TECH design®

SCIENCE

TECHNOLOGY

ENGINEERING

MATH

Lab-Volt®

Interactive Multimedia
Technology Education

eLearning Curriculum Designed for Skill Reinforcement and STEM Support

# Developing Student Engagement and Skills in Science, Technology, Engineering and Math (STEM)

Featuring a competency-based, interactive multimedia curriculum, Tech-Design has led the way in meeting the highest standards in modular technology education today.

The Tech-Design technology modules are designed to meet the standards established by the International Technology Education Association (ITEA). They feature dynamic, hands-on activities to reinforce specific skills, with an emphasis on science, technology, engineering, and math (STEM).

Activities and exercises aim to foster inquiring minds, logical reasoning, and collaboration, as well as link content with promising career pathways.

- **Career Exploration**

  Students explore diverse opportunities in manufacturing and engineering fields. They discover their individual interests and strengths, and realize how they can achieve successful and rewarding professional lives.

- **Differentiated Learning**

  Modular set-up enables students to learn at their own pace. Furthermore, a combination of multimedia curriculum and hands-on activities appeals to both visual and kinesthetic learners.

- **Employability Skills**

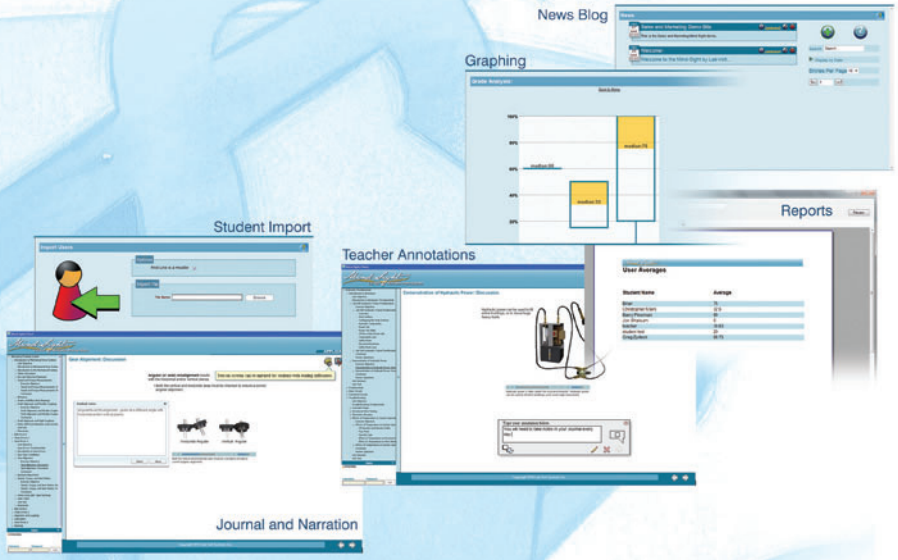
  In addition to technical skills, students are introduced to foundations of the business world, including corporate structure, marketing, design and manufacturing processes, and production technologies.

# Introducing Mind-Sight: Lab-Volt's Multimedia eLearning Management System

Tech-Design modules are primarily offered through Mind-Sight – Lab-Volt's LMS, which offers a seamless integration of course delivery and classroom management. Built around the most up-to-date programming standards, Mind-Sight's functionalities enhance the Tech-Design eSeries curriculum.

Instructors can use Mind-Sight to manage student enrollment, schedule learning activities, customize courseware, and track student achievement as they work through the courses.

Mind-Sight is offered as a web-based solution, allowing students to log on and study from anywhere, at any time, or as a LAN-based solution to deliver curriculum locally.

