Collaborative Learning

An overarching goal of Pitsco Education's Modules curriculum is for students to become responsible learners and to work cooperatively with others. Modules are student directed, giving students control of their own learning experience. And because students work with a partner to complete each Module, the experiences they share promote positive communication, teamwork, inquiry, learning, and social skills.

Modules are delivered through a combination of hands-on activities and proprietary multimedia curriculum. Math, science, technology, and language arts experiences are woven throughout each of the Modules' seven sessions. Equipment, materials, reference texts, and all supplies necessary to achieve success reside at the Module workstation.

Every student's unique learning style is accommodated in Pitsco Education's Modules curriculum. Whether a student is a kinesthetic or visual learner, a nonreader, or a speaker of English as a second language, Modules ensure student success through a combination of text, graphics, video, and hands-on activities.

LUTHER BURBANK MIDDLE SCHOOL
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Joe Reed – Facilitator

This program was implemented through
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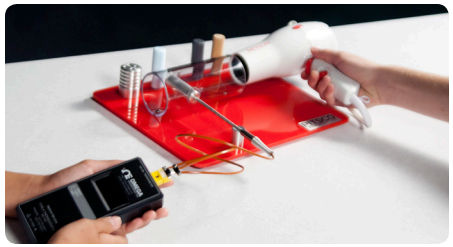
MODULES

Welcome to

Luther Burbank Middle School



APPLIED PHYSICS

In *Applied Physics*, students learn about the wonderful forces of nature that they must control and learn to live with to make their lives more enjoyable. Using an air track, students learn about motion by calculating the velocity and acceleration of air track cars using a photogate timer. Students study data transmission using a laser. Students also learn about radio waves, light, and heat and do experiments using mathematics.

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.

AQUACULTURE

In *Aquaculture*, students learn fish biology, care, and management by maintaining their own goldfish tank. After an introduction to the history of aquaculture, they conduct chemical tests of tank water, learn fish anatomy and metabolism, calculate fish growth and productivity, and maintain records of their activities. Along the way, they learn the processes involved in a large-scale aquaculture operation and consider environmental impacts of aquaculture.

AUDIO BROADCASTING

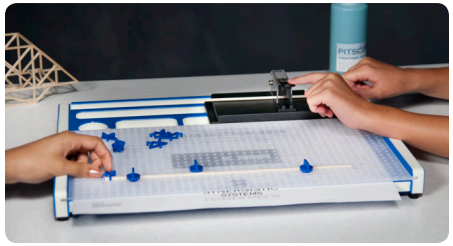
In *Audio Broadcasting*, students experience the important medium of radio and produce a radio broadcast. Students learn how to use a digital audio editing software program, record several announcements and stories, and assemble the recorded pieces into a sample broadcast. Students also learn about radio waves and how sound is sent from the station to people's radios in their homes and automobiles miles away.

CNC MANUFACTURING

In *CNC Manufacturing*, students explore the manufacturing process and important inventions that have advanced these various processes. Students learn the relationship of software to manufacturing and use software to design a project that is later machined on the Z-Mill. The Cartesian coordinate system and its effects on machine movement and digital automation are also presented.

ELECTRONICS

In *Electronics*, students learn the common components of basic circuits in electronic devices. Students learn how to solder electrical components together to form a circuit. They also complete various electronic experiments using an educational instrument. The construction of a simple electronics kit helps them to learn the application of each component used to make the project function successfully.



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.

ENGINES

In *Engines*, students are introduced to the history, theory, and applications of engines. Students learn shop and equipment safety, basic operating principles, parts, and tools – all through practical hands-on experience with a common four-stroke motor.

FLIGHT TECHNOLOGY

In *Flight Technology*, students learn the principles of flight. Students use a computer flight simulator to experience piloting an aircraft. Each student evaluates the other and prepares a written critique of his or her partner's flight. Students are introduced to navigation and plot a course using angular measurement and mathematical computation.

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!

LIGHT & LASERS

In *Light & Lasers*, students explore aspects of light and lasers and see how that technology can be used. Students use geometric concepts to divide and reflect a laser beam along a path and to create a security system utilizing the beam. Light is explored and manipulated through experiments that use lenses, prisms, filters, and intensity meters. The data from these experiments is analyzed and interpreted to provide a clear picture of the nature of light.

MICROBIOLOGY

In *Microbiology*, students learn classification systems and characteristics of bacteria, protistans, and fungi. They culture and identify bacterial colonies and observe living protistans and fungi. They distinguish between simple prokaryotic and more complex eukaryotic cells. They learn microscope use, measure microscopic organisms, and calculate actual sizes of microorganisms based on their magnification.

PRACTICAL SKILLS

In *Practical Skills*, students learn to identify common tools and their uses. They are introduced to the history of measuring systems, repair faulty systems, and follow directions to assemble prefabricated furniture. One important skill is to recognize situations when it would be best to call in a professional to help them solve the problem.

RESEARCH & DESIGN

In *Research & Design*, students design, manufacture, and race a model CO_2-powered dragster car. Students design their car to meet certain specifications and limitations so that it qualifies as a legal car on race day. They learn the concepts and terms in the design process as well as gain an understanding of lift and drag on an object. After they finish their car, students test it in several ways and predict its performance.

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.

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.