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| North Star Elementary School |
| Grant Proposal |
| Alcoa Foundation |
|  |
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| **2/18/2013** |

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# Executive summary

Creative ways to teach STEM education is in demand. This grant proposes a new and inovative way to present core standards. Video games in the classroom have been the center of many studies; Minecraft is a PC game that seamlessly integrates technology into the classroom. It is an open-ended and changeable game. It can be tailored for a variety of curriculum needs. Hundreds of lesson plans already exist that effectively use the game in the classroom. Minecraft allows for creative expression and development of critical thinking skills.

It is our aim to provide a diverse learning environment for the students while meeting the standards set by a competitive market. We must create a learning institution that strives for excellence through the services it provides the students. Minecraft is a full package of learning opportunities, ranging from STEM to language arts and social studies.

# Statement of need

## Description of specific problem targeted

STEM (Science, Technology, Engineering and Mathematics) education has become the focus of many schools. “There is growing concern that the United States is not preparing a sufficient number of students, teachers, and practitioners in the areas of science, technology, engineering, and mathematics (STEM).” Students are not being properly taught STEM concepts, and many of them are lagging in these ares as they reach middle school (Kuenzi, 1). STEM education needs to be integrated into the classroom, and the instructors need to be given the tools and technology to do so (Sanders, 1).

## Previous actions to deal with this need

Because of the need to improve our students in STEM education, many different programs have been created to remedy the situation. “…a partnership of industry groups and technology companies was formed to focus on creating video games to promote STEM education” (Hyatt 106). Many instructors found that there were games already on the market that allowed for the integration of technology into the classroom that improved STEM education. One specific game called MineCraft allows for the integration of engineering, design, drafting and the sciences (Hyatt, 111). There have been many instances of instructors successfully using MineCraft in the classroom. There is even a website devoted to instructional techniques and how to download a special instructor’s version of the game (http://minecraftedu.com).

## Approach and benefit

MineCraft would provide a fun, interactive way for children in the classroom to play with STEM concepts. Lessons could be centered on exploring the environment and creating different elements (depending upon the lesson). It can create a cumulative learning experience that can also support teamwork with their other classmates. The game has an option to be played in multiplayer mode. It is easy to run and does not require a high end gaming system. The controls are simple enough for a child in preschool to learn. The game is constantly being provided with different updates, which are all free.

The different task is the game includes exploration of different terrains (ranging from a desert are to a lush rainforest) gathering resources, like iron to make pickaxes, and crafting of tools and food items in order to survive.

# Project description

## Logistics

Introducing the game MineCraft into the classroom is a simple process technology wise. The game will be installed on the school’s computers and laptops. The game is also available for the IPad, however it is not a full version. Instructors will be given resources in order to create and control their “worlds.” The game will be contained on a server in which the instructor will have full access to. They will be able to restrict specific actions (such as killing other characters, destroying parts of the world, etc). Instructors can create entire worlds based upon their lesson plans. Minecraft.edu also provides premade levels, instructional sets and ideas to use and build upon.

Explanation of the MineCraft project and permission sheets will be sent home to the parents. They will be encouraged to become involved in the creative process. Logins will be assigned to the students. They will receive tutorials on how to navigate and craft within the game. They will also be monitored in order to ensure they are behaving appropriately within the game. Any misconduct will result in expulsion from the game, and an alternate task will be assigned (i.e., a research paper).

## Objectives

Objectives will vary upon the lesson being taught. However, playing MineCraft in the classroom will:

* Provide a creative learning environment in which students will learn from experience
* Create a social atmosphere that will encourage teamwork
* Incorporate their daily lessons into the game while encouraging critical and creative thinking
* Give the students motivation to overcome challenges with creative solutions and risk taking
* Allow teachers to seamlessly and effectively integrate technology into their curriculum

## Evaluation of Project

The Evaluation of the project will be conducted internally using a combination of qualitative and quantitative methods. The evaluation will attempt to measure both cognitive and social progress within the class. Satisfaction with the course will also be measured on the student’s behalf as well as the teacher’s. The following tools will be used:

* Pretest and posttest regarding curriculum taught
* Interviews with the students and the teachers
* Observations conducted twice a month
* A rubric to evaluate the progress of the students socially (to be filled out by the teachers) \*See appendix

# Budget

## Financial description of the project

Minecraft.edu is a website affiliated with the creators of Minecraft, and they offer special discounts to classrooms that use the game for educational benefits. The cost for a set of 25 game licenses is $335 USD. The games will be installed on school computers, and will be able to be reused for future classes. Updates to the game are free of charge. The game can be linked up to a internal server. Support for this is provided on the website free of charge.