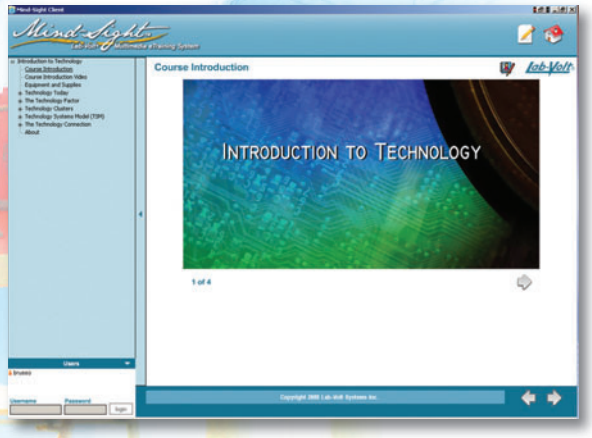



## Building Career Success 40076-70

Succeeding in the workplace requires a set of skills that can be difficult to learn in school. Building Career Success helps develop these skills by focusing student attention to what an employer is looking for in a valuable employee. Students improve their written and spoken communication skills, develop career planning capabilities and job search skills, and learn to take advantage of all job advancement opportunities. They learn to manage their financial lives as they practice money management skills and controlling credit. They discover the best ways to save and increase the money they earn.

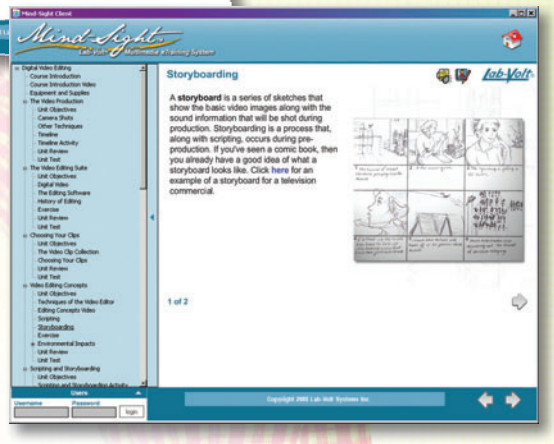

## Introduction to Technology 40090-70

Introduction to Technology is a five-unit course and an important foundation for students to understand the other Tech-Design courses they will complete. By the end of this course, students gain an understanding of the nature of technology, explore the Tech-Design multimedia program, and describe the differences in technology throughout the world. Students examine what the future might hold for new technologies, define the five clusters of technology and how they are connected, describe the Technology Systems Model (TSM), and use it to solve problems.



## Video Production 40026-70

Have you ever seen a television show being videotaped or wonder how it's done? In the Video Production course, students explore their artistic and technical abilities for creating video presentations. They explain the basics of how professional videos are produced, and explore the pre-production phase of videotaping. Through hands-on experiences, they learn how films are created and explore various careers that involve video production.


## Digital Video Editing 40025-70

When a film or video is shot, industry practice is to record scenes in a random order to take advantage of particular circumstances. So, how does a group of randomly ordered scenes come together as a flowing presentation? In the Digital Video Editing course, students learn how videos are edited to create outtake-free presentations and how audio content is dubbed into videos. Students are introduced to the basic techniques and principles of storyboarding, voice-overs, and digital video editing. They also explore educational and career opportunities in the exciting field of video editing.


## Web Development 40072-70

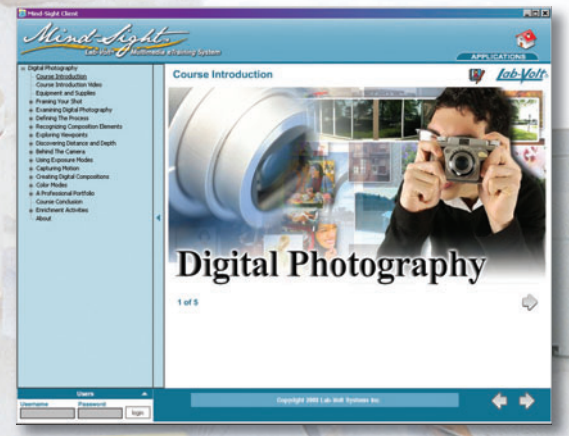
Think of all the websites you visit in a week and how different they are from each other. Maybe you've thought of creating a website of your own. This course introduces students to the process of creating web pages through the use of Hypertext Mark-up Language (HTML) and professional web-development software. Using the provided software package, students learn the tools necessary for creating their own web pages, and they explore possible careers in web design and related fields.

