



WHAT IS STEM?

STEM education integrates **science, technology, engineering** and **mathematics**, and incorporates the skills of the 21st Century learner.

These critical areas of study assist students in gaining college and career readiness skills, including problem solving, critical thinking, team building, and others while promoting advancements in all STEM-related areas.

Somerset ISD STEM curriculum prepares students and holds promise for future employment in high demand, high pay career fields. The future is now – preparing our students is the priority!



PitSCO Education Modules present a dramatically different learning environment which sparks fundamental changes in attitude and stimulates revolutionary learning. Students apply a variety of real-world skills to authentically solve problems with peers. It's a place where success is the rule, not the exception.



Somerset ISD is partnering with PITSCO Education to usher in a new era of learning for Bulldog students!

S O M E R S E T I S D



REVOLUTIONARY LEARNING FOR THE 21ST CENTURY

INSPIRATION
INNOVATION
INTEGRATION

Somerset High School

Fourteen modules are taught at the High School, including:



ALTERNATIVE ENERGY - In Alternative Energy, students explore the basic concepts of energy, as well as the law of conservation of energy. Information is presented about renewable and nonrenewable energy sources and how these resource types are important for meeting global energy demands. The advantages and disadvantages of alternative energy forms such as solar, wind, biomass, geothermal, and hydropower are presented. Hands-on experiences include experiments with a wind turbine, solar cells, and hydrogen fuel cells.



BIOENGINEERING - In BioEngineering, students explore topics related to kinesiology and sports performance. They cover mathematical concepts including measuring and classifying angles, absolute values, positive and negative rational numbers, data collection, and simple algebra. Students perform flexibility tests, take digital images of the tests, and use the computer to analyze their flexibility.



BIOTECHNOLOGY - In Biotechnology, students explore the past, present, and future of biotechnology. Through hands-on activities, computer simulations, and laboratory experiments, they investigate the structure of the DNA molecule and learn how it can be changed through genetic engineering, including recombinant DNA, gene splicing, and transgenic biotechnology. They consider some implications of using biotechnology in medicine, agriculture, and other fields.



ENERGY, POWER, & MECHANICS - When students complete Energy, Power & Mechanics, they have a basic understanding of energy sources, the principles of power technology, and the concept of mechanical advantage and machines. Students see how fluids can be used with other simple machines. Using educational instruments, students learn the fundamentals of gears, fluid mechanics, and three classes of levers. Students also use a solar hot dog cooker and experience the concept of wind power.



ENGINEERING BRIDGES - In Engineering Bridges, students solve an engineering problem as a team. Their task is to build a balsa wood bridge that will span a space and hold the most weight before breaking. There are certain rules that the students must follow to build their bridges correctly. Students learn the relationships among design, structure, and strength of a bridge. By building a bridge and testing its strength on a structure tester, students learn valuable engineering concepts and principles.



FORENSIC MATH - In Forensic Math, students create a theory about how a car may have been damaged in a fictional high school parking lot. Students use triangulation and polar coordinates to specify locations of objects within a crime scene and create scaled scene drawings. Tire impressions, footprints, and crime scene photos are used to piece together students' theories. Students find functions describing given relationships, determine slope, and determine the equation of a line.



ROBOTS - In Robots, students learn about the fascinating role that robots play in our lives. More and more, this technology is helping to improve the way we live and manufacture items. Students learn how to operate, program, and use robots in different environments. Initially, each student learns to manipulate the robot and program it to conduct repeatable tasks. Students learn about each of the sensors and how to program them to control a self-directed robot. Ultimately, they program a robot to operate by using the sensors as inputs to solve a challenge.



Somerset ISD STEM labs are designed to:

- Present a hybrid approach to instruction which includes both project-based learning experiences through virtual and face-to-face interactions.
- Create a vertically-aligned continuum of learning from junior high to high school.
- Promote inquiry-based learning in various STEM-related fields.
- Generate high levels of authentic and meaningful learning which directly connects to real-world applications.

Our goal is to Inspire and ignite student success through Innovation and purposeful Integration.

Somerset Junior High School

Fourteen modules are taught at the Junior High School, including:



COMPUTER GRAPHICS & ANIMATION - In Computer Graphics & Animation, students learn how the use of computers can enhance products created by professional artists and animators. With the use of a computer and related software, students produce an animated sequence using bendable cartoon figures. Students use a digital camera to capture a picture and create an animated project. Students also explore 3-D animation and create an animated 3-D movie.



ENVIRONMENTAL ISSUES - In Environmental Issues, students use multimedia and hands-on activities and experiments to explore pollution, loss of habitats and biodiversity, resource use, waste management, global climate change, and human population growth. They learn statistics related to these issues and do activities relating to acid rain, paper recycling, resource use, oil-spill cleanup, and global warming.



FORENSIC SCIENCE - In Forensic Science, students determine the prime suspect in a fictitious vandalism of a local high school. Students analyze evidence, which includes fingerprints, hair samples, handwriting, and ink. Students also extract DNA from a sample. Students compare the evidence with samples taken from suspects. Finally, they must put all the evidence together and identify a prime suspect. Teachers may customize suspect samples and evidence, just to keep it interesting!



GENETICS - In Genetics, students learn genetics terminology and simulate breeding experiments similar to Gregor Mendel's. They construct models of chromosomes and DNA. Students create Punnett squares and determine probabilities of offspring given specific parent genotypes. They complete a dihybrid cross and a natural selection experiment.



INVESTIGATING CAREERS - Investigating Careers will allow students opportunities to research career information in the 16 recognized career clusters. Sample real-world activities will be completed to assist students in assessing their likes, dislikes, and aptitudes. Interview and employment skills useful in any career will be explored.



ROCKETRY & SPACE - In Rocketry & Space, students learn about the development of rocketry and the United States space program and its history. The principles of rocket design, propulsion, and certain scientific principles that are fundamental to successful rocket flight are important concepts in Rocketry & Space. Students construct and launch a model rocket as a means of bringing application to the scientific concepts presented.