

STEM Career Pathways

Design and
Technology Program

Project-based learning

Easy to set up and run

Aligned to standards



LJCREATE™
Learning for life



Design and
Technology
Program

→ Hands-On Projects

Innovative STEM program to teach career pathways

Design and Technology Foundation Courses (Grades 6-10)

The program provides:

- ⚙️ 15 design projects over 200 lesson periods
- ⚙️ Active learning approach
- ⚙️ Content aligned to standards
- ⚙️ Extensive teacher support material
- ⚙️ Flexible implementation
- ⚙️ Learning management system
- ⚙️ Additional content library
- ⚙️ Extension projects

A complete suite of science lessons that complement the Design and Technology Program is also included!

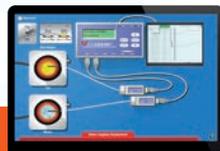


Teaching Demonstrations

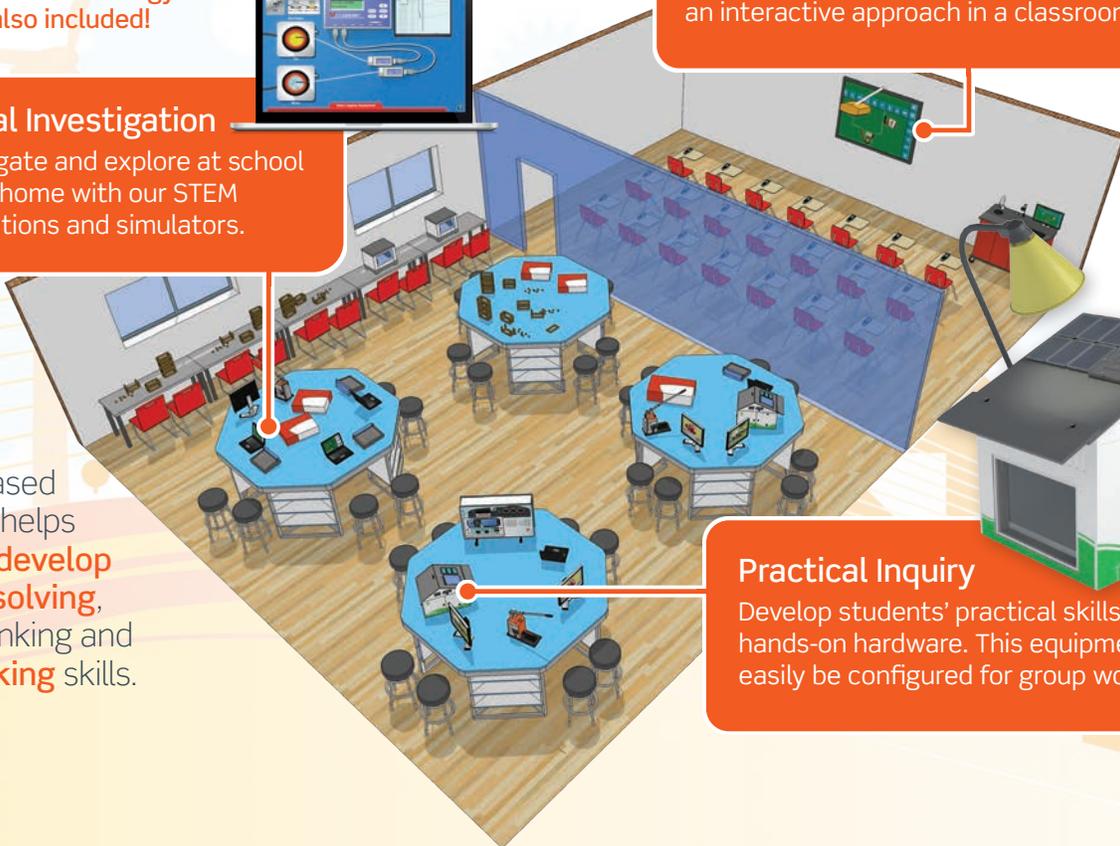
Present theory topics and practical demos with an interactive approach in a classroom setting.

Virtual Investigation

Investigate and explore at school and at home with our STEM applications and simulators.



Using a project-based approach helps students **develop problem solving, critical thinking and teamworking** skills.



Practical Inquiry

Develop students' practical skills with our hands-on hardware. This equipment can easily be configured for group work.



START WITH ENGINEERING DESIGN

Create your own flexible program from 17 STEM courses

Engineering Design Course

Identify the engineering design process and apply it in problem solving. Design and build an automated vehicle gate.



Construction Engineering Course

Explore structural design and construction materials. Design, build, and test bridges.



Electronics Technology Course

Investigate the principles and application of electronic systems. Design, build, and test a control system.



Marketing and Sales Course

Explore how marketing is used to develop sales for engineered products and services.



Manufacturing Technology Course

Explore material properties and manufacturing processes. Design and develop a plastic component for mass production.



Mechatronics Course

Explore core principles of mechatronics. Design and program a fairground ride.



Machine Tools Course

Explore how CNC machines can be used to automate product manufacture.



Energy Generation Course

Explore fossil fuels, wind, solar, geothermal, hydro, and nuclear power. Use a simulator to model strategies for sustainable power.



Automotive Technology Course

Investigate automotive systems as applied to internal combustion engine-powered vehicles.



Rapid Manufacturing Course

Explore rapid prototyping and tooling techniques. Design and develop a new component suitable for mass production.



Biomedical Technology Course

Explore applications of science and technology in medicine. Design, build, and program a medical scanner.



Industrial Robotics Course

Investigate concepts and applications of industrial robotics. Design and develop an automated elevator.



Agricultural Technology Course

Explore the impact of technology in modern agriculture. Design, build, and program an automated agricultural machine.



Mobile Robotics Course

Investigate mobile robotic concepts and applications. Design and build a lifting robot.



Energy in Buildings Course

Explore how energy is used in buildings. Design, build, and test environmental systems.



Computer Science Course

Develop core computer science principles. Design, build, and program robotic systems.



Transportation Technology Course

Explore the core principles and applications of technology in transportation. Design, build, and program an automated vehicle.



→ Career Pathways

College and career readiness instruction for STEM

Each course provides college and career readiness instruction for STEM pathways, like:

- ⚙️ Agricultural Technology
- ⚙️ Architecture and Construction
- ⚙️ Business, Management, and Administration
- ⚙️ Health Science
- ⚙️ Information Technology
- ⚙️ Manufacturing
- ⚙️ Marketing, Sales, and Service
- ⚙️ Science, Technology, Engineering, and Mathematics

We introduce students to EVERY LEVEL of STEM careers!



In addition to Vocational and Higher Education advice for students, we also include the following to help prepare for STEM careers:

- Exposure to a broad range of STEM activities
- STEM lifelong learning skills
- Core academic skills
- Motivation through exciting projects

→ Courses Overview

Create your design and technology program



The Design and Technology Program includes **17 task-based courses**. An outline of each course is included in each Program Guide, including:

- A description of the course
- Project description
- Equipment requirements
- Support notes
- Typical careers
- Learning objectives
- Lessons

Each course contains:

- A presentation to introduce the course and identify relevant career pathways
- A pre- and post-test
- A set of lessons including theory presentations, hands-on practical activities, and investigations

The Design and Technology Program is extremely flexible and can be adapted to suit your actual class size and the availability of equipment and computers. Courses can be run as a **whole class activity**, as part of a rotational model, or a combination of both.

