

## Tennessee State Standards

### Foundations of Technology

#### **1.1 Realize that Technology is an intrinsic part of human culture, both shaping and being shaped by it; the technology available to people greatly influences what their lives are like.**

- Defines the term 'technology'.
- Identifies the role of Construction Technology.
- Recognizes the impact of technology upon drafting.
- Recognizes how technology has changed drafting.
- Investigates the impact of technology on medical treatments.
- Recognizes the impact of technology on health.
- States the impact of technology on health.
- Evaluates the impact of space technology on society.
- Explores the benefits that new technology has brought to communication systems.
- Examines changes in manufacturing technology.
- Explains reasons why manufacturing companies should use CNC technology.
- Describes the roles of people using CNC technology.
- Recognizes the contribution that electronics technology has made to society.
- States the impact transistors have made to electronics technology.
- States the changes Electronics Technology has made to society.
- Describes the roles of people using CNC technology.
- Examines the impact of CAM and CNC technology on manufacturing.

#### **1.2 Realize that technology cannot always provide successful solutions for problems or fulfill every need.**

- Indicates that the use of fossil fuels harms the environment.
- Identifies the possible dangers of using nuclear energy.
- Investigates the greenhouse effect using experimental models.
- Identifies a major cause of acid rain.
- States dangers of nuclear energy.
- Identifies the problems associated with non-renewable energy resources.
- Identifies the effect of earthquakes on skyscrapers.
- Identifies areas of weakness in structures.
- States the effect of earthquakes on skyscrapers.
- Explains weaknesses in a problem solution.
- Identifies the problems with placing people in space.
- Identifies the problems with protecting people in space.
- Recognizes basic technical problems with photographic images.

#### **1.3 Describe the social benefits and the social and environmental harm caused by significant technological advances, e.g., the automobile, the light bulb, and the computer.**

- Indicates that the use of fossil fuels harms the environment.
- States dangers of nuclear energy.
- Identifies the possible dangers of using nuclear energy.
- Identifies the benefits of bridge construction.
- Explores the benefits that new technology has brought to communication systems.
- Identifies the harmful substances and the risks involved when using tobacco.

- States the dangers of smoking.
- Defines the harmful effects of smoking.
- Defines the harmful effects of alcohol abuse.
- Describes the effects and dangers of excessive alcohol consumption.
- Defines the harmful effects of drug abuse.
- Identifies the dangers of taking drugs.
- Identifies the need for protection when using potentially harmful processes.
- States the technological advances in Industrial Control.
- States the technological advances in Industrial Control.

**1.4 Realize that technology has strongly influenced the course of history and continues to do so. Develop a historical perspective of the major technological advances.**

- Describes changes in manufacturing history.
- Explores the history of industrial control.
- Identifies points in the origin and history of animation.
- Identifies points in the origin and history of animation.
- Examines the early history of motor car development.
- States the technological advances in Industrial Control.
- States the technological advances in Industrial Control.
- Identifies the technological aspects of the evolution of industrial control.
- Uses multimedia software to identify aspects of the evolution of Industrial Control.

**1.5 Realize that societies influence which aspects of technology are developed and how these are used; people control technology and are responsible for its effects.**

- Identifies the function of CAD within society.
- States the general uses of energy in society.
- Investigates the impact of orthotics and prosthetics on society.
- Evaluates the impact of space technology on society.
- Recognizes the contribution that electronics technology has made to society.
- States the changes Electronics Technology has made to society.
- Describes changes in manufacturing history.
- Explores the history of industrial control.
- Identifies points in the origin and history of animation.
- Examines the early history of motor car development.
- States the development of the transistor.
- Examines the early history of motor car development.
- Identifies the development of the internal combustion engine.

**1.6 Explain how the workplace has been, and is affected by advances in technology.**

- States the technological advances in Industrial Control.
- States the technological advances in Industrial Control.

**2.1 Design and make devices and systems that solve complex problems.**

- Interprets a brief to design a bridge.
- Designs a bridge construction.
- Follows a design brief to draw a mechanical component.
- Uses car performance simulation software to design a streamlined car.
- Designs and tests car on computer.
- Solves a car design problem using computer software.
- Designs a transmission system for a winch.

Designs and builds a pneumatic circuit to operate a sliding door.  
Designs a hydraulic circuit to simulate a sequencing application.  
Applies the design process to complete a program for sorting bobbins.  
Investigates the design problem and solution for a simulated TV animation.  
Solves problems in designing and producing an animation.  
Compares the hardness of materials to find appropriate solutions for product designs.  
Evaluates the heat properties of materials to find appropriate solutions for product designs.  
Evaluates the densities of materials to find appropriate solutions for product designs.  
Designs a tabletop game using thermoplastic parts.  
Uses an original design to machine a component on a CNC mill.

### **2.2 Identify the nature of the problem.**

Analyzes data to select the most appropriate technology for a given problem.  
Identifies the problems associated with non-renewable energy resources.  
Identifies problems created by turbulence.  
Recognizes the problems of stalling.  
Identifies the problems with placing people in space.  
Identifies the problems with protecting people in space.  
Investigates the problem of slippage in pulley belt systems.  
Evaluates proposed solutions to a pneumatic problem.  
Investigates the design problem and solution for a simulated TV animation.  
Identifies problems and solutions in animating a human walk.  
Investigates the design problem and solution for a simulated TV animation.  
Identifies problems and solutions in animating a human walk.  
Recalls some of the problems and solutions associated in producing a simulated TV sequence.  
Recognizes basic technical problems with photographic images.  
Identifies problems with shot composition.

### **2.3 Research, identify, and apply existing technologies to solve problems.**

Identify some of the ways in which alternative energy sources are being used globally.  
Solves problems in a circuit during testing.  
Solves problems involving an electronic alarm circuit.  
Solves math problems relating to health management.  
Solves a car design problem using computer software.  
Solves problems in aerodynamics to test a glider.  
Solves the problems with placing people in space.  
Solves problems involving mechanical advantage.  
Solves problems involving gear ratios.  
Solves problems in designing and producing an animation.  
Identifies problems and solutions in animating a human walk.  
Solves problems in designing and producing an animation.  
Recalls some of the problems and solutions associated in producing a simulated TV sequence.  
Identifies problems with shot composition.

### **2.4 Research and combine relevant information from a variety of resources to solve problems.**

Solves problems involving an electronic alarm circuit.  
Creates tables, graphs and flowcharts when conducting research.  
Solves a car design problem using computer software.  
Solves problems in aerodynamics to test a glider.

Solves the problems with placing people in space.  
Presents a solution to a communication problem.  
Solves problems involving mechanical advantage.  
Solves problems involving gear ratios.  
Researches text to find a commercial application of pneumatic systems.  
Evaluates proposed solutions to a pneumatic problem.  
Solves problems in designing and producing an animation.  
Identifies problems and solutions in animating a human walk.  
Recalls some of the problems and solutions associated in producing a simulated TV sequence.  
Investigates the design problem and solution for a simulated TV animation.  
Presents a solution to the TV animation problem.  
Compares the hardness of materials to find appropriate solutions for product designs.  
Evaluates the heat properties of materials to find appropriate solutions for product designs.  
Evaluates the densities of materials to find appropriate solutions for product designs.

### **2.5 Develop criteria and requirements for solutions to design problems based on specific needs.**

Uses a transistor as a switch to develop the steady hand game.  
Uses a capacitor as a time delay to develop the steady hand game.  
Identifies relevant criteria to create an itinerary for a business trip.  
Creates a business trip itinerary taking into account all specified criteria.  
Identifies the medical solutions to kidney failure.  
Evaluates proposed solutions to a pneumatic problem.  
Compares the hardness of materials to find appropriate solutions for product designs.  
Evaluates the heat properties of materials to find appropriate solutions for product designs.  
Evaluates the densities of materials to find appropriate solutions for product designs.  
Designs and creates a poster to inform the public the dangers of smoking tobacco.  
Solves a car design problem using computer software.  
Applies aerodynamic principles to automobile design.  
Uses resizing tools and design tools to alter a graphic.  
Designs and builds a pneumatic circuit to operate a sliding door.  
Designs a hydraulic circuit to simulate a sequencing application.  
Applies the design process to complete a program for sorting bobbins.  
Identifies stages of the design process used to complete a control program.  
Investigates the design problem and solution for a simulated TV animation.  
Solves problems in designing and producing an animation.  
Designs a tabletop game using thermoplastic parts.  
Uses an original design to machine a component on a CNC mill.  
Analyzes data to select the most appropriate technology for a given problem.  
Solves problems involving an electronic alarm circuit.  
Describes the stages in the Design and problem solving loop.  
Solves a car design problem using computer software.  
Solves problems in aerodynamics to test a glider.  
Solves the problems with placing people in space.  
Presents a solution to a communication problem.  
Evaluates proposed solutions to a pneumatic problem.

### **2.6 Develop action plans for the creation of products, systems, and environments.**

Plans a weekly fitness program.  
Makes Video pre-production plans.

Completes an operation plan for using a thermoplastic molder.  
Uses distance and coordinate data to help plan routes.  
Uses coordinate systems to help plan routes.  
Uses a plan to take source footage long shots.  
Makes an advertisement using pre-production planning, production shooting and post-production editing.  
Creates tables, graphs and flowcharts when conducting research.  
Creates a business trip itinerary taking into account all specified criteria.  
Uses coordinate systems to help plan routes.

**3.1 Use a variety of "hard" and "soft" materials when fabricating conceptual models and prototypes.**

Builds a motor support structure and uses an appropriate alternative energy source to drive it.  
Uses CAD to create 3D models.  
Uses digital sensors to monitor conditions and provide data to control systems.  
Uses the wind tunnel to measure drag.  
Uses car performance simulation software to design a streamlined car.  
Uses IT to examine the effect of thrust and mass on a rocket.  
Uses software to manipulate data relating to model rockets.  
Uses voice command to control the movement of an object on screen.  
Uses software to write a simple program.  
Uses the computer as a device to control external equipment via the parallel port.  
Uses a computer and software to control a model set of traffic lights.  
Uses resizing tools and design tools to alter a graphic.  
Uses instruments to perform quality control checks.  
Assembles and uses a stepped pulley and belt system.  
Builds and uses 2nd and 3rd order lever systems.  
Uses symbols to draw a pneumatic circuit diagram.  
Uses valves to control a fluid in a hydraulic system.  
Uses a transistor as a switch to develop the steady hand game.  
Uses computer simulation to compare the heat properties of metals and plastics.  
Uses computer simulation to compare the density of metals and plastics.  
Uses distance and coordinate data to help plan routes.  
Uses coordinate systems to help plan routes.  
Designs a bridge construction.  
Designs and creates a poster to inform the public the dangers of smoking tobacco.  
Designs and tests car on computer.  
Designs a transmission system for a winch.  
Designs and builds a pneumatic circuit to operate a sliding door.  
Designs a hydraulic circuit to simulate a sequencing application.  
Compares the hardness of materials to find appropriate solutions for product designs.  
Evaluates the heat properties of materials to find appropriate solutions for product designs.  
Evaluates the densities of materials to find appropriate solutions for product designs.  
Designs a tabletop game using thermoplastic parts.

**3.2 Identify materials for specific purposes based on their physical properties.**

Identifies two transducers used in the solar powered car.  
Identifies the device used to convert wind energy to electrical energy.  
Identifies substances which will allow light to pass through.  
Identifies equipment connected to the weather monitor console.

Identifies insulation as a property of construction material.  
Identifies the function of the parts of a d.c. motor.  
Identifies the functions of a pulse and blood pressure monitor.  
Identifies the name and function of the different regions of the human brain.  
Identifies the properties of the materials used for making denture casts.  
Identifies the uses of airstream indicators.  
Identifies the function of different parts of an aircraft.  
Identifies the function of wind tunnels.  
Identifies the features of wing design.  
Identifies part of a rocket.  
Identifies the function of each part in a microwave communication system.  
Identifies parts of the human anatomy that allow us to speak and hear.  
Identifies the tools used to perform specified operations using audio software.  
Identifies individual elements of a computer system.  
Identifies the mechanical processes in operating a mouse.  
Identifies the process used by printers to create text and graphics.  
Identifies the purpose and uses of types of software.  
Identifies the requirement for support circuitry and expansion slots in computers.  
Identifies applications in the home where computers are used.  
Identifies the difference between a computer input device and a computer output device.  
Identifies the components of a letterpress printing plate.  
Identifies the components of a lithographic printing plate.  
Identifies elements of a model robot.  
Identifies suitable applications for robots.  
Identifies differences between a CNC lathe and a CNC mill.  
Identifies the materials used and their importance in CNC technology.  
Identifies different tools and measuring instruments used with a CNC machine tool.  
Identifies types of gears.  
Identifies lever systems.  
Identifies pneumatic components and their function from symbols.  
Identifies the function of compressors, filters and lubricators.  
Identifies the operation of a pneumatic system by looking at a diagram.  
Identifies hydraulic system basics.  
Identifies the function of hydraulic valves.  
Identifies the electrical connections of elements in a Work-Cell.  
Identifies the elements of a typical industrial control Work-Cell.  
Identifies the function of sensors in a Work-Cell.  
Identifies key features in the use of a computer.  
Identifies controls used in recording and playing sound effects.  
Identifies the parts of a video camcorder.  
Identifies drawing and text tool buttons in a multimedia presentation editor.  
Identifies the slide editing view options in a multimedia presentation editor.  
Identifies types of media used in a multimedia presentation.  
Identifies electronic components and systems on the Experiment Card Master Board.  
Identifies the components providing feedback to a system.  
Identifies Input, Process, Output and Feedback devices from a diagram.  
Identifies how a capacitor alters the waveform of unsmoothed DC.  
Identifies and uses software function tools to edit and format a document.

