

Elements of an Engaging K-12 STEM Presentations

The following is a guide for college students to use when planning a service-learning presentation for a K-12 public school setting. To access a web version of this content, please visit [Boise State Service Learning: Elements of an Engaging K-12 STEM Activity](#).

Boise State University Service-Learning Program, 2008

Be Relevant

Identify a local community issue that would interest K-12 students.

Pick a current topic that is relevant and engaging to the K-12 students and their immediate world, i.e. a polluted neighborhood swim hole, a trashed skate park, an animal shelter. Try not to select an issue that is too advanced or complicated. Keep it fairly simple. It is better to cover less material in a clear, thorough manner, than to present too much information.

For example:

- [YouTube: Giant Bubble](#)

Include Lessons

Connect with learning objectives that are age and level appropriate for your students

To create objectives that are both age and level appropriate, consult with the K-12 teacher or go to [Idaho State Department of Education Content Standards](#) for specific content area and grade level education standards. Design the presentation so K-12 students can clearly see the connection between learning and service.

For example:

- [YouTube: Grade 6-Flight Unit](#)

Use Visuals

Engage K-12 students with fun visuals*, hands-on activities, and lively discussions.

Include visuals (either PowerPoint, handouts, a video, overheads, or a poster) to show students what you are expecting. Do not rely on Powerpoint as your only visual... unless you have good animation.

For example:

- [YouTube: Google Earth 3D Solar System Animation](#)
- [YouTube: Making Molecules with Atoms](#)
- [YouTube: MythBusters - Diet Coke & Mentos](#)

Be interactive

Young students have a voice and want to be heard

Let students interact with you, so instead of using a lecture format, use class discussion with engaging questions and activities. Break up your presentation into sections in which students are doing different things. A suggestion is to split the class into 5 - 10 minute increments, switching activities to keep the presentation interesting and moving.

For example, if your presentation is 45 minutes long, begin with a 5 minute introduction and warm-up activity like an ice-breaker so that students will feel comfortable participating. Next, give an overview and present the information of your service project. This would be a good time to introduce an interactive activity where all students “do” something. Finally, use discussion questions to conclude the presentation. If you are coming back, make sure that all students understand their tasks to prepare for your next visit. For example:

For example:

- [YouTube: Monster Foam Elephant's Toothpaste](#)
- [YouTube: Crushing a can with air pressure](#)

Communicate at their level

Use appropriate language when speaking to K- 12 students and staff.

Do not talk down to K-12 students. Match your vocabulary with their level of understanding. Do not use slang and euphemisms to get students' attention. You will gain more respect from younger audiences by cleaning up your vocabulary and speaking properly.

For example:

- [YouTube: Dry Ice Fun](#)
- [YouTube: How to Make a Cloud in a Bottle](#)

Repeat instructions

Clearly communicate expectations with K-12 students so that they know what they should be doing during your time with them.

Clearly communicate to the K-12 students what their responsibilities are. Do this several times and do not assume that they will just know what to do next. Spell out each of the steps, and model the desired activity. Don't be afraid to review their jobs more than once to check for understanding.

For example:

- [YouTube: Cookie Lab](#)

Be enthusiastic

Speak clearly, energetically and with passion for your issue. If you are excited, you're students will be too.

Make sure you have a great deal of energy when you present your information. Speak loudly enough so that everyone can hear and use inflections in your voice so that you "sound" as excited as you feel.

Show passion for your topic. If you are excited, chances are the students will be, too. SMILE!

For example:

- [YouTube: Doppler Effect](#)

Evaluate

Reflect on the service learning experience with your K-12 students

When your service project is done you will need to debrief with the students in a reflective manner. This will allow students to identify and understand the kind of impact they had on themselves and the community. Reflection and evaluation can take many forms: discussions, reflective papers, skits, drawings, letters, documents and charts, class presentations.

For example:

- [YouTube: Classroom Reflections](#)

Plan

Think through an outline and time line for accomplishing the objectives above.

Decide what you want the students to accomplish by the time you are finished. A good rule of thumb is to 1) provide an overview, 2) present the material and project idea, 3) give students their assignments or work together with them, 4) discuss the outcomes and reflect on the completed project.

Practice

Practice Practice Practice. Do not assume you can “wing” it.

Write out your presentation on note cards so that you can practice ahead of time at home. You want to be smooth and sound like you know what you are doing. Students can very quickly pick up on a presentation that is not well- prepared.

Prepare

Set up all supplies ahead of time so that no time is wasted during presentation.

Make sure that you have enough supplies for the entire class plus a few extras. If you will be using audio-visual equipment, check in advance to make sure the K-12 school has what you need, equipment can be set up, and that you know how to use it. Go to

the school early so that you can have everything ready to go. Ask the teacher if you can set up your presentation quietly while he/she is teaching

Thank participants

Send thank you notes to the students, staff and community members that you worked with.

A little note goes a long way when building community bridges. Make sure the notes are sent in a timely manner. Include any pictures or data that you collected or recorded during the service learning.