



# SCIENCE EDUCATION

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## ABOUT JEFFERSON LAB

Thomas Jefferson National Accelerator Facility (Jefferson Lab) is a U.S. Department of Energy (DOE) Office of Science national laboratory. Scientists worldwide use the lab's unique particle accelerator, known as the Continuous Electron Beam Accelerator Facility (CEBAF), to probe the most basic building blocks of matter - helping us to better understand these particles and the forces that bind them.

Managed and operated by Jefferson Science Associates (JSA), LLC, the lab's primary research mission is to expand the understanding of the structure of matter and the forces that hold the atom's nucleus together.

The DOE and Jefferson Lab are dedicated to training the next generation of scientists and engineers to maintain U.S. scientific and technological leadership. The lab is a valued contributor

to science education and a major resource to the local, regional and national education communities.

In partnership with the local public school districts, the lab also designs and offers programs to enhance the quality of K-12 science, technology, engineering and math (STEM) education. The lab's long-term commitment to science education is focused on:

- Increasing the number of teachers with a substantial background in math and science.
- Strengthening the motivation and preparation of K-12 students in STEM.
- Addressing the under representation of minorities and females in science, math, engineering and technology careers.

## TEACHER DEVELOPMENT PROGRAMS

### JLAB SCIENCE ACTIVITIES FOR TEACHERS (JSAT)

JSAT is an initiative funded by JSA designed to build teachers' skills in the physical sciences.

Each teacher attends 16 sessions throughout the school year. Each session includes lab-related activities, projects and/or lectures.

Efforts are made to cover material that participants are teaching so that they can apply new strategies to their current lesson plans that meet SOL science objectives.

In addition, teachers are given the materials necessary to implement these new strategies. Teachers who attend 80 percent of the sessions are eligible to receive a stipend at the end of the school year.





## STUDENT PROGRAMS

### BECOMING ENTHUSIASTIC ABOUT MATH AND SCIENCE (BEAMS)

BEAMS brings classes of fifth through eighth grade students (1,000 per year) and their teachers to the lab for science and math interactive activities.

The goals of the BEAMS program are to:

- Provide teachers with classroom activities based on the science and technology at the lab.
- Motivate students and strengthen their academic preparation.
- Increase the representation of minorities and women in the science and engineering workforce.
- Motivate students and strengthen their STEM academic

preparation (or in STEM).

Students and their teachers are immersed in the lab's research, interacting with scientists, engineers and technicians as they participate in science and math activities.

BEAMS has been recognized by the National Academy of Science RISE (Resources for Involving Scientists in Education) project as one of only 13 K-12 science education programs where scientists, engineers and other community members have especially effective roles.

### PHYSICS FEST

At least one day each month during the school year is set aside for groups of students to attend a presentation in the lab's auditorium. This two-hour presentation includes a brief interactive summary of

the science and technology at the lab followed by experiments involving static electricity, liquid nitrogen and plasmas. Seating is limited and reservations are required. More information can be found at:

[education.jlab.org/physicsfest](http://education.jlab.org/physicsfest)

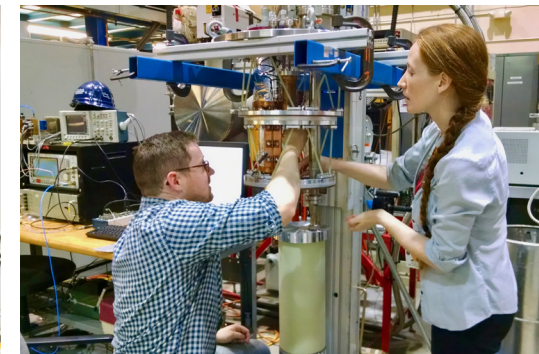
### SCIENCE BOWL®

The Science Bowl® is a highly visible educational event and academic competition among teams of students who compete in a verbal forum to answer questions in all branches of science and math. These events encourage student involvement in math and science

activities, improve awareness of career options in science and technology, and provide an avenue of enrichment and reward for academic science achievement. The lab hosts two regional Science Bowls®: one for high school students in early February and one for middle school students in early March. The winning team from each competition wins an all-expenses paid trip to participate at the National Science Bowl®, held in late April in Washington, D.C.

To register visit:

[education.jlab.org/nsb](http://education.jlab.org/nsb)



## INTERNSHIPS

### SCIENCE UNDERGRADUATE LABORATORY INTERNSHIP (SULI)

The SULI program, funded by the DOE Office of Science's Office of Workforce

Development for Teachers and Scientists (WDTS), supports the advancement of undergraduate students interested in careers in scientific and engineering fields. Students are selected from a competitive, nationwide

## JEFFERSON LAB SCIENCE EDUCATION WEBSITE

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The Jefferson Lab Science Education website is a helpful resource for students, teachers and people who have a general interest in the physical sciences.