Identifies and uses icons to edit and find data.  
Identifies the function of the heat controller on a thermoplastic molder.  
Identifies that a mold can make multiple parts in one operation.  
Identifies that wood, metal and plastic are shaped using a variety of manufacturing processes.  
Identifies uses of secondary materials for the manufacture of parts.  
Identifies the materials and processes used to make a clip, a door, a door handle and a chess piece.  
Identifies the components of a digital camera.  
Identifies lighting components used in photography.  
Identifies the transmission, brakes and electrical system of a car.  
Identifies the steering and braking systems of a car.  
Identifies the function of the basic electrical sub-systems of a car.  
Identifies the operation of a four stroke engine cycle.  
Identifies types of suspension system used in modern cars.  
Identifies the function of the transmission system of a motor vehicle.  
Identifies the parts and functions of a camcorder.

### **3.3 Select and properly use material processing tools and equipment.**

Use a Web Browser to search for selected information.  
Selects different plastics in a set of sample materials from given descriptions.  
Selects different metals in a set of sample materials from given descriptions.  
Selects different woods in a set of sample materials from given descriptions.  
Selects different composite materials in a set of sample materials from given descriptions.  
Uses resizing tools and design tools to alter a graphic.  
Assesses the use of different tools used by a CNC lathe.  
Changes using edit tools an existing animation of a cockatoo into a bald eagle.  
Identifies and uses software function tools to edit and format a document.  
Uses different cutting tools with a CNC mill.  
Uses test equipment to analyze deflection.  
Uses the computer as a device to control external equipment via the parallel port.  
Manipulates objects using a computer image manipulation program.  
Manipulates text on a photographic image.  
Extracts material information from a table to make a tabletop game.  
Chooses appropriate Video technology Hardware.

### **3.4 Select appropriate adhesives to join similar and dissimilar materials.**

Evaluates methods of joining components.  
Designs a bridge construction.

### **3.6 Apply metric units by measuring with the accuracy of one millimeter (linear).**

Converts between different measuring systems.  
Identifies different tools and measuring instruments used with a CNC machine tool.  
Measures distance between lines to show that they are parallel.  
Measures chord length of wing section.  
Measures chord length of wing section.

### **3.7 Apply standard units by measuring with an accuracy of one-sixteenth of an inch (linear).**

Measures distance between lines to show that they are parallel.  
Measures chord length of wing section.  
Measures chord length of wing section.  
Measures distance using a map scale.

**3.8 Select and use existing products, devices, and systems as resources for solving problems.**

- Solves problems in a circuit during testing.
- Solves problems involving an electronic alarm circuit.
- Solves a car design problem using computer software.
- Solves problems in aerodynamics to test a glider.
- Solves the problems with placing people in space.
- Solves problems involving mechanical advantage.
- Solves problems involving gear ratios.
- Solves problems in designing and producing an animation.
- Locates and selects a background scene and appropriate overlay graphics.
- Selects and applies mouse over effects to objects.
- Builds a motor support structure and uses an appropriate alternative energy source to drive it.
- Uses a computer to detect and display localized weather data.
- Uses information from a graph to calculate temperature readings.
- Uses information from a graph to calculate instantaneous and average rainfall.
- Uses test equipment to analyze deflection.
- Uses CAD to create 3D models.
- Uses digital sensors to monitor conditions and provide data to control systems.
- Uses a Temperature, Pulse and Respiration chart to recognize the health state of patient.
- Uses the wind tunnel to measure drag.
- Uses car performance simulation software to design a streamlined car.
- Uses a voice recognition system to open a virtual safe.
- Uses input devices to alter information in a graphics file.
- Uses software to write a simple program.
- Uses the computer as a device to control external equipment via the parallel port.
- Uses resizing tools and design tools to alter a graphic.
- Uses instruments to perform quality control checks.
- Uses ladder logic counters and timers to identify object widths.

**3.9 Apply safety rules and regulations when using tools, equipment and performing processes.**

- States the safety procedures used when operating the maglev system.
- Describes safety guidelines when using model rockets.
- Describes safety procedure for launching dowel rods.
- States safety procedures used when making a component.
- States safety procedures used with CNC machine tools.
- States the importance of safety procedures when using mechanisms.
- Identifies safety procedures when working with pneumatic systems.
- Explains the importance of safety procedures when using hydraulics.
- Identifies safety precautions needed when working with hazardous processes.
- Identifies the care and safety aspects of using a camcorder.
- States safety procedures used with CNC machine tools.
- Describes the procedures to ensure a model rocket is launched safely.
- Describes procedures for setting up a CNC lathe safely.
- Operates the mechanical systems trainer safely.
- Operates hydraulic equipment safely.
- Identifies procedures for using a thermoplastic injection molder safely and accurately.
- Describes procedures for operating the CNC mill safely.

**4.1 Create two and three dimensional technical drawings by hand, and electronically to develop and express design proposals.**

Translates 'real world' information into working drawings.  
Creates a CAD drawing using coordinate systems.  
Uses CAD to create 3D models.  
Designs and creates a poster to inform the public the dangers of smoking tobacco.  
Creates an advertising flyer using a word processor, incorporating text and graphics.  
Draws a three-dimensional mechanical component.  
Follows a design brief to draw a mechanical component.  
Uses car performance simulation software to design a streamlined car.  
Designs and tests car on computer.  
Solves a car design problem using computer software.  
Designs a car following a design brief.  
Uses resizing tools and design tools to alter a graphic.  
Recognizes the computer as a design tool.  
Animates multiple fish actors and paths, including the design and animation of a new fish.  
Solves problems in designing and producing an animation.

**4.2 Apply artistic rendering techniques to enhance technical drawings.**

Creates a CAD drawing using coordinate systems.  
Completes a CAD drawing of a kitchen plan.  
Identifies how to draw a three-dimensional object by adding elevation.  
Draws a three-dimensional mechanical component.  
Draws an orthographic projection of a 3D model.  
Follows a design brief to draw a mechanical component.  
Translates 'real world' information into working drawings.  
Uses symbols to draw a pneumatic circuit diagram.  
Identifies landscape features from contour lines by drawing cross sections.  
Applies orthographic projection.

**4.3 Use diagrams, charts, and technical drawings to explain how devices and systems operate, and are constructed.**

Interprets information from robot sequence diagrams.  
Indicates some key features in flow diagrams.  
Interprets force diagrams.  
Uses diagrams to identify logic gate symbols.  
Interprets information from flick book diagrams.  
Interprets information from computer equipment connection diagrams.  
Interprets video system diagrams showing signal flow.  
Interprets diagrams in software programs relating to electronic components and systems.  
Interprets electrical diagrams showing different connections for a multimeter in a circuit.  
Interprets text, instructions and diagrams.  
Creates tables, graphs and flowcharts when conducting research.  
Interprets data from growth charts.  
Identifies the drafting conventions used to draw an orthographic projection.  
Translates 'real world' information into working drawings.  
Reads dimensions from a draftsman's drawing.  
Uses an accurate technical vocabulary to describe electronic devices and circuits.  
Recognizes the principles of coordinate systems used in CAD.

Identifies electronic components and systems on the Experiment Card Master Board.  
Interprets diagrams in software programs relating to electronic components and systems.  
Recognizes the correct symbols and conventions when designing electronic systems.  
Uses coordinate systems to help plan routes.  
Identifies the steering and braking systems of a car.  
Identifies the function of the basic electrical sub-systems of a car.  
Recognizes the function of the major sub-systems of a car.  
Identifies the parts and operation of car steering systems.

**4.4 Use schematic symbols to plan and organize design proposals.**

Uses symbols to draw a pneumatic circuit diagram.  
Uses symbols to draw a pneumatic circuit diagram.  
Uses symbols to draw a pneumatic circuit diagram.  
Recognizes the correct symbols and conventions when designing electronic systems.

**4.5 Create diagrams and sketches by hand, and electronically to express design ideas and solutions.**

Uses symbols to draw a pneumatic circuit diagram.  
Creates a CAD drawing using coordinate systems.  
Designs and creates a poster to inform the public the dangers of smoking tobacco.  
Creates an advertising flyer using a word processor, incorporating text and graphics.  
Creates titles for a video film using a computer.  
Creates titles for a video film using computer software.  
Designs and tests car on computer.  
Designs a car following a design brief.  
Designs letters to match an existing font pattern.  
Produces a print-out of a digital photographic image.  
Produces a poster which includes a digitized photographic image.  
Produces a picture for an internet web page.  
Constructs CAD images using coordinate systems.

**5.1 Identify and describe the types, purposes and relationships of technological systems.**

Identifies the technological aspects of the evolution of industrial control.  
States the technological advances in Industrial Control.  
State the purpose of the sub-systems within a hydroelectric power plant.  
Recognizes the principles of coordinate systems used in CAD.  
Investigates three-dimensional coordinate systems.  
States the main sources of energy used in transportation systems.  
States the difference between acceleration and deceleration and how these affect vehicular systems.  
States the sub-systems which make up a vehicular system.  
States the possible impact of transportation systems of the future.  
Recognizes the sources of energy used in transportation systems.  
Recognizes the concepts of Systems and control.  
Examines propulsion systems used with space technology.  
Describes propulsion systems of importance to space technology.  
Examines wire communication systems.  
Explores the benefits that new technology has brought to communication systems.  
Identifies types of personal computer systems.  
Uses the mechanical trainer to investigate pulley systems.  
Describes methods of transferring energy using mechanical systems.

Identifies lever systems.  
Researches text to find a commercial application of pneumatic systems.  
Evaluates compressed air as a medium for transferring energy in fluid power systems.  
Recognizes Bernoulli's Law in Hydraulic Systems.  
Recognizes the advantages of hydraulic systems.  
Describes characteristics of manufacturing systems.  
Uses multimedia software to identify manufacturing systems.  
Identifies elements of automated systems and their relation to a Work-Cell.  
Identifies the input-process-output elements of computer control systems.  
Identifies types of manufacturing systems.  
Interprets diagrams in software programs relating to electronic components and systems.  
Describes electronic systems in terms of Input, Process and Output.  
Uses information from GPS systems accurately.  
Identifies the steering and braking systems of a car.  
Identifies the function of the basic electrical sub-systems of a car.  
Recognizes the function of the major sub-systems of a car.  
Identifies the parts and operation of car steering systems.

**5.2 Realize that many technological systems are designed as subsystems with a variety of applications.**

State the purpose of the sub-systems within a hydroelectric power plant.  
States the sub-systems which make up a vehicular system.  
Identifies the function of the basic electrical sub-systems of a car.  
Recognizes the function of the major sub-systems of a car.

**5.3 Apply the system model (input, process, output, and feedback), and describe how its parts interact with each other.**

Uses input devices to alter information in a graphics file.  
Identifies the input-process-output elements of computer control systems.  
Classifies electronic devices as input devices, process devices or output devices and states an appropriate use for them.  
Identifies Input, Process, Output and Feedback devices from a diagram.  
Describes electronic systems in terms of Input, Process and Output.  
Explores the production of manufacturing inputs.  
Identifies the output capabilities of a personal computer.  
Uses an oscilloscope to monitor the output of an LDR.  
States the operation of individual components in a temperature controlled system with feedback.  
Identifies the components providing feedback to a system.  
Constructs a fully operational electronic circuit with feedback to monitor and react to temperature changes.  
Describes the action of an electronic system to monitor temperature and provide feedback from a motor controlled fan.

**5.4 List the resources on which all technological systems depend (information/ knowledge, people, tools, space, and materials). Recognize that technological systems are essential to, and influence a vast number of occupations, industries, energy, capital**

Identifies the need to preserve existing energy resources and to find new methods of providing energy.  
Identifies the problems associated with non-renewable energy resources.  
Recognizes the impact of technology upon drafting.  
Recognizes the stages in the Design and Problem Solving Loop.

Recognizes the sources of energy used in transportation systems.  
Recognizes the concepts of Systems and control.  
Recognizes the impact of technology on health.  
Recognizes appropriate software use.  
Recognizes multimedia applications.  
Recognizes the computer as a design tool.  
Recognizes characteristics of a model robot work-cell.  
Recognizes an application of mechanical technology.  
Recognizes the use and function of flow restrictors.  
Recognizes Pascal's Law in a hydraulic system.  
Recognizes Bernoulli's Law in Hydraulic Systems.  
Recognizes basic hydraulic laws.  
Recognizes how components are used in a hydraulic system.  
Recognizes the advantages of hydraulic systems.  
Recognizes the contribution that electronics technology has made to society.  
Recognizes the operation and components of a four stroke internal combustion engine.  
Recognizes the function of wheels and tires on a road vehicle.  
Recognizes the major parts and function of a lubrication system.  
Recognizes the function of the major sub-systems of a car.  
Recognizes the basic parts of a car electrical system.  
Recognizes the basic parts and function of a car engine.  
Recognizes the basic parts and function of a car suspension system.  
Defines alternative energy.  
States that wind energy can be used to generate electricity.  
Identifies the need to preserve existing energy resources and to find new methods of providing energy.  
Identify some of the ways in which alternative energy sources are being used globally.  
Identifies jobs provided by the alternative energy industries.  
States an application of electrical energy.  
States the general uses of energy in society.  
States the forms and types of energy.  
Recognizes the sources of energy used in transportation systems.

**6.1 Access information from a variety of resources, including electronic bulletin boards (via modem), commercial information services and electronic encyclopedias to conduct research.**

Uses information from a graph to calculate temperature readings.  
Uses information from a graph to calculate instantaneous and average rainfall.  
Translates 'real world' information into working drawings.  
Develops a sequence of commands to control movement using information from a graph.  
Translates information from a graph into a computer program which is then used to control a system.  
Interprets basic information about vital signs.  
Selects information about the stages of model rocket flight from a table.  
Extracts information from a block diagram of walkie-talkies.  
Use a Web Browser to search for selected information.  
Extracts information about communications technology using a Web Browser.  
Explores the process of sending information across a microwave link.  
Obtains technical information about wave files from various sources.  
Recognizes the way computers regard input information.  
Uses a simple word processor to read and write information to disk.

