optional.

Ecosystem1.jpg

Attachment 2
Ecosystem2.jpg

Attachment 3
Ecosystem3.jpg

File Attachment Summary

Applicant File Uploads

- ExpandingEcosystemsBudget.xlsx
- Ecosystem1.jpg
- Ecosystem2.jpg
- Ecosystem3.jpg

Budget:	
Tank	179.99
Stand	235.99
Glass Tops	45.99
Styrofoam	50
Cement	30
Cement Color	20
Cement Sealer	30
Lights	199.99
Hydroton	45
Substrate Barrier	6
Substrate	36
Plants	95
Frogs	300
	1273.96