Three different program sequences have been provided in the Program Guide, as an illustration for planning your own custom course sequence.

The **Engineering Design** course should be **studied first** by all students. The remaining courses are optional and can be studied in any order. The equipment required for each course is shown in the following table. The number of sets of equipment will depend on class size.

Equipment Listing

COURSE	EQUIPMENT
Engineering Design	Engineering Construction Kit
Rapid Manufacturing	Injection Molding Trainer, 3D Printer
Construction Engineering	Structures and Materials Teaching Set
Biomedical Technology	Engineering Construction Kit, Biomedical Technology Kit
Electronics Technology	Electronic Circuits Trainer Teaching Set
Industrial Robotics	Engineering Construction Kit
Marketing and Sales	No Equipment Required
Agricultural Technology	Engineering Construction Kit
Manufacturing Technology	Injection Molding Trainer
Mobile Robotics	Engineering Construction Kit
Mechatronics	Engineering Construction Kit, Fluid Power Student Resource Pack
Energy in Buildings	Green Energy in Buildings Trainer
Machine Tools	Machine Tools Class Pack
Computer Science	Educational Robotics Invention Kit <u>or</u> Engineering Construction Kit
Energy Generation	Sustainable Energy Production Resource Pack
Transportation Technology	Engineering Construction Kit
Automotive Technology	Displays and Accessories Panel Trainer





ENGINEERING CONSTRUCTION KIT

This kit is used to investigate, design, build, and program robotic and automated machinery in a range of areas of technology. Simple yet sophisticated programming software allows students to bring their models to life.

Typical practical tasks and topics include:

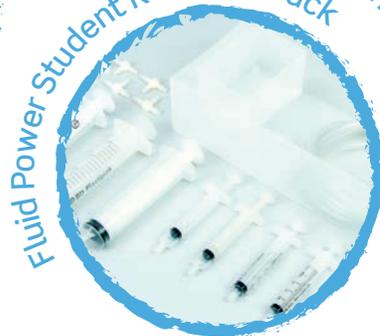
- Design automated agricultural machines
- Design an elevator control system
- Design mobile robots



Structures and Materials Teaching Set



Injection Molding Trainer



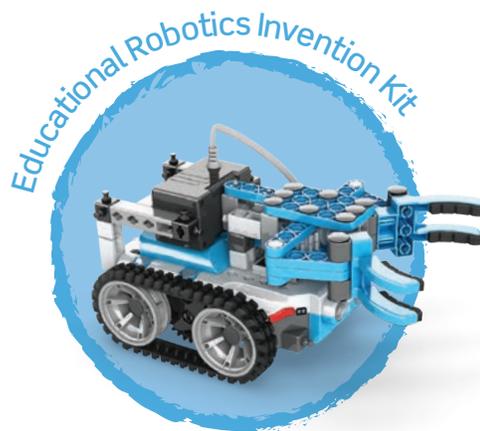
Fluid Power Student Resource Pack



Displays and Accessories Trainer



Biomedical Technology Kit



Educational Robotics Invention Kit



Machine Tools Class Pack



Green Energy in Buildings Trainer

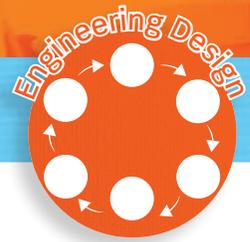


Sustainable Energy Production Student Resource Pack



Electronic Circuits Trainer Teaching Set

Engineering Design Course (15 Lessons)



Students explore the **engineering design process** as a methodology for solving problems, improving and developing new products. They create design specifications, generate and evaluate alternative solutions, **produce models and prototypes** of their solution, and recognize the importance of communication in the design process.

Learning Objectives

- Explore the design process as a method for solving engineering problems
- Use elements of the design process to solve engineering problems
- Recognize the importance of recording and communicating the design process



Typical Careers

Design Engineer, Product Designer, Electrical Engineer, Project Manager, Aerospace Engineer

Lessons

- Introduction to Engineering Design
- Engineering Problems
- Alternative Solutions
- Models and Prototypes
- Communicating Engineering Design
- Design Project - An Automated Vehicle Gate

Design Project

Students design and build a model of an automated vehicle gate with an active warning system.

Equipment

Engineering Construction Kit (220-02)

Notes

The Engineering Design Course should be **studied before any other course** in the Design and Technology program.

In addition to introducing students to the engineering design process, this course also provides a good introduction into using, designing with, and programming the Engineering Construction Kit.

This course should be carried out as a **whole-class activity**.



Rapid Manufacturing Course (15 Lessons)

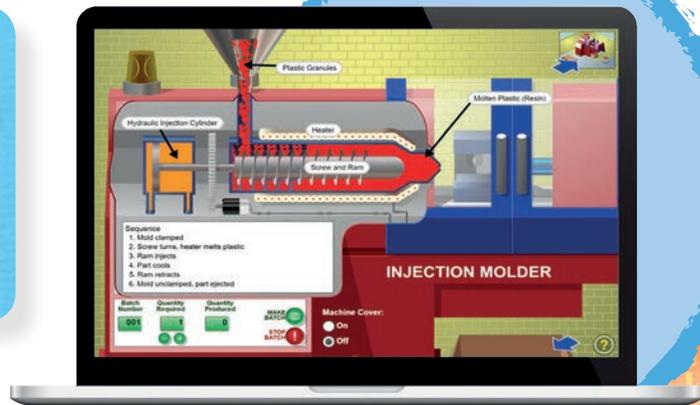
Rapid Manufacturing



This course investigates the use of 3D printers as part of a rapid manufacturing process. Students explore **how 3D printers can be used** to produce tooling for manufacturing and will design and develop tooling for injection molding. Students **design and manufacture a plastic product** using 3D printing and an injection molding machine.

Learning Objectives

- Investigate 3D printing technology, material, and application
- Recognize how 3D printing can be used to produce tooling in a rapid manufacturing processes
- Design 3D printed tooling for an injection molding process



Typical Careers

Manufacturing Engineering Technologist, Production Engineer, Tool and Die Maker, Industrial Engineer

Lessons

- 3D Printing Materials and Applications
- 3D Printing Process
- 3D Printing
- Rapid Prototyping
- Headphone Cord Wrap
- Rapid Tooling
- Headphone Cord Wrap Injection Mold
- Improved Headphone Cord Wrap
- Multi-Part Gear Mechanism
- Design Loop
- Design Project - Rapid Prototyping and Manufacture
- Product Promotion

Design Project

Students design and develop a plastic component using rapid manufacturing technology.

Equipment

Injection Molding Trainer (350-01)
3D Printer

Notes

With access to an Injection Molding Trainer, the Rapid Manufacturing Course can be studied by **two groups of students** as part of an **optional rotational program**.

Students will also need **access to a 3D printer** and associated 3D design software.



Construction Engineering Course (15 Lessons)



Explore how structures are designed to withstand the forces imposed on them due to the weight of the structure, the building contents, and natural events such as **earthquakes and weather**. Students investigate how beams are used in construction and **design a series of beams** using different materials. The properties of concrete structures are also investigated.