Researches information on printers.  
Locates information in a variety of media.  
Selects information in text, audio and visual formats.  
Researches information from a computer generated document.  
Extracts technical information from research material.  
Interprets information from robot sequence diagrams.  
Interprets information from computer control of robots text.  
Interprets information from written text as to the positive features of different robots.  
Extracts and compares information from text.  
Interprets information from flick book diagrams.  
Interprets information to create an animation path.  
Interprets written information, explaining how many frames a movie contains.  
Interprets information from computer equipment connection diagrams.  
Relates storyboard planning information with the corresponding multimedia presentation.  
Identifies slide information in a storyboard.  
Interprets information from reference material.  
Extracts information from text related to search and display functions in an encyclopedia.  
Searches an encyclopedia to find appropriate information relating to an unfamiliar subject.  
Extracts information from a multimedia application relating to Iceland.  
Searches a help screen to extract information regarding conventions used in news writing.  
Searches a help screen to extract information regarding conventions used in news writing.  
Extracts information about holding devices from a textbook.  
Extracts part information from a diagram to make a tabletop game.  
Extracts material information from a table to make a tabletop game.  
Uses information from GPS systems accurately.  
Reads and interprets information from the instruments of a car dashboard.  
Extracts information about the ignition system of a car.  
Obtains information from a CNC Mill programming table.

**6.2 Use computer aided drafting (CAD) to draw design ideas and plans.**

Creates a CAD drawing using coordinate systems.  
Completes a CAD drawing of a kitchen plan.  
Demonstrates how to use CAD commands.  
Explains how to use CAD commands.  
Examines the use of CAD in architectural drafting.  
Examines the use of CAD in component drafting.  
Uses CAD to create 3D models.  
Constructs CAD images using coordinate systems.  
Examines the use of CAD in component drafting.  
Uses CAD to create 3D models.

**6.3 Use a facsimile (FAX) machine to send and receive information.**

States the basic operation of the Fax machine.  
Identifies advantages and disadvantages of Fax technology.  
Understand the basics of Fax Modem communication.

**6.4 Use digital input devices, such as a scanner or digitizing cameras, as a means of recording information.**

Maintains and organizes a record of work.

Records a sentence to a computer using audio software.  
Converts text to speech using computer software.  
Demonstrates sound wave conversion using a microphone, computer, and cassette recorder.  
Uses digital speech recognition to open a computer controlled virtual safe.  
Uses the computer as a device to control external equipment via the parallel port.  
Uses a computer and software to control a model set of traffic lights.  
Creates titles for a video film using a computer.  
Uses computer software to edit video recordings.  
Creates titles for a video film using computer software.  
Uses computer simulation to obtain Brinell hardness figures of metals and plastics.  
Uses computer simulation to compare the heat properties of metals and plastics.  
Uses computer simulation to compare the density of metals and plastics.  
Produces a print-out of a digital photographic image.  
Uses a trip computer to analyze the performance of a vehicle under different load conditions.  
Captures source footage for an advertisement onto a computer.  
Manipulates text on a photographic image.  
Applies special effects to a photographic image.  
Produces a print-out of a digital photographic image.  
Adds text to a photographic image.  
Produces a poster which includes a digitized photographic image.  
Produces a picture for an internet web page.  
Records source footage close-ups by following a shooting script.  
Makes a computer generated title for use in a video.  
Records source footage of mid-shots by following a shooting script.  
Uses a storyboard with cut-ins and cut-aways to edit mid-shots into a video.  
Inserts Barn Doors transitions into a video product.  
Inserts a Cross Dissolve transition into a video product.  
Adds a musical sound track onto a video product.  
Captures source footage for an advertisement onto a computer.  
Edits source footage into an advertisement.  
Makes a copy of an advertisement onto a VHS cassette.  
Makes a video film.

#### **7.1 Articulate the problem solving process.**

Recognizes the stages in the Design and Problem Solving Loop.  
Analyzes data to select the most appropriate technology for a given problem.  
Speaking - presents a solution to a bridge construction problem.  
Solves a problem involving ratios.  
Solves math problems using substitution into Ohm's Law expression.  
Solves a math problem involving ratios.  
Solves math problems involving fractions.  
Solves problems in a circuit during testing.  
Explains weaknesses in a problem solution.  
Solves problems involving an electronic alarm circuit.  
States the differences between problems solved by invention and by innovation.  
Solves a car design problem using computer software.  
Solves problems in aerodynamics to test a glider.  
Identifies problems created by turbulence.

Identifies the problems with placing people in space.  
Identifies the problems with protecting people in space.  
Solves the problems with placing people in space.  
Presents a solution to a communication problem.  
Investigates the problem of slippage in pulley belt systems.  
Solves problems involving mechanical advantage.  
Solves problems involving gear ratios.  
Solves math problems for pneumatic applications.  
Investigates the design problem and solution for a simulated TV animation.  
Identifies problems and solutions in animating a human walk.  
Solves problems in designing and producing an animation.  
Presents a solution to the TV animation problem.  
Recognizes basic technical problems with photographic images.  
Identifies problems with shot composition.

### **7.2 Understand, construct, and use spreadsheets and data banks.**

Interprets data from a color reading chart.  
Analyzes data to select the most appropriate technology for a given problem.  
Analyzes data from a table.  
Identifies methods for gathering weather data.  
Extracts a temperature reading from a table of weather data.  
Extracts data from an air to ground lightning strike map.  
Interprets technical data.  
Plots weight and age data for infants on a growth chart.  
Interprets data from growth charts.  
Uses data to create a growth chart.  
Interprets data from a Temperature, Pulse and Respiration chart.  
Applies height formula to data from a model rocket launch.  
Applies velocity formula to data from a model rocket launch.  
Uses software to manipulate data relating to model rockets.  
Extracts data from an instrument readout panel (Voltage measurements).  
Extracts data from an instrument readout panel (Capacitor charge and discharge waveforms).  
Identifies and uses icons to edit and find data.  
Interprets the data from a vehicle speed sensor.  
Interprets the data from a vehicle fuel level sensor.  
Calculates the speed of a vehicle using data from sensors.  
Calculates fuel quantities using data from sensors.  
Analyzes the performance of a road vehicle from test data.  
Explores procedures for backing up data.

### **7.3 Write technical materials (e.g., instructions for playing a game) that include specific details.**

Writes a report on the Workstation Tutorials.  
Writes a report on Alternative Energy.  
Writes a report on Weather Monitoring.  
Writes a report on Construction Technology.  
Writes a report on Computer Aided Design.  
Writes a report on Basic Electricity.  
Writes a report on Research and Design.  
Writes a report on Health Management.

Writes a report on Biomedical Technology.  
Writes a report on Aerodynamics Technology.  
Writes a report on Space Technology.  
Writes a report on Electronic Communications.  
Writes a report on Digital Sound Technology.  
Uses a simple word processor to read and write information to disk.  
Uses software to write a simple program.  
Writes a report on Computer Applications.  
Writes a report on Computer Aided Publishing.  
Writes a report on Robotics and Automation.  
Writes a report on CNC Technology.  
Writes a program for a CNC lathe.  
Writes a report on Mechanisms.  
Writes a report on Pneumatics.  
Writes a report on Hydraulics.  
Writes a report on Industrial Control Technology.  
Writes a report on Graphics and Animation.  
Writes a script and storyboard for a video.  
Writes a video script.  
Writes a report on Electronics Technology.  
Writes a report on Materials and Processes.  
Writes a report on Navigation and GPS.  
Writes a report on Digital Photography.  
Writes a report on Automotive Technology.  
Writes a report on CNC Technology.  
Writes a program for a CNC mill.

#### **7.4 Cite sources of information.**

Uses information from a graph to calculate temperature readings.  
Uses information from a graph to calculate instantaneous and average rainfall.  
Develops a sequence of commands to control movement using information from a graph.  
Translates information from a graph into a computer program which is then used to control a system.  
Interprets basic information about vital signs.  
Selects information about the stages of model rocket flight from a table.  
Extracts information from a block diagram of walkie-talkies.  
Use a Web Browser to search for selected information.  
Extracts information about communications technology using a Web Browser.  
Researches information on printers.  
Researches information from a computer generated document.  
Extracts technical information from research material.  
Interprets information from robot sequence diagrams.  
Interprets information from computer control of robots text.  
Interprets information from written text as to the positive features of different robots.  
Extracts and compares information from text.  
Interprets information from flick book diagrams.  
Interprets information to create an animation path.  
Interprets information from computer equipment connection diagrams.  
Relates storyboard planning information with the corresponding multimedia presentation.

Interprets information from reference material.  
Extracts information from text related to search and display functions in an encyclopedia.  
Searches an encyclopedia to find appropriate information relating to an unfamiliar subject.  
Extracts information from a multimedia application relating to Iceland.  
Searches a help screen to extract information regarding conventions used in news writing.  
Extracts information about holding devices from a textbook.  
Extracts part information from a diagram to make a tabletop game.  
Extracts material information from a table to make a tabletop game.  
Reads and interprets information from the instruments of a car dashboard.  
Reads and interprets information from the instruments of a car dashboard.  
Extracts information about the ignition system of a car.  
Obtains information from a CNC Mill programming table.

#### **7.5 Gather data for research from a variety of sources.**

Analyzes data to select the most appropriate technology for a given problem.  
Analyzes data from a table.  
Uses a computer to detect and display localized weather data.  
Extracts a temperature reading from a table of weather data.  
Extracts data from an air to ground lightning strike map.  
Outlines how satellite technology is used to gather weather data.  
Uses digital sensors to monitor conditions and provide data to control systems.  
Uses a digital impact sensor to monitor conditions and provide data to the user.  
Plots weight and age data for infants on a growth chart.  
Interprets data from growth charts.  
Interprets data from a Temperature, Pulse and Respiration chart.  
Applies height formula to data from a model rocket launch.  
Applies velocity formula to data from a model rocket launch.  
Uses software to manipulate data relating to model rockets.  
Extracts data from an instrument readout panel (Voltage measurements).  
Extracts data from an instrument readout panel (Capacitor charge and discharge waveforms).  
Identifies and uses icons to edit and find data.  
Identifies and uses icons to edit and find data.  
Interprets the data from a vehicle speed sensor.  
Interprets the data from a vehicle fuel level sensor.  
Calculates the speed of a vehicle using data from sensors.  
Calculates fuel quantities using data from sensors.  
Analyzes the performance of a road vehicle from test data.

#### **7.6 Develop informal ways of approximating the surface area and volume of familiar objects.**

Calculates the averages of building heights and areas.  
Determines the dimensions and settings for the drawing area.  
Determines the size of the drawing area.  
Calculates facing area of shapes.  
Calculates the area of reception, for a walkie-talkie transmitter.  
Calculates areas of squares and rectangles used by printers.  
Calculates the area of a factory floor.  
Calculates area and volume using units of measure.  
Performs force-pressure-area evaluation on cylinder applications.  
Calculates areas of simple shapes.

Calculates the area of a piston in a hydraulic cylinder.  
Calculates the volume of a robot workspace using fractions.

**7.7 Analyze tables and graphs to identify properties and relationships.**

Analyzes data to select the most appropriate technology for a given problem.  
Analyzes data from a table.  
Analyzes the performance of a road vehicle from test data.  
Interprets data from a color reading chart.  
Extracts a temperature reading from a table of weather data.  
Interprets technical data.  
Interprets data from growth charts.  
Uses data to create a growth chart.  
Interprets data from a Temperature, Pulse and Respiration chart.  
Analyzes the performance of a road vehicle from test data.  
Compares results in a table and identifies the highest wind speeds.  
Selects information about the stages of model rocket flight from a table.  
Selects values from a tangent table to determine height of rockets in flight.  
Selects values from a tangent table.  
Identifies desktop publishing type styles from a table.  
Selects coordinates of a point for a lathe program from a table.  
Uses a table to identify actuators on an Industrial Control Work-Cell.  
Selects a secondary material from a table.  
Extracts material information from a table to make a tabletop game.  
Extracts information about secondary materials from a table.  
Identifies from a shooting script table the position of a TV presenter for continuity.  
Identifies the scene to be taken first from a shooting script table.  
Obtains information from a CNC Mill programming table.  
Reads characteristics from load deflection graphs.

**7.8 Understand and use the rectangular coordinate system.**

Recognizes the principles of coordinate systems used in CAD.  
Creates a CAD drawing using coordinate systems.  
Investigates three-dimensional coordinate systems.  
Constructs CAD images using coordinate systems.

**7.9 Determine the degree of accuracy needed in a given situation and choose units accordingly.**

Follows written instructions to discover the degree of base rotation of a model robot.  
Translates the four cardinal points (N, S, E, W) into degrees.  
Translates halfway points (NE, SE, SW, NW) into degrees.  
States the number of degrees in a circle.  
Converts degrees into minutes and minutes into seconds.  
Reads latitude and longitude in degrees, minutes and seconds on a GPS receiver.  
Calculates the difference in degrees of latitude and longitude between two locations.  
States the number of degrees in a circle around the Earth.  
Reads latitude and longitude in degrees, minutes and seconds on a GPS receiver.  
Works with units of measure of velocity.  
Calculates area and volume using units of measure.  
Measures d.c. voltage.  
Measures d.c. current.

