

NY State Learning Standards - Standard 5 - Technology (Intermediate)

Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.

Identify needs and opportunities for technical solutions from an investigation of situations of general or social interest.

- L2 M71.20 V02 Speaking - presents a solution to a bridge construction problem.
- L2 M71.40 V03 Interprets technical data.
- L2 M71.40 V03 Speaking - presents technical details clearly.
- L2 M71.40 V03 Explains weaknesses in a problem solution.
- L2 M71.70 V02 Identifies the medical solutions to kidney failure.
- L2 M71.00 V03 Presents a solution to a communication problem.
- L2 M71.10 V03 Obtains technical information about wave files from various sources.
- L2 M71.30 V03 Extracts technical information from research material.
- L2 M71.70 V04 Evaluates proposed solutions to a pneumatic problem.
- L2 M71.00 V02 Investigates the design problem and solution for a simulated TV animation.
- L2 M71.00 V02 Explains other potential solutions to the TV animation.
- L2 M71.00 V02 Presents a solution to the TV animation problem.
- L2 M71.50 V01 Compares the hardness of materials to find appropriate solutions for product designs.
- L2 M71.50 V01 Evaluates the heat properties of materials to find appropriate solutions for product designs.

Locate and utilize a range of printed, electronic, and human information resources to obtain ideas.

- L2 M71.10 V03 Uses information from a graph to calculate instantaneous and average rainfall.
- L2 M71.10 V03 Uses information from a graph to calculate temperature readings.
- L2 M71.00 V03 Use a Web Browser to search for selected information.
- L2 M71.00 V03 Extracts information on communications from a portion of text.
- L2 M71.00 V03 Extracts information about communications technology using a Web Browser.
- L2 M71.10 V03 Obtains technical information about wave files from various sources.
- L2 M71.10 V03 Recognizes the way computers regard input information.
- L2 M71.00 V03 Explores the process of sending information across a microwave link.
- L2 M71.20 V04 Locates information in a variety of media.
- L2 M71.20 V04 Selects information in text, audio and visual formats.
- L2 M71.30 V03 Extracts technical information from research material.
- L2 M71.20 V04 Extracts science and technology facts from an encyclopedia CD-ROM.
- L2 M71.30 V03 Researches information from a computer generated document.
- L2 M71.00 V02 Extracts and compares information from text.
- L2 M71.40 V01 Interprets information from reference material.
- L2 M71.40 V01 Searches an encyclopedia to find appropriate information relating to an unfamiliar subject.
- L2 M71.70 V01 Uses information from GPS systems accurately.
- L2 M71.80 V01 Extracts photographic information from paragraphs of text.
- L2 M71.90 V01 Reads and interprets information from the instruments of a car dashboard.

Consider constraints and generate several ideas for alternative solutions, using group and individual ideation techniques (group discussion, brainstorming, forced connections, role

play); defer judgement until a number of ideas have been generated; evaluate (critique) ideas; and explain why the chosen solution is optimal.

- L2 M71.50 V02 Evaluate their own performance during the module.
- L2 M71.70 V02 Evaluates the importance of different properties of alginate to dentists.
- L2 M71.80 V02 Evaluates the differences between different types of wing.
- L2 M71.00 V02 Identify some of the ways in which alternative energy sources are being used globally.
- L2 M71.40 V03 Explains weaknesses in a problem solution.
- L2 M71.00 V03 Presents a solution to a communication problem.
- L2 M71.70 V04 Evaluates proposed solutions to a pneumatic problem.
- L2 M71.00 V02 Investigates the design problem and solution for a simulated TV animation.
- L2 M71.00 V02 Explains other potential solutions to the TV animation.
- L2 M71.20 V04 Views and evaluates a multimedia presentation.
- L2 M71.50 V01 Compares the hardness of materials to find appropriate solutions for product designs.
- L2 M71.50 V01 Evaluates the heat properties of materials to find appropriate solutions for product designs.

Develop plans, including drawings with measurements and details of construction, and construct a model of the solution, exhibiting a degree of craftsmanship.