Learning Objectives

- Investigate forces on structures and how they impact building design
- Design, model, and test a range of beam designs
- Explore concrete, its basic properties, and its application in the construction industry

Typical Careers

Construction and Building Inspector, Structural Engineer, Architectural and Civil Drafter, Civil Engineer

Lessons

- Forces on Structures
- Beams
- Concrete
- Green Materials in Construction
- Building Bridges
- Design Project - Bridge Design

Design Project

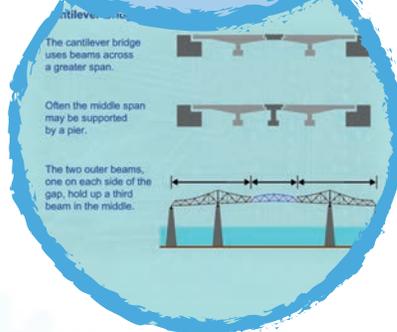
Design, build, and test a model bridge.

Equipment

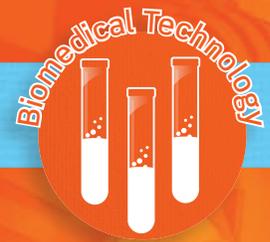
Structures and Materials Teaching Set (121-00)

Notes

The Construction Engineering Course can be studied by a **whole class** or as part of an **optional rotational program**.



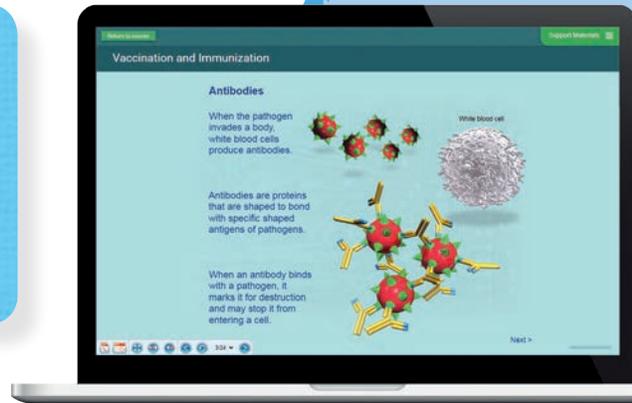
Biomedical Technology Course (15 Lessons)



Students explore the impact on society of medical advances such as **sanitation and vaccination**. They investigate genetic engineering and medical scanning as examples of biomedical technology. Students also design and develop a control system for a **medical scanning machine**.

Learning Objectives

- Identify the impact of medical advances such as sanitation and vaccination
- Recognize the principles and application of genetic engineering
- Explore medical scanning technology and its application



Typical Careers

Radiation Therapists, Medical Electronics Technician, Medicine, Radiologic Technologists

Lessons

- Sanitation
- Vaccination and Immunization
- Genetic Engineering
- Heredity Traits
- Pharmaceuticals
- Medical Scanning
- Design Project - Model Scanner

Design Project

Students design and develop a control system for a model scanner.

Equipment

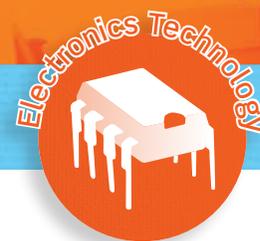
Engineering Construction Kit (220-02)
Biomedical Technology Kit (230-01)

Notes

The Biomedical Technology Course can be studied by a **whole class** or as part of an **optional rotational program**.



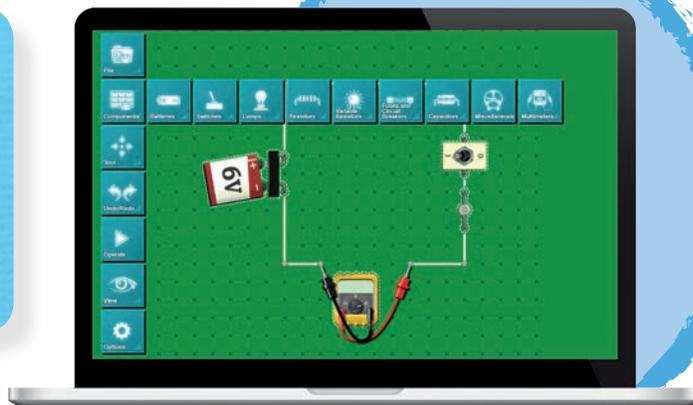
Electronics Technology Course (15 Lessons)



Students explore the design, development, and production of electronic systems. Students also **use simulation tools to model electronic circuits** and develop a series of electronic circuits using the systems approach.

Learning Objectives

- Recognize electronic components and their application in electronic systems
- Use simulation tools to model electronic systems
- Design and build electronic systems to solve problems



Typical Careers

Electronics Engineer, Electronics Engineering Technologist, Electrical and Electronics Drafter, Microsystems Engineer

Lessons

- Simple Lamp Circuit
- Polarity Tester
- LED Lamp Circuit
- Automatic Light Circuit
- Breadboarding
- The Voltage Divider
- Improved Automatic Light Circuit
- Design Project - Improved Automatic Light Circuit

Design Project

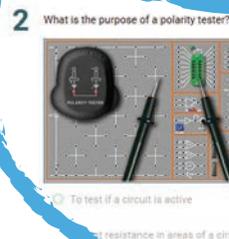
Students design and develop an automatic lighting system.

Equipment

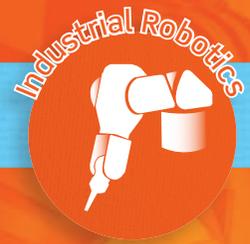
Electronic Circuits Trainer Teaching Set (450-00)

Notes

With access to a single Electronic Circuits Trainer Teaching Set, the Electronics Technology Course can be studied by **two groups of students** as part of an **optional rotational program**.



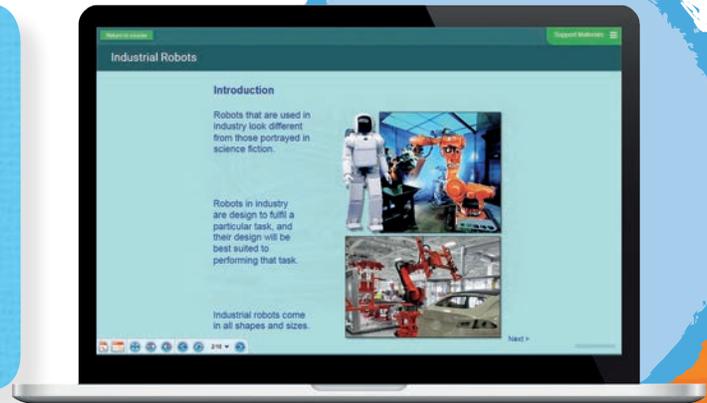
Industrial Robotics Course (15 Lessons)



Students explore the deployment of industrial machines and their **impact on society**. They also investigate the basic components of robotic systems and design a series of **automated robotic systems** to solve industrial problems.

Learning Objectives

- Investigate the development of industrial machinery and its impact
- Recognize and apply control theory to robotic systems
- Design control systems for industrial machines and robotic systems
- Investigate the impact of computer systems and robotics on manufacturing



Typical Careers

Robotics Engineer, Industrial Maintenance Technician, Automation Specialist, Industrial Production Manager

Lessons

- Industrial Machines
- Controlling Machines
- The Control Loop
- Sensors
- Actuators
- Industrial Robots
- Computers and Manufacturing
- Design Project - An Elevator

Design Project

Students use the design process to develop an automated elevator and program the control system.

