

### Abstract:

The Playground Project was a project that was created as a new STEM, Science, Technology, Engineering and Mathematics, activity that meets Pennsylvania standards but that connects all curriculum, content, learning activities and assessments. This project was designed for third grade students who will be given a task that they must complete: to build a replica of a playground to help their school when creating a new playground for their schoolyard.

## The Playground Project

This project, The Playground Project, was created during an upper level class of the Integrative STEM Education minor. The Integrative STEM Education minor is new to Millersville University. STEM; Science, Technology, Engineering and Mathematics is a new and upcoming concept within the classrooms. Teachers are now incorporating those four, along with a few others, subjects into many different subjects during regular classroom instruction. During the Millersville class; EDTE 490, Integrative Learning using Experiential Strategies is the second to last during the six-class process of the minor. In the class, students are asked to create many different assignments that can integrate the different STEM concepts into different lessons. Also during the course, the students reviewed different STEM curriculum that has created by different companies that are popular amongst teachers. One of the assignments that the class was asked to complete was the 'Integrative STEM Curriculum Project'. During this project, the class was asked to demonstrate the ability to design and create a new integrative STEM activity based on standards.

Throughout the assignment, there were several components that were required when creating the curriculum. The requirements were: introduction or overview, standards, goals or objectives, design brief, implementation instructions, assessments, tools materials & supplies, classroom guidelines, references, and sample product/solution. For the assignment, the project was intended for third grade students who are to imagine that the situation they are given is something that they are currently experiences. The third grade students would be designing a new playground for their school since the old playground is unsafe and dangerous to play on. The students will be designing and building a replica of their new, dream, playground for their school. The project is intended to take over a six to seven day period for one period of their day, which is 45 minutes. The curriculum is intended for students to work in groups of three. Although the students have much freedom to create a playground they would love to have for their school, they have specific requirements they must follow. The students' playground must have three different simple machines that are



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#### Design Brief

##### Context

In class we've been learning about money: exchanging, purchasing and managing dollars and cents. We have also been learning about simple machines and their functions. Your playground at school is unsafe and dangerous to play on at recess. Based on the topics we have been learning, you will act as engineers and builders to help solve the playground problem.

##### Challenge

You engineers will work in groups of three to design and build a new playground for you and your classmates to play on. Since building an entire playground is a great deal of work, you will be building a replica of what the new playground would look like. Design four playgrounds before selecting which playground your group will build and design. Your team will only have \$5,000 to spend on materials that you will need to build the playground.

##### Criteria & Constraints

- Each group only has \$5,000 to spend on materials
- Playground must have two different types of simple machines that are present on the playground.
- Complete the design log throughout the process
- Replica of designed playground must be at least 12 inches tall



Throughout the process of this assignment, the students will be completing a Design Log and Notebook. The Design Log and Notebook is designed to help keep the students thoughts organized throughout the process. This notebook is where the students will keep their drawings of the four different possible solutions of what they would like their replica of the playground like would like on their schoolyard. On top of the drawings of the possible solutions, the students will need to draw the final solution that the group has chosen to build and design. After the students have drawn their selected design, they are asked to answer a few questions that will allow the students to think deeply about why their final solution was chosen. After that section, the students are given another set of questions that will require deep thinking to help them process their thoughts during the assignment. Having the students complete these set of questions will help them relate their previous work to the work that they are continuing on. After that section, the final section, which is to be completed after the students have built their replica of their playground, design. These questions will allow the students to reflect on different parts of the assignment, such as the materials that they have purchased, the simple machines that were included and other parts.

After creating this entire assignment, the final part of the assignment is to build an example of what a replica could look like. Having done the worksheets and building a replica that goes along with the packet that was completed prior to handing it in, allows a teacher to understand challenges that the students may face during the process. This project that is given to students incorporates the STEM areas throughout the project by the following: science, which is incorporating the simple machines into the playground, engineering, which involves the construction of the playground replica and mathematics, which is when the students are constructing the purchasing log which consists of money. By creating a project for students that involves them to create a playground for their school, allows them to be able to relate to the project. The students are exposed to their school playground on a daily basis, which they are able to relate to. The students know what they would like to have in a playground but by adding the different restraints requires the students to think about the different aspects that belong on a playground and how they can relate to science.

**Design Log & Notebook**

**The Playground Project**

Name: \_\_\_\_\_

Group Members Names: \_\_\_\_\_

**Complete Before Starting To Build**

1. What is the problem your school has?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. How are you going to fix the problem the school has?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. What are four solutions you could create to help your school? Please draw 4 different possible options

Possible Solution 1:  
\_\_\_\_\_

Possible Solution 2:  
\_\_\_\_\_

Possible Solution 3:  
\_\_\_\_\_

Possible Solution 4:  
\_\_\_\_\_