Meet the Standards & Enhance Your Chemistry Classroom with Other People’s Money

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Kenetia Thompson

American Chemical Society

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What standards are you and your students required to meet in the chemistry classroom?

- Next Generation Science Standards (NGSS)
- Your State (non-NGSS) Science Standards
- AP Chemistry
- IB Chemistry
- Common Core State Standards
- Other
- None
Imagine...
In what ways would you use $1,000 to enhance your chemistry classroom?

- Laboratory Equipment & Supplies
- Classroom Materials
- Professional Development
- Science Outreach
- Student-based Field Study
- Other
Today’s Objectives

• Define the elements of successful grant proposal.
• Offer tips and strategies for writing a successful grant proposal.
• Provide resources of funding including grants opportunities available through the American Chemical Society.
Good Ideas
Idea Generating Questions

• What standard would you like to help your students meet?
• Is there a learning outcome or concept you would like your students to learn?
• Is there equipment you need for your lab or classroom?
• Are there demonstrations your students and you would like to perform?
• How would you like to incorporate new technology?
The Elements of a Grant Proposal

THE NEED

GOALS

DESCRIPTION

EVALUATION

BUDGET
Mapping Proposal Elements to Experimental Design
Why use the standards for proposal writing?
Example NGSS-Based Grant

HS-PS1-3

Students who demonstrate understanding can:

HS-PS1-3. Plan and conduct an investigation to gather evidence of the structure and interactions of substances at the bulk scale to infer the strength of electrical forces between particles. (Clarification Statement: Emphasis is on the forces between particles, not on naming specific intermolecular forces. Examples of particles could include ions, atoms, molecules, or larger clusters such as graphite. Examples of bulk properties of substances include boiling point, vapor pressure, and surface tension. The performance expectation does not include Raoult’s law calculations of vapor pressures.)

The performance expectation above was developed using the following elements:

**Science and Engineering Practices**
- Planning and Carrying Out Investigations
- Disciplinary Core Ideas
    - The structure and interactions of matter at the bulk scale are determined by electrical forces within and between particles.

**Project Summary & Goals**

With Illinois’ adoption of the Next Generation Science Standards, I have been making dramatic changes to our chemistry curriculum. This spring, my students designed and implemented their first lab that met the performance expectations of NGSS. Following HS-PS1-3, students were required to “Plan and conduct an investigation to gather evidence of the structure and interactions of substances at the bulk scale to infer the strength of electrical forces between particles.” After extensive research, many students requested Mel-Temp devices. High schools do not typically utilize these devices due to the high cost. I would like to purchase 2 used Mel-Temp devices for our high school.

**Description (Excerpt)**

The lab that my students designed and implemented was my first attempt at meeting the performance expectations of NGSS. After research and class discussion boards, my students agreed that melting point determination of the unknown white solids would help them understand the attractive forces between particles in the compounds. I contacted several universities and begged them to let my students borrow their Mel-Temp devices. Luckily I was able to gain their support for this lab, and I managed to borrow four Mel-Temp devices for my students. I gained some knowledge about these devices that will help me narrow
The Need Statement
Features of a Strong Need Statement:

- Clearly states the problem or issue
- Frames the need in terms of student learning
- Describes your students and their current learning situation (e.g., student demographics, school demographics, learning levels, and etc.)
Example of a Strong Need Statement

...This spring, my students designed and implemented their first lab that met the performance expectations of NGSS. Following HS-PS1-3, students were required to "Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles." After extensive research, many students requested Mel-Temp devices. High schools do not typically utilize these devices due to the high cost. I would like to purchase 2 used Mel-Temp devices for our high school.

• What? Students need Mel-Temp devices
• Who? High school chemistry students at an Illinois high school
• Why? To meet NGSS standard HS-PS1-3
S.U.P.E.R. Goals & Outcomes

- **Specific**
- **Use Science & Engineering Practices (SEP)**
- **Practical**
- **Evaluable**
- **Relevant**
Example of a Strong Goals & Outcomes

…I hope this lab pushes my students one step closer to confidence in lab development and thinking like a true scientist…

Their lab write-ups also helped me identify misconceptions in curriculum that I never knew existed up until this point. This project will improve student learning in chemistry by allowing students to design their own labs rather than following a step-by-step procedure. This style of lab helps my students get one step closer to meeting the performance expectations of NGSS. It also allows students to think like real scientists and engineers.