Equipment

Engineering Construction Kit (220-02)

Notes

The Industrial Robotics Course can be studied by a **whole class** or as part of an **optional rotational program**.



Marketing and Sales Course (15 Lessons)



Students will explore how marketing is used to **develop sales for engineered products** and services. Students will **investigate how advertising and pricing can be used** to promote sales of products and investigate the process by which the products are sold and distributed to customers.

Learning Objectives

- Explore planning processes used in marketing products and services to customers
- Recognize how pricing strategies are developed and used in marketing and sales
- Identify the sales process including order processing and distribution



Typical Careers

Sales Engineer, Marketing Assistant, Social Media Influencer, Product Designer, Advertising Copywriter

Lessons

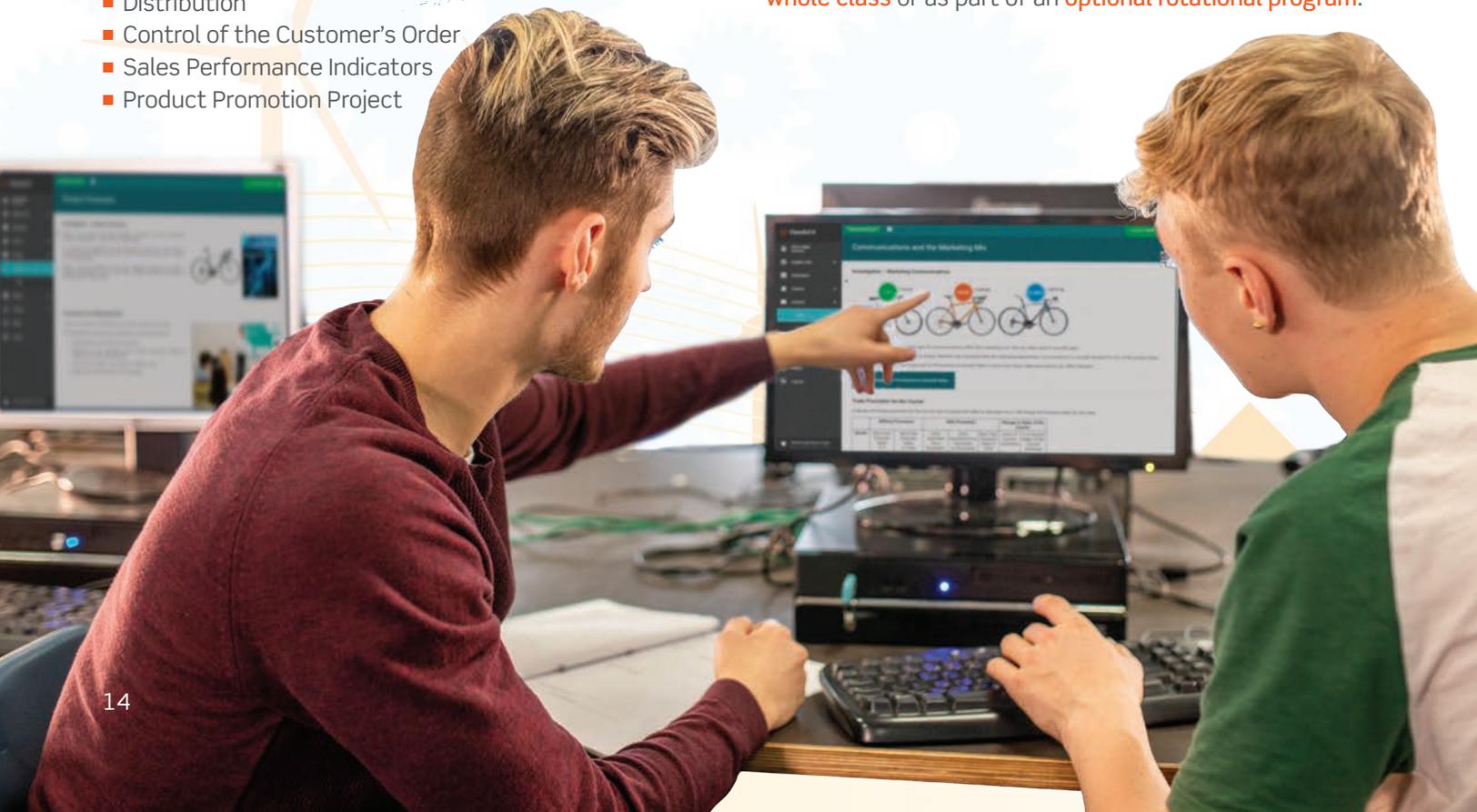
- Marketing Planning
- Products
- Pricing Strategies
- Advertising
- Marketing Communications
- Distribution
- Control of the Customer's Order
- Sales Performance Indicators
- Product Promotion Project

Design Project

Students will develop a marketing plan for a new product.

Notes

The Marketing and Sales Course can be studied by a **whole class** or as part of an **optional rotational program**.



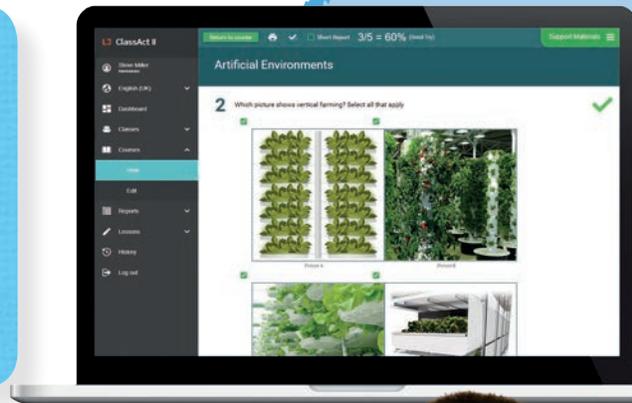
Agricultural Technology Course (15 Lessons)



Students investigate the development of agricultural technology and its impact. The application of **biotechnology in agriculture is also explored**. Students also design a series of automated agricultural machines and **environmental control systems**.

Learning Objectives

- Investigate the development of agricultural machinery and its impact
- Explore the application of biotechnology in producing sustainable energy resources
- Design and program automated agricultural machinery
- Explore the use of technology in the design and control of artificial environments



Typical Careers

Agricultural Engineer, Agricultural and Food Science Technician, Farm Equipment Mechanic, Precision Agriculture Technician

Lessons

- Irrigation
- Agricultural Machines 1
- Agricultural Machines 2
- Creating Power from Biomass
- Artificial Environments
- Design Project - Mobile Tree Shaker

Design Project

Students build a mobile tree shaker and design a program for it to search for trees, grip, and then shake them.

Equipment

Engineering Construction Kit (220-02)

Notes

The Agricultural Technology Course can be studied by a **whole class** or as part of an **optional rotational program**.



Students investigate how products are manufactured by **processing materials**. They also explore the process of injection molding of plastics, and they design and produce a series of **injection molded products**.