- L2 M71.00 V02 Builds and tests a model car powered by solar energy.
- L2 M71.00 V02 Investigates the greenhouse effect using experimental models.
- L2 M71.00 V02 Identifies the units used to measure speed.
- L2 M71.00 V02 Identifies the units used to measure energy and power.
- L2 M71.20 V02 Identifies the role of Construction Technology.
- L2 M71.20 V02 Identifies insulation as a property of construction material.
- L2 M71.20 V02 Identifies the benefits of bridge construction.
- L2 M71.20 V02 Follows a construction brief.
- L2 M71.30 V03 Draws an orthographic projection of a 3D model.
- L2 M71.30 V03 Translates 'real world' information into working drawings.
- L2 M71.30 V03 Uses CAD to create 3D models.
- L2 M71.80 V02 Sets up a model wing in a wind tunnel.
- L2 M71.90 V03 Uses IT to examine the structure of model rockets.
- L2 M71.20 V04 Uses a computer and software to control a model set of traffic lights.
- L2 M71.20 V04 Identifies tools used in constructing a multimedia presentation.
- L2 M71.70 V01 Recognizes that map detail is related to the scale used.
- L2 M71.70 V01 Uses a multimedia Atlas to observe 3D topographic detail viewed from above.

In a group setting, test their solution against design specifications, present and evaluate results, describe how the solution might have been modified for different or better results, and discuss tradeoffs that might have been modified for different or better results, and discuss tradeoffs that might have to be made.

- L2 M71.00 V02 Builds and tests a model car powered by solar energy.
- L2 M71.20 V02 Uses test equipment to analyze deflection.
- L2 M71.20 V02 Speaking - presents a solution to a bridge construction problem.
- L2 M71.30 V03 States why the specifications have changed for a component part.
- L2 M71.40 V03 Solves problems in a circuit during testing.
- L2 M71.40 V03 Explains weaknesses in a problem solution.
- L2 M71.50 V02 States the features and operating parameters of a vehicular system which has been tested by the student.

- L2 M71.50 V02 Applies tests and improvement procedures to check the quality of systems.
- L2 M71.80 V02 Designs and tests car on computer.
- L2 M71.80 V02 Solves problems in aerodynamics to test a glider.
- L2 M71.00 V03 Presents a solution to a communication problem.
- L2 M71.60 V03 Builds and tests a moveable pulley system.
- L2 M71.70 V04 Evaluates proposed solutions to a pneumatic problem.
- L2 M71.00 V02 Investigates the design problem and solution for a simulated TV animation.
- L2 M71.00 V02 Identifies problems and solutions in animating a human walk.
- L2 M71.00 V02 Explains other potential solutions to the TV animation.
- L2 M71.00 V02 Presents a solution to the TV animation problem.
- L2 M71.00 V02 Recalls some of the problems and solutions associated in producing a simulated TV sequence.
- L2 M71.20 V04 Tests frames of a multimedia presentation following written instructions.
- L2 M71.50 V01 Compares the hardness of materials to find appropriate solutions for product designs.
- L2 M71.50 V01 Evaluates the densities of materials to find appropriate solutions for product designs.
- L2 M71.90 V01 Analyzes the performance of a road vehicle from test data.

Tools, Resources, and Technological Processes: Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, material resources into more useful forms.

Choose and use resources for a particular purpose based upon an analysis and understanding of their properties, costs, availability, and environmental impact.

- L2 M71.00 V02 States that wind energy can be used to generate electricity.
- L2 M71.00 V02 Examines how energy is produced by a nuclear power plant.
- L2 M71.00 V02 States how energy is transferred in a hydroelectric power plant.
- L2 M71.00 V02 Indicates that the use of fossil fuels harms the environment
- L2 M71.00 V02 Identifies the need to preserve existing energy resources and to find new methods of providing energy.
- L2 M71.00 V02 Uses multiplication to work out electricity cost.
- L2 M71.00 V02 Identifies a non-renewable energy resource.
- L2 M71.00 V02 Identifies the problems associated with non-renewable energy resources.
- L2 M71.20 V02 Examines material properties.
- L2 M71.20 V02 Identifies insulation as a property of construction material.
- L2 M71.20 V02 States properties of structures.
- L2 M71.70 V02 Calculates the cost of different forms of treatment for kidney failure.
- L2 M71.70 V02 Identifies the properties of the materials used for making denture casts.
- L2 M71.70 V02 Evaluates the importance of different properties of alginate to dentists.
- L2 M71.70 V02 Identifies why the property of materials is important for medical use.
- L2 M71.00 V03 Demonstrates the penetration properties of microwaves.
- L2 M71.00 V03 Calculates the cost of a communication link.
- L2 M71.70 V04 Investigates the properties of fluids.
- L2 M71.30 V02 States an application of, and the physical properties of an electric motor driven fan.
- L2 M71.50 V01 Uses computer simulation to compare the heat properties of metals and plastics.
- L2 M71.50 V01 Compares fixed and variable costs for manufacturing.

