“I have never encountered any children in any group who are not geniuses. There is no mystery on how to teach them. The first thing you do is treat them like human beings and the second thing you do is love them.”

*- **Dr. Asa Hilliard**, world renowned Pan-Africanist educator*

Thank you for agreeing to host students in your lab!

This is an exciting opportunity for you to share your research with students and for students to learn more about science and the nature of science research. Our goal with this document is to help you plan a visit that will be safe, fun, and interactive for students and help them develop a real understanding of the work you do. To that end, here are a couple of things to keep in mind:

1) **Create a bridge between students’ background and your specific research**
   The students visiting your lab will likely have a large range of interests and scientific backgrounds, and because the research you do is quite specific, an important part of the lab visit is planning for how you will create a bridge between the knowledge, skills, and interests of the students visiting your lab and the nuances of the research you do.
2) ***Do*, don’t talk about doing.**
   Most people don’t get excited about science by listening to someone else talk about it. Really excellent lab visits provide opportunities for students to participate hands-on in some way. This does not mean that you will incorporate anything they do into a real dataset, but it does mean that creating opportunities for students to get a real feel for the type of work you do will go much farther than just waving your hands at some equipment while you talk about it.
3) **They’re teenagers, not adults. Embrace and support that.**
   Students of all ages participate and show their interest in many different ways. Some students are boisterous and outspoken, while others may be more reserved. Setting up your lab visit with this knowledge, and so that all types of students are encouraged to safely participate, will create a more inclusive experience.

Questions to consider as you plan:

- Are you expecting students to have prior knowledge? If so, have you communicated this with their chaperone? If not, how will you orient students at the beginning of the visit?
- How will you create opportunities for students to share their prior knowledge? Interests? Skills? What questions will you ask? How will you adapt your lab visit to this information?
- What do you do in your lab that students could also do? (Filtering? Looking through a microscope? Pushing buttons? Measuring things?)
- How many different activities are there for students to do? (i.e. can students rotate through a couple different stations? Do you have the staff for this?)
- Based on the answer to the previous questions, what is your ideal group size?
- What connections can you make to issues and experiences students have had?

- What lab safety procedures need to be followed, and how will you communicate this clearly with students and check for understanding?
- What will you do to encourage participation in a variety of ways?
- What is your measure of success? How will you determine whether students had fun, learned something and/or challenged themselves?

Specific Suggestions for a Successful Lab Visit:

- Break into small groups and do rotations whenever possible (3-5 students per group)
- Ask pre and post questions (What do you already know about? What questions do you have about _____? What is one thing you learned today? What was your favorite part of the day?)
- Cap the amount of time you talk at the full group at 5 minutes. And any subsequent talking time at 3 minutes.
- Ask the teacher/chaperone what methods they already use to gather attention then use these as needed (ie: “Clap once if you can hear me”)
- Provide an opportunity for students to ask about how you got to your current role. They’re often interested in stories as well as content…they want to see themselves in your story. (Did you *always* know you wanted to be a marine scientist? Or did you have no idea in high school?)

Example of a great lab tour (hosted by the Padilla-Gamino lab at UW SAFS to learn about microplastics and corals):

High School students visited a lab space in groups of ~20, broken into 4 groups of 5 and rotated between stations, each one hosted by a member of the lab. Each station was in a corner of the same room.

- **Station 1:** Feeding plastic to anemones
    - Grad student provided brief explanation of why this anemone species was used, how to estimate the health of the anemone, and the materials used
    - Students used tweezers to attempt to feed a small piece of red Solo cup to an anemone and observe what happens
    - **Why this was great:** students got to test out lab skills and observe a live study organism. The grad student did a great job explaining the key features of anemone anatomy that made them a useful coral proxy and how to observe their health.

- **Station 2:** Filtering water samples with microplastics in them (gathered from a local water source)
    - Undergraduate student student explained why they filter water and how the filtration system worked, then demonstrated
    - Students got to practice using the filtration system with supervision
    - At the end, students retained their filter paper for the next station
    - **Why this was great:** students got to see participation in the lab from many different types of individuals (undergrads, grad students, research scientists) and learn more about the undergraduate program. Students got to use real fancy

science equipment (in a safe, low stakes environment).

- **Station 3:** Identifying microplastics under a microscope
    - Students brought their filter paper from the previous station over and tried to identify microplastics
    - Graduate student explained that in order to analyze these, we need to pick individual plastics off the filter paper
    - Students attempted to pick up individual microplastic samples off the filter paper using a microscope that was also projected to a screen. Then brought those samples to the next station
    - **Why this was great**: students were using a sample that they contributed to filtering, which gave them a feel for how different parts of the process were connected. They also got to see how challenging some of the skills are, and feel successful when they were able to select a microplastic. The screen was helpful in keeping the whole group engaged by watching.

- **Station 4:** FTIR (spectrometer) demonstration
    - Research scientist demonstrated how to prepare a slide and how the FTIR can be used to identify composition of microplastics
    - Did a sample test and students identified the piece as a piece of latex.
    - Discussion of why we care about source of microplastics
    - **Why this was great:** the lab didn't shy away from showing the really fancy equipment and how the activities students did at the other stations built up to using this machine. This station also provided valuable context related to microplastic identification and how this knowledge can be used.