Learning Objectives

- Explore how materials are selected for manufacturing projects
- Investigate how plastic products are mass produced using injection molding technology
- Design and develop plastic products, and produce them using an injection molding machine



Typical Careers

Production, Planning, and Expediting Clerk, Production Engineer, Machinist, Extruding, Forming, Pressing, and Compacting Machine Operator

Lessons

- Plastic Materials
- Injection Machine Controls
- Mechanical Properties of Materials
- Testing Materials
- Design Choices
- Design and Make a Door Knob
- Waste
- Reducing Waste and Cost
- Manufacturing Technology
- Design Loop
- Design Project - Manufacturing Technology

Design Project

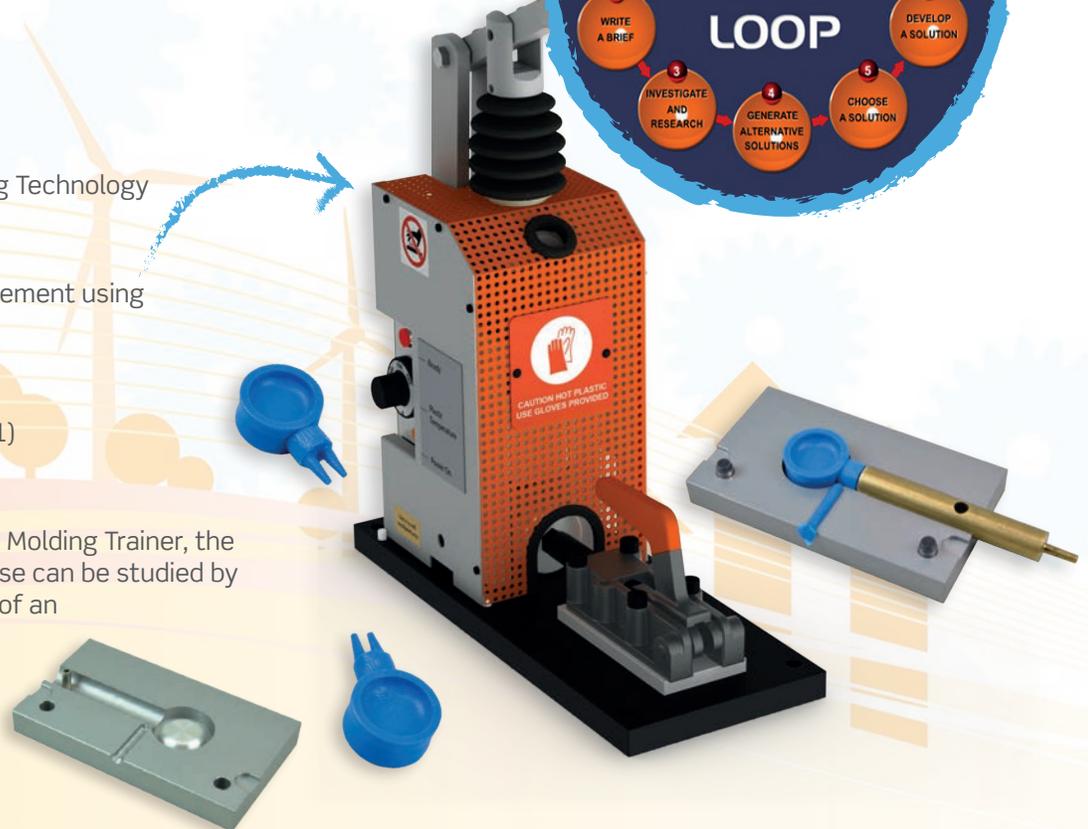
Develop a design for a food implement using injection molding technology.

Equipment

Injection Molding Trainer (350-01)

Notes

With access to a single Injection Molding Trainer, the Manufacturing Technology Course can be studied by **two groups of students** as part of an **optional rotational program**.

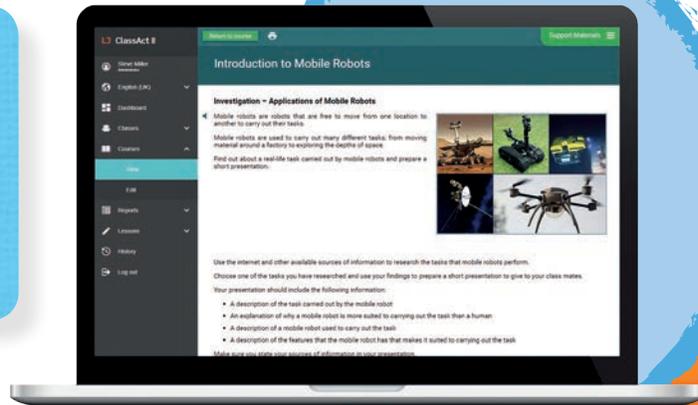


Mobile Robotics Course (15 Lessons)

Students explore applications of mobile robotic systems and investigate how mobile robotic systems are **powered and controlled**. Students also design a series of mobile robotic systems to **meet a design brief**.

Learning Objectives

- Investigate applications of mobile robotic systems
- Explore how mobile robotic systems are powered and controlled
- Investigate sensing systems used by mobile robots
- Design mobile robotic systems to meet a given brief



Typical Careers

Robotics Technician, Robotics Engineer, Planetary Scientist, Aerospace Engineer, Mechatronics Engineer

Lessons

- Introduction to Mobile Robots
- Powering Mobile Robots
- Controlling Mobile Robots
- Sensors for Mobile Robots
- Space Robots
- Design Project – Automated Lifting Robot

Design Project

Students design a robot that changes shape when an obstacle is detected, and then modify its design to enable it to lift and move objects in its path.

Equipment

Engineering Construction Kit (220-02)

Notes

The Mobile Robotics Course can be studied by a **whole class** or as part of an **optional rotational program**.



Mechatronics Course (15 Lessons)

This course **explores basic mechanical principles**, including simple machines such as gears, pulleys, and levers. Students design and develop solutions to a range of engineering problems using mechanical systems. The **principles of fluid power** and its application in construction machines is also investigated.

Learning Objectives

- Recognize basic mechanical principles and machines such as gears and levers
- Identify how to use gears to change direction of motion, speed, and torque
- Identify the basic principles of fluid power systems
- Recognize applications of fluid power systems



Typical Careers

Industrial Engineering Technician, Machinery Maintenance Worker, Mechanical Engineer, Industrial Production Manager

Lessons

- Simple Machines
- Mechanical Systems
- Gears and Simple Gear Trains
- Compound Gear Trains
- Special Gears
- Basic Fluid Power Engineering
- Fundamental Principles of Pneumatics
- Fluid Power Cylinders
- Basic Control Valves
- Hydraulic Applications
- Hydraulics in Operation
- Lever Principles
- Design Project - A Fairground Ride

Design Project

Students design a fairground ride.

Equipment

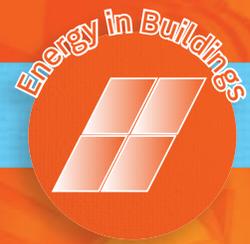
- Engineering Construction Kit (220-02)
- Fluid Power Student Resource Pack (278-01)

Notes

The Mechatronics Course can be studied by a **whole class** or as part of an **optional rotational program**.



Energy in Buildings Course (15 Lessons)



Discover how **energy is used in modern buildings** and explore technology that helps reduce the energy used in buildings, including glazing insulation and heat pumps. Students also explore how **renewable energy generation** can be used to provide energy for buildings.