Use a variety of hand tools and machines to change materials into new forms through forming, separating, and combining processes, and processes which cause internal change to occur.

- L2 M71.10 V03 Identifies the tools used to perform specified operations using audio software.
- L2 M71.10 V03 Identifies tools involved in digital speech synthesis.
- L2 M71.20 V02 Examines material properties.
- L2 M71.20 V02 Calculates structural material quantities.
- L2 M71.20 V02 Demonstrates differences in material strength.
- L2 M71.40 V03 States factors effecting the resistance of a conducting material.
- L2 M71.70 V02 Identifies the properties of the materials used for making denture casts.
- L2 M71.70 V02 Identifies why the property of materials is important for medical use.
- L2 M71.10 V03 Identifies the tools used to perform specified operations using audio software.
- L2 M71.30 V03 Uses resizing tools and design tools to alter a graphic.
- L2 M71.30 V03 Recognizes the computer as a design tool.
- L2 M71.50 V01 Assesses the use of different tools used by a CNC lathe.
- L2 M71.50 V01 Identifies the materials used and their importance in CNC technology.
- L2 M71.20 V04 Identifies tools used to produce graphics.
- L2 M71.20 V04 Identifies tools used in constructing a multimedia presentation.
- L2 M71.50 V01 Identifies the use of compressing and stretching forces to shape materials.
- L2 M71.50 V01 Evaluates the densities of materials to find appropriate solutions for product designs.
- L2 M72.50 V01 Examines the classification of materials used in manufacturing.
- L2 M72.50 V01 Defines types of materials.
- L2 M71.50 V01 Identifies the wasting and separating processes used to manufacture a wooden spoon.
- L2 M71.50 V01 Identifies the shaping and forming processes used to manufacture a metal spoon.
- L2 M71.50 V01 Identifies the molding processes used to manufacture a plastic spoon.

Combine manufacturing processes with other technological processes to produce, market, and distribute a product.

- L2 M71.50 V01 Describes changes in manufacturing history.
- L2 M71.50 V01 Examines changes in manufacturing technology.
- L2 M71.50 V01 Describes how automation is employed in manufacturing.
- L2 M71.90 V02 Defines each manufacturing system.
- L2 M71.90 V02 Documents the technological advances in industrial control.
- L2 M71.00 V02 Demonstrates the use of an encoder to convert a movie from computer source to video product.
- L2 M71.20 V04 Describes how technology is used producing multimedia presentations.
- L2 M72.50 V01 Examines the classification of materials used in manufacturing.
- L2 M72.50 V01 Describes changes that have occurred in manufacturing.
- L2 M71.50 V01 Describes changes that have occurred in manufacturing.
- L2 M71.40 V04 Accounts for the importance of sensors in manufacturing.
- L2 M71.50 V01 Explains reasons why manufacturing companies should use CNC technology.
- L2 M71.50 V01 Examines the impact of CAM and CNC technology on manufacturing.
- L2 M71.90 V02 Identifies types of manufacturing systems.
- L2 M71.90 V02 Simulates two manufacturing systems.
- L2 M71.90 V02 Identifies manufacturing systems.
- L2 M71.50 V01 Identifies that wood, metal and plastic are shaped using a variety of manufacturing processes.
- L2 M71.50 V01 Compares fixed and variable costs for manufacturing.

L2 M72.50 V01 Examines the classification of materials used in manufacturing.

Process energy into other forms and information into more meaningful information.