## Desktop Publishing 40014-70

Desktop Publishing is the process of using a computer and specific types of software to combine text and graphics or images to produce newsletters, brochures, books, and other documents. In this course, students learn the art of manipulating text and graphics to produce documents that are visually pleasing as well as effective communication tools.

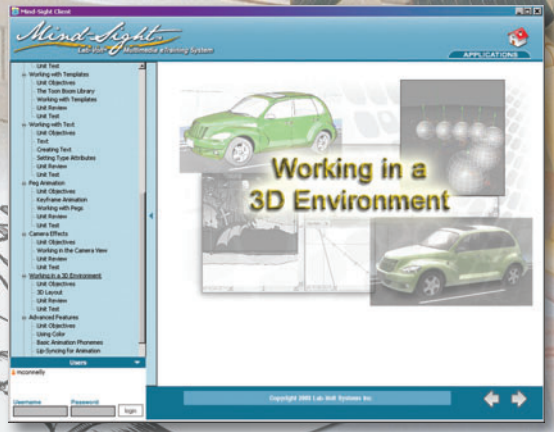

## Digital Photography 40074-70

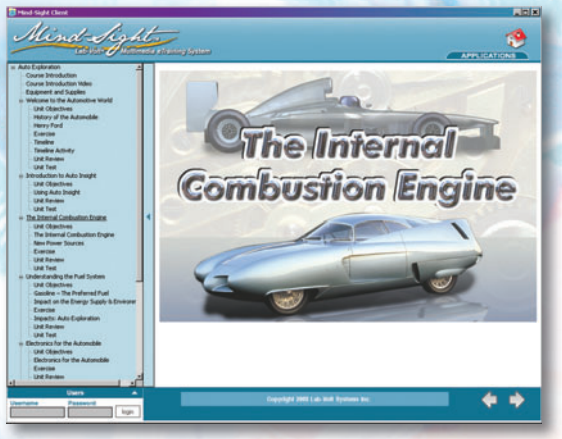
In this course, students explore the concepts of good photography and the process of using digital photography equipment and software. When they understand how to merge the artistic concepts of photography with the specifics of using the camera and equipment, they are ready to capture great images. Then, as they connect the camera to their computers, they store, transform, and print their images electronically. Using this organized approach to digital photography gives students plenty of time to experiment with this relatively new art form.




## Animation 40003-70

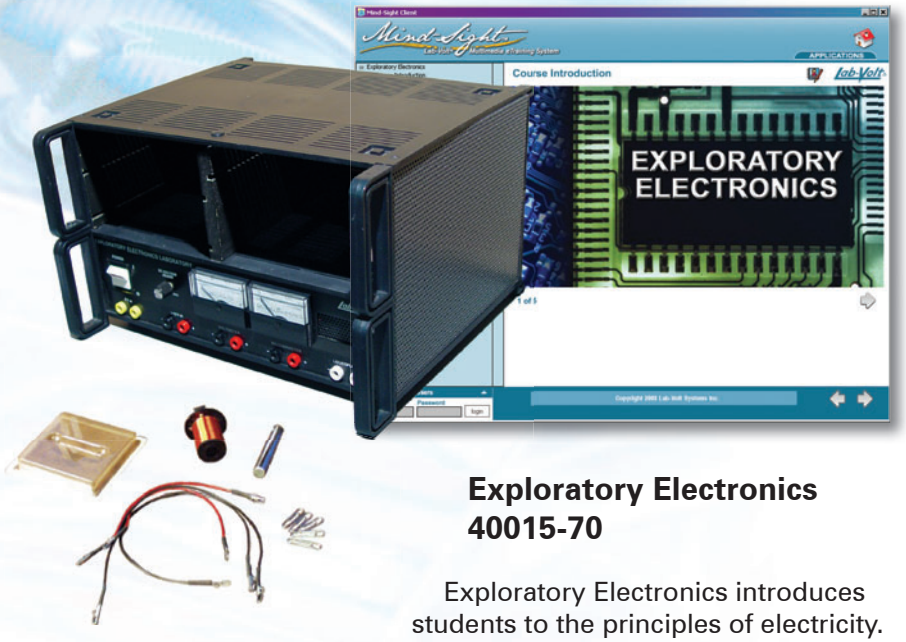
Pixar™ – DreamWorks™ – Aardman™. How do these animation studios create such amazing animations? This course teaches the principles and techniques of producing computer-generated animations through the use of sophisticated animation software. Students experiment with various animation techniques to create 2D and 3D animations complete with voice over and sounds.