Measures resistance.  
Measures d.c. current in a circuit containing a variable resistor.  
Measures resistor values, using a multimeter.  
States the procedures used to measure quantities in a d.c. circuit, using a digital multimeter.  
Measures the minimum force required to move a vehicle.  
Works with units of measure of velocity.  
Measures pulse and blood pressure.  
Measures distance between lines to show that they are parallel.  
Measures temperature, pulse and respiration rates.  
Uses the wind tunnel to measure drag.  
Measures the effect of vehicle design on drag.  
States vertical angle measured using protractor and plumb line.  
Measures chord length of wing section.  
Measures the effect of increasing the angle of attack.  
Measures lift force created by a flat wing section.  
Measures lift readings to compare different wing types.  
Measures the value of an angle using a protractor.  
States the unit of measure for light.  
Calculates area and volume using units of measure.  
Measures force.  
Measures forces on an inclined plane.  
States the different connections required when using a multimeter to measure voltage and current.  
Uses a multimeter to measure voltage.  
Uses a multimeter to measure current.  
Uses an oscilloscope to measure voltage.  
Uses an oscilloscope to measure voltage across a variable power supply.  
Extracts data from an instrument readout panel (Voltage measurements).  
Uses an oscilloscope to measure voltage, frequency and time period.  
States how to use a multimeter to measure physical quantities in an electronic circuit.  
States how to use a multimeter to measure physical quantities in an electronic circuit.  
States how to use a computerized oscilloscope to measure physical quantities in an electronic circuit.  
Identifies the equator and prime meridian as the origins for latitude and longitude measurement.  
Measures distance using a map scale.

**7.10 Apply the knowledge of measurement to the construction of a variety of two and three dimensional figures.**

Calculates averages of building dimensions.  
Determines the dimensions and settings for the drawing area.  
Identifies how to draw a three-dimensional object by adding elevation.  
Draws a three-dimensional mechanical component.  
Designs a bridge construction.  
Follows a construction brief.  
Constructs CAD images using coordinate systems.  
Constructs an electronic circuit to monitor and react to light levels using an LDR, Amplifier and a Buzzer.  
Constructs an electronic circuit with feedback to monitor and react to temperature levels.  
Constructs a fully operational electronic circuit with feedback to monitor and react to temperature changes.  
Constructs a fully functional electronic steady hand game, with a time delay and a reset switch.

**7.11 Understand properties of lines, including parallel and perpendicular, intersecting lines and planes, and angle of incidence.**

- Distinguishes between the different lines used in drafting.
- Measures distance between lines to show that they are parallel.
- Interprets contour lines to determine slope.
- Identifies landscape features from contour lines by drawing cross sections.
- Interprets contour lines.
- Measures distance between lines to show that they are parallel.
- Measures forces on an inclined plane.
- Recognizes the use of an inclined plane.
- Identifies the properties of a polygon.

**7.12 Use a variety of tools to measure mathematical and physical objects in the world around us.**

- Uses information from a graph to calculate temperature readings.
- Uses information from a graph to calculate instantaneous and average rainfall.
- Measures localized weather conditions.
- Uses test equipment to analyze deflection.
- Measures national weather conditions.
- Measures d.c. voltage.
- Measures d.c. current.
- Measures resistance.
- Measures d.c. current in a circuit containing a variable resistor.
- Measures resistor values, using a multimeter.
- Measures the minimum force required to move a vehicle.
- Measures pulse and blood pressure.
- Measures distance between lines to show that they are parallel.
- Measures temperature, pulse and respiration rates.
- Measures the effect of vehicle design on drag.
- Measures chord length of wing section.
- Measures the effect of increasing the angle of attack.
- Measures lift force created by a flat wing section.
- Measures lift readings to compare different wing types.
- Measures the value of an angle using a protractor.
- Measures force.
- Measures forces on an inclined plane.
- Measures distance using a map scale.

**7.13 Determine, collect, organize, and analyze data needed to solve problems.**

- Maintains and organizes a record of work.
- Maintains and organizes a record of work.
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Maintains and organizes a record of work.  
Maintains and organizes a record of work.  
Maintains and organizes a record of work.  
Solves problems in a circuit during testing.  
Solves problems involving an electronic alarm circuit.  
Solves problems in aerodynamics to test a glider.  
Solves problems involving mechanical advantage.  
Solves problems involving gear ratios.  
Solves problems in designing and producing an animation.  
Solves problems involving gear ratios.  
Analyzes data to select the most appropriate technology for a given problem.  
Analyzes symptoms of diabetes.

**7.14 Demonstrate that when more than one force acts on an object at the same time, the forces can reinforce or cancel each other, producing a net force that will change the speed or direction of the moving object.**

Identifies the types of forces operating in structures.  
Identifies forces applied to bridge construction.  
Defines and predicts the performance of a maglev vehicle when magnetic forces are increased.  
States the effect of increasing and decreasing the magnetic forces between track and vehicle on its velocity.  
Investigates the relationship between force and motion.  
Identifies the forces that are important in space technology.  
Interprets force diagrams.  
Measures forces on an inclined plane.  
Performs force-pressure-area evaluation on cylinder applications.  
States the relationships between force, pressure and area.

**7.15 Demonstrate how the force of friction acts to retard motion.**

Examines force of friction when rolling and sliding loads.  
Recognizes friction as a factor in mechanical systems.  
Uses a remote control model car to investigate the friction and traction.  
Identifies how friction affects the systems of a car.

**7.16 Explain that energy exists in many forms, including heat, light, sound, chemical, nuclear, mechanical, and electrical.**

- Defines alternative energy.
- States that energy can be transformed.
- States that wind energy can be used to generate electricity.
- Identifies the processes involved when using nuclear energy to generate electricity.
- Identifies the need to preserve existing energy resources and to find new methods of providing energy.
- Identify some of the ways in which alternative energy sources are being used globally.
- States an application of electrical energy.
- States that kinetic energy is energy an object has because it is moving.
- States the energy conversion taking place in a wind turbine.
- States how energy is transferred in a hydroelectric power plant.
- Identifies the correct energy flow in a nuclear power plant.
- Writes a report on Alternative Energy.
- Makes a presentation to a group on Alternative Energy.
- States the energy groups.
- Recognizes the difference between potential and kinetic energy.
- States the main sources of energy used in transportation systems.
- States the general uses of energy in society.
- States the forms and types of energy.
- Recognizes the sources of energy used in transportation systems.
- Describes methods of transferring energy using mechanical systems.
- Investigates motion and energy transformations in pneumatics.
- Evaluates compressed air as a medium for transferring energy in fluid power systems.

**7.17 Compare common technological elements found in all cultures.**

- Recognizes common car engine cylinder arrangements.
- Identifies the technological aspects of the evolution of industrial control.
- States the technological advances in Industrial Control.
- Identifies individual elements of a computer system.
- Identifies individual elements of a computer system.
- Identifies programming elements.
- Identifies elements of a model robot.
- Recognizes elements in programming logic.
- Identifies the input-process-output elements of human control systems.
- Identifies the electrical connections of elements in a Work-Cell.
- Identifies the elements of a typical industrial control Work-Cell.
- Identifies elements of automated systems and their relation to a Work-Cell.
- Identifies the input-process-output elements of computer control systems.
- Identifies elements of Industrial Control Equipment.
- States elements of video pre-production planning.

**7.18 Understand the relationships between technology and how people live.**

- States the relationship between science and technology.
- Describes the roles of people using CNC technology.
- Identifies the function of CAD within society.
- States the general uses of energy in society.
- Investigates the impact of orthotics and prosthetics on society.
- Evaluates the impact of space technology on society.

Recognizes the contribution that electronics technology has made to society.  
States the changes Electronics Technology has made to society.

**8.4 Demonstrate effective presentation skills.**

Makes a presentation to a group on the Workstation Tutorials.  
Makes a presentation to a group on Alternative Energy.  
Makes a presentation to a group on Weather Monitoring.  
Makes a presentation to a group on Construction Technology.  
Makes a presentation to a group on Computer Aided Design.  
Makes a presentation to a group on Basic Electricity.  
Makes a presentation to a group on Research and Design.  
Makes a presentation to a group on Health Management.  
Makes a presentation to a group on Biomedical Technology.  
Makes a presentation to a group on Aerodynamics Technology.  
Makes a presentation to a group on Space Technology.  
Makes a presentation to a group on Electronic Communications.  
Makes a presentation to a group on Digital Sound Technology.  
Makes a presentation to a group on Computer Applications.  
Makes a presentation to a group on Computer Aided Publishing.  
Makes a presentation to a group on Robotics and Automation.  
Makes a presentation to a group on CNC Technology.  
Makes a presentation to a group on Mechanisms.  
Makes a presentation to a group on Pneumatics.  
Makes a presentation to a group on Hydraulics.  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Graphics and Animation.  
Makes a presentation to a group on Electronics Technology.  
Makes a presentation to a group on Materials and Processes.  
Makes a presentation to a group on Navigation and GPS.  
Makes a presentation to a group on Digital Photography.  
Makes a presentation to a group on Automotive Technology.  
Makes a presentation to a group on CNC Technology.  
Demonstrates a multimedia presentation.  
Enhances a multimedia presentation.

**8.5 Identify skills that are transferable from one occupation to another.**

Identifies the function of CAD within society.  
Investigates the impact of orthotics and prosthetics on society.  
Evaluates the impact of space technology on society.  
States the changes Electronics Technology has made to society.  
States the changes Electronics Technology has made to society.

**9.1 Recognize and develop skills related to personal responsibility and accountability.**

Recognizes the importance of a healthy heart.  
Recognizes the importance of calorie control.  
Recognizes the symptoms of eating disorders.  
Recognizes the importance of a good self-image.  
Recognizes the meaning of stress.  
Recognizes the importance of maintaining personal health.

Recognizes that exercise is an important to maintain a healthy body.  
Recognizes the importance of maintaining personal health.  
Uses a Temperature, Pulse and Respiration chart to recognize the health state of patient.  
States the safety procedures used when operating the maglev system.  
Describes safety guidelines when using model rockets.  
Describes the procedures to ensure a model rocket is launched safely.  
Describes safety procedure for launching dowel rods.  
Describes procedures for setting up a CNC lathe safely.  
States safety procedures used when making a component.  
States safety procedures used with CNC machine tools.  
Operates the mechanical systems trainer safely.  
States the importance of safety procedures when using mechanisms.  
Identifies safety procedures when working with pneumatic systems.  
Operates hydraulic equipment safely.  
Explains the importance of safety procedures when using hydraulics.  
Identifies procedures for using a thermoplastic injection molder safely and accurately.  
Identifies safety precautions needed when working with hazardous processes.  
Identifies the care and safety aspects of using a camcorder.  
Describes procedures for operating the CNC mill safely.

**9.2 Explore and identify personal interests, abilities, and strengths.**

Writes a report on Alternative Energy.  
Writes a report on Weather Monitoring.  
Writes a report on Construction Technology.  
Writes a report on Computer Aided Design.  
Writes a report on Basic Electricity.  
Writes a report on Research and Design.  
Writes a report on Health Management.  
Writes a report on Biomedical Technology.  
Writes a report on Aerodynamics Technology.  
Writes a report on Space Technology.  
Writes a report on Electronic Communications.  
Writes a report on Digital Sound Technology.  
Writes a report on Computer Applications.  
Writes a report on Computer Aided Publishing.  
Writes a report on Robotics and Automation.  
Writes a report on CNC Technology.  
Writes a report on Mechanisms.  
Writes a report on Pneumatics.  
Writes a report on Hydraulics.  
Writes a report on Industrial Control Technology.  
Writes a report on Graphics and Animation.  
Writes a report on Electronics Technology.  
Writes a report on Materials and Processes.  
Writes a report on Navigation and GPS.  
Writes a report on Digital Photography.  
Makes a presentation to a group on the Workstation Tutorials.  
Makes a presentation to a group on Weather Monitoring.

Makes a presentation to a group on Construction Technology.  
Makes a presentation to a group on Computer Aided Design.  
Makes a presentation to a group on Basic Electricity.  
Makes a presentation to a group on Research and Design.  
Makes a presentation to a group on Health Management.  
Makes a presentation to a group on Biomedical Technology.  
Makes a presentation to a group on Aerodynamics Technology.  
Makes a presentation to a group on Space Technology.  
Makes a presentation to a group on Electronic Communications.  
Makes a presentation to a group on Digital Sound Technology.  
Makes a presentation to a group on Computer Applications.  
Explains the processes involved in creating a presentation.  
Makes a presentation to a group on Computer Aided Publishing.  
Makes a presentation to a group on Robotics and Automation.  
Makes a presentation to a group on CNC Technology.  
Makes a presentation to a group on Mechanisms.  
Makes a presentation to a group on Pneumatics.  
Makes a presentation to a group on Hydraulics.  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Graphics and Animation.  
Demonstrates a multimedia presentation.  
Makes a presentation to a group on Electronics Technology.  
Makes a presentation to a group on Materials and Processes.  
Makes a presentation to a group on Navigation and GPS.  
Makes a presentation to a group on Digital Photography.  
Makes a presentation to a group on Automotive Technology.  
Makes a presentation to a group on CNC Technology.

### **9.3 Explore occupations of interest.**

Writes a report on Alternative Energy.  
Writes a report on Weather Monitoring.  
Writes a report on Construction Technology.  
Writes a report on Computer Aided Design.  
Writes a report on Basic Electricity.  
Writes a report on Research and Design.  
Writes a report on Health Management.  
Writes a report on Biomedical Technology.  
Writes a report on Aerodynamics Technology.  
Writes a report on Space Technology.  
Writes a report on Electronic Communications.  
Writes a report on Digital Sound Technology.  
Writes a report on Computer Applications.  
Writes a report on Computer Aided Publishing.  
Writes a report on Robotics and Automation.  
Writes a report on CNC Technology.  
Writes a report on Mechanisms.  
Writes a report on Pneumatics.  
Writes a report on Hydraulics.