- L2 M71.00 V02 States that energy can be transformed.
- L2 M71.00 V02 Explains wind energy and its uses.
- L2 M71.00 V02 Uses wind power to generate electricity.
- L2 M71.00 V02 States the applications of water for energy.
- L2 M71.00 V02 Assembles and demonstrates a model hydro-electric power plant.
- L2 M71.00 V02 Powers a 'Lego' car using solar energy.
- L2 M71.00 V02 States some of the energy theory behind the 'greenhouse effect'.
- L2 M71.00 V02 Defines alternative energy.
- L2 M71.50 V02 Recognizes the difference between potential and kinetic energy.
- L2 M71.50 V02 States the main sources of energy used in transportation systems.
- L2 M71.50 V02 States the general uses of energy in society.
- L2 M71.70 V04 Investigates motion and energy transformations in pneumatics.
- L2 M71.30 V03 Identifies how to draw a three-dimensional object by adding elevation.
- L2 M71.10 V03 Adds control to a voice trained command.
- L2 M71.00 V02 Interprets instructions to add sound to an animation.
- L2 M71.00 V02 Describes how the use of actors and paths can add realism to an animation.
- L2 M71.00 V02 Records sound effects and adds the results to an animation.
- L2 M71.00 V02 Recalls some control features used to add seaweed to the underwater animation.
- L2 M71.10 V02 Adds titles to video.
- L2 M71.20 V04 Adds an exit option to a multimedia presentation.
- L2 M71.20 V04 Adds a special effect to a multimedia presentation.
- L2 M71.20 V04 Adds sounds to a multimedia presentation.
- L2 M71.80 V01 Identifies the process of adding special effects to a photographic image.
- L2 M71.80 V01 Adds text to a photographic image.

Computer Technology: Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.

Assemble a computer system including keyboard, central processing unit and disc drives, mouse, modem, printer, and monitor.

- L2 M71.00 V02 Demonstrates a knowledge of computers.
- L2 M71.50 V02 Describes the action of a computer program when using the computer screen as the output.
- L2 M71.20 V04 States computer operations.
- L2 M71.20 V04 Identifies individual elements of a computer system.
- L2 M71.20 V04 Identifies types of personal computer system.
- L2 M71.20 V04 Uses a simple word processor to read and write information to disk.
- L2 M71.20 V04 Compares disk drive types and their operation.
- L2 M71.20 V04 Calculates storage and rotational speed for a computer disk drive.
- L2 M71.20 V04 Identifies the mechanical processes in operating a mouse.
- L2 M71.20 V04 Identifies the process used by printers to create text and graphics.
- L2 M71.20 V04 Locates information on printers from written text.
- L2 M71.20 V04 Indicates knowledge of the operation of computer screens.
- L2 M71.20 V04 Uses the computer as a control device to external equipment.
- L2 M71.20 V04 Identifies the requirement for support circuitry and expansion slots in computers.
- L2 M71.20 V04 Researches computer networks using software and book resources.

- L2 M71.20 V04 Explains disk drive operations.
- L2 M71.30 V03 Interprets computer icon tool buttons.
- L2 M71.30 V03 Demonstrates the ability to open a computer file.
- L2 M71.90 V02 Identifies which computer output is linked to the conveyor.
- L2 M71.00 V02 Identifies key features in the use of a computer.
- L2 M71.00 V02 Interprets information from computer equipment connection diagrams.

Use a computer system to connect to and access needed information from various Internet sites.

- L2 M71.00 V03 Use a Web Browser to search for selected information.
- L2 M71.00 V03 Extracts information about communications technology using a Web Browser.
- L2 M71.80 V01 Extracts digital camera details from a simulated internet site.
- L2 M71.20 V04 Identifies individual elements of a computer system.
- L2 M71.20 V04 Identifies types of personal computer systems.
- L2 M71.80 V01 Produces a picture for an internet web page.

Use computer hardware and software to draw and dimension prototypical designs

- L2 M71.30 V03 Creates a CAD drawing using coordinate systems.
- L2 M71.30 V03 Explores the role of CAD in the design process.
- L2 M71.30 V03 Determines the dimensions and settings for the drawing area.
- L2 M71.30 V03 Determines the size of the drawing area.
- L2 M71.30 V03 Identifies how to draw a three-dimensional object by adding elevation.
- L2 M71.30 V03 Recognizes commands used in CAD software.
- L2 M71.80 V02 Uses car performance simulation software to design a streamlined car.
- L2 M71.80 V02 Designs and tests car on computer.
- L2 M71.80 V02 Solves a car design problem using computer software.
- L2 M71.90 V03 Uses software to manipulate data relating to model rockets.
- L2 M71.20 V04 Recognizes appropriate software use.
- L2 M71.30 V02 Interprets diagrams in software programs relating to electronic components and systems.