- Specific on what will be accomplished
- Uses the SEP of planning and carrying out investigations
- States how it will stretch the students
- List several learning outcomes
Description
Features of a Good Description:

• Connects to student learning
• States how students will be engaged
• Considers strategies and practices that works best for your students
• Has a timeline of events/activities and shows that the events/activities take place within the granting period
• Includes partnerships/collaborations (if appropriate)
Your Evaluation Plan
Example of an Evaluation Plan

There are several ways that I will measure whether or not my students have met the performance expectations of NGSS. My students create pre-lab designs that require research and preparation…Students will also provide post-lab write-ups to discuss what they’ve learned from their data.

I also track student performance through Standards Based Grading to determine if students have mastered the performance expectations of NGSS.

- Aligns with stated goals and outcomes
- Includes several performance indicators for meeting standard
- References multiple forms of assessments:
  - Pre-lab design
  - Lab reports
  - Discussions
  - Standards Based Grading
Does your evaluation plan…

• Align with the stated goal?
• Use multiple forms of assessment?
• Indicate some form of change or impact?
What would you use to evaluate your proposal?

- Assessment scores
- Surveys
- Lab Reports
- Journal Reflections
- Testimonials
- Other
**Sample Grant Budget Form**

*Applicant Institution: Chemistry High School*
*Applicant: Awesome Chemistry Teacher*
*Project Grant Period: 01/01/2017 through 12/31/2017*

<table>
<thead>
<tr>
<th>Item</th>
<th>Supplier</th>
<th>Cost</th>
<th>Amount Needed</th>
<th>Projected Cost</th>
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<td><strong>Supplies and Materials</strong></td>
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<td>Go Wireless pH probe</td>
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Questions?
ACS Grant Opportunities
ACS ChemClub
Community Activities Grant

• Supports community service projects and community interactions
• Request up to $300 or $500 if partnered with ACS student (college) chapter or ACS Local Section
• Application Period: April 1 – June 1 annually
ACS-Hach Professional Development Grant

• Supports professional development opportunities for U.S. high school chemistry teachers
• Teachers can request up to $1,500
• Application Period: October 15th – January 4th annually
ACS-Hach High School Chemistry Classroom Grant

- Supports U.S. high school chemistry teachers seeking funds to support ideas that enhance the teaching and learning of chemistry in their classroom
- Teachers can request up to $1,500
- Application Period: February 1st – April 1st annually
**ACS Grant Opportunities for High School Teachers and Students**

<table>
<thead>
<tr>
<th></th>
<th>ChemClub Community Activities Grant</th>
<th>ACS-Hach Professional Development Grant</th>
<th>ACS-Hach High School Chemistry Grant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Awarded To</strong></td>
<td>Chartered ACS ChemClub <em>(students and teachers)</em></td>
<td>High school educators teaching chemistry within the U.S. and U.S. territories <em>(teachers only)</em></td>
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</tr>
<tr>
<td><strong>Award Amount</strong></td>
<td>Up to $300 for ChemClub only; Up to $500 for ChemClub collaboration with ACS Student Chapter or Local Section</td>
<td>Up to $1,500</td>
<td>Up to $1,500</td>
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<tr>
<td><strong>Target Audience</strong></td>
<td>Your Community</td>
<td>Your Classroom &amp; Chemical Education Colleagues</td>
<td>Your Classroom</td>
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<tr>
<td><strong>Application Deadline</strong></td>
<td><strong>June 1, 2017</strong></td>
<td><strong>January 4, 2018</strong></td>
<td><strong>April 1, 2017</strong></td>
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<td><strong>For More Information</strong></td>
<td><a href="http://www.acs.org/chemclub">www.acs.org/chemclub</a></td>
<td><a href="http://www.acs.org/hachgrants">www.acs.org/hachgrants</a></td>
<td><a href="http://www.acs.org/hachgrants">www.acs.org/hachgrants</a></td>
</tr>
</tbody>
</table>
Based upon your proposal, to which grant opportunity would you apply?

- ChemClub Community Grant
- ACS-Hach Professional Development Grant
- ACS-Hach High School Chemistry Grant
- Other
Putting It Together
Top 10 Grant Writing Tips

1. Read and follow all instructions.
2. Prepare early.
4. K.I.S.S. (Keep It Short and Simple)
5. Get permission.
6. Emphasize the benefits to your students.
7. Develop your proposal to fit the application.
8. Demonstrate impact.
10. Be persistent!
Thank You!

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Questions?
Survey, Certificate, and Downloads

To complete a brief survey about this webinar, and to generate your certificate of attendance, visit:

To Download Resources:
http://bit.ly/TeachingGrant