

# Project Grant Application

## APPLICANT'S ORGANIZATION

Example High School

## ORGANIZATION'S WEBSITE

Example High School website

## ORGANIZATION'S ADDRESS

Example Address  
Example City, Alabama 12345  
United States

## PROJECT LEADER'S NAME

John Doe

## PROJECT LEADER'S EMAIL

email@domain.com

## ARE ANY OF THE PROJECT ORGANIZERS MEMBERS OF ACERS, KERAMOS, OR AN AFFILIATED MATERIALS SOCIETY (WORLDWIDE)? IF YES, PLEASE LIST MEMBER AND AFFILIATION BELOW.

N/A

## PROJECT TITLE

Materials Science: Metals v. ceramics/glass

## ANTICIPATED START DATE

08/25/2024

## ANTICIPATED END DATE

04/25/2025

## TARGET AUDIENCE

Materials Science Students at Example High School

## APPROXIMATE NUMBER OF PEOPLE SERVED BY THIS PROJECT

50

## GEOGRAPHIC AREA TO BE SERVED BY THIS PROJECT

Area around Example High School

## PROJECT SUMMARY

This project will be implemented in my materials science course, where students will interact with all types of materials. So, every lab in these kits will be utilized. I am planning to focus this project on metals and ceramics. During my ASM camp metals were described as "wannabe" ceramics, which really stuck with me. So, I plan to take some time to focus on comparing and contrasting these two types of materials. To do this, I want to expand on the metals labs included in the kits and create an additional station for my students. This new station will be focused on the malleability metals. I have a bunch of glass rods in my classroom already to expand on my glass stations. In my glass stations, students will create a glass stir rod and a raku pot. I want my students to take away something from the metals stations too, so this project's goal will be to create bracelets. Students will add designs to these by stamping flat metal, and then bending it to shape showing malleability.

These kits along with the project are essential because this is the first year my school will have a materials science class. After all my training this summer, I see a need for students to be interested in materials science and this project will hopefully spark a few of my students' interests and lead to future ceramic engineers, or metallurgists!

## WHAT IS THE TOTAL BUDGET FOR THIS PROJECT?

\$850

## WHAT IS THE TOTAL AMOUNT OF SUPPLEMENTAL FUNDING YOU ARE REQUESTING? (UP TO \$2,500)

\$850

## DESCRIBE HOW YOU WILL USE THE SUPPLEMENTAL FUNDING.

Experiment/Item/Quantity/Cost/Vendor/Total  
Candy Fiber/Jolly ranchers/1/\$10/Walmart/\$10  
Borax Beads/Propane tanks (6pk)/1/\$51/Amazon/\$51  
Borax Beads/Nichrome wire/1/\$24.30/Flinn/\$24.30  
Strong Chocolate/Chocolate bars boxes/3/\$26/Costco/\$78 Thermal Shock/Glass Rods/6/\$17.68/Flinn/\$106.08  
Shape Memory Alloys/Nitinol/12/\$1.97/Flinn/\$23.64 Extension/Letter stamps lower case/2/\$59.99/Michaels/\$119.98  
Extension/Letter stamps upper case/2/\$59.99/Michaels/\$119.98 Extension/Letter stamps  
numbers/2/\$24.66/Michaels/\$49.32 Extension/Steel block/2/\$19.99/Michaels/\$39.98 Extension/Stamping  
hammer/2/\$29.99/Michaels/\$59.98 Extension/Bracelet kit/2/\$49.99/Michaels/\$99.98

The total cost of the materials listed above is \$782.24, but many companies may have additional shipping costs, so an additional 10% is being asked for to cover these. Materials for the other projects are either in our chem labs or can be purchased using consumable funds.

In addition the the materials listed, I would like to request 2 additional Materials Science kits (this will help me with stations. I understand many of the materials can be re-used, but I would like the flexibility to accommodate my students with 6 stations). I would also like to request 13 mini kits.