Use a computer as a modeling tool.

- L2 M71.10 V03 Identifies the tools used to perform specified operations using audio software.
- L2 M71.30 V03 Interprets computer icon tool buttons.
- L2 M71.30 V03 Demonstrate knowledge of design tools used for desktop publishing.
- L2 M71.30 V03 Recognizes the computer as a design tool.
- L2 M71.50 V02 States if a propeller driven computer controlled maglev system can be accelerated and decelerated
- L2 M71.50 V02 Develops a sequence of commands to control movement to accelerate and decelerate a vehicle in a controlled manner.
- L2 M71.50 V02 States the principles of operation of magnetic levitation vehicles.
- L2 M71.10 V03 Uses digital speech recognition to open a computer controlled virtual bank vault.
- L2 M71.20 V04 Uses a computer and software to control a model set of traffic lights.
- L2 M71.20 V04 Follows a sequence of events when programming a set of traffic lights.
- L2 M71.40 V04 Interprets information from computer control of robots text.
- L2 M71.90 V02 Completes a ladder logic simulation of a vehicle production line.

Use a computer system to monitor and control external events and/or systems.

- L2 M71.10 V03 Identifies equipment connected to the weather monitor console.
- L2 M71.10 V03 Defines methods for monitoring weather.

L2 M71.50 V02	Describes the action of sense and control indicators from a computer screen.
L2 M71.50 V02	Uses digital sensors to monitor conditions and provide data to control systems.
L2 M71.50 V02	Translates information from a graph into a computer program which is then used to control a system.
L2 M71.50 V02	Uses a digital impact sensor to monitor conditions and provide data to the user.
L2 M71.50 V02	Develops a sequence of commands to control movement to accelerate and decelerate a vehicle in a controlled manner.
L2 M71.10 V03	Uses digital speech recognition to open a computer controlled virtual bank vault.
L2 M71.20 V04	Uses a computer to control a simulated set of traffic lights.
L2 M71.20 V04	Identifies use of computers in control of external devices.

Technological Systems: Technological systems are designed to achieve specific results and produce outputs, such as products, structures, services, energy, or other systems.

Select appropriate technological systems on the basis of safety, function, cost, ease of operation, and quality of post-purchase support.

L2 M71.00 V02	Analyses data to select the most appropriate technology for the given problem.
L2 M71.20 V02	Defines the term 'technology'.
L2 M71.50 V02	Applies tests and improvement procedures to check the quality of systems.
L2 M71.30 V03	Identifies the function of CAD within society.
L2 M71.50 V02	States the safety procedures used when operating the maglev system.
L2 M71.70 V02	Calculates the cost of different forms of treatment for kidney failure.
L2 M71.80 V02	Identifies the function of wind tunnels.
L2 M71.90 V03	Describes safety guidelines when using model rockets.
L2 M71.90 V03	Describes support processes related to space technology.
L2 M71.00 V03	Identifies the function of each part in a microwave communication system.
L2 M71.00 V03	Calculates the cost of a communication link.
L2 M71.30 V03	Interprets computer aided publishing software functions.
L2 M71.40 V04	Calculates cost of robot elements using basic addition and subtraction.
L2 M71.50 V01	States safety procedures used when making a component.
L2 M71.60 V03	States the importance of safety procedures when using mechanisms.
L2 M71.70 V04	Identifies safety procedures when working with pneumatic systems.
L2 M71.70 V04	Investigates the function of simple pneumatic components.
L2 M71.80 V03	States the importance of safety procedures when using hydraulics.
L2 M71.80 V03	Identifies the function of hydraulic valves.
L2 M71.30 V02	States the functions of a multimeter.
L2 M71.30 V02	States the function of electronic components.
L2 M71.30 V02	States the function of electronic circuits.
L2 M71.40 V01	Identifies and uses common functions in computer software.
L2 M71.50 V01	Compares fixed and variable costs for manufacturing.
L2 M71.50 V01	Identifies safety precautions needed when working with hazardous processes.
L2 M71.90 V01	Uses a remote control model car to investigate the function of a motor vehicle suspension system.
L2 M71.90 V01	Recognizes the function of wheels and tires on a road vehicle.
L2 M71.90 V01	Recognizes the function of the major sub-systems of a car.

