Pre-Tech Program

The Career and Technical Education Center at Sullivan County BOCES recently unveiled a new program that combines a developed Pre-Tech program with a STEM-based project approach.

The **Pre-Tech Program** is a 9th & 10 grade credit-bearing, career exploration program wherein students gain a solid foundation of basic skills in multiple vocational areas while also managing a student-run business.

The Pre-Tech program mirrors the changes in the world and requires the student to take a different approach in responding to today's problems, through the use of innovation, technology, and good old-fashioned "American Ingenuity". This is accomplished without requiring the extensive use of "high-tech", expensive equipment, only the use of innovation.

The **STEM component** offers a vast array of renewable energy practices, as well as alternative food production projects. Each project requires the student to engage in active problem-solving using higher-order thinking skills. Furthermore, the program challenges the student to build knowledge in viable energy and food production alternatives.

The use and advancement of these alternative technologies has been put to the side, while the United States enjoyed many years of fossil fuel based systems, making all others unnecessary. There has been a recent shift in this perception, however, due to the documented decline of these resources. A "retooling" of ideas is required.

Engaging Students with Active Problem-solving while using Higher-order Thinking Skills

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Sullivan County
Pre-Tech Career Exploration
Career & Technical Education
"Skills, knowledge and work ethic for the 21st century"

Pre-Tech Career Exploration Program is one of the many programs offered through the Career & Technical Education Center at Sullivan County BOCES.

Career & Tech prepares students to be college and career ready. Students leave the program with the skills necessary for success in post-secondary education, the work force, apprenticeships, or the military.

Students have the opportunity to earn up to seven high school credits towards graduation, while meeting industry standards and learning the job skills essential for a specific career or trade.

All of our SED approved programs include articulation agreements with colleges and trade schools. Therefore, students can earn college credit toward an associate or bachelor degree, while they are in high school.

Sullivan County
SCB
~ Board of Cooperative Educational Services ~
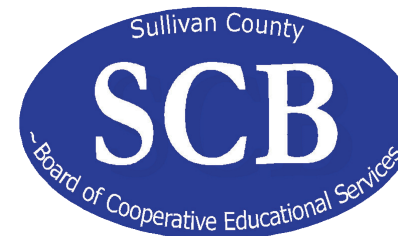
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Innovation Starts Here...

Pre-Tech Program

STEM Initiative

Differentiated instruction focused on both career and college preparedness

Career & Technical Education Center at Sullivan County BOCES
(845) 295-4152 | scboces.org

Multi-Faceted Program

The purpose of the program is multi-faceted:

First, to afford the student an opportunity to experience different trades and technologies, so they can make an educated decision as to what trade and/or technology they want to pursue in their junior and senior years.

Second, to educate the student through project-based learning utilizing traditional as well alternative energy technologies. Further, how to make use of limited space to produce food and creating a controlled environment to raise food to offset dwindling natural resources.

Finally, for some students, the program will serve as a spring board that will vault them into an educational path where they expand their knowledge and understanding of renewable energy and alternative food production systems, and may go on to make a living in those fields as a professional.

Program goals are achieved with a teamed instructional approach which allows for the differentiation of instruction focused on both career and/or college preparedness.

Engineering by System Design

Engineering by system design, uses what you have to engineer with. This is the underlying philosophy of the program. With a STEM-based initiative, the aim is to teach the student to utilize current resources to overcome obstacles and create basic necessities such as power and food, required to live on a daily basis.

- "What if" scenarios are utilized, such as, what if there was a lack of power, but a good source of stream water or wind? How would one harness these natural resources?

- Students are taken out into the field to calculate the potential of each renewable energy technology. This learning process is also used in the alternative food production systems where aquaculture, hydroponics, and other initiatives, are covered.

- The program also features a "tiny house" built from standing timber. The students mill the lumber and construct the unit. The house utilizes several of the alternative energy technologies and demonstrates student proficiencies, while providing a mobile educational tool for student presentations at local districts.

Program Initiatives

Bio Gas Generator:
Utilizing one recycled 18 liter water bottle, plastic tubing, a cork, a valve, a "T" adapter, Mylar balloon, and cow manure from Animal Science, the class constructs a bio-gas generator.

Wood Gas Generators
Utilizing two 55-gallon drums, miscellaneous pipes, connections, filters and cooling pipe, and a welder from Precision Machinery, the class constructs a generator fueled by wood, to run vehicles, generators, furnaces and stoves.

Hydroponics
System is built from PVC pipe and fittings, installed basket pots, utilizing a pump to provide water from a fish tank to fertilize the plants.

Aquaculture Systems
A fish tank is installed in the classroom, allowing the students to learn some of the basic concepts of fish farming. The water from the tank is then pumped through the proposed hydroponic system to feed the plants.

Wind Turbine (on campus)
Using wind data collected from the campus wind site, students design and install a 30' tower which will support a 300 Watt wind generator.

Micro-Hydro (on campus)
Using data collected by the students to calculate potential power capabilities from the stream that runs through the campus, students construct a micro-hydro generator utilizing recycled parts.

Mobile Renewable Education Unit (Tiny House)
Utilizing trees harvested in approved Silviculture practices, students mill the lumber necessary to build the "tiny house", and then construct the unit incorporating several of the renewable energy technologies.

Student-Run Business
Students define a wood product project or a Culinary Arts project to construct or produce; the students design it, plan out a marketing approach, sell the product, manage the money, and put the revenues back into the program.

Bio-Gas Generator   Hydroponics   Aquaculture Systems   Wind Turbine   Micro-Hydro   Student Run Business

Utilizing Innovation and Technology to Achieve a Higher Order of Thinking Skills