Let Us See the Unseen

Collaborative Classroom Grant Application

Lewis and Clark Life Science

Mrs. Tricia Jansen
1315 Lewis Ave
Billings, 59102

jansent@billingsschools.org
O: 406-281-5951

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Application Form

Report Fields

Project Name*
Name of Project

Let Us See the Unseen

Amount Requested
Amount Requested

$2,801.94

Grade Level
Program Area of Request

Middle School (7-8)

Primary Subject Area
Please choose the primary subject area.

Science

School
Please select your school.

Lewis and Clark Middle School

Applicants*
Please list the educators collaborating on this grant.

Shirley Greene
Tricia Jansen
Patricia Loken
(Lewis and Clark 7th grade life science)

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

320

Project Cost
What is the total cost of your project?

2801.94

Statement of Need

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

Within life science, seeing the microscopic world is critical. Students need to see what they are to look for under the microscope. By being able to project the field of vision, students will be able to do that. All students will benefit from this, especially the visually impaired. In order to serve them, we would like to have three ExoLab microscopes, and three iPad2s. This will give us the ability to project microscope images at an affordable cost.

ISTE's NETs Standards for Students

1. Social, ethical, and human issues. Students practice responsible use of technology systems, information and software.

2. Technology productivity tools. Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

3. Technology communications tools. Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

MT Science Content Standard 3

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment. Students gain a better understanding of the world around them if they study a variety of organisms, both microscopic and macroscopic. Through the study of similarities and differences of organisms, students learn the importance of classification and the diversity of living organisms. The understanding of diversity helps students understand biological evolution and life's natural processes (e.g., cycles, growth, and reproduction). Structure, function, body organization, growth and development, health and disease are important aspects to the study of life. The study of living systems provides students important information about how humans critically impact Earth's biomes.

3.1 Compare the structure and function of prokaryotic cells (bacteria) and eukaryotic cells (plant, animal, etc.) including the levels of organization of the structure and function, particularly with humans.

Science Content Standard 1

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.Students must understand the process of science—how information is gathered, evaluated and communicated to others. Learning by inquiry mirrors the process of science itself. The knowledge and skills related to scientific inquiry enable students to understand how science works. Inquiry allows students to construct an understanding of scientific facts, principles, concepts and applications. In addition, scientific inquiry stimulates student interest, motivation and creativity.

Safety is a fundamental concern in all experimental science. Appropriate safety procedures must be applied when storing, using, and caring for materials.

1.2 Select and use appropriate tools including technology to make measurements (in metric units), gather, process and analyze data from scientific investigations

1.6 Compare how observations of nature form an essential base of knowledge among the Montana American Indians.

Next Generation Science Standards:

MS-LS1:Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

MS-LS1-1:Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

MS-LS1-3:Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

MS-LS4-3:Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

Primary Goal

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

Every student will be able to see the microscope's field of vision, no matter their ability. Teachers will be able to show an entire class how to focus, what they should be looking for, appreciate the hidden world of microscopy, and identify various microorganisms.

The ExoLab digital microscope requires an iPad to display the image. This pairing will allow for visually impaired students to see microscope organisms and other items.

Each computer/digital device experience with our students offers an opportunity to model and expect ethical use of technology systems, information, and software.

Project Description

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

The ExoLab digital microscope when paired with iPads will allow all students to see whatever specimen is being seen through the microscope. Teachers will be using the ExoLab and iPad to project the microscopic image for class observation and discussion. In addition, the ExoLab and iPad can be taken to individual microscopes so everyone can see student findings. Being able to see the unseen is one of the foundations of life science, and for many students, this is their first experience with a standard microscope. Ensuring a positive experience is paramount!

Though the ability to project microscopic images is our primary goal, having iPads adds another dimension to our ability to have students become involved with technology. STEM (Science, Technology, Engineering and Math) standards are being integrated into our curriculum, and this would help us meet those goals. All 7th grade students take science, no matter their math or reading grade levels. iPads allow us to differentiate as needed. In addition, every lesson done in collaboration with library and teaching staff at Lewis & Clark includes an aspect of digital citizenship. Examples of this include citing sources for a research project, finding images in the public domain to use in a presentation, or talking about publishing student created work with Creative Commons attributes.

Professional Development

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

ExoLab training will be done through online training at www.exolab.com during PLC time. The teachers involved will develop lessons during PLC time. This will facilitate optimal use of the equipment within the life science department.

Project Timeline

When will you implement your project?

We have used West High's ExoLab digital microscope as well as an iPad from the library. Trish Loken was able to implement the borrowed devices into her classroom immediately when her class was using

microscopes to observe protists. Therefore, we expect to be able to use these on the first day of school, and continue to use them throughout the year.

Plan for Evaluation

How will you evaluate student outcomes for your project?

Students will be evaluated using both formative and summative assessments. Formative assessments will include lab reports and drawings, along with class discussions. Summative assessments will be our common assessments, which have been written with objectives related to microorganisms viewed during our labs. The use of the digital microscopes will ensure success for all students.

Project Budget

Please explain how the funds from this grant will be spent to support your project goal. You can either type or upload a project budget to show how funds will be used. Please identify other funding sources if applicable.

Grant.doc

The total cost of the project will be $2888.94. This will provide us with three iPads, the cases, screen protectors, dongles and three ExoLab digital microscopes. The iPads will cost $1197. The protector cases will cost $89.97. The price of the screen protectors are $29.97. The dongles to project the iPads are $87.00. The three ExoLab digital microscopes are $1485. Our goal would be to have three setups so each life science teacher has access to the devices at anytime.

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.

Screen Shot 2014-03-11 at 4.17.13 PM.png

Attachment 2

Screen Shot 2014-03-11 at 4.17.27 PM.png

Attachment 3

Screen Shot 2014-03-11 at 4.33.21 PM.png

File Attachment Summary

Applicant File Uploads

- Grant.doc
- Screen Shot 2014-03-11 at 4.17.13 PM.png
- Screen Shot 2014-03-11 at 4.17.27 PM.png
- Screen Shot 2014-03-11 at 4.33.21 PM.png

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Tax*			$0.00
Total			**$1,485.00**

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*Tax will be added to orders shipped within Washington State.

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