Learning Objectives

- Explore how energy is used in buildings
- Investigate technology that can be used to reduce the energy consumption of a building
- Model the impact of various systems on the energy use of a building

Typical Careers

Solar Energy Systems Engineer, Surveyor, Architect, Wind Turbine Service Technician, Solar Photovoltaic Installer, Energy Engineer

Lessons

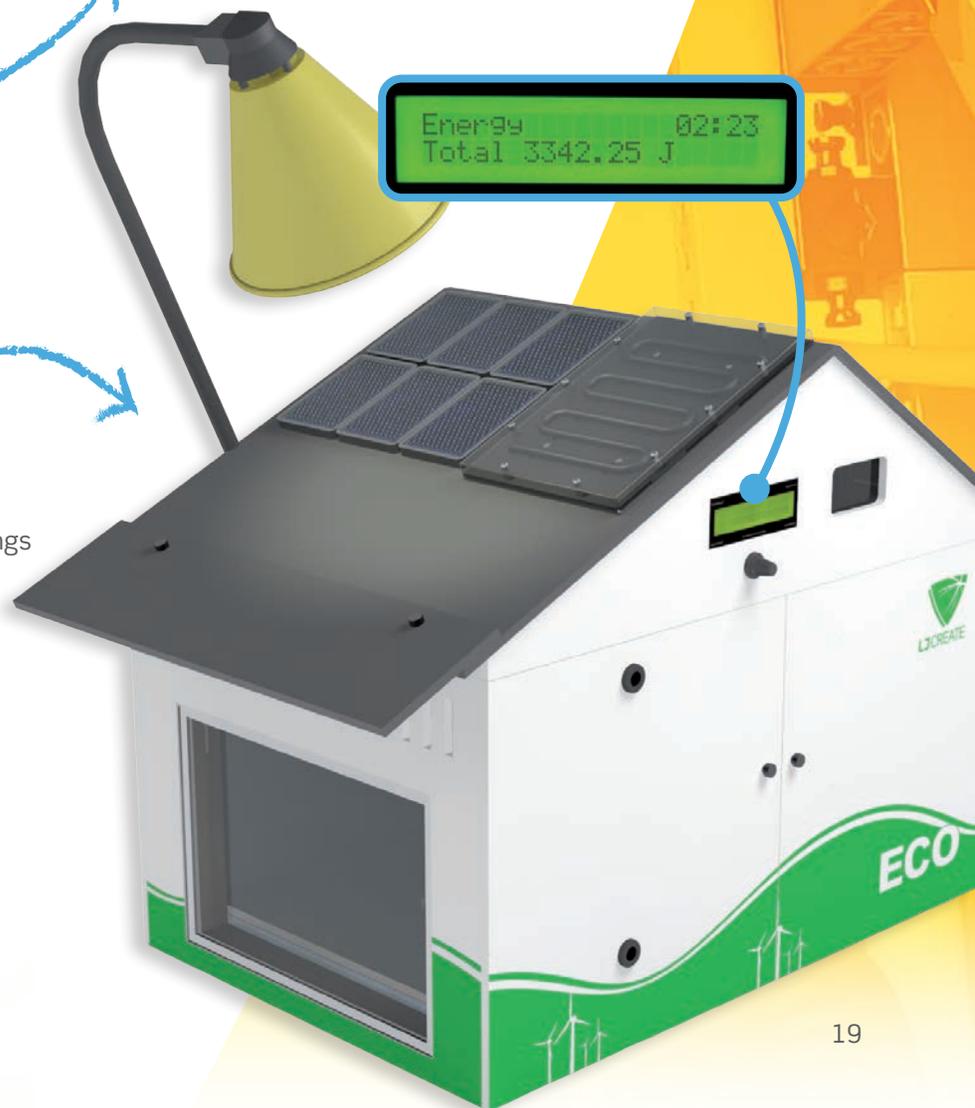
- Energy and Power
- Small Scale Wind Turbines
- Solar Electricity for the Home
- Solar Water Heating
- Insulating Buildings
- Glazing Systems
- Cooling

Equipment

Green Energy in Buildings Trainer (122-01)

Notes

With access to a single Green Energy in Buildings Trainer, the Energy in Buildings Course can be studied by **two groups of students** as part of an **optional rotational program**.



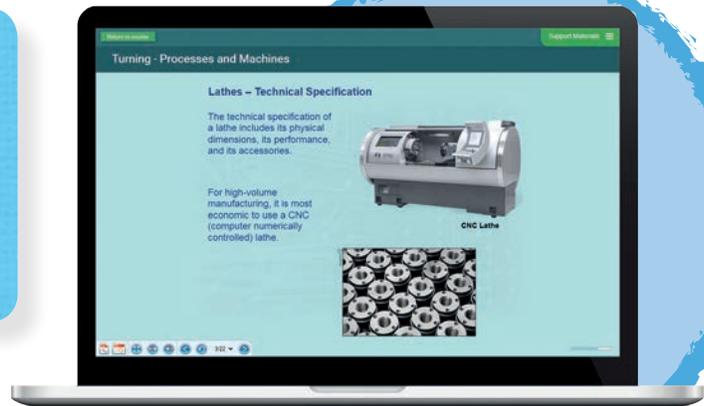


Machine Tools Course (15 Lessons)

Discover how machine tools, such as saws, lathes, and mills are used to **convert materials into useful products**. Students also explore how CNC machines can be used to **automate the manufacture of product parts**.

Learning Objectives

- Explore how machine tools are used to convert materials into products
- Investigate the setup, programming and operation of computer controlled machine tools
- Use a range of machine tools to design and manufacture a product



Typical Careers

Design Engineer, CNC Programmer, Mechanical Drafter, Production Supervisor, Millwright, Model Maker, Machine Tool Operator, Engineering Buyer

Lessons

- Safety and Protective Measures
- Manufacturing Processes
- Machine Tools and Terminology
- Cutting Metal
- Turning
- Milling
- CNC and the Basics of Programming
- CNC Programming for Milling
- Reading Machine Diagrams
- CNC Machine Challenge
- Cutting Forces and Angles of Cutting
- Design Project - Design and Manufacture a Product using Machine Tools

Equipment

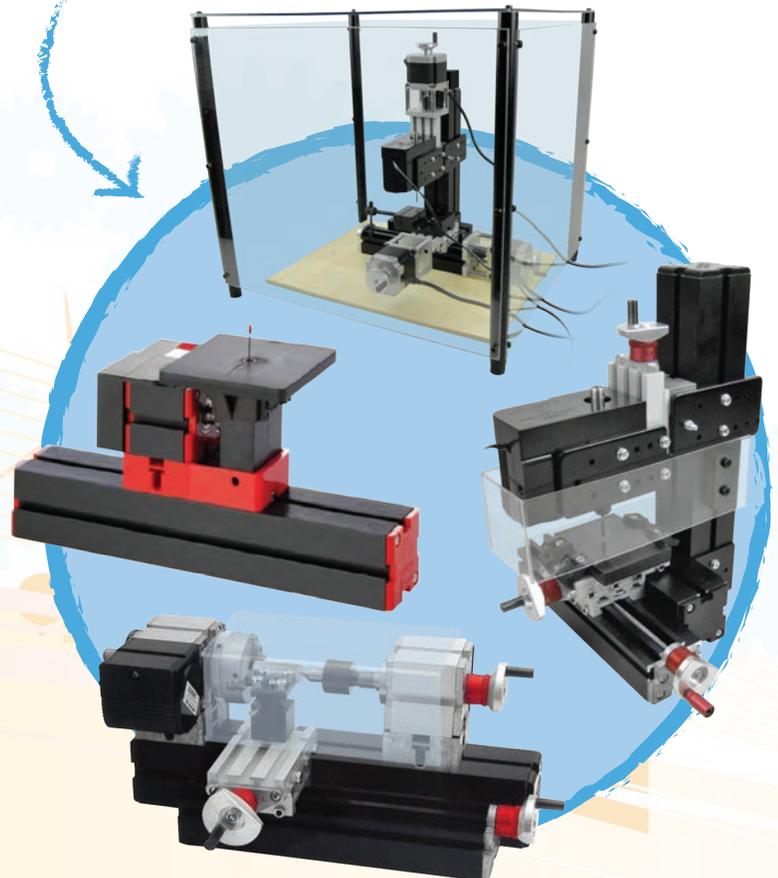
Machine Tools Class Pack (506-50)