## Auto Exploration 40027-70

Most students dream of getting their own car. In Auto Exploration, students use simulation software and hands-on activities to explore the automobile and its impact on society. They learn all the major systems that work together to make cars perform. Students also learn about production and automation in the auto industry and use software to design, build, and test an automobile.




## Exploratory Electronics 40015-70

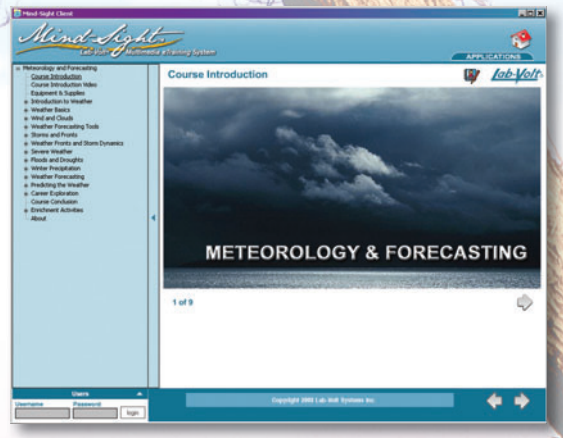
Exploratory Electronics introduces students to the principles of electricity. They learn basic safety rules, experiment with circuitry, and define Ohm's Law as the relationship among voltage, resistance, and current. Students use the Lab-Volt Exploratory Electronics Laboratory to perform experiments and demonstrate basic electrical concepts, including three-way switching and magnetism.


## Exploring Mechanisms 40042-70

What do the inclined plane, the lever, the wheel and axle, and the pulley have in common? They are the four simple machines that make everyday tasks easier. The Exploring Mechanisms course introduces the scientific concepts and components that make machines work. Students also learn about careers in mechanical systems, construction, and manufacturing, where they can expand and apply the knowledge gained throughout the course.

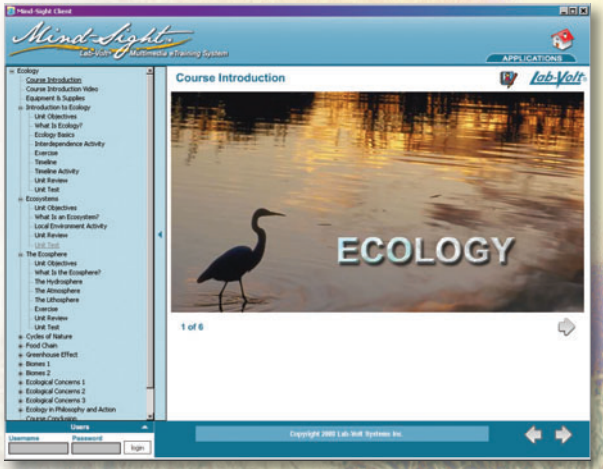
## Meteorology and Forecasting 40030-70

The Meteorology & Forecasting course offers hands-on activities that illustrate how weather patterns are recognized and how forecasts are developed. Students gain fundamental knowledge about weather and meteorology, and learn about instruments and computer-based tools that are used to predict the weather. They study the Earth's atmosphere, pressure systems, weather fronts, and storm-tracking, and explore careers in weather-related fields.




## Ecology 40035-70

In the Ecology course, students investigate how ecosystems work together and how environmental issues, such as global warming, acid rain, and soil erosion affect the Earth. Various activities in the course are designed to increase students' awareness of the Earth and its diverse and delicate life forms. Students explore career opportunities through which they can contribute to a healthier and more balanced world.




