

Shadow Day Assignment*

In October, we will have an opportunity to visit in person research labs at the University of _____. Students will be divided into three groups: 1) those visiting engineering labs, 2) those visiting chemistry labs and 3) those visiting biology labs. Each group will visit three different labs within their cohort (*e.g.*, three different biology labs in the biology cohort) and students will be assigned to a group that will be responsible for summarizing for the class the experience for a particular lab as outlined below.

To help you prepare for this visit (do this with your team).

1. Read the paper associated with the research lab that serves as the focus for your team.
2. Generate at least 6 questions that you will ask your researcher when we visit. At the start, this can be hard, so here are some leads you can use:
 - a. What is unique about this project?
 - b. What equipment do you use for your work?
 - c. Ask the host to help you understand some of the new vocabulary from the article.
 - d. How did you come up with the idea for this project?
 - e. How long did it take you to set up/run the project?
 - f. How many people work in this lab?
 - g. Are there any future applications for this knowledge or technique?
 - h. When did you start this research?
 - i. Where do you go from here?
3. Assign tasks to the team members (see **Before the visit ...**)
4. Prepare a sheet for recording your observations and documenting the interview.
5. Prepare a sheet for recording responses to your questions.

On the day of your visit

1. Welcome the guide, thank him/her/them for taking the time to meet with you.
2. Be friendly, courteous, and professional.
3. Ask if you can take a photo of the experiment.
4. Demonstrate an interest in what the host shares with you.
5. Be a good listener – take time to ask questions.
6. Attempt to learn something from each lab.
7. See if you can take a picture for your report.

After the visit

1. Write a 1 to 2-page summary of your visit that includes a summary and a photo of the experiment. (see **After the visit ...**)
2. Put together a presentation on your experience to share with the class. (see **After the visit ...**)
3. Write a thank you letter that will be sent to your host. (see **Thank you letter from the team ...**)

*This activity was inspired by one authored by Zahava Scherz and Miri Oren: "How to change students' images of science and technology." *Science education* 90.6 (2006): 965-985
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Before the Visit ...

List the names of your team members: _____

Identify the lab and department: _____

What does this lab study: _____

Address of the lab: _____

Host name: _____

Goals of the visit to the lab:

1. _____
2. _____
3. _____

Date and time of the lab visit: _____

Division of Tasks:

Task	Name
Reading background information	ALL Team members
Preparing interview questions	ALL Team members
Preparing an observation sheet**	
Documenting observations during the visit	
Taking photos during the visit	
Asking interview questions	
Recording responses to interview questions	

**An observation sheet should be a layout of the lab space or a chart documenting what you saw and heard during your visit.

After the visit ...

The 1- to 2-page summary you submit needs to concisely present the main messages of the research you visited. It includes:

1. Title of the investigation
2. Names of the team members
3. Name(s) of the host(s) and workplace.
4. One paragraph explaining the importance of the subject.
5. One paragraph explaining the research goal(s).
6. A general description of the research site.
7. Your findings and conclusions – one or two paragraphs describing what you learned about the research from this visit.

Next, your team will present their findings to the class. Read the table below carefully to understand the criteria that will be used to evaluate your presentation.

Title of Investigation: _____

Names of team members: _____

Type of presentation:

- Newspaper article (to be read aloud to the class)
- Podcast
- Scientific Poster
- Power point presentation (3-slides)

Item	Excellent	Poor	Missing
Identified research topic, names of students & lab			
Provided background information			
Explained why the research is important			
Identified two findings from the interview			
A clear diagram or photo was included & described			

After the visit ... on your own

1. Look up three key terms you came across during this activity and write down the definitions or descriptions of these terms:

Key Term	Definition/Description	Your source of information

2. Identify a concept that you did not understand.
3. Answer one of the following three questions:
 - a. An interesting aspect of this research that I would like to explore is _____
 - b. In my opinion, this research is important for society because _____
 - c. One additional question I have is _____

Thank you letter from the team...

In all areas of professional life, it is important to demonstrate your appreciation for the time and effort others have made to your growth and education. With your team, write a thank you letter addressed to the host who shared their research. This letter needs to include:

1. Today's date
2. The date of the visit
3. Your (first) names and that you are students from ___ High School
4. Why you visited the lab [*you are part of a group of students who will be conducting your own research*].
5. Identify something interesting you learned from the visit.
6. Anything else you would like to include.
7. Sincerely thank the host.
8. Sign your (first) names.

Note to Teacher: This field trip is a highlight of the year for students. For many, it is a first glimpse into the ivory towers of academic research. By working with a liaison in each academic department, graduate students are recruited as ambassadors. High school students feel at ease with these older students and learn to question and discuss details about the experiments in a friendly, yet professional manner.

Prior to going to the university, I ask each liaison for a journal article that would be representative of each of the research labs the students would visit. I divide the class into 9 teams (3 teams for each department) and each team of students learns in detail about one of the labs they will visit, using the journal article to dive a bit deeper into the topic. They are to read the journal article together and develop questions that they will ask the host.

Typically, the entire group of students is divided into three groups, with each group visiting one of three departments. While each group tours three labs within a department, the individual teams take turns with in-depth recording of their findings in the lab to which they were assigned. This part of the trip lasts for about 90 minutes. Then, students meet for lunch and a first-year faculty member presents their research to the students. After, a whole-class debriefing helps the ambassadors and department liaisons ascertain how well everything went, and we return to school.

I try to choose three departments that are most aligned with the research areas chosen by students, but the most important aspect of department choice is ease of access. If there is a liaison in a particular department who is helpful and energetic, that will be my go-to person when planning this excursion and communicating with the other departments.

To pay for lunch and transportation, students each contribute \$5 and my own classroom funds pay for the remainder. I did notice, however, that there is money available sometimes through the university for hosting such an outreach event.

This field trip is an eye-opener for students, so closure is important. There are a variety of activities that worked well for me; see **After the visit ...**

Lastly, it is important that each group of students send to their host a thank you letter and that the entire class send a letter to the professor who spoke with the students during lunch. I use this activity to guide students on the importance of appreciating every bit of help they receive along their journey and to express gratitude to everyone who made their experience possible.