Notes

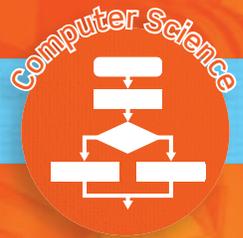
With access to a single Machine Tools Class pack, the Machine Tools Course can be studied by **two groups of students** as part of an **optional rotational program**.

Design Project

Students will design and manufacture a product using a range of machine tools.



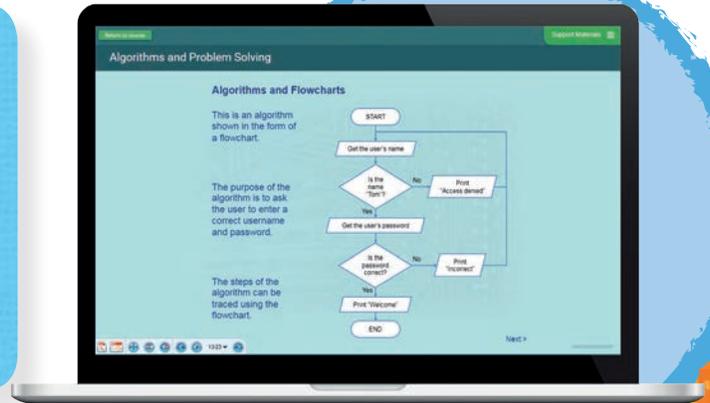
Computer Science Course (15 Lessons)



This course will explore **techniques for algorithm development** including the use of problem solving techniques, **flowchart design** and **pseudo code**. Students will design algorithms, and then develop and test programs to control an expandable mobile robot.

Learning Objectives

- Use algorithm problem-solving processes to develop solutions to engineering problems
- Develop algorithms that use sensor inputs and physical outputs
- Use control structures in the design of programs for robotic systems
- Design and program solutions to a range of robotic systems



Typical Careers

Applications Software Developer, Computer Programmer, Software Quality Assurance Engineer, Robotics Engineer

Lessons

- Computing Concepts
- Algorithms and Problem Solving
- Inputs and Outputs
- Data, Constants, and Variables
- Operators and Control Structures
- Documentation and Testing
- Design Project - A Gripper Robot

Design Project

Students design and program a robotic control system.

Equipment

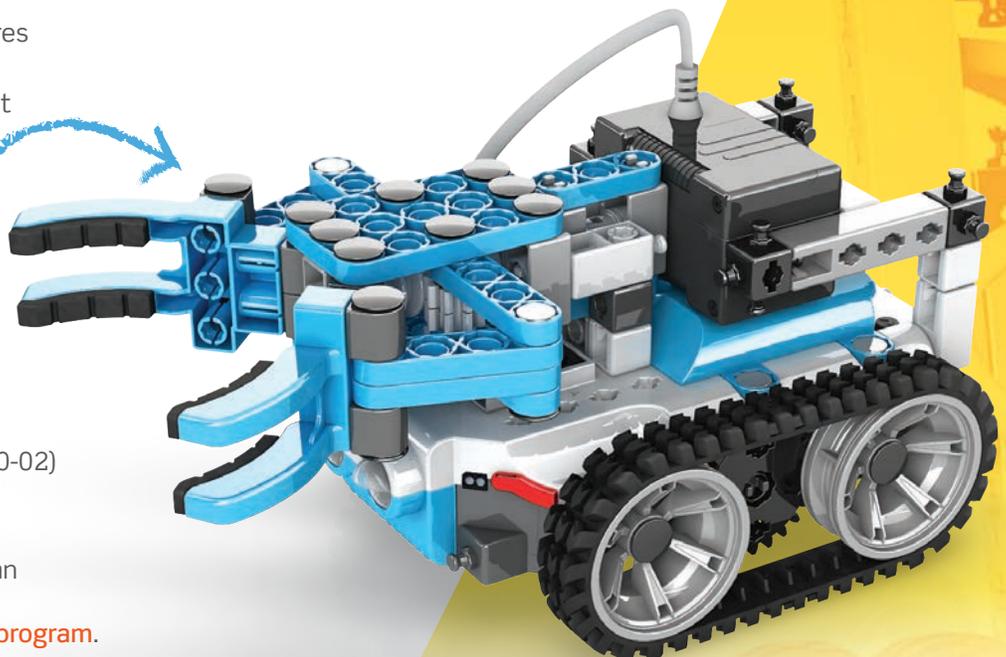
Educational Robotics Invention Kit (250-02)

OR

Engineering Construction Kit (220-02)

Notes

The Computer Science Course can be studied by a **whole class** or as part of an **optional rotational program**.



Energy Generation Course (15 Lessons)



Students explore how electricity is generated in fossil-fuel power plants. Students investigate a range of sustainable **methods of power generation**, including wind, solar, geothermal, hydro, and nuclear power. A simulation tool is used to design a series of **plans for sustainable power generation**.

Learning Objectives

- Investigate the generation of electricity in power plants
- Explore sustainable energy production technology
- Explore fuel cell technology and its efficiency
- Design plans for sustainable energy generation

Typical Careers

Solar Thermal Technician, Power Distributor and Dispatcher, Nuclear Engineer, Wind Energy Engineer, Environmental Science Technician, Power Plant Operator

Lessons

- Generating Electricity
- Wind Power
- Solar Power
- Hydropower
- Biomass Power
- Geothermal Energy
- Nuclear Power
- Hydrogen Fuel Cell
- Efficiency of Power Generation
- Power Transmission
- Design Project - National Grid Challenge

Design Project

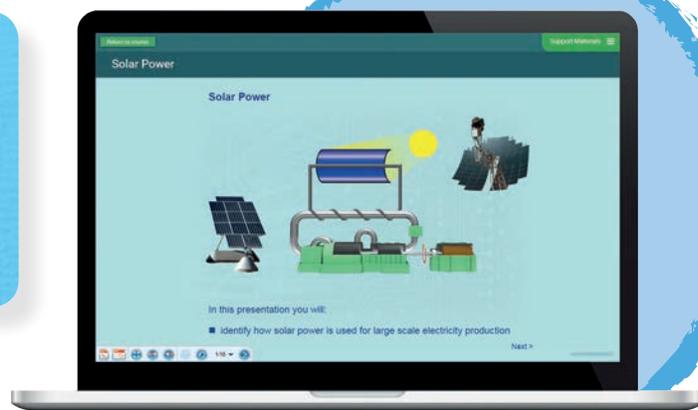
Students design and develop a plan for sustainable energy generation for a country-wide grid system.