Writes a report on Industrial Control Technology.  
Writes a report on Graphics and Animation.  
Writes a report on Electronics Technology.  
Writes a report on Materials and Processes.  
Writes a report on Navigation and GPS.  
Writes a report on Digital Photography.  
Writes a report on Automotive Technology.  
Writes a report on CNC Technology.  
Makes a presentation to a group on Alternative Energy.  
Makes a presentation to a group on Weather Monitoring.  
Makes a presentation to a group on Construction Technology.  
Makes a presentation to a group on Computer Aided Design.  
Makes a presentation to a group on Basic Electricity.  
Makes a presentation to a group on Research and Design.  
Makes a presentation to a group on Health Management.  
Makes a presentation to a group on Biomedical Technology.  
Makes a presentation to a group on Aerodynamics Technology.  
Makes a presentation to a group on Space Technology.  
Makes a presentation to a group on Electronic Communications.  
Makes a presentation to a group on Digital Sound Technology.  
Makes a presentation to a group on Computer Applications.  
Makes a presentation to a group on Computer Aided Publishing.  
Makes a presentation to a group on Robotics and Automation.  
Makes a presentation to a group on CNC Technology.  
Makes a presentation to a group on Mechanisms.  
Makes a presentation to a group on Pneumatics.  
Makes a presentation to a group on Hydraulics.  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Graphics and Animation.  
Demonstrates a multimedia presentation.  
Makes a presentation to a group on Electronics Technology.  
Makes a presentation to a group on Materials and Processes.  
Makes a presentation to a group on Navigation and GPS.  
Makes a presentation to a group on Digital Photography.  
Makes a presentation to a group on Automotive Technology.  
Makes a presentation to a group on CNC Technology.

## **Diversified Technology 1**

### **1.1 The student will identify the logical research process.**

States the purpose of research and the meaning of 'human factors engineering'.  
Researches information from text relating to exercise.  
Uses a database to research a given topic.  
Researches information from text relating to nutrients.  
Researches facts about the history of the telegraph.  
Researches television signal production.  
Researches interactive articles on a computer.  
Researches computer games using computer and book resources.

Uses computer based reference material to research and develop ideas.  
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.  
Researches the elements of graphic design for use in a multimedia presentation.  
Researches the principles of graphic design for use in a multimedia presentation.

**1.2 The student will apply the logical research process.**

Makes informed decisions based on both given and researched information.  
Demonstrates knowledge of early wind powered generators, gained from research in a book.  
Researches information from text relating to exercise.  
Uses a database to research a given topic.  
Researches information from text relating to nutrients.  
Researches facts about the history of the telegraph.  
Researches television signal production.  
Researches interactive articles on a computer.  
Researches computer games using computer and book resources.  
Uses computer based reference material to research and develop ideas.  
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.  
Researches the elements of graphic design for use in a multimedia presentation.  
Researches the principles of graphic design for use in a multimedia presentation.

**1.3 The student will understand how to measure the outcomes of research.**

Measures the velocity of a model rocket.  
Measures current output of solar cell.  
Describes the methods by which energy transformation can be measured.  
Measures localized weather conditions.  
Measures voltage and current in a circuit.  
Measures quantities in an electrical circuit using a multimeter.  
Measures temperature, pulse and respiration rates.  
Identifies how drag is measured.  
Identifies how to measure forces using the Aerostream Monitor.  
Measures lift created by wings at various angles of attack.  
Uses a clinometer to measure altitude.  
Examines the impact of measurement errors on predictions about rocket flights.  
Interprets measurements used in Computer Aided Publishing.  
Recognizes pressure as a measurement of force in fluids.  
Investigates the measurement of pressure.  
States how a multimeter is used to measure physical quantities in an electronic circuit.  
States how an oscilloscope is used to measure physical quantities in an electronic circuit.  
Measures the Izod Impact Strength of acrylic using a software simulation program.  
Uses a multimeter to measure voltage and resistance.  
Recognizes torque and power as measures of engine performance.

**2.1 The student will select and properly use tools and equipment.**

Selects appropriate ICT equipment and software for specific purposes.  
Uses software tools to open and play audio files.  
Uses software tools to modify audio files and add special effects.  
Recognizes tools used to create digital sound applications.

Uses graphics tools to produce a flowchart.  
Operates hydraulic equipment safely.  
Defines elements of industrial control equipment.  
Identifies devices of Industrial Control equipment.  
Selects appropriate tools to enhance the realism of an animated space shuttle launch.  
Identifies the combined function of connected video equipment.  
Recognizes the tools used in creating a title screen for a multimedia product.  
Identifies the tools used in creating a text file suitable for a multimedia product.  
Recognizes tools used in creating a multimedia presentation.  
Uses tools to record a narrative for a multimedia presentation.  
Identifies the mechanical fastenings, and their tools, used in the fabrication of furniture.  
Indicates the requirement and use of equipment in a photographic darkroom.  
Extracts a list of required photographic equipment from a chapter of a book.

**2.2 The student will apply appropriate safety rules and regulations.**

Describes safety guidelines when using model rockets.  
Identifies procedures needed to carry out a model rocket launch safely.  
Identifies procedures used when launching a model rocket safely.  
Examines the importance of safety in manufacturing.  
States safety procedures used when making a component.  
States the importance of safety procedures when using mechanisms.  
Identifies safe procedures when working with pneumatic systems.  
Operates hydraulic equipment safely.  
Investigates safety in manufacturing.  
States some of the rules governing safety when using and building electrical systems.  
Identifies safety requirements when working with materials processing equipment.

**2.3 The student will identify and select appropriate materials for specific needs.**

Determines the properties of materials from tensile test data.  
Identifies how the properties of various materials influence their use.  
Examines the use of concrete as a construction material.  
Identifies the properties of materials and how they effect its use.  
Identifies the importance of concrete as a construction material.  
Recognizes how the properties of materials influence their use in construction.  
Identifies the importance of medical material properties.  
Investigates the concept of microwave penetration on various materials.  
Performs an experiment to investigate the reflection of microwaves on different materials.  
Extracts information from computer based reference material using graphical hotspots.  
Uses computer based reference material to research and develop ideas.  
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.  
Explores the structure of and materials used to build integrated circuits.  
Examines the use of semiconductor materials.  
Identifies pine wood as the processing material on an operation sheet.  
Selects different plastic and metal sample materials using descriptions.  
Identifies the uses of materials relating to their impact resistance characteristics.  
Identifies the uses of materials relating to their strength characteristics.  
Identifies the need for materials with a high strength to weight ratio.  
Identifies the primary raw materials of a floppy disk as exhaustible or renewable.

Identifies that Life Cycle Analysis aids recycling by saving materials and energy.  
Identifies the waste materials produced in manufacturing a wooden, metal or plastic spoon and how they can be recycled.

**3.1 The student will understand the need for basic research concepts and how to apply them.**

Makes informed decisions based on both given and researched information.  
Demonstrates knowledge of early wind powered generators, gained from research in a book.  
States the purpose of research and the meaning of 'human factors engineering'.  
Uses a database to research a given topic.  
Researches information from text relating to nutrients.  
Researches facts about the history of the telegraph.  
Researches television signal production.  
Researches interactive articles on a computer.  
Researches computer games using computer and book resources.  
Uses computer based reference material to research and develop ideas.  
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.  
Researches the elements of graphic design for use in a multimedia presentation.  
Researches the principles of graphic design for use in a multimedia presentation.

**3.2 The student will understand and develop a logical process in applying technical research.**

Makes informed decisions based on both given and researched information.  
Demonstrates knowledge of early wind powered generators, gained from research in a book.  
States the purpose of research and the meaning of 'human factors engineering'.  
Researches information from text relating to exercise.  
Uses a database to research a given topic.  
Researches information from text relating to nutrients.  
Researches facts about the history of the telegraph.  
Researches television signal production.  
Researches interactive articles on a computer.  
Researches computer games using computer and book resources.  
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.  
Researches the elements of graphic design for use in a multimedia presentation.  
Researches the principles of graphic design for use in a multimedia presentation.

**3.3 The student will demonstrate how to measure the outcomes of research.**

States the units used to measure work, heat and power.  
Measures personal power output.  
Measures angles of elevation using the 'Altiscan' Altitude Indicator.  
Measures the velocity of a model rocket.  
Measures current output of solar cell.  
Describes the methods by which energy transformation can be measured.  
Measures localized weather conditions.  
Determines actual size from measured using a scale.  
Measures voltage and current in a circuit.  
Determines the value of resistors by reading color coded bands and by measurement.  
Detects faulty resistors by comparing measured value with the color coded band.  
Measures quantities in an electrical circuit using a multimeter.  
Describes the units of measure relating to velocity.

Measures temperature, pulse and respiration rates.  
Identifies how drag is measured.  
Identifies how to measure forces using the Aerostream Monitor.  
Measures lift created by wings at various angles of attack.  
Uses a clinometer to measure altitude.  
Examines the impact of measurement errors on predictions about rocket flights.  
Interprets measurements used in Computer Aided Publishing.  
Recognizes pressure as a measurement of force in fluids.  
Investigates the measurement of pressure.  
States how a multimeter is used to measure physical quantities in an electronic circuit.  
States how an oscilloscope is used to measure physical quantities in an electronic circuit.  
Measures the Izod Impact Strength of acrylic using a software simulation program.  
Uses a multimeter to measure voltage and resistance.  
Recognizes torque and power as measures of engine performance.

**3.4 The student will demonstrate the use of basic or applied technical research.**

Makes informed decisions based on both given and researched information.  
Demonstrates knowledge of early wind powered generators, gained from research in a book.  
Uses a database to research a given topic.  
Uses computer based reference material to research and develop ideas.  
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.  
Applies tests and improvement procedures to check the quality of systems.  
Applies mathematical formulae to the motion of rockets.  
Applies gear ratio formula to observed results.  
Applies the gear ratio formula to a timing pulley system.  
Applies truth tables to input and output binary conditions of a ladder logic program.  
Applies logic statements to a program.  
Applies branches, latches and sensor feedback to complete a ladder logic rung.  
Applies truth tables to input and output conditions of a ladder logic program.  
Applies formulae to calculate the resistance of resistors in series and in parallel.  
Applies formulae to calculate the capacitance of capacitors in series and in parallel.  
Applies the formula for calculating the gain of inverting operational amplifier.  
Applies trigonometry to find bearings of routes.  
Applies Pythagoras' Theorem to find distances of routes.  
Applies color information to solve filtration problems.

**4.1 The student will understand the proper steps in the problem solving sequence.**

Solves hydroelectric power problems using worked examples.  
Describes the stages in the design and problem solving process.  
Diagnoses kidney problems using a range of information.  
States alternative problems that have solutions related to aerodynamics.  
Solves problems involving gear ratios.  
States that logic can be used to solve simple control problems.  
Uses logic to simplify a pneumatic control problem.  
Uses logic to solve electro-pneumatic control problems.  
Identifies the stages of a design loop and their use in problem solving.

**4.2 The student will understand how problem solving skills can be applied to life.**

- Uses the formula  $\text{Power} = \text{Work}/\text{Time}$  to solve problems.
- Solves hydroelectric power problems using worked examples.
- States the impacts of existing solutions to technological problems.
- Describes the stages in the design and problem solving process.
- Diagnoses kidney problems using a range of information.
- Solves static and dynamic pressure problems using the Bernoulli equation.
- States alternative problems that have solutions related to aerodynamics.
- Identifies methods of improving early communication systems.
- Identifies methods of increasing the range of early communication systems.
- Uses the Windows calculator to solve communication system problems.
- Retrieves information using keywords on a database in order to solve simulated crimes.
- Solves problems involving gear ratios.
- States that logic can be used to solve simple control problems.
- Uses logic to simplify a pneumatic control problem.
- Uses logic to solve electro-pneumatic control problems.
- Identifies the stages of a design loop and their use in problem solving.
- Applies color information to solve filtration problems.
- Investigates the impact of orthotics and prosthetics on quality of life.

**4.3 The student will understand creative thinking in the problem solving process.**

- Solves hydroelectric power problems using worked examples.
- Recognizes the important factors in beam design.
- Designs the mechanical layout of a vehicle to meet a design brief.
- Identifies methods of improving early communication systems.
- Uses software to write a control program to create a loop to control an articulated joint.
- Uses a flowchart to design a program to move the robot and run the conveyor a specified number of times.
- Uses flowcharts to design control programs.
- Creates a CNC program using CAD/CAM software.
- Uses CAM software to create a program for a CNC lathe.
- Interprets a logic gate diagram to create a ladder logic program.
- Creates an animation from information given in a storyboard.
- Creates a storyboard for the module video.
- Creates a storyboard for a multimedia presentation from an example product.
- Creates a login screen for a multimedia presentation using a CBT design package.
- Creates an objective screen for a multimedia presentation using a CBT design package.
- Creates a choice screen for a multimedia presentation using a CBT design package.
- Creates a lesson screen for a multimedia time line presentation.
- Applies slide transition settings to create a presentation that is navigated using text index links, forward, backward and exit buttons.
- Identifies the stages of a design loop and their use in problem solving.
- Identifies the need to modify a mold design to improve its function.
- Uses a design loop in making a plastic doorknob suitable for fixing with a metal screw by changing part of the mold.
- Uses a design loop in making a plastic doorknob with a metal embedded thread for fixing with a nut by changing part of the mold.
- Uses an orienteering compass to design and follow a route plan that involves bearings and distances.

**4.4 The student will identify and evaluate consumer issues.**

- Creates a user directory by following written instructions.
- Uses software to write a control program to calculate and output to the screen user friendly information.
- Identifies that scrap metal is recycled as cast iron products.
- Identifies how parts are fixed in the fabrication of products.
- Evaluates the suitability of modular construction.
- Evaluates the social impact of manufacturing.
- Evaluates the use of control systems.
- Evaluates the use of different cameras for a sports photo finish.
- States the social impacts of the automobile in the early part of the 20th Century.
- Identifies social and health factors that relate to the increasing use of cellular phones.
- Recognizes a social, economic and environmental advantage or disadvantage of electronic communication systems.

