

Educational Outreach Newsletter

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Welcome!

The Donald Danforth Plant Science Center (DDPSC) in St. Louis offers its Education and Outreach program to facilitate formal and informal science education. This program connects the resources of the DDPSC to citizens (e.g. educational leaders, students, farmers, families, etc.). Our mission is to improve learning in science through hands-on, investigative teaching methods.



For more information, please contact the Education Research and Outreach Lab at Education@danforthcenter.org



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PLANT SCIENCE CENTER



Design and Build Hydroponics

Hydroponics is a type of horticulture and a subset of hydroculture, which is a method of growing plants without soil by using mineral nutrient solutions in a water solvent.

Engage students during remote learning with the hands-on, innovation-fostering project of designing and building a hydroponics unit to grow plants.

Grade level: 2-7.

Contact: Ruth Kaggwa
(Rkaggwa@danforthcenter.org).

Online Student Study

We are excited to be able to offer self-guided activities for students to execute online.

Students will learn how to use the image analysis program, PlantCV, and contribute to DDPSC science through data analysis of plant parameters such as leaf angle, disease damage, leaf area, and plant height, among others.

Grade level: 9-16.

Contact: Ruth Kaggwa
(RKaggwa@danforthcenter.org).

Bringing Genotype-to- Phenotype To the Classroom

Leaf angle in corn plants plays a role in determining plant density (how many plants can be grown per acre) and yield (the number of ears of corn that are produced per acre). Students grow corn seedlings, learn ways to measure leaf angles manually and using the image analysis software PlantCV, contributing real data to the laboratory of Danforth Center Principal Investigator Andrea Eveland, Ph.D.

In a second exercise, students test for the presence of specific changes in the DNA of the corn plants in order to understand the correlation between these genotypic changes and the variation in the phenotypes (physical characteristics) of the plants.

By screening hundreds of corn genotypes, students contribute molecular and phenotypic data that can help the Eveland lab develop predictive models to determine the leaf angle of an adult plant based on the seedling data.

Through this experience, teachers and students are trained in concepts of genetics as they relate to agriculture, food security, and data science. This program offers professional development to educators and supplies and support for classroom settings and independent projects conducted at home by students.

Grade level: High school and college students.

Contact: Sandra Arango-Caro
(SArango-Caro@danforthcenter.org).



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Coming in October

Professional development on the use of **Augmented and Virtual Reality (AVR)** educational tools and design of plant science curricula



Short virtual pre-workshop -
October 8

In-person workshop -
October 17



Discovering Volvox Development (DVD)

The green algae *Volvox carteri* is a visually engaging organism for learning important lessons on the concept of organismal life cycles. Volvox is an experimentally tractable multicellular species with only two types of cells (germ and somatic). The highly-visual nature of Volvox makes scientific research exciting for students.

Students attend lectures, learn to work with Volvox cultures, screen for possible mutants, and document mutants to upload to the DVD website, making DVD a great opportunity for students to engage in an authentic research experience. Students save candidate mutants for further research on the evolution of multicellularity by Danforth researchers in the lab of Jim Umen, principal investigator at the Danforth Center.

This program offers professional development to educators and supplies and support for classroom settings and independent projects conducted at home by students.

Grade level: High school students.
Contact: Sandra Arango-Caro
(SArango-Caro@danforthcenter.org).

Contact Us

If you would like more information or would like to get supplies, for any of the protocols listed, feel free to reach out to us:

Discovering Volvox Development, Genotype to Phenotype:

Sandra Arango-Caro,
SArango-Caro@danforthcenter.org

Hydroponics, Online Student Study:

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Other inquiries:

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