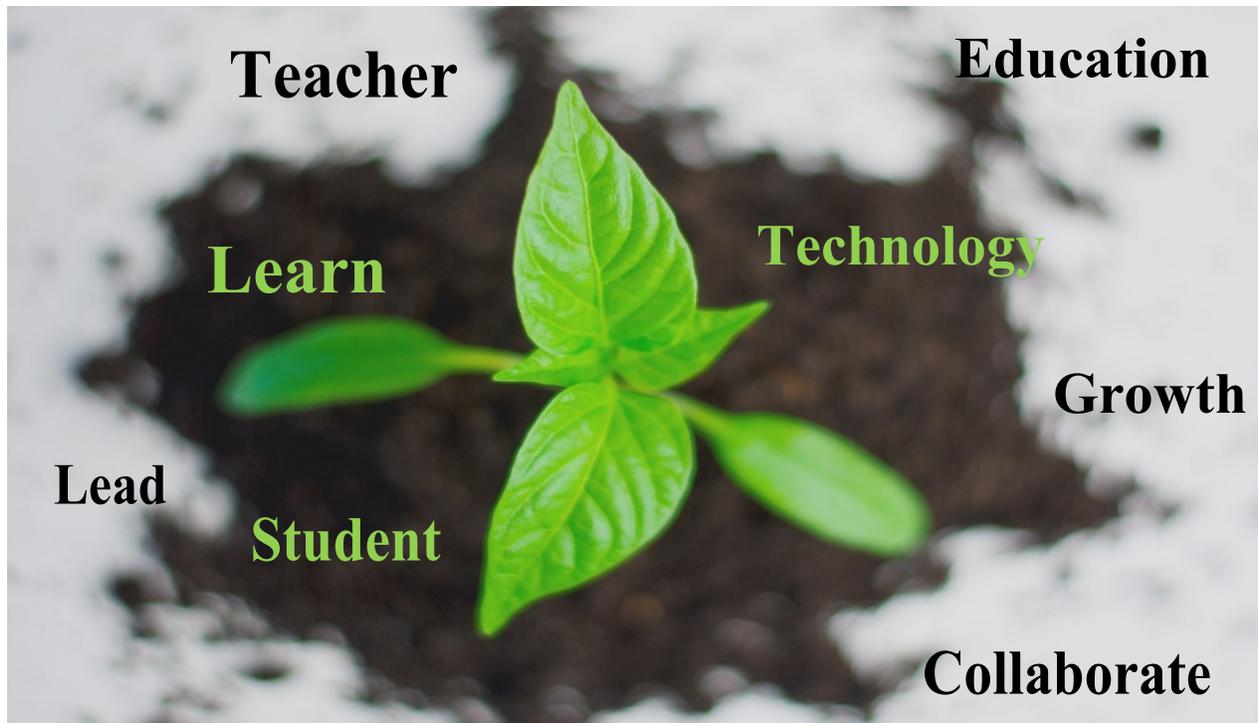


## NEATEC PROFESSIONAL DEVELOPMENT

How will **You** grow?



NEATEC offers **Training Sessions** such as

*Raspberry Pi*

*Atomic Force Microscopy*

*Arduino*

*Introduction to Nanotechnology*

*STEM Pathways For The Future*

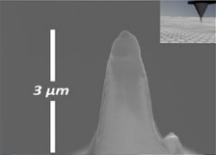
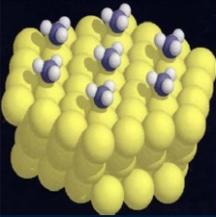
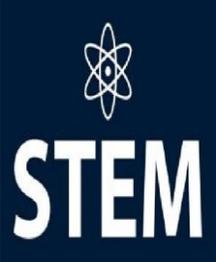
As well as **Learning Modules**

Each module is available as a kit which includes lesson plans, consumable and non-consumable lab materials, black-line masters, and presentation materials. The kits are available for teachers to borrow at no-cost after their completed module training. NEATEC offers module trainings, which provide teachers the opportunity to experience the kit instruction as a student while also examining the instructional techniques and learning standards covered by the module.

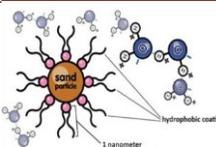
# NEATEC TRAINING SESSIONS AND MODULES

Content available for download on [NEATEC.org](http://NEATEC.org) or contact [neatec.kits@gmail.com](mailto:neatec.kits@gmail.com)

## Training Sessions

	<b>Raspberry Pi</b>	In this 6-hour session. Participants learn how to hook-up, turn on, and program the Raspberry Pi to take pictures and detect real-world signals such as motion, temperature, and pressure. The workshop culminates with a hands-on project in which participants make a burglar alarm system by programming the Raspberry Pi to turn on a camera and record a video when motion is detected.
	<b>Atomic Force Microscopy</b>	In this 4 ½ hour session, participants learn the science behind the creation of images by an atomic force microscope. They learn how to properly handle an AFM, understand how to prepare samples, understand how to load and take images of the samples, and learn how to replace AFM probes.
	<b>Arduino</b>	This 8-hour workshop is an introduction to the open-source electronics platform based on the Arduino microcontroller. The first 4 hours are dedicated to learn about microcontrollers and to install the Arduino platform. The participant will be introduced to the basic Arduino programming language through simple exercises. The second 4-hour part will be dedicated to specific projects using sensors, actuators and electronic components.
	<b>Introduction to Nanotechnology</b>	This is a 45-hour, on-line course intended for Science and Technology teachers who are interested in teaching nanotechnology. The course provides a highly interdisciplinary introduction to the science of nanoscale materials (nanoscience). Topics include historical background, characterization techniques, physics and chemistry of nanoscale materials, fabrication techniques, nanoscale applications, and ethical/societal considerations.
	<b>STEM Pathways for the Future</b>	In this 2-hour information session school counselors and teachers, learn what nanotechnology and advanced manufacturing are and the types of careers available in these field. During this session at SUNY Polytechnic Institute, participants tour the College of Nanoscale Science and Engineering, learn about pathways for students of all abilities that will lead to careers in the growing field of nanotechnology, and advanced manufacturing. The session incorporates a discussion of how NEATEC can help educators help their students.

## 6-12 Learning Modules

	<b>Thin Films Grades 6-8</b>	Using soap bubbles, students learn how to measure the thickness of a thin film by observing the colors of the light spectrum and comparing them to a wavelength chart. They also learn the application of Thin Films in the world of nanotechnology and the everyday objects it is used for. Many elements of middle school math are also incorporated into the module as students calculate the volume and surface area of a sphere. This module includes four, forty minute lessons.
	<b>What is Nanoscience? Grades 6-8</b>	Introductory overview of nanoscience and how size affects the property of materials. Using flashcards, students compare objects ranging from macroscale to the nanoscale and match them up with scientific notation. Surface area reaction time is then explored using different size tablets dissolved in water while monitoring the height of the reaction over a given time. This module includes four, forty minute lessons.
	<b>Chemistry of Hydrophobic Sand Grades 9-12</b>	In this activity your students will have learned the structure and properties of water, differences between polar and non-polar molecules, and how their polarity affects intermolecular forces, and solubility and hydrophobic effect by synthesizing and exploring properties hydrophobic sand as compared with regular beach sand.

NEATEC

SUNY Polytechnic Institute, 257 Fuller Road, Albany, NY 12203