**5.2 The student will demonstrate the ability to learn new tasks.**

- Identifies how the animation task of synchronizing lip movements is achieved.
- Performs a test to demonstrate forces acting on a projectile.
- Builds a model rocket using a computer program.
- Builds a motorized winch system.
- Builds basic interactive events into the cockatoo animation.
- Builds a push-pull current amplifier using NPN and PNP transistors.
- Describes a design brief and the purpose of specification statements.
- Designs and tests a computer program to simulate a transport system operating in continuous mode.
- Describes the stages in the design and problem solving process.
- Defines how physical factors affect the design of automobiles.
- Designs the mechanical layout of a vehicle to meet a design brief.
- Identifies the technical terms relating to wing design.
- States the factors that are important in launch vehicle design.
- Uses and derives specifications, flowcharts and truth tables as part of a systematic design process.
- Demonstrates design and management skills.
- Uses a flowchart to design a program to move the robot and run the conveyor a specified number of times.
- Uses a flowchart to design a control program to fully automate a workcell.
- Designs a motorized winch model.
- Designs and builds a pneumatic circuit to operate a sliding door.
- Creates a login screen for a multimedia presentation using a CBT design package.
- Creates an objective screen for a multimedia presentation using a CBT design package.
- Creates a choice screen for a multimedia presentation using a CBT design package.
- Interprets a design brief for a Class Year presentation.
- Recognizes the correct symbols and conventions when designing electronic systems.
- Identifies the stages of a design loop and their use in problem solving.
- Uses a design loop in making a plastic doorknob suitable for fixing with a metal screw by changing part of the mold.
- Uses a design loop in making a plastic doorknob with a metal embedded thread for fixing with a nut by changing part of the mold.
- Uses an orienteering compass to design and follow a route plan that involves bearings and distances.

**5.5 The student will demonstrate an ability to learn new skills and behavior.**

- Designs a beam according to specific criteria.
- Designs and tests a computer program to simulate a transport system operating in continuous mode.
- Designs the mechanical layout of a vehicle to meet a design brief.
- Designs a motorized winch model.
- Designs and builds a motorized winch system.
- Designs and builds a pneumatic circuit to operate a sliding door.
- Designs a doorknob that has a good finger grip.
- Builds a model rocket using a computer program.
- Builds a motorized winch system.
- Builds basic interactive events into the cockatoo animation.
- Builds a push-pull current amplifier using NPN and PNP transistors.
- Creates a computer program which responds to data from sensors then uses this data to output messages to the VDU.
- Creates a user directory by following written instructions.
- Creates a master voice file from individual voice files.
- Creates a proportional graphical image.
- Creates a CNC program using CAD/CAM software.
- Creates an animation from information given in a storyboard.
- Creates a storyboard for the module video.
- Creates a variety of different light conditions using a camcorder light.
- Creates a storyboard.
- Creates a storyboard for a multimedia presentation from an example product.
- Creates a login screen for a multimedia presentation using a CBT design package.
- Creates an objective screen for a multimedia presentation using a CBT design package.
- Creates a choice screen for a multimedia presentation using a CBT design package.
- Creates a lesson screen for a multimedia time line presentation.
- Creates a lesson screen showing how man has evolved.
- Creates multimedia content frames on the subjects of The Wheel, The Great Wall of China or The Egyptian Pyramids.
- Creates a True/False exercise screen for a multimedia presentation.
- Creates a multiple choice question screen.
- Creates a hobby presentation that loops and includes text, graphics, scanned images and recorded narrative.
- Creates a Class Year presentation that uses indexed linking and forward, backward and exit action buttons.
- Creates solid plastic from thermoplastic granules.

**5.6 The student will plan and organize work.**

- Maintains and organizes a record of work.
- Maintains and organizes a record of work.
- Uses Architectural CAD software to draw an outline plan of a building.
- Maintains and organizes a record of work.
- Maintains and organizes a record of work.
- Maintains and organizes a record of work.
- Maintains and organizes a record of work.
- Maintains and organizes a record of work.
- Maintains and organizes a record of work.
- Maintains and organizes a record of work.



Identifies information presented in a computer design package.  
Derives design criteria from a design brief.  
Designs the mechanical layout of a vehicle to meet a design brief.  
Describes how a wing design fulfills its purpose.  
Designs a car to specified requirements using computer software.  
States the factors that are important in launch vehicle design.  
Uses and derives specifications, flowcharts and truth tables as part of a systematic design process.  
Demonstrates design and management skills.  
Uses a flowchart to design a program to move the robot and run the conveyor a specified number of times.  
Uses a flowchart to design a control program to run a workcell and count the cycles.  
Uses a flowchart to design a control program to fully automate a workcell.  
Designs a motorized winch model.  
Designs and builds a motorized winch system.  
Designs and builds a pneumatic circuit to operate a sliding door.  
Creates a login screen for a multimedia presentation using a CBT design package.  
Recognizes the need for testing the design of a multimedia product at regular intervals.  
Creates an objective screen for a multimedia presentation using a CBT design package.  
Creates a choice screen for a multimedia presentation using a CBT design package.  
Researches the elements of graphic design for use in a multimedia presentation.  
Researches the principles of graphic design for use in a multimedia presentation.  
Identifies design principles from on-screen text and diagrams.  
Interprets a design brief for a Class Year presentation.  
Identifies the stages of a design loop and their use in problem solving.  
Identifies the need to modify a mold design to improve its function.  
Uses a design loop in making a plastic doorknob suitable for fixing with a metal screw by changing part of the mold.  
Uses a design loop in making a plastic doorknob with a metal embedded thread for fixing with a nut by changing part of the mold.  
Designs a doorknob that has a good finger grip.  
Uses an orienteering compass to design and follow a route plan that involves bearings and distances.

**6.1b The student will understand the process of financing a product.**

Interprets data from a graph relating to energy costs.  
Calculates the costs involved in excavation.  
Calculates the cost of kidney treatment.  
Calculates the cost of broadcasting a radio presentation.  
Identifies the cost and energy saving benefits of different thickness of insulation.  
Identifies the cost and energy saving benefits of different glazing methods.  
Calculates a fuel cost using multiplication and division.  
Calculates the cost of medical treatment using multiplication and addition.  
Calculates the cost of laying cables using multiplication and addition.

**6.1c The student will understand the process of marketing a product**

Identifies the format of an audio presentation.  
Compares modern publishing techniques with traditional publishing techniques.  
Lists the advantages of modern publishing.  
Identifies the format of an audio presentation.  
Identifies software techniques for displaying graphic images.

Identifies the use of scanners for Computer Aided Publishing.  
Identifies the animation sequence in the Sales presentation.  
Creates a storyboard for a multimedia presentation from an example product.  
Identifies the usage of text, graphics, animation, audio, and video within a multimedia presentation.  
Produces a title screen for a multimedia presentation.  
Uses a multimedia authoring package to create a title screen for a computer based training presentation.  
Creates a login screen for a multimedia presentation using a CBT design package.  
Creates an objective screen for a multimedia presentation using a CBT design package.  
Creates a choice screen for a multimedia presentation using a CBT design package.  
Creates a lesson screen for a multimedia time line presentation.  
Investigates the uses of multimedia presentations.  
Researches the elements of graphic design for use in a multimedia presentation.  
Researches the principles of graphic design for use in a multimedia presentation.  
Recognizes effective ways to communicate in multimedia presentations.  
Recognizes effective ways to communicate in multimedia presentations from written text.  
Manipulates scanned images for use in a multimedia presentation.  
Applies settings to make a self running presentation.  
Describes different types of audio for a multimedia presentation.  
Uses tools to record a narrative for a multimedia presentation.

**6.1d The student will understand the process of management of a product.**

Identifies the use of new technologies in medical administration.  
Demonstrates design and management skills.

**6.1e The student will understand the process of production of a product.**

Applies line production techniques to the assembly of a model vehicle.  
States the manufacturing system used to create products.  
Identifies the roles of production workers.  
Interprets text to identify the role of a product distributor on a simulated sorting line.  
Investigates video pre-production practices, specifically Outline, Brief and Treatment.  
Identifies key points in the pre-production planning of the Scantek Development Video, specifically the use of Outline, Brief and Treatment.  
Investigates video pre-production practices, specifically Script and Storyboarding.  
Identifies the production stage in which a video rough-cut is made.  
Explores the importance of lighting in video production.  
Explores the use of rostrums within video production.  
Uses pre-production planning techniques.  
Recognizes the tools used in creating a title screen for a multimedia product.  
Recognizes the need for testing the design of a multimedia product at regular intervals.  
Identifies the tools used in creating a text file suitable for a multimedia product.  
Identifies that several parts can be molded at once and that their shape can aid the fabrication of a product.  
Identifies that scrap metal is recycled as cast iron products.  
Identifies the waste materials produced in manufacturing a wooden, metal or plastic spoon and how they can be recycled.  
Identifies how parts are fixed in the fabrication of products.

**6.1f The student will understand the process of distribution of a product.**

Interprets text to identify the role of a product distributor on a simulated sorting line.

**6.2 The student will identify career clusters in the construction and manufacturing systems that are related.**

- Explores the role of various personnel within the construction industry.
- Identifies career pathways in industry and manufacturing.
- Identifies the role of a construction worker from written text.
- Investigates the role of people in industry and manufacturing.
- Evaluates the changes in employment due to changes in manufacturing technology.
- Identifies the roles of production workers.

**6.3 The student will identify facilities and similar equipment used in the study of informational and physical systems.**

- Identifies how computer software is used to enhance satellite images.
- Identifies the equipment connected to the weather monitor console.
- Uses software to convert infrared information into color coded temperature maps.
- Uses Architectural CAD software to draw an outline plan of a building.
- Selects information from text relating to technological systems.
- States the categories of transportation systems and the processes within them.
- Identifies from text the output and processes of transportation systems.
- States the need for support systems and facilities.
- Uses analog sensors to monitor conditions and provide data to control information systems.
- Selects appropriate ICT equipment and software for specific purposes.
- Compares the mechanisms of two asthma drug delivery systems.
- Examines the systems that are used in real and model rocketry.
- Identifies propulsion systems of importance to space technology.
- Identifies suitable communication systems for a deaf person.
- Identifies one and two way communication systems.
- Investigates the concept of microwave polarisation, used in satellite television systems.
- Identifies the properties and applications of coding systems for digital information.
- Identifies and describes software and hardware requirements of computer applications.
- Lists the principal computer hardware components required for Computer Aided Publishing.
- Accounts for the importance of accurate sensors in systems.
- States the advantages of using programmable digital controllers in automated systems.
- Assesses the use of CAD/CAM systems in CNC technology.
- Compares rotary power transmission systems.
- Makes predictions about systems that combine different rotary power transmission systems.
- Describes methods of transferring energy using mechanical systems.
- Identifies commercial uses of pneumatic systems.
- Recognizes the fundamental properties and components of pneumatic systems.
- Identifies the input and output part of systems.
- Recognizes the basics of hydraulic systems.
- Recognizes an advantage of hydraulic systems.
- Identifies manufacturing systems.
- Evaluates the use of control systems.
- Defines elements of industrial control equipment.
- Identifies manufacturing systems.
- Identifies devices of Industrial Control equipment.
- Identifies the impact of control systems in manufacturing.
- Examines the functions, operation and outputs of GPS systems.

Examines controls and instruments used to aid modern transport navigation.  
Extracts a list of required photographic equipment from a chapter of a book.  
Uses a remote control model car to recognize basic automotive steering and drive systems.  
Recognizes the basic mechanical systems of a modern motor vehicle.  
Identifies sensors used in automotive control systems.  
Recognizes the components of a modern car engine.  
Recognizes the components of a car's electrical and electronic systems.

**6.4 The student will identify new trends in system designs.**

Identifies trends using a table of tangent values.  
Identifies the use of new technologies in medical administration.  
Recognizes the impact of new technologies on methods of working.  
Compares modern publishing techniques with traditional publishing techniques.  
States the advantage of a computer based animation package compared with traditional methods.  
Compares the operation of conventional and digital cameras.  
Compares image quality between conventional and digital cameras.  
Compares conventional and digital processing of photographic images.  
Compares the performance of an engine using variable valve timing with that of a standard engine.

**7.1 The student will synthesize research data in an original work and present that work in an appropriate manner.**

Identifies the animation sequence in the Sales presentation.  
Creates a storyboard for a multimedia presentation from an example product.  
Produces a title screen for a multimedia presentation.  
Uses a multimedia authoring package to create a title screen for a computer based training presentation.  
Creates a login screen for a multimedia presentation using a CBT design package.  
Follows instruction to resize and move a text block in a multimedia presentation.  
Creates an objective screen for a multimedia presentation using a CBT design package.  
Creates a choice screen for a multimedia presentation using a CBT design package.  
Creates a lesson screen for a multimedia time line presentation.  
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.  
Creates a True/False exercise screen for a multimedia presentation.  
Researches the elements of graphic design for use in a multimedia presentation.  
Researches the principles of graphic design for use in a multimedia presentation.  
Recognizes effective ways to communicate in multimedia presentations.  
Enters text, graphics and file names on a storyboard for a hobby presentation.  
Recognizes effective ways to communicate in multimedia presentations from written text.  
Edits text in a multimedia presentation editor.  
Uses the spell checking tool in a multimedia presentation editor.  
Re-orders slides in a multimedia presentation editor.  
Scans and inserts images into a multimedia presentation.  
Manipulates scanned images for use in a multimedia presentation.  
Applies settings to make a self running presentation.  
Uses tools to record a narrative for a multimedia presentation.  
Interprets a design brief for a Class Year presentation.  
Applies slide transition settings to create a presentation that is navigated using text index links, forward, backward and exit buttons.

Applies custom animation settings to a Class Year presentation.