Visitors to the site can view and download educational information and activities, instructions to build science equipment for classroom demonstration, and a wide range of science education videos.

Through the science education website, people can access information about atoms, learn about upcoming public events

and programs and play a myriad of science and math educational games. The most popular game is based on the Virginia Standards of Learning test items and provides students with opportunities to enhance their knowledge and test-taking skills. To further benefit teachers and students, many questions are organized to promote learning in specific areas of need.

For more information about the science education website, visit:  
[education.jlab.org](http://education.jlab.org)



pool and work with scientists or engineers for 10 weeks, during the summer, on projects related to Jefferson Lab research. SULI prepares students to pursue professional careers and graduate school opportunities as they become part of the lab's research community and establish long-term research relationships with the lab scientists and engineers.

Students can apply online at:  
[science.osti.gov/wdts/suli](http://science.osti.gov/wdts/suli)

### COMMUNITY COLLEGE INTERNSHIP (CCI)

Supported by the DOE, the CCI program encourages community college students to explore technical careers year-round. Students work on technology or instrumentation projects guided by DOE's mission, under the

mentorship of lab scientists or engineers.

Students can apply online at:  
<https://science.osti.gov/wdts/ccl>

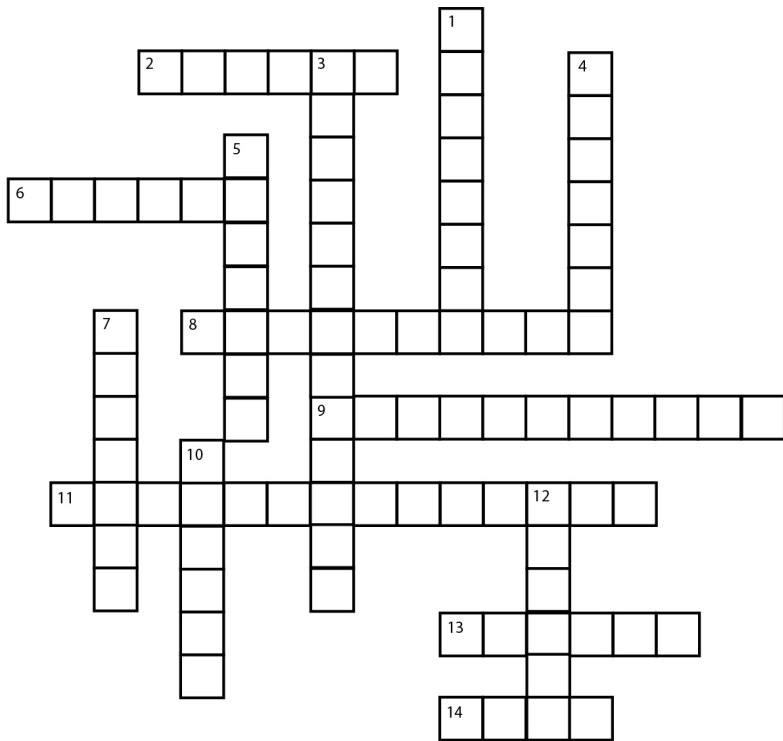
### HIGH SCHOOL SUMMER HONORS PROGRAM (HSSHP)

The six-week HSSHP offers work experience in physics and engineering divisions under the guidance of a lab mentor to the highest achieving high school students in the Hampton Roads area.

This program is for high school students who are least 16 years old and in good academic standing and with a grade-point average of at least 3.5 (on a 4.0 scale).

More information is available at:  
[education.jlab.org/hsapplication](http://education.jlab.org/hsapplication)





**Down:**

1. Negatively charged particles that circle an atom's nucleus.
3. A magnet that requires electricity in order to work.
4. The central part of an atom.
5. Neutral particles found in the nucleus of the atom.
7. The study of matter and energy.
10. Particles found in protons and neutrons.
12. Particles that bind quarks together inside of protons and neutrons.

**Across:**

2. Anything that has mass and takes up space.
6. The amount of space something takes up.
8. The study of the production and effects of low temperatures.
9. Scientists at Jefferson Lab use one of these machines to study inside of atoms.
11. Material used in Jefferson Lab's Physics Fest to produce low temperatures.
13. Positively charged particles found in the nucleus of the atom.
14. The amount of mater in an object.



Thomas Jefferson National Accelerator Facility is managed by Jefferson Science Associates, LLC, for the U.S. Department of Energy's Office of Science



Learn more about Jefferson Lab by visiting [www.jlab.org](http://www.jlab.org), by sending an email to [jlabinfo@jlab.org](mailto:jlabinfo@jlab.org), or by calling 757-269-7100.

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