Assemble, operate, and explain the operation of simple open-and closed-loop electrical, electronic, mechanical, and pneumatic systems.

L2 M71.10 V03	Examines the basic properties of electrical charges.
L2 M71.40 V03	Solves problems involving an electronic alarm circuit.

- L2 M71.40 V03 Explains the principles of electrical power generation.
- L2 M71.60 V03 Operates the mechanical systems trainer safely.
- L2 M71.60 V03 Recognizes an application of mechanical technology.
- L2 M71.70 V04 Tests a simple pneumatic circuit.
- L2 M71.70 V04 Identifies the operation of a pneumatic system by looking at a diagram.
- L2 M71.60 V03 Describes methods of transferring energy using mechanical systems.
- L2 M71.60 V03 Recognizes friction as a factor in mechanical systems.
- L2 M71.60 V03 Describes methods of transferring energy using mechanical systems.
- L2 M71.70 V04 Identifies safety procedures when working with pneumatic systems.
- L2 M71.70 V04 Explains the workings of a pneumatic system.
- L2 M71.30 V02 Describes the action of an electronic system to monitor temperature and provide feedback from a motor controlled fan.
- L2 M71.30 V02 Recognizes the correct symbols and conventions when designing electronic systems.
- L2 M71.30 V02 Identifies electronic systems in terms of Input, Process and Output.
- L2 M71.90 V01 Identifies the transmission, brakes and electrical system of a car.
- L2 M71.90 V01 Recognizes the basic parts of a car electrical system.

Describe how subsystems and system elements (inputs, processes, outputs) interact within systems.

- L2 M71.40 V03 Calculates output/input as a percentage.
- L2 M71.20 V04 Identifies input procedures.
- L2 M71.30 V03 Identifies the difference between a computer aided publishing input device and a computer aided publishing output device.
- L2 M71.90 V02 Links inputs to a boiler system output.
- L2 M71.30 V02 Classifies electronic devices as input devices, process devices or output devices and states an appropriate use for them.
- L2 M71.30 V02 Identifies Input, Process, Output and Feedback devices from a diagram.
- L2 M71.30 V02 Describes electronic systems in terms of Input, Process and Output.
- L2 M71.50 V02 Describes the action of a computer program when using the computer screen as the output.
- L2 M71.10 V03 Recognizes the way computers regard input information.
- L2 M71.10 V03 Identifies processes involved in digital speech recognition.
- L2 M71.20 V04 Uses input devices to alter information in a graphics file.
- L2 M71.20 V04 Identifies the mechanical processes in operating a mouse.

Describe how system control requires sensing information, processing it, and making changes.

- L2 M71.50 V02 Uses digital sensors to monitor conditions and provide data to control systems.
- L2 M71.90 V02 Evaluates the use of control systems.
- L2 M71.90 V02 Defines the expression - integrated control system.
- L2 M71.10 V03 Recognizes the processes required for speech processing.
- L2 M71.90 V02 Identifies an application for sensors used to provide feedback in a control system.
- L2 M71.90 V02 Identifies an integrated control system.

History and Evolution of Technology: Technology has been the driving force in the evolution of society from an agricultural to an industrial to an information base.

Describe how the evolution of technology led to the shift in society from an agricultural base to an industrial base to an information base.

- L2 M71.90 V02 Documents the evolution of Industrial Control.

- L2 M71.90 V02 Documents the technological advances in industrial control.
- L2 M71.30 V03 Identifies the function of CAD within society.
- L2 M71.50 V02 States the general uses of energy in society.
- L2 M71.70 V02 Investigates the impact of orthotics and prosthetics on society.
- L2 M71.90 V03 Evaluates the impact of space technology on society.
- L2 M71.30 V02 Recognizes the contribution that electronics technology has made to society.
- L2 M71.30 V02 States the changes Electronics Technology has made to society.
- L2 M71.50 V01 Describes changes in manufacturing history.
- L2 M71.50 V01 Examines changes in manufacturing technology.
- L2 M71.00 V02 Identifies points in the origin and history of animation.
- L2 M71.90 V01 Examines the early history of motor car development.

Understand the contributions of people of different genders, races, and ethnic groups to technological development.

- L2 M71.90 V02 Documents the technological advances in industrial control.
- L2 M71.50 V02 States the differences between problems solved by invention and by innovation.
- L2 M71.30 V02 Recognizes the contribution that electronics technology has made to society.