Equipment

Sustainable Energy Production
Student Resource Pack (100-02)

Notes

The Energy Generation Course can be studied by a **whole class** or as part of an **optional rotational program**.



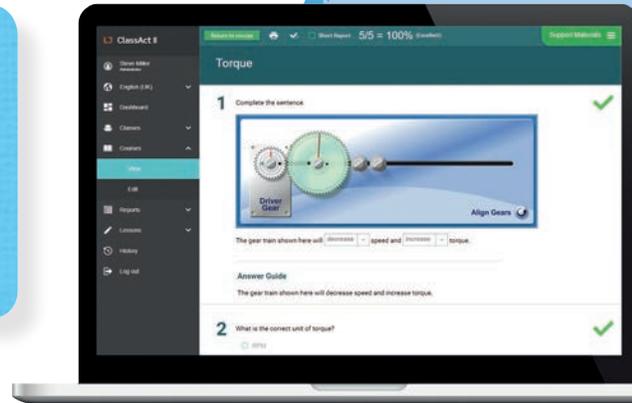
Transportation Technology Course (15 Lessons)



This course investigates the development of transportation technology and its impact on society. Students explore the **fundamental principles of transport technology** and apply the physical science concepts to design transportation systems. Development of **automated transportation systems** is also covered.

Learning Objectives

- Explore the development of transportation systems
- Apply the science concepts of power and torque to transportation systems
- Investigate the application of computer technology in modern vehicles



Typical Careers

Automobile Engineer, Vehicle Designer, Automotive Technician, Cargo and Freight Agent

Lessons

- Introduction to Transportation
- Power and Control
- Torque
- Intelligent Vehicles
- Freight Transport
- Design Project - A Dump Truck

Design Project

Students build a model of a robot that can drive, stop, and tip out a load at a destination.

Equipment

Engineering Construction Kit (220-02)

Notes

The Transportation Technology Course can be studied by a **whole class** or as part of an **optional rotational program**.

Self-Drive Vehicles

The ultimate Self-Drive Vehicle should combine several new technologies:

- Navigate and drive itself
- Adapt to weather conditions
- Spot and avoid collisions with stationary objects, pedestrians, and other vehicles

Find a parking space and park in it



Automotive Technology Course (15 Lessons)



Students use a large simulator panel to **explore the operation of auto electrical systems**. Students will learn about the **operation of internal combustion engines**, transmission systems, brakes, and steering and suspension. They will verify operation and troubleshooting by taking electrical measurements.

Learning Objectives

- Explore how display and accessory systems operate on a typical vehicle
- Troubleshoot combustion engine transducer faults
- Apply physical science principles to braking, steering and suspension



Typical Careers

Auto Design Engineer, Auto Manufacturing Technician, Auto Maintenance Technician, Roadside Assistance Technician, Auto Salesperson, Auto Parts Manager

Lessons

- Starting Systems
- Starting and Charging
- Lighting Systems
- Introduction to Engine Systems
- Engine Coolant Temperature
- Automatic Transmission Systems
- Manual Transmission Systems
- Definition of Electric Vehicles
- Wheel and Tire Fundamentals
- Brake Fluid Warning System
- Problem Solving - Lighting System Fault Diagnosis
- Problem Solving - Engine Sensor Fault Diagnosis

Notes

With access to a single panel trainer, the Automotive Technology Course can be studied by **two groups of students** as part of an **optional rotational program**.

Equipment

Displays and Accessories Panel Trainer (752-01)



→ IT Requirements

For your Design and Technology Program

The courses within our Design and Technology program are delivered by the ClassAct II Learning Management System. ClassAct II is a cloud-based LMS system that runs in the following web browsers:

- Chrome
- Safari
- Edge
- Firefox

The content consists of a range of lesson components that include **presentations**, **investigations**, **assessments**, and hands-on **practical tasks**.

Investigations

Some investigations require the use of ClassAct II applications or third party applications - which must be installed locally on a Microsoft Windows PC.

Presentations and Assessments

All presentations and assessments will run on any modern HTML5 browser.

Practical Tasks

Practical tasks that use the Engineering Construction Kit require the use of KEIRO programming software.

The KEIRO software is available to run on both Microsoft Windows PCs, Mac, IOS devices and Chromebooks via the android play store. If using a Chromebook, a mouse is recommended.

Some practical tasks require access to specific hardware which has to be connected to a Windows PC.

Software installation requirements for each Design and Technology course:

COURSE	SOFTWARE INSTALLATION REQUIRED	WINDOWS PC
Engineering Design	KEIRO Software*	
Rapid Manufacturing	Requires 3D Printer and Software (Not Supplied)	
Construction Engineering	N/A	
Biomedical Technology	KEIRO Software*	
Electronics Technology	Electronic Circuits Design & Simulation Software* Virtual Electric Circuits Trainer	REQUIRED
Industrial Robotics	KEIRO Software*	
Marketing and Sales	N/A	
Agricultural Technology	KEIRO Software*	
Manufacturing Technology	N/A	
Mobile Robotics	KEIRO Software*	
Mechatronics	KEIRO Software*	
Energy in Buildings	Eco Building Interface Software	REQUIRED
Machine Tools	CNC Control Software	REQUIRED
Computer Science	KEIRO Software*	
Energy Generation	N/A	
Transportation Technology	KEIRO Software*	
Automotive Technology	N/A	

* Third party applications

→ Why Choose Us?

LJ Create are the blended learning experts, here's why...

Is the program easy to use?

Yes, it's very easy to use. The entire program is designed to be flexible and easy to implement.

Our digital content team follow our two minute rule: "Teachers must be able to pick up and use our software within two minutes" What's more, we provide additional assistance with our comprehensive teaching guides.

Do you meet academic standards?

Yes, we concentrate on aligning our course material to state and national academic standards, including ITEEA, and Next Generation Science Standards.

Will I need to purchase lots of consumable items?

No, you won't. We understand that the cost of consumables can make project-based learning an expensive option.

We have deliberately selected project activities that do not require a large investment in consumable items.

Does your digital content include simulators?

Yes, our development team have created a suite of virtual simulators which students use to test designs and carry out experiments in real-world situations.



"I like the way we can work in small groups and by ourselves when we want."

Rebecca, Student

What do teachers and students think of our program

"The LJ Create program mapped perfectly into the different pathways that we wanted students to explore and to understand. For them to then see connections to the content area is awesome."

Ms. Kaytie Palmiter, Principal
Pottersville Middle & High Schools

"I love this class it's so much fun using the presentations and making things work!"

Sierra, Student

"The cool thing about this class is how quickly the students get to be hands-on, so they're really excited about it."

Jamielyn Johnson, Instructor
Harrison Junior School

"I think it's cool to use the computer simulator programs to do experiments."

Sam, Student

"It is unbelievable what our students are doing and learning in this lab."

Mr. Robert A. Celli,
District Administrator

"One of the benefits of the program is that it encourages students to do more critical thinking, they really have to think about their answers."

Leavernard Jones,
Technology Teacher



For more information on our range of STEM resources, please contact:

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