

## Experiment 6

### Class Visits

#### OUTCOMES

After completing this experiment, the student should be able to:

- explain basic chemical concepts at a grade school level.
- present experiments to others in a way that informs and excites.

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#### DISCUSSION

Science is fun! Unfortunately, many students today are not pursuing science related fields because these fields are thought to be difficult. Educators are trying to counter this mindset and to encourage students to take STEM related classes. However, by the time they reach high school, students often have established in their own minds that math or science is hard and so they avoid classes that they might otherwise find enjoyable. Because of this, it is important to expose students to the joys of science when they are young and impressionable. Not all of these students will go on to pursue STEM fields, but they will hopefully be less likely to avoid them and more willing to become scientifically literate. One difficulty in exposing elementary students to science is that many school districts need to devote the majority of the elementary school day to math and reading to prepare their kids for tests that they need to take. This forces them to adopt a science curriculum that typically consists of two or three short modules for only a couple of weeks at a time.

A number of years ago, the Anoka-Ramsey Community College chemistry department began having Chem 1062 students do class visits at local elementary schools as a way to help both the schools and themselves. By visiting the schools, the chemistry students bring excitement to science and expose the elementary students to concepts that they would not normally find in their curriculum. The college students are also able to bring in equipment or materials that are not accessible to the elementary teachers in their classrooms, such as liquid nitrogen. In return, the college students have the opportunity to work on their organization and presentation skills, both of which are highly valued in the business world. As an added bonus, the interaction with these young minds provides a valuable reminder to all that science is not just about equations and formulas. It is about the wonder and mystery of how things work and why. Sometimes, as college students, we need that reminder that what we do is cool and fun.

## PROCEDURE

### ***Guidelines***

You will be traveling in groups of two (or three if there are an odd number of students in the lab) to local elementary schools to perform chemistry demonstrations and teach elementary students about some basic chemical concepts. While some of you may be shy about speaking in front of people, this is a chance to enjoy yourself and have fun! You will be the chemistry expert in the classroom. You will be the ones that they look up to and will be talking about for several days. Be prepared to answer lots of curious questions. Do not be afraid to tell them if you do not know the answer as you are still a student learning chemistry.

One member of the group will be required to drive the group to and from the elementary school. All group members will be required to fill out an [Anoka-Ramsey student travel form](#). If you are younger than 18, this form does require a parental signature so these should be filled out and turned in during the first week of lab. Once you have been informed about the elementary school you will be visiting, please check the [maps and directions to the schools](#) to make sure that you know exactly how to get there and the time required for the drive *before* the day of the presentations.

You are going as a representative of Anoka-Ramsey Community College. Please do not look like you have just crawled out of bed. If you have something semi-nice to wear, then wear it. Most school dress codes prohibit spaghetti straps, shorts or skirts that do not extend past the fingertips, or T-shirts with designs that could be deemed offensive. Please do not wear these types of clothing. Additionally, the only complaints that we have received in the past have been related to exposed midriffs and low necklines, so please cover these up as well.

### ***Selection of Visit Demonstrations***

You should plan on your presentation taking approximately 30 minutes to complete. This typically means you will complete 3 to 5 demonstrations for the classroom. There are [nine demonstrations](#) for you to choose from and they will be presented by the instructor during the first week of the lab. These demonstrations cover concepts such as acid/base chemistry, charges, polymers, states of matter, and chemical properties. It may also be possible for you to present a demonstration that you have seen elsewhere. However, it will require the instructor's approval. Activities involving flammable liquids, balloons, or even moderate hazards will not be allowed. Once you have selected the demonstrations you would like to perform, please [sign up](#) with your instructor before leaving the lab so that the appropriate supplies may be obtained.

### ***Experiment Design***

Once you have chosen your demonstrations, you will need to prepare for the presentation. You will be given a bin which you can use to pack all of your supplies for easy carrying. You will

need to collect and pack any glassware required for the experiments, chemicals, waste containers, cleaning supplies, and safety glasses. If you would like to have a student volunteer for any of your demonstrations, you will need to bring an extra pair of goggles for that student. Before you leave for the demonstration the second week, you will probably need to pick up last minute perishable supplies such as liquid nitrogen, bananas, flowers, and cabbage juice. You will also need to print out and bring an evaluation form and a letter to the teacher from your instructor. *Please write your names at the top of the evaluation form.* You may use this [checklist](#) to keep track of what needs to be done during the week and before you leave for the visit.

In the week before going out to the classroom, your group should prepare what you will talk about during the presentation. Begin the presentation by introducing yourselves. Tell the kids where you are from, where you grew up, what your major is, and what you plan to do after college. Let them know how many chemistry classes (or other science classes) you will need to take to get to where you want to go.

Although the kids will probably enjoy just watching what is happening, the teachers are giving us valuable classroom time and would like us to teach the kids something while we are there. Thus, you should prepare explanations and visual aids for each demonstration as well. During the first week of lab, you will find out what classroom you are going to so that you know the level of your audience. Remember to explain your demonstrations in an age-appropriate manner, give some background information, and relate them to things kids can understand (acid rain, Hindenberg or hydrogen powered vehicles, glow sticks, helium balloons, etc.). Be prepared to clearly write terms and other information down on the board. You do not have to give extensive lecture notes, but a few key words (and pronunciations!) would help a lot. Plan on getting the kids involved by asking questions to see what they know and asking them to make predictions before an experiment, if appropriate. Remember to discuss any safety issues that are pertinent to each demonstration.

### ***Safety and Disposal***

As the chemistry authority in your classroom, **one of your primary responsibilities is to *demonstrate and stress appropriate safety measures***. Wear your goggles or safety glasses. Provide goggles for any student volunteers. Also, children should be advised of safety issues related to the demonstrations that you do such as to never play with fire and to NOT try these things at home (exceptions: red cabbage indicator, magic sign demos, and gluep—under adult supervision only). Potential liability dictates that these things be stressed.

If you have acetone or phenolphthalein solutions (which contain ethanol), please keep them away from all flames. Most elementary schools are now latex-free, so no balloons or latex gloves are permitted on campus.

All waste solutions generated during the class visit must be contained and brought back to Anoka-Ramsey for disposal—even solutions that are allowed to go down the drain. We do not

want to cause odors to come from the elementary school drains. Please make sure that you are obtaining the appropriate size and type of waste containers for the demonstrations you will be performing. Because the demonstrations can generate either aqueous or organic wastes, do NOT mix wastes together from different demonstrations unless you are told you may do so by the instructor or lab manager before the visit.

⚠ ***Wear safety glasses or goggles at all times for this activity.***

⚠ ***Dispose of all chemicals in the proper waste container.***

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### **POSTLAB ACTIVITY**

This lab is worth a total of 20 points. The majority of these points come from the teacher's evaluation of your presentation, so look over the evaluation form before going to make sure that you are covering all of the objectives. Some of the objectives (such as safety) are weighted more heavily than others. In addition, your attitude and contribution towards preparation and clean-up will be considered in the final grade you receive.