**7.2 The student will use advanced publication methods**

Compares modern publishing techniques with traditional publishing techniques.  
Demonstrates some of the benefits of modern publishing.  
Defines terminology used to describe words and pictures in Computer Aided Publishing.  
Lists the principal computer hardware components required for Computer Aided Publishing.  
Lists the principal software requirements for Computer Aided Publishing.  
Compares a selection of printers used for Computer Aided Publishing.  
Interprets measurements used in Computer Aided Publishing.  
Interprets information about Computer Aided Publishing.

**7.3 The student will browse, link, and elaborate on information in a nonlinear, multimedia database.**

Extracts information from a database.  
States how to use a database as an information store.  
Uses the basic functions of a database.  
Uses a database to research a given topic.  
Follows instructions to operate a database to retrieve data.  
Uses a database to retrieve information regarding the calorific value of foods.  
Exports information from a database and enters it into a spreadsheet.  
Adds information to a database.  
Extracts information from records held in a database.  
Uses a database to retrieve data about model rockets.  
Retrieves data about model rocket programs from a database.  
Records results from a model rocket launch using a database.  
Retrieves information about criminals using a simulated police database program.  
Retrieves information using keywords on a database in order to solve simulated crimes.  
Identifies how graphics are linked to a page layout.  
Browses clipart to view and select images.  
Applies action settings to text to create links from an index slide.  
Applies slide transition settings to create a presentation that is navigated using text index links, forward, backward and exit buttons.  
Creates a Class Year presentation that uses indexed linking and forward, backward and exit action buttons.  
States that presentations can be saved as a web browser file.

**7.4 The student will generate original ideas based on previous knowledge and research.**

Uses computer based reference material to research and develop ideas.  
Uses basic geometrical shapes to create a drawing.  
Modifies a drawing according to a new design brief.  
Creates a computer program which responds to data from sensors then uses this data to output messages to the VDU.  
Uses data from a spreadsheet to create a chart of results.  
Uses wordprocessor templates to create a letter head.  
Follows instructions to create a letter head using a template.  
Designs the mechanical layout of a vehicle to meet a design brief.  
Creates a user directory by following written instructions.  
Uses a play list to create a compilation of tracks from a CD.  
Uses and derives specifications, flowcharts and truth tables as part of a systematic design process.  
Uses software to write a control program to create a loop to control an articulated joint.

Uses a flowchart to design a program to move the robot and run the conveyor a specified number of times.

Uses flowcharts to design control programs.

Creates a CNC program using CAD/CAM software.

Uses CAM software to create a program for a CNC lathe.

Interprets a logic gate diagram to create a ladder logic program.

Creates an animation from information given in a storyboard.

Creates a storyboard for the module video.

Creates a storyboard for a multimedia presentation from an example product.

Creates a login screen for a multimedia presentation using a CBT design package.

Researches the principles of graphic design for use in a multimedia presentation.

Creates a hobby presentation that loops and includes text, graphics, scanned images and recorded narrative.

Uses an orienteering compass to design and follow a route plan that involves bearings and distances.

Explains how a route plan was created using bearings and distances.

#### **7.6 The student will estimate probabilities and predict outcomes from actual data.**

Navigates around a database to make predictions about model rocket flights.

Approximates the predicted altitude of a model rocket.

Compares predictions made about model rocket launches with results obtained from real launches.

Calculates the error of rocket flight predictions from given data.

Examines the impact of measurement errors on predictions about rocket flights.

Uses gear ratios to predict changes in gear speed.

Makes predictions about systems that combine different rotary power transmission systems.

Estimates the angle of a slope of a communication system from an elevation diagram.

Estimates the effect of reducing path length upon an animation.

#### **7.7 The student will use graphing programs to organize and display quantitative information.**

Interprets data from a graph relating to energy costs.

Plots a graph of Sun angle against time of day.

Plots graphs of weather data.

Plots a graph comparing inside and outside temperature.

Extracts temperature information from a graph of weather data.

Interprets a graph showing the strength to carbon ratio of steel.

Extracts information from a graph showing pulse rate over a period of time.

Extracts data from a graph of Polio statistics drawn by the student.

Plots and interprets renogram data graphically.

Reads length of time taken by a model rocket to complete a phase of its launch from a graph.

Plots a graph showing how payload mass affects rocket apogee.

Reads values from a graph of payload mass against rocket apogee.

Relates parts of a Radar system to graphics in a computer simulation.

Uses graphics tools to produce a flowchart.

States the operating range of a sensor from information in a graph.

Uses graphs to analyze a simple pneumatic circuit.

Uses graphical methods to analyze control systems.

Identifies the time against temperature graph for the warm-up period of an injection molder.

Finds information from simple line graphs.

Interprets a simple bar graph and adds numbers which include decimals.

**7.8 The student will use simulations to show 3D modeling.**

- Makes a 3D computer model of clouds.
- Translates scaling factors between drawings (2D-3D).

**7.9 The student will apply algebraic formulas while solving problems.**

- Solves an algebraic equation.
- Calculates work done using the formula work = force x distance.
- Uses the formula Power = Work/Time to solve problems.
- Calculates the power output of a wind generator using the formula  $W = A \times V$ .
- Uses formula to calculate the height of model rockets.
- Uses velocity formula with data on moving rockets.
- Applies mathematical formulae to the motion of rockets.
- Applies gear ratio formula to observed results.
- Applies the gear ratio formula to a timing pulley system.
- Interprets the formula for calculating Mechanical Advantage.
- Uses the formula  $F = P \times A$ .
- Applies formulae to calculate the resistance of resistors in series and in parallel.
- Applies formulae to calculate the capacitance of capacitors in series and in parallel.
- Uses the formula for calculating the time constant of a capacitor and resistor combination.
- Applies the formula for calculating the gain of inverting operational amplifier.
- Uses formula to calculate electrical power.
- Uses formula to calculate average velocity and distance covered.
- Applies formula to calculate area of rectangles.
- Applies formula to calculate area of circles.
- Calculates force by determining area and then using the formula for force.

**7.10 The student will calculate, explain, and understand how mathematical principles are used in areas of construction, manufacturing, information, and physical systems.**

- Calculates totals for columns of figures on pollutant gases.
- Calculates and compares the amount of work done and energy requirements of a team of workers.
- Uses the formula Power = Work/Time to solve problems.
- Calculates the height of objects using tangents.
- Calculates wind chill using the wind chill index.
- Calculates the volume of soil to be excavated to level a construction site.
- Calculates the costs involved in excavation.
- Calculates volume and surface area of a geodesic dome.
- Uses the radius of a circle to calculate a diameter.
- Calculates the angles used on an isometric grid in CAD.
- Calculates the angles used for polar coordinates in CAD.
- Calculates the multimeter range setting required to measure the voltage across batteries in series.
- Calculates the percentage of resistors that fail in a given batch.
- Calculates the calorific values of food.
- Calculates the total number of cards in a database.
- Calculates the percentage composition of the contents of a sachet of Oral Rehydration Salts.
- Calculates the cost of kidney treatment.
- Calculates the facing area of drag panels.
- Calculates the mileage range on one tank of fuel.
- Calculates the required range from one tank of fuel.
- Calculates height using angles and trigonometry.

Uses formula to calculate the height of model rockets.  
Calculates average velocity of model rockets from given data.  
Calculates and compares journey times using speed and distance variables.  
Uses Pythagoras' theorem to calculate the length of cable required to connect two buildings on a slope.  
Uses the Windows calculator to solve communication system problems.  
Calculates the space required on a computer for a wave file.  
Interprets flowcharts to solve mathematical problems.  
Calculates time taken to simulate activities in virtual time.  
Retrieves information using keywords on a database in order to solve simulated crimes.  
Calculates a number of print impressions using simple arithmetic.  
Calculates the number of dots per square inch of an image scanner.  
Calculates the size of typefaces.  
Calculates how many ms in 5 seconds.  
Uses software to write a control program to calculate and output to the screen user friendly information.  
Calculates the number of cutting passes needed to remove a specified depth of material.  
Calculates gear ratios.  
Calculates ratios of compound gear trains.  
Calculates the circumference of a wheel.  
Calculates output speeds of pulley belt systems.  
States that logic can be used to solve simple control problems.  
Calculates the energy stored in a pneumatic system.  
Calculates areas of simple shapes.  
Calculates density ratio of air to water.  
Calculates the area of hydraulic pistons.  
Calculates the period a PLC timer records.  
Uses division to calculate the number of vehicles to be manufactured using available capital.  
Calculates the number of frames in an animation.  
Calculates the number of frames suitable for an animation text transition path.  
Calculates the run-time for animation using loops.  
Applies formulae to calculate the resistance of resistors in series and in parallel.  
Applies formulae to calculate the capacitance of capacitors in series and in parallel.  
Calculates values of resistor tolerance limits.  
Calculates the weight of quantities of sample materials.  
Calculates the strength to weight ratios for sample materials.

**7.10a The student will explain how mass and force affect transportation systems.**

Identifies how down force is produced by various objects.  
Determines down force and drag forces on a sports car model.  
Identifies greatest lift force produced for various wing designs.  
Describes how lift force is dependent on wing span and chord length.  
Calculates lift coefficient and lift force.  
Investigates the effect of turbulent air flow on down force production.  
States the effect of down force.  
Indicates how lift force is produced, and used by aircraft.  
Describes how the mass of a rocket influences the flight of the rocket.  
Plots a graph showing how payload mass affects rocket apogee.  
Demonstrates forces acting on model rockets.

Performs a test to demonstrate forces acting on a projectile.  
States the force produced by pressurized gases that powers rockets.  
Identifies the forces that are important in space technology.

**7.11 The student will select and use appropriate instrumentation to design and conduct investigations.**

Identifies the software tools used to create audio.  
Uses software tools to open and play audio files.  
Uses software tools to modify audio files and add special effects.  
Recognizes tools used to create digital sound applications.  
Connects control hardware to a computer.  
Simulates fires using a multimedia software package and control hardware.  
Uses graphics tools to produce a flowchart.  
Identifies and describes software and hardware requirements of computer applications.  
Develops sets of instructions to control hardware and software devices.  
Tests and modifies sets of instructions to control hardware and software devices.  
Selects appropriate tools to enhance the realism of an animated space shuttle launch.  
Chooses appropriate video technology hardware.  
Recognizes the tools used in creating a title screen for a multimedia product.  
Uses tools to record a narrative for a multimedia presentation.  
Identifies the mechanical fastenings, and their tools, used in the fabrication of furniture.

**7.13 The student will explain how mechanical systems operate and function.**

Identifies the action of a computer controlled mechanical system, from information given in a flowchart.  
Identifies the input to and output from a mechanical system.  
Identifies the action of a computer controlled mechanical system, from a dry run of a control program.  
States the operating characteristics of a complete computer controlled mechanical system.  
Uses analog and digital sensors to monitor conditions and provide data to test feedback loops in a mechanical system.  
Designs the mechanical layout of a vehicle to meet a design brief.  
Identifies examples of mechanical components used to control movement in the roboTEK workcell.  
Describes mechanical and electrical components used in automated workcells.  
Compares rotary power transmission systems.  
Examines the effort gained using fixed pulleys to raise loads.  
Calculates Mechanical Advantage for pulley systems.  
Compares the theoretical mechanical advantage with observed mechanical advantage of pulley systems.  
Calculates the efficiency of pulley systems.  
Identifies uses of specialized gears.  
Describes methods of transferring energy using mechanical systems.  
Describes the uses of pulleys.  
Recognizes friction as a factor in mechanical systems.  
Identifies how mechanisms can be used to change speed and direction.  
Recognizes the basic mechanical systems of a modern motor vehicle.

**7.15 The student will develop and present a research proposal on the proper use and removal of biological and chemical waste.**

Writes a report on Biomedical Technology.  
Makes a presentation to a group on Biomedical Technology.

**7.16 The student will explain the steps and processes that occur during lift of vehicles.**

- Identifies greatest lift force produced for various wing designs.
- Relates drag and lift readings for wings with flaps to practical applications.
- Describes how lift force is dependent on wing span and chord length.
- Indicates how lift force is produced, and used by aircraft.

**7.17 The student will analyze a variety of persistent technological issues and dilemmas facing various cultures.**

- States some of the problems pollution causes.
- States the impacts of existing solutions to technological problems.
- Identifies the use of new technologies in medical administration.
- Recognizes the impact of new technologies on methods of working.
- States alternative problems that have solutions related to aerodynamics.
- States scientific principles of importance to space technology.
- Identifies the forces that are important in space technology.
- Identifies propulsion systems of importance to space technology.
- Identifies problems with early communication systems.
- Identifies and analyzes components required to transmit and receive voices along wires.
- Identifies advantages and disadvantages of Fax technology.
- Analyzes the merits of different people purchasing cellular phones.
- Analyzes the merits and drawbacks of various cellular telephone tariffs.
- Assesses the use of CAD/CAM systems in CNC technology.
- States that logic can be used to solve simple control problems.
- Uses logic to solve electro-pneumatic control problems.
- Evaluates the changes in employment due to changes in manufacturing technology.
- Identifies the technological advances in Industrial Control.
- Explains problems encountered when taking photographs.
- Applies color information to solve filtration problems.
- Analyzes an engine torque curve.
- Determines engine problems from a description of spark plug tip condition.

**8.3 The student will describe career plans that reflect the importance of life-long learning.**

- Identifies career pathways in industry and manufacturing.

**Diversified Technology 2**

**1.1 The student will identify the logical research process.**

- Researches the dangers of smoking, using a text book.
- Researches information to be included in a leaflet advertising a drug awareness day.
- Researches and presents advice on health and well-being to others.
- Researches applications of computers.
- Uses the search tools of a World Wide Web simulation to research information about planets.
- Researches sensor connections on a security system.
- Researches security alarm sounds on a security system.
- Researches fire alarm systems using computer based material.
- Uses computer based reference material to research and develop ideas.
- Researches information from text relating to the rotation properties of 3D shapes.
- Uses a Research Material Fact File to research information about the Mayan civilization, Paper, and the Roman empire.