In addition to the game, there is a custom mod (add-on) available for purchase. It is specifically designed for classroom use. Many lesson plans on the website include the mod. The cost is 41 USD for unlimited school use.

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| Description | Amount | Total |
| Minecraft (25 licenses) | 4 classrooms | $1340.00 |
| Minecraft Mod | 1 | $41.00 |
|  | | $1381.00 |

# Organization of information

## History of School

North Star School District includes the following boroughs: Boswell, Stoystown, Jennerstown, and Hooversville and Jenner and Quemahoning townships. North Star Central Elementary School is located in Boswell, Pennsylvania. The name North Star was taken from a local highway that was named the North Star Way. It has since lost its name, however in favor of U.S. Route 219. In 2010, the Pittsburgh Business Times ranked North Star School District 295th out of 493 Pennsylvania school districts. The ranking was based on three years of student academic performance on the reading, writing, math and two years of science PSSAs.

## Audiences and Services

The North Star School District is dedicated to creating a learning atmosphere for its students. They strive to provide them with the skills needed to successfully develop their academic, technological, physical, artistic, and social potential. The school encourages support systems encompassing the family, community, and local businesses. This will empower the students so that when they graduate, they are productive citizens of society that embrace lifelong learning.

Conclusion

This grant will promote critical and creative learning in the classroom. Minecraft provides advanced solutions that are easy to implement within the classroom. Students will be able to play an interactive software solution while learning crucial core standards.

The grant will cover the entire cost of the license. The game will be able to be used multiple times, providing collaborative experiences for current and future students at North Star Elementary school.

# References

Kuenzi, Jeffrey J., "Science, Technology, Engineering, and Mathematics (STEM) Education: Background, Federal Policy, and Legislative Action" (2008). Congressional Research Service Reports. Paper 35.

Hyatt, K.J., Barron, J.L., Noakes, M.A. (2012). Video gaming for STEM education. In S. Wang and H. Yang (Ed.), Cases on Formal, Non-Formal, and Informal Online Learning: Opportunities and Practices.

# Appendix

Collaborative Work Skills Rubric

Student Name

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CATEGORY | **4** | **3** | **2** | **1** |
| **Focus on the task** | Consistently stays focused on the task and what needs to be done. Very self-directed. | Focuses on the task and what needs to be done most of the time. Other group members can count on this person. | Focuses on the task and what needs to be done some of the time. Other group members must sometimes nag, prod, and remind to keep this person on-task. | Rarely focuses on the task and what needs to be done. Lets others do the work. |
| **Attitude** | Never is publicly critical of the project or the work of others. Always has a positive attitude about the task(s). | Rarely is publicly critical of the project or the work of others. Often has a positive attitude about the task(s). | Occasionally is publicly critical of the project or the work of other members of the group. Usually has a positive attitude about the task(s). | Often is publicly critical of the project or the work of other members of the group. Often has a negative attitude about the task(s). |
| **Monitors Group Effectiveness** | Routinely monitors the effectiveness of the group, and makes suggestions to make it more effective. | Routinely monitors the effectiveness of the group and works to make the group more effective. | Occasionally monitors the effectiveness of the group and works to make the group more effective. | Rarely monitors the effectiveness of the group and does not work to make it more effective. |
| **Working with Others** | Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together. | Usually listens to, shares, with, and supports the efforts of others. Does not cause "waves" in the group. | Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member. | Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player. |
| **Pride** | Work reflects this student's best efforts. | Work reflects a strong effort from this student. | Work reflects some effort from this student. | Work reflects very little effort on the part of this student. |