## GOALS AND OBJECTIVES

This project will allow me to successfully implement the materials science curriculum acquired from the ASM Materials 1 Camp with my new materials science classes at Example High School. The students in these classes are typically not our college-bound students (these students tend to take chemistry or physics in their junior and senior year). So, the hope for students in this class is to experience a science curriculum with a lot of real-world scenarios. Example High School is a Title I school, with approximately # of students. The demographics of my classroom are similar to that of my school, with approximately 45% minority students. Students in this class are juniors and seniors. There are 2 sections of Materials Science this year at Example High School, serving about 50 students.

Students will learn about all of the material types throughout the school year, starting with crystals and metals in first semester. During second semester, students will return and learn about ceramics/glass, then polymers, and end the year with composites. At the end of the school year, the students should have a basic understanding of how these materials are made, their general properties, how their properties are manipulated to fit a use/need, and why they are used to make different objects in our everyday lives. The goal of this project is to provide my students with hands-on experiences with each of these materials and provide students with examples of careers/jobs that specialize in these materials. The success of this project will be evaluated based on the completion of student laboratory write-ups, products, journal entries, assessments, and surveys administered throughout the year.

## IMPLEMENTATION PLAN

This project will be implemented in my own classroom, giving me complete autonomy with the integration of these activities into my curriculum. During 1st quarter, I plan to teach my students about the basics of crystals, and start on metals. So, my metal stations and extension station with stamping metal will be implemented in either 1st or 2nd quarter. By second semester, the goal is students will start learning about glass/ceramics. So, during 3rd quarter, students will complete the candy pull and borax beads lessons. Third quarter will probably include some polymers, which will continue into 4th quarter. At the end of the school year, we will focus on composites, and my students will complete the strong chocolate activity and make/test cement/concrete pucks.

Throughout the year, students will complete assessments and lab assignments that will show me if I need to reteach skills or if my students have mastered the content being taught. Since this is a brand new class, and new concepts to me, I will constantly be looking up information and preparing myself to best teach my students. Additionally, I will ask my students for feedback, so I know how to improve my delivery of this content in the future or inform me if I should reteach my students a concept.

We have a new CTE building and programs at my school including HVAC, construction, and welding. So, I think many students interested in these fields will benefit from this science course at my school, and I predict student enrollment in this class will be steady or increase in future years. As I continue to teach these projects with my students all consumable items for the labs in the kit can be sustained through my consumable budget. My district and administration are very excited to see the implementation of what I have learned from the Crystals, Candy & Clinker training, and the ASM I Camp.

**MEASUREMENTS AND EVALUTATION METRICS**

Students will be completing lab notebooks. In the lab notebooks, students will be expected to write observations and draw pictures to explain the phenomenon they're observing. During a unit, the teacher will check these notebooks, and assess how students are doing with the different concepts being taught through the use of the kits. The teacher will use this data to revisit material and provide students with additional support if needed. In addition to the notebook, the teacher will engage in conversations with the students which will allow them to assess mastery in a less formal setting. Students tend to feel more at ease when discussing the concepts in a lower-stake setting. So, this will also serve as a way to measure the progress of the project. Ultimately, the goal is that students leave with a better understanding of the properties associated with the materials of glass, ceramics, and metals.

**MISSION ALIGNMENT**

I hope this class is interesting to students, and they feel inspired to look into the ceramic and glass profession! This is a new class, and career opportunities will definitely be a focus throughout the year. Students will learn about these different materials and manipulate them throughout the year, so hopefully this will inspire them. I will continue to do research throughout the year to help them find a future in ceramics or glass if that is their interest as a result of this class. I have spent a lot of time thinking about ways to make this content interesting, and hopefully, this will help to attract students to careers in this exciting field!

In addition, this class is aligned with our new CTE building, which offers HVAC, Carpentry, and Welding. All of these fields rely on the materials that are taught in this class, and hopefully students will gain a better appreciation for the materials that exist around them.

**HOW DID YOU HEAR ABOUT US?**

Crystals, Candy & Clinker Taining

**APPENDIX**

This is the first year we will be offering Materials Science at our school. I would love to be able to provide my students with as many engaging opportunities related to Materials Science as possible! And this grant and additional funding would help in providing my students with these opportunities, and hopefully get them excited to look into careers related to Materials Science. Thank you for considering me for this opportunity.

**HIDDEN FIELD**

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