Uses a Research Material Fact File to research information about Black Death, William Shakespeare, and Christopher Columbus.

Uses a Research Material Fact File to research information about Charles Darwin, Thomas Edison, and The Gettysburg Address.

Uses a Research Material Fact File to research information about the Space Shuttle, the Moon Landing, and Rock 'n' Roll.

**1.2 The student will apply the logical research process.**

Researches the dangers of smoking, using a text book.

Researches information to be included in a leaflet advertising a drug awareness day.

Researches and presents advice on health and well-being to others.

Researches applications of computers.

Uses the search tools of a World Wide Web simulation to research information about planets.

Researches sensor connections on a security system.

Researches security alarm sounds on a security system.

Researches the purpose of security alarm sounds on a security system.

Researches fire alarm systems using computer based material.

Uses computer based reference material to research and develop ideas.

Researches information from text relating to the rotation properties of 3D shapes.

Uses a Research Material Fact File to research information about the Mayan civilization, Paper, and the Roman empire.

Uses a Research Material Fact File to research information about Muhammad, The Islamic Faith, and Leif Ericson.

Uses a Research Material Fact File to research information about Black Death, William Shakespeare, and Christopher Columbus.

Uses a Research Material Fact File to research information about Charles Darwin, Thomas Edison, and The Gettysburg Address.

Uses a Research Material Fact File to research information about the Space Shuttle, the Moon Landing, and Rock 'n' Roll.

**1.3 The student will understand how to measure the outcomes of research.**

Measures national weather conditions.

Measures actual dimensions on a component and converts this information into a 2D working drawing.

Uses the maglev system to measure impact.

Measures turning forces produced by propellers.

Measures aerodynamic forces on a ballistic object.

Uses photographic data to measure height.

Measures the length of an aerial photograph in millimeters.

Measures the amount of material used to create various plastic products.

Calculates engine data using engine measurements.

**3.1 The student will understand the symbols in flow-charting.**

Identifies symbols used in flow diagrams.

Interprets formula and symbols used by a high level control language to perform calculations.

Interprets formula and symbols used by a high level control language to perform sort operations.

Interprets formula and symbols used by a high level control language to perform swap routines.

Recognizes symbols used in flow charts.

Recognizes symbols used in flow charts and logic diagrams.

Identifies hydraulic components from symbols.

**3.2 The student will understand a flow-chart that will represent the steps of a solution to a complex problem.**

- Uses flowcharts to design a control program.
- Uses flowcharts to design a control program.
- Converts model rocket launch instructions into flow diagram components.
- Creates a flow diagram to show the stages involved in launching model rockets.
- Designs and tests a flowchart for a prototype security system.
- Designs a flowchart for a smoke detection system.
- Designs a flowchart for a heating control system.
- Designs and tests a flowchart for a prototype security system.
- Produces a flowchart for an automatic door system.
- Uses a flowchart to design a control program to input three numbers and output them biggest first.
- Uses a flowchart to design a control program to cycle control rods with minimal errors and maximum accuracy.
- Uses a flowchart to design a control program to add, subtract or multiply two numbers.
- Uses a flowchart to design a control program which is completely interactive.
- Identifies how a flow control valve can be used to control cylinder speed.
- Programs simple ladder logic using flow charts.
- Observes the flow of logic through a flashing lights program.
- Observes the flow of logic through a program for identifying objects.
- Predicts logic flow in a conveyor control program.
- Programs simple ladder logic using flow charts.
- Uses a troubleshooting flow chart to investigate problems in a car's starting and ignition systems.

**3.3 The student will understand the proper steps used in problem solving.**

- Uses problem solving skills to design a glider to given specifications.
- Solves pneumatic cylinder problems using  $P=F/A$ .
- Evaluates hydraulic lever problems.
- Applies problem solving techniques to develop an animation character.
- Applies problem solving techniques to animate a character.
- Investigates a design problem and solution for a commercial animation movie.
- Defines a stage in the problem and solution cycle for an animation task.
- Defines stages in the classic problem solving loop.
- Identifies how boolean algebra can be used to solve control problems using combinations of logic gates.
- Evaluates an electronic control problem using logic.
- Creates a greeting card following the standard problem solving processes.
- Removes people from a photograph following the standard problem solving cycle and using image manipulation techniques.
- Uses a troubleshooting flow chart to investigate problems in a car's starting and ignition systems.
- Uses a multimeter to investigate problems in a car's cooling system electronics.
- Carries out fault finding to investigate a problem in the air bag system of a vehicle.
- Identifies the function of a compression test in diagnosing engine problems.

**3.4 The student will understand how problem-solving skills can be applied to life.**

- States some of the options available to relieve the energy problems facing society today.
- Uses problem solving skills to design a glider to given specifications.
- Solves problems involving gear ratios.
- Solves force, pressure & area problems.

Solves pneumatic cylinder problems using  $P=F/A$ .  
Applies problem solving techniques to animate a character.  
Defines stages in the classic problem solving loop.  
Identifies how boolean algebra can be used to solve control problems using combinations of logic gates.  
Creates a greeting card following the standard problem solving processes.  
Removes people from a photograph following the standard problem solving cycle and using image manipulation techniques.  
Applies problem solving techniques to develop an animation character.  
Investigates a design problem and solution for a commercial animation movie.  
Defines a stage in the problem and solution cycle for an animation task.  
Evaluates an electronic control problem using logic.  
Uses a troubleshooting flow chart to investigate problems in a car's starting and ignition systems.  
Uses a multimeter to investigate problems in a car's cooling system electronics.  
Carries out fault finding to investigate a problem in the air bag system of a vehicle.  
Identifies the function of a compression test in diagnosing engine problems.

**3.5 The student will understand and demonstrate creative thinking in the problem-solving process.**

Uses problem solving skills to design a glider to given specifications.  
Applies problem solving techniques to develop an animation character.  
Applies problem solving techniques to animate a character.  
Identifies how boolean algebra can be used to solve control problems using combinations of logic gates.  
Creates a greeting card following the standard problem solving processes.  
Removes people from a photograph following the standard problem solving cycle and using image manipulation techniques.  
Uses a spreadsheet to create a chart.  
Creates a flow diagram to show the stages involved in launching model rockets.  
Uses a Web Page Editor simulation to create a Web Page relating to digital signals.  
Uses a Web Page Editor simulation to create a Web Page about Binary Code.  
Explains the process involved in creating a fully automatic control program to input three numbers and output them biggest first.  
Explains the process involved in creating a fully automatic control program to cycle control rods with minimal errors and maximum accuracy.  
Explains the process involved in creating a fully automatic control program to add, subtract or multiply two numbers.  
Explains the process involved in creating a fully automatic control program which is completely interactive.  
Uses CAM software to create a CNC milling program.  
Uses different canned cycles with CAM software to create a CNC mill program.  
Creates a CNC mill program that cuts a dish shaped pocket.  
Creates a CNC program for milling plastic using CAM software.  
Uses a CNC mill program to create a component designed by the student.  
Creates a program to control a conveyor belt with a timed sequence.  
Creates a program to control the work-cell pistons with a timed sequence.  
Creates a program that sorts bobbins into batches of four.  
Creates a program to sort two different size bobbins.  
Creates realistic movement of a space shuttle.  
Creates a sky background for use in a space shuttle animation.

- Determines how to create realistic path movements for an astronaut.
- Explains the process involved in creating the drawings of the animation character.
- Creates a Fill in the Blank exercise screen for a multimedia product.
- Creates voice-overs for a multimedia presentation.
- Creates a matching pairs screen for a multimedia application.
- Creates a Course Map for a multimedia presentation.
- Selects and customizes a slide template to create a table.
- Uses an automatic shape function to create action buttons.
- Creates invisible hotspots on a slide.
- Creates an exit slide that contains exit and return options.
- Extracts information from tables to create a résumé.
- Creates a plastic model car with an intentional fault.
- Creates a budget plan for a company working with Materials and Processes.
- Creates a map using supplied GPS survey data.
- Creates a digital filter using a mathematical matrix.
- Creates 3-dimensional text using perception techniques.
- Creates special effects using digital manipulation tools.

**4.1 The student will understand the need for technological changes.**

- Identifies the need to automate a security system.
- Identifies the need for automatic systems when working with dangerous substances.
- States the changes electronics technology has made to society.
- States some of the options available to relieve the energy problems facing society today.
- States social, economic, ethical and moral issues raised by new technologies.
- Evaluates the impact of space technology on society.
- Investigates the impact of communication links on society.
- Identifies short term and long term social and environmental impacts of communication systems.

**4.2 The student will understand the role of technology in satisfying the needs of society.**

- States some of the options available to relieve the energy problems facing society today.
- States social, economic, ethical and moral issues raised by new technologies.
- Evaluates the impact of space technology on society.
- Investigates the impact of communication links on society.
- Identifies short term and long term social and environmental impacts of communication systems.
- States the changes electronics technology has made to society.
- Describes how CNC technology can improve manufacturing.
- Investigates modern bridge technology.
- Evaluates how new technology is used in tunnel construction.
- Evaluates the impact of space technology on society.
- Identifies the differences between video cassette technology and laser disc technology.
- Identifies the technology used in compact disc production and use.
- Identifies the technology of automated processes in the manufacturing industry.
- Investigates turbocharger and supercharger technology and how they boost engine performance.

**5.1 The student will recognize communication skills as an integral part of technical presentations.**

- Makes a presentation to a group on Alternative Energy.
- Uses information technology to support a weather presentation.
- Completes a weather presentation.
- Makes a weather presentation in a professional manner.

Makes a presentation to a group on Weather Monitoring.  
Makes a presentation to a group on Construction Technology.  
Makes a presentation to a group on Computer Aided Design.  
Makes a presentation to a group on Basic Electricity.  
Makes a presentation to a group on Research & Design.  
Researches and presents advice on health and well-being to others.  
Uses ICT to communicate information and statistics.  
Makes a presentation to a group on Health Management.  
Makes a presentation to a group on Biomedical Technology.  
Makes a presentation to a group on Aerodynamics Technology.  
Makes a presentation to a group on Space Technology.  
Makes a presentation to a group on Electronic Communications.  
Makes a presentation to a group on Digital Sound Technology.  
Makes a presentation to a group on Computer Applications.  
Writes and presents a personal profile.  
Makes a presentation to a group on Computer Aided Publishing.  
Makes a presentation to a group on Robotics and Automation.  
Makes a presentation to a group on CNC Technology  
Makes a presentation to a group on Mechanisms.  
Makes a presentation on troubleshooting in a professional manner.  
Makes a presentation to a group on Pneumatics.  
Communicates a hydraulic system solution using a circuit diagram.  
Makes a presentation to a group on Hydraulics.  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Graphics and Animation.  
Makes a presentation to a group on Video Production Technology.  
Identifies the requirements to enhance the content of a multimedia presentation.  
Demonstrates an interactive multimedia presentation.  
Identifies techniques and skills used in designing content for a multimedia presentation.  
Creates a product promotion presentation that includes charts created by importing data.  
Makes a presentation to a group on Electronics Technology.  
Makes a presentation to a group on Materials and Processes.  
Makes a presentation to a group on Navigation and GPS.  
Makes a presentation to a group on Digital Photography.  
Makes a presentation to a group on Automotive Technology.

**5.2 The student will identify available multimedia resources.**

Retrieves information about the workings of a microphone using a multimedia encyclopedia.  
Uses a Research Material Fact File to research information about the Mayan civilization, Paper, and the Roman empire.  
Locates names of multimedia files from a table of associated lesson screens.  
Identifies tools used in creating a summary screen for a multimedia presentation.  
Identifies the requirements to enhance the content of a multimedia presentation.  
States technology used in multimedia devices.  
Identifies techniques and skills used in designing content for a multimedia presentation.  
Identifies the content of a multimedia product.  
Identifies when and where authoring templates are used in the design of a multimedia product.

Identifies the types and purpose of screens available in the production of a multimedia presentation.  
Recognizes tools used in creating a multimedia presentation.  
States multimedia file types.  
Identifies characteristics of tables in a multimedia presentation editor.

**5.3 The student will compare the advantages and disadvantages of various types of communication media.**

Identifies a suitable communication method for a pilot to talk to an air traffic control tower.  
Investigates the cause and effect of signal errors on an electronic communication link.  
Investigates the financial aspects of various types of communication links.  
Investigates the impact of communication links on society.  
Calculates the costs of various types of communication links.  
Specifies suitable communication links for a landscape within a given budget.  
Calculates total communication link costs made up of various linking systems.  
Analyzes potential line of sight communication links from information on a map.  
Investigates the purposes and intentions of communication.  
Justifies suitable communication links for a landscape within a given budget.  
Identifies short term and long term social and environmental impacts of communication systems.  
Justifies choices of communication links in a planning exercise.  
Justifies choices of composite materials for a specified communication system within a fixed budget.  
Recognizes some advantages and disadvantages of electronic communication systems.  
Identifies various communication transmitters, receivers and carriers used in communication systems and networks.  
States some advantages and disadvantages of speech recognition.  
Lists the advantages of different types of hardware used in Computer Aided Publishing.

**5.4 The student will demonstrate the use of multimedia resources in technical presentations.**

Uses information technology to support a weather presentation.  
Makes a weather presentation in a professional manner.  
Identifies the content type of an audio presentation.  
Identifies a strategy for creating an audio presentation.  
Identifies the function of tools used in creating a digital sound presentation.  
Creates a Fill in the Blank exercise screen for a multimedia product.  
Creates voice-overs for a multimedia presentation.  
Adds voice-overs to screens of a multimedia presentation.  
Creates a matching pairs screen for a multimedia application.  
Identifies tools used in creating a summary screen for a multimedia presentation.  
Creates a Glossary for a multimedia presentation.  
Creates a Course Map for a multimedia presentation.  
Creates a test screen for a multimedia