Describe how new technologies have evolved as a result of combining existing technologies (e.g., photography combined optics and chemistry; the airplane combined kite and glider technology with a lightweight gasoline engine).

- L2 M71.00 V02 Analyses data to select the most appropriate technology for the given problem.
- L2 M71.10 V03 Outlines how satellite technology is used to gather weather data.
- L2 M71.20 V02 Defines the term 'technology'.
- L2 M71.20 V02 Interprets the term Construction Technology.
- L2 M71.50 V02 Defines the meaning of the term technology.
- L2 M71.60 V03 Recognizes the impact of technology on health.
- L2 M71.30 V03 Recognizes how technology has changed drafting.
- L2 M71.60 V03 Investigates the impact of technology on medical treatments.
- L2 M71.70 V02 Describes different careers in biomedical technology.

Impacts of Technology: Technology can have positive and negative impacts on individuals, society, and the environment and humans have the capability and responsibility to constrain or promote technological development.

Describe how outputs of a technological system can be desired, undesired, expected, or unexpected.

- L2 M71.50 V02 Describes the action of a computer program when using the computer screen as the output.
- L2 M71.20 V04 Identifies the output capabilities of a personal computer.
- L2 M71.90 V02 Determines which element of the work cell is linked to PLC output.
- L2 M71.90 V02 Identifies which computer output is linked to the conveyor.
- L2 M71.00 V02 Calculates the power output of a 20% efficient system and identifies an application for the energy produced.
- L2 M71.00 V02 Calculates the power output of a single generator.
- L2 M71.00 V02 Identifies the possible dangers of using nuclear energy.
- L2 M71.00 V02 Identifies jobs provided by the alternative energy industries.

Describe through examples how modern technology reduces manufacturing and construction costs and produces more uniform products.

- L2 M71.50 V01 Examines changes in manufacturing technology.

- L2 M71.00 V03 Calculates the cost of a communication link.
- L2 M71.00 V03 Evaluates communication links.
- L2 M71.20 V02 Identifies the role of Construction Technology.
- L2 M71.20 V02 Calculates insulation efficiency.
- L2 M71.50 V01 Describes changes in manufacturing history.
- L2 M71.50 V01 Describes how automation is employed in manufacturing.
- L2 M71.50 V01 Explains reasons why manufacturing companies should use CNC technology.
- L2 M71.90 V02 Identifies manufacturing systems.
- L2 M71.50 V01 Compares fixed and variable costs for manufacturing.

Management of Technology: Project management is essential to ensuring that technological endeavors are profitable and that products and systems are of high quality and built safely, on schedule, and within budget.

Manage time and financial resources in a technological project.

- L2 M71.50 V02 States the reason for the difference in time taken for a timed run when the fan motor is reversed.
- L2 M71.00 V03 Calculates the cost of a communication link.
- L2 M71.50 V02 Identifies time relative to a power level from a graph.
- L2 M71.70 V02 Calculates the cost of different forms of treatment for kidney failure.
- L2 M71.40 V03 Calculates cost of robot elements using basic addition and subtraction.
- L2 M71.00 V02 Calculates the cost of making an animation, using basic multiplication.
- L2 M71.50 V01 Differentiates between fixed and variable costs for manufacturing.

Provide examples of products that are well (and poorly) designed and made, describe their positive and negative attributes, and suggest measures that can be implemented to monitor quality during production.

- L2 M71.50 V01 Uses instruments to perform quality control checks.
- L2 M72.50 V01 Explains the purpose of quality inspections.
- L2 M73.50 V01 Assesses quality control systems.
- L2 M71.50 V02 Applies tests and improvement procedures to check the quality of systems.
- L2 M72.50 V01 Checks the quality of a component machined on a CNC mill.

Assume leadership responsibilities within a structured group activity.

- L2 M71.50 V02 Gives direct instructions to control movement.
- L2 M71.70 V02 States responsibilities of medical technicians.
- L2 M71.70 V02 States the responsibilities of opticians and associated personnel.
- L2 M71.70 V02 States responsibilities of nursing personnel.
- L2 M71.70 V02 States the responsibilities of personnel working in therapeutic services.
- L2 M71.70 V02 States the responsibilities of paramedics, physicians and veterinary personnel.