



Frequently Asked Questions about the PlantingScience Digging Deeper {F2} study

What is the F2: The Next Generation of the Digging Deeper study?

F2: The Next Generation of the Digging Deeper study is a research study funded by the National Science Foundation. The grant was awarded to the Botanical Society of America (BSA), BSCS Science Learning (BSCS), and the University of Colorado Colorado Springs (UCCS).

F2 builds on a previous grant, Digging Deeper. Digging Deeper was a successful study that investigated the effects of quality curriculum, in depth professional learning, and mentoring by professional scientists to improve student outcomes in content achievement and attitudes about scientists. The F2 study is a study to ensure that the positive outcomes of Digging Deeper can be replicated. In addition, F2 adds a new component. This study will compare an in-person professional learning experience with an online format, which could be more sustainable. The design of the study is as a randomized control trial, the most rigorous type of design for educational research.

Who is doing the research study?

This research study, as was with the previous Digging Deeper study, is a collaboration among three organizations. The Botanical Society of America is the professional organization of botanists and plant scientists. BSCS Science Learning is a nonprofit organization that is a recognized leader in science education including instructional materials, professional learning, and science education research. Researchers at the University of Colorado Colorado Springs bring extensive experience in designing, conducting, and analyzing educational research studies.

What are the benefits of participation?

- All teachers will receive professional learning. Teachers in the treatment groups will receive the professional learning experience either through an in-person format or an

online format during the first year of the study. Teachers assigned to the control group will take part in online professional learning during the second year of the study.

- Students of teachers who participate in the study will benefit from experiencing a high-quality curriculum that includes authentic independent research projects and collaboration with scientist mentors.
- BSA will provide some supplies for teaching the Power of Sunlight module in participating classrooms.
- Teachers who participate in the study will receive a stipend of \$1400 paid in installments if they complete the two-year study.

Who is eligible to participate in the study?

- We are looking for US high school teachers who teach biology or life science. Other related classes, including environmental science, honors biology, or AP biology are also eligible. (If you have a question about eligibility, please do not hesitate to contact us with your questions.)
- Teachers who took part in the earlier Digging Deeper research project are not eligible.
- Teachers who have previously taught the PlantingScience Power of Sunlight module are not eligible.

What is the PlantingScience Power of Sunlight module?

- The PlantingScience Power of Sunlight module is an online module focusing on photosynthesis and cellular respiration. Students begin the module with guided investigations and work toward a culminating activity in which they design and conduct an independent investigation. Throughout the module, students communicate with their scientist mentors online for help and feedback.
- We anticipate that teachers will spend the equivalent of approximately two weeks with the Power of Sunlight module. However, this will not be “full-time.” For example, on some days students will spend an entire class period on investigations and discussions. On other days, students may spend approximately 15 minutes checking in with their mentors online followed by other activities of your choice. Days of instruction do not need to be consecutive.

If I am selected to participate in the study, what are my duties and responsibilities?

If you are selected for the study, you will be assigned randomly to one of three groups. The responsibilities are somewhat different for each group, as specified below.

- **Treatment group 1: In-person professional learning.** Teachers in this group will
 - Attend a 5-day in-person professional learning experience at the Missouri Botanical Garden in St. Louis, MO the week of June 24th, 2024.
 - Disseminate and collect assent and consent forms from students and parents for participation in the research study.
 - Teach the Power of Sunlight module to their class during the fall 2024 semester.
 - Complete brief (approximately 5 minute) surveys to document their instruction each day while teaching the module.
 - Administer pre-surveys and post-surveys to students.
 - Complete end-of-unit teacher surveys.

- **Treatment group 2: Online professional learning.** Teachers in this group will
 - Participate in approximately 36 hours of online professional learning. This will take place from July 8-July 19, 2024. The professional learning will include facilitated large group sessions held on M/W/F as well as non-facilitated small group sessions and independent work taking place between the scheduled large group sessions.
 - Disseminate and collect consent and assent forms from students and parents for participation in the research study.
 - Teach the Power of Sunlight module to their class during the fall, 2024 semester.
 - Complete brief (approximately 5 minute) surveys to document their instruction each day while teaching the module.
 - Administer pre-surveys and post-surveys to students.
 - Complete end-of-unit teacher surveys.

- **Control group: Business-as-usual.** Teachers in this group will
 - Disseminate and collect consent and assent forms from students and parents for participation in the research study.
 - Teach their usual curriculum materials on photosynthesis and cellular respiration to their class during the fall, 2024 semester. Teachers will be provided with a list of scientific concepts that they should address in their lessons.
 - Complete brief (approximately 5-minute) daily surveys to document their instruction each day while teaching the module.
 - Administer pre-surveys and post-surveys to students.
 - Complete end-of-unit teacher surveys.
 - During the **summer of 2025**, teachers will take part in online professional learning.

Summary of Timeline for the 3 Study Groups

	summer 2024	fall 2024	summer 2025
Treatment Group 1	in-person Professional Learning June 24-28	Teach PlantingScience Power of Sunlight module	no scheduled activities
Treatment Group 2	Online Professional Learning July 8-19	Teach PlantingScience Power of Sunlight module	no scheduled activities
Treatment Group 3	no scheduled activities	Teach your usual lessons about photosynthesis and cellular respiration	Online Professional Learning

NOTE: This is designed to be a two-year study. However, we realize it can be difficult to complete this requirement. For this reason, we prioritize participation during the first year. If participants are not sure if they would be able to complete the second year, we would still encourage them to apply and take part in the first year of the study. Payment of the honorarium is phased and linked to completion of the tasks and responsibilities of the study as described above. Participants who complete all the requirements of study will receive up to \$1400.

Who do I contact if I have questions?

If you have questions about the research study or the application process, please contact

Jenine Cotton-Proby

Science Educator

BSCS Science Learning

DiggingDeeperF2@bscs.org