## Environmental Technology 40017-70

The importance of clean water to all life on earth cannot be exaggerated. In this course, students examine the role of water in our lives. They explore the water cycle and the physical and chemical properties of water. They examine how controlling water pollution is vital to the environment and experiment with different methods of water treatment.


## Fiber Optics and Lasers 40018-70

How is light used to transmit sound? What is fiber optics? How are codes, data, voice, radio, and light transmitted through optical fibers and over laser beams? The Fiber Optics and Lasers course teaches students the basic concepts of these technologies. Students perform experiments to observe these phenomena, demonstrate how light is used in communications, and explore career opportunities in these continually-expanding fields.


## CNC Lathe 40009-70

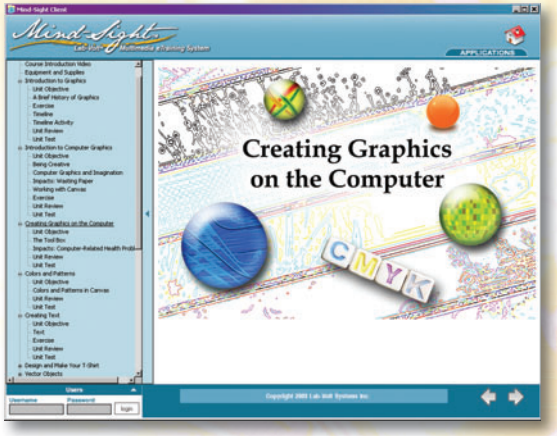
The Computer Numerical Control (CNC) Lathe course provides hands-on experience with industrial-grade equipment that allows students to discover the importance of CNC in manufacturing. Through programming and operating the lathe, students learn how machines make manufacturing more productive, efficient, and safe. They learn to specify dimensions, program a lathe, and machine a part.


## CNC Mill 40070-70

In the Computer Numerical Control (CNC) Mill course students are introduced to how products are designed and manufactured using computer-aided technology. They learn how to program and operate the mill, specify dimensions, and manufacture parts that meet these specifications. Students learn the basic tools needed to create three-dimensional drawings, create part programs, and execute the part programs to produce a part or product.

## Computer Graphic Design 40008-70

Can you picture the logo of your favorite soft drink? What makes it memorable? The Computer Graphic Design course introduces students to the techniques and graphic design software that help produce logos in various communications media. Students experiment with different colors, texts, and layouts to explore their creative design potential by developing their own logo and transferring it onto a T-shirt.




## Computer-Aided Design (CAD) 40007-70

This course teaches students about the role CAD plays in the creation of buildings, vehicles, appliances, and industrial equipment. Professional CAD software helps students develop the CAD skills while creating technical drawings, floor plans, orthographic projections, isometric drawings, and house designs.


## Computer Problem Solving 40010-70

The Computer Problem Solving course helps students develop essential problem solving skills and apply them to various challenging situations. Students learn how technological problems are solved, what a problem statement is, and how to write a design brief. By developing good strategies to address problems, students become armed with skills that can be applied to all areas of their lives.


## Automation and Robotics 40005-70

The introduction of robotics and material handling in the manufacturing industry has created higher quality, less expensive products. This course teaches students to program a robot, parts feeder, and conveyor system to replicate what happens in a high-tech manufacturing plant.



## Controls and Sensors 40013-70

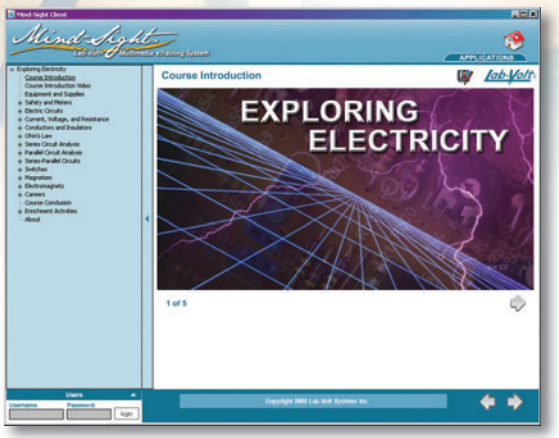
The Controls and Sensors course teaches students how devices such as electronic doors and automatic lights function. Sensors gather data from the environment, and controls utilize the information to direct a machine response. Students build machine models and write software programs to direct their operation.

