Online science mentoring in the PlantingScience community: Scientist’s Guide

Thank you for your interest in mentoring PlantingScience!

The purpose of this guide is to help you, the scientist, plan when you like to volunteer as a mentor and anticipate how to communicate with students.

- Overview of Mentoring Aims and Opportunities
- Time Commitments and Expectations
- The Scientist’s Role
- Concerns about Communicating Effectively
- Logistics and the Substance of Online Conversations
- What to Expect of the Online Mentoring Process
- Navigating the Website, Contacting Us

PlantingScience Mentoring Aims and Opportunities

PlantingScience brings together scientists, teachers, and students in a community fostering student research, scientific inquiry, and mentorship.
In designing the program, we aim to make it as convenient as possible for you to volunteer your expertise, without ever having to leave your office. Mentoring does, however, require a commitment.

**Time Commitments and Expectations**

- Participate in those sessions that fit your schedule. We will send an invitation to prior to each online session, unless you indicate an absence, and we will typically match you to ~2 teams.
- Upload an image (or avatar) so students can get a feel for you as they read your comments.
- Anticipate **about 1 hour per week** mentoring students. Projects typically last only 2-4 weeks—so your input is vital!
- **Post at least 2-3 times per week** to your teams.
- Respond to your students’ postings within 48 hours.
- Notify us if you will be out of contact for more than a few days so that we may fill in gaps.
- Submit survey about your mentoring experience, which sent to scientists in the spring to help us evaluate the program.

**Meet Internet Safety Practices**

- Do not provide your personal e-mail contact information to students.
- Please screen websites before recommending them to students.
- The program does not sponsor or authorize any unsupervised contact between mentors and students.

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**Opportunities to Mentor:**

**Twice per Academic Year**

- Fall Online Session (usually Oct.-Nov.)
- Spring Online Session (usually Mar.-Apr.)

**Master Plant Science Team**

*Special Opportunity for Graduate Students and Post-doctoral Researchers* — Perks for greater commitment both sessions of academic year.
The Scientist’s Role

The purpose of the asynchronous blog/online conversation is to provide one-on-one conversation between scientists and students. Through the conversation, students have opportunities to reflect on their evolving understanding, use you as a sounding board for their ideas and thinking, and enrich their knowledge of plants in their everyday lives and in life on Earth.

Your role is to help students to:

**See the fun and interesting side of plant science.**
- Students are fascinated by “Did you know...?” such as historical tidbits or “science facts.”
- Connect to the gizmos & travel of scientific endeavors.
- Connect to current social issues or life problems.

**See scientists as someone like them.**
- How you decided to become a scientist.
- Your life stories/experiences.
- How you face struggles in science.

**Visualize everyday experiences with plants.**
- When you walk home from the school bus stop, what do plants do you see? Do you have plants at home? (help students situate their thinking in a familiar place.)
- What have you done with plants in school this year?

**Put forward and “unpack” their ideas about biology content.**
- How do you think [insert vocabulary word or idea student is using] means?
- How do you think that works?

**Be more reflective about their ideas and reasoning.**
- I’m trying to understand what you mean by XXX. Tell me more.
- How does XXX relate to YYY?

**Use data as evidence in making their emerging models more sophisticated.**
- What did you see? Not see?
- Does this make sense with how you think photosynthesis [or XXX] works? Why or why not?
- In your mind, is this the only possible explanation? What are alternative explanations?

**Recognize conflicts between their emerging ideas, their everyday experiences, and data.**
- So if carbon dioxide is a gas, does it have mass? Does it take up space? What about when it’s inside a plant?
- Does that mean that [contrast two claims]?

**Reason about cause-and-effect relationships and build mental models.**
- Does that mean that if [claim/idea #1] is true, then XXX should [also be true/happen]?
- If A and B are true, what does this say about what happens when [condition]?

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**How to realize your role**

- Craft a 1st message introducing yourself, your interests in plants, science, or mentoring.
- Start the conversation; do not wait for a question from your mentees.
- Respond promptly—You are a key feedback mechanism for student learning.
- Encourage students to do the thinking. The trick is asking the right questions at the right time, without giving away the punch line.
- Suggest resources students might use to answer questions posed.
- Focus on the SUBSTANCE of the science, not just the technical details.
Concerns about Communicating Effectively

Mentoring students through an asynchronous blog/online conversation presents some challenges that you might not face with your own students. Anticipate that building a productive dialog may happen more slowly than in a face-to-face situation. Seek to establish open, frequent communication with the students and clarify expectations with the teachers at the outset.

Am I making sense whatsoever to the students?
One challenge in working with students of any age is language. As scientists, we become comfortable with jargon unfamiliar to most family and friends, let alone teachers and students. Good teaching (which is what you are doing online) is about being understood and checking for understanding.

How do I know what the students know?
- Assuming whatever they do know, this is your starting point. Help students see what they truly know and get them thinking about what it means.
- Participating in PlantingScience may the student’s first experience conducting extended plant investigations.
- Middle school teachers are often not trained to teach science. The last science class for some high school teachers may have been a 100-level college class.

What is the life of middle school and high school student like?
The skills and background of participating students will vary enormously. Being familiar with a few general characteristics of young learners may help you gauge expectations.
- Middle school students are making many transitions in their personal, social and school lives. Most will have moved from a small, self-contained elementary school where science may not be taught as a separate subject. They are learning the basics of experiments. By grade 7, students should be familiar with a “fair test” (in which everything is kept constant except one variable).
- High school students are moving toward more independent projects and individual intellectual expression. They are more likely to test limits, but like middle school students, value their peers.

Why aren’t the student research projects progressing as I anticipated?
It can sometimes be difficult to distinguish why student research projects are not progressing as you expect. Student motivation and unpreparedness may be factors, but class time constraints or computer access may also impact the student work and online communication.

Logistics and the Substance of Online Conversations

When are classes online? When do I start?
Teachers choose timeframes that fit their schedules and relay their estimated start dates. We attempt to match you to teams that fit your schedule and interests. You will begin receiving email notifications on those days the Team Research Webpage is updated.

- Schedules often change. Check the Teacher-and-Mentor Forum for updates to estimated project timeframe, as well as information about the class meeting schedule.
- Student access to computers will likely limited to a few days per week. They will either have arrangements to go to a computer lab or have the laptop cart in their class.
What should I be asking/talking about with students?
Communicating with the teacher is key. We strongly encourage teachers to share information about their students’ backgrounds and project schedule and to engage mentors early in the inquiry process.

- The Teacher-and-Mentor Discussion Forum is the primary place to talk about expectations for the student investigations, what is happening in the class, and how your comments can support this.
- Review the Inquiry Module to learn what protocols students will likely follow.

What to Expect of the Online Mentoring Process

Navigating PlantingScience.org, Contacting Us
Your primary page will be your Scientist Page. You’ll find web resources to support your experience:

Scientist Tab (logged in):
- Team Research Webpages.
- Teacher-and-Mentor Forum
- Mentor-to-Mentor Forum
- Your Info
  - Edit Your Professional Information
  - Update Availability and Mentoring Preferences
  - Update Your Email or Password
  - Add/Update Your Image

Scientist Tab (open to all):
- Video how-to’s to help navigate the website
- Slides from mentoring workshops
- Mentor Guide

Plant Theme Tab:
- Curriculum materials

Research Gallery Tab:
- All current student projects
- All past student projects

We want your mentoring experience to be rewarding. Let us know if we can help.

Email psteam@plantingscience.org
Project Coordinator 314-577-9535

www.plantingscience.org  |  Email: psteam@plantingscience.org  |  New Mentor Guide Jan. 2010  |  p. 5