

# NYSF Youth Science Discovery Experience

*The Youth Science Discovery Experience (YSDE) teams students and teachers with practicing scientists to pursue semester-long projects in fields of science, technology, engineering, and mathematics. Research teams use distance-learning technologies to continue their work between residential visits to the National Center for Youth Science Education in Tucker County, West Virginia. The Youth Science Discovery Experience is operated by the National Youth Science Foundation®, a nonprofit 501(c)(3) corporation.*

## Goals

- **Introduce** new scientific topics, especially those not typically covered in traditional secondary curricula
- **Encourage** lifelong learning in science, technology, engineering, and mathematics
- **Develop** science reasoning skills and understanding of the scientific research process
- **Demonstrate** relationships among the sciences and between science and other disciplines
- **Prepare** students to face challenges of college, career, and continuing education
- **Develop creativity**, instill self-confidence, and foster camaraderie among future leaders

## Program Overview

The YSDE program utilizes a project-based learning model that emphasizes activities in science, technology, engineering, and math (STEM) fields and is designed to instill a strong appreciation for mathematics and science in students while they make critical decisions that guide and impact their academic and professional careers. Elements of the YSDE are based on activities at the highly successful National Youth Science Camp (NYSC) and the project-based learning program of the West Virginia Governor's School for Mathematics and Science (the GSMS is partially staffed by teachers trained through a program at the National Radio Astronomy Observatory and funded by a grant from NASA).

The YSDE program provides the curriculum materials necessary to initiate and complete the projects. It includes short-duration residential sessions and leverages information technology to support continued exploration as the students return to their schools. At the conclusion of the YSDE, the teams present their findings to their peers. Their material will also be published in a section of the NYSF's web site dedicated to youth science research.

Each research team consists of six tenth-grade students, one teacher, and one practicing scientist. Together the team investigates an area of current scientific concern using a program model that integrates in-residence experiences with continuing education activities conducted in the students' and teacher's school setting.





## Program Features

### Physical Environment

YSDE facilities include science laboratories, a computer center, and arts and music studios located along the Blackwater River in West Virginia's ecologically diverse, geologically complex eastern mountains. The area provides an outstanding natural laboratory for teaching and experimentation. Isolation from the usual distractions of cities or college campuses provides a nurturing atmosphere.

### Intensive, Cooperative Learning

The residential portion of YSDE offers near "around-the-clock" learning opportunities in a challenging yet friendly setting. Cooperative learning encourages teamwork and collaborative skills, using science as a common language to allow students to learn from peers, staff, and visiting experts.

### Professional Partnerships

A key component of the YSDE is its relationship with partner organizations that can help support the project learning modules. Partner organizations are selected and invited based on their interest in developing project-based learning activities for students in high school. The YSDE program leverages the Foundation's existing network of scientists and educators to identify professional scientists who will serve as mentors to the student/teacher teams. YSDE's partnerships with organizations like the Canaan Valley Institute and the National Radio Astronomy Observatory provide unique access to world-class facilities and human resources.

## YSDE Outline

The Youth Science Discovery Experience begins with a five-day residential session where students will be introduced to YSDE and learn principals of scientific inquiry. Each research team works with its scientist to plan an approach to its project.

Student/teacher teams return to their home institutions and continue working on research projects throughout the semester. Two more intermediate five-day sessions in residence provide further intensive, face-to-face guidance from scientists and offer opportunities to collaborate with other teams. On-site visits also allow YSDE staff to take participants into the magnificent outdoor natural laboratory and playground provided by the surrounding national forests.

YSDE concludes with a final session in residence where teams wrap up and present their research for their peers.

### Research Topic Examples:

- Radio astronomy
- Geology
- Geographic information systems
- Mathematical modeling of natural systems
- Sustainable resource management

For more information about the YSDE or the National Youth Science Foundation, please visit our web site at [www.nysf.com](http://www.nysf.com), call us at (304) 342-3326, send an E-mail message to [nysf@nysf.com](mailto:nysf@nysf.com), or write us at the National Youth Science Foundation, Post Office Box 3387, Charleston, WV 25333-3387.