## Alternative Energy 40036-70

Many of the environmental problems we face are a result of our dependency on fossil fuels. In this course, students examine clean, efficient, alternative sources of power. They discover the principles of solar, wind, biomass, hydroelectric, and geothermal energy. They discuss the difference between non-renewable and renewable energy sources and the importance of conserving energy. Students examine the environmental benefits and challenges of alternative energy sources, and the future of energy technology.


## Fluid Power 40020-70

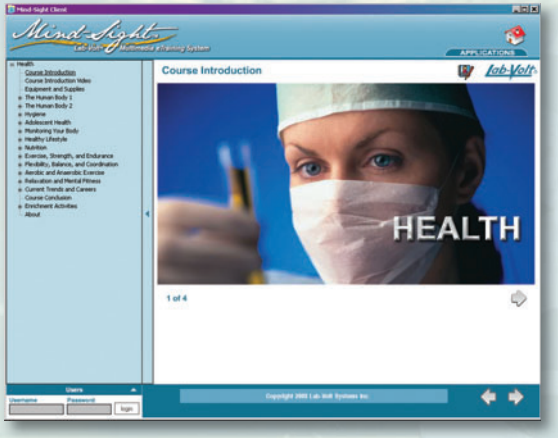
Through the Fluid Power course and hands-on exercises, students learn the scientific principles and components that make up fluid power systems and how these systems operate in machines and equipment. They are introduced to the physics and mathematics of fluid power, including pressure, area, force, work, and energy. They discover many of the ways in which pneumatics and hydraulics provide the power to accomplish difficult tasks.


## Exploring Electricity 40043-70

How does electricity work? How did people ever live without it? Through the Exploring Electricity course, students discover how electrical circuits are built and tested. They explore the scientific principles that explain how circuits and other components make electric devices operate. With an understanding of these inner workings, students may consider careers in electrical science, or at least be able to troubleshoot electrical issues at home.

## Health 40033-70



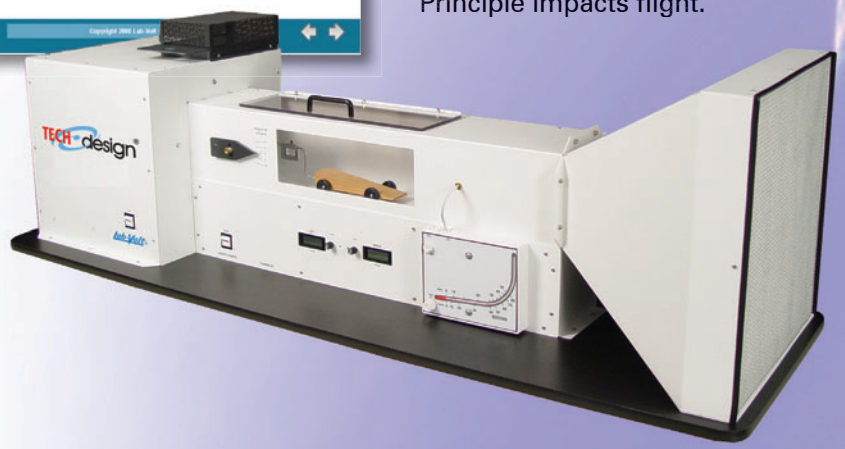

This course examines the living systems that comprise the human body. Students learn the role personal responsibility plays in maintaining their health. The course emphasizes the importance of nutrition, hygiene, and physical and mental fitness and introduces students to technologies, including fitness equipment and medical treatments, that help improve health. After completing this course, students may decide to continue learning for their personal benefit or possibly choose a path to health-related careers.


## Biotechnology 40006-70

The purpose of this course is to introduce the students to the diverse field of biotechnology and its applications. They learn how biological systems can be affected, created, altered, and influenced by technology. This course also encourages students to explore the various fields that combine life science with technology, including ergonomics, bioengineering, bionics, health and medicine, nutrition, hydroponics, energy, genetics, and the environment.


## Aerodynamics 40000-70

This course teaches students the fundamentals of aerodynamics. They discuss the forces of lift, weight, and thrust. Students learn how to operate a wind tunnel, and test various airfoils and model cars. Using a weather center, students collect and measure atmospheric data. They examine advanced topics, such as how Bernoulli's Principle impacts flight.

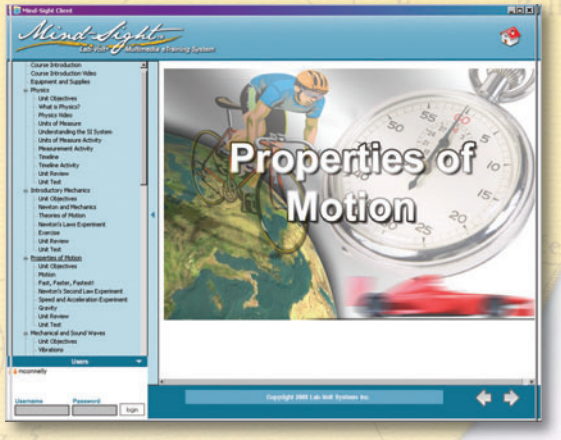



## Space & Rocketry 40031-70

The Space and Rocketry course examines the past, present and future of space exploration. Students study the history of human inquiry into the workings of the cosmos and learn about the many modern products that are manufactured due to discoveries made in space. They explore the possibility of future space colonies and the potential for travel to and from modern space stations. Students simulate and apply technologies and scientific principles involved in space travel and exploration, and build and launch their own rocket.

## Discover Physics 40028-70

Discover Physics presents the principles, theories, and applications of physics in a fun format. Students explore the laws of motion by experimenting with collision carts, and examine different wave theories by experimenting with polarizing optical lenses and the Slinky®. They demonstrate the reflective principles of light by using mirrors to "see" around corners, and explain electrostatics in action by demonstrating the attractive forces of opposite charges and how like charges repel each other. All these hands-on activities make physics come alive.





## Design & Construction 40046-70

**10 UNIT COURSE**

This course is an introduction to Residential Design and 3D Modeling. Students learn about the many factors and considerations that are faced when designing a home. Factors such as site planning, layout of floor plan, spatial relationships, climate, roof configurations, and energy efficiency are discussed. Students draw a floor plan to scale using architectural drawing tools and use sophisticated 2 and 3D modeling software to design a dream home.


## Engineering & Stress Analysis 40016-70

Building structures that are strong, safe, and long-lasting requires engineers to create designs that incorporate the theories of stress analysis. In this course, students examine the loads that are put on structures, the properties of different building materials, and the designs of different structural members. They apply what they've learned by designing and testing bridges in the stress analyzer.

## Manufacturing and the $CO_2$ Raceway 40029-70

### 10 UNIT COURSE

The Manufacturing and the $CO_2$ Raceway course demonstrates how a product is manufactured—beginning with raw material at the factory and ending with a final product on a retail shelf. Students explore the manufacturing process as it relates to all the inputs, processes, and outputs associated with the design, development, production, and sale of a product. They demonstrate their understanding of this process as they apply several steps to design, manufacture and test their own $CO_2$-powered model car.



## Residential Wiring 40044-70

### 10 UNIT COURSE

This course is an introduction to residential electrical wiring. Students consider the many factors of wiring new circuits in the home. Topics such as safety, wiring techniques, wire gauge selection, coaxial cables, telephone wire, service panels, circuit breakers, and the National Electrical Code are discussed.

Students gain practical experience wiring switches, outlets, light fixtures, doorbells, phone jacks, and cable TV connectors.

For more information about any Lab-Volt technical or technology training systems, call toll-free in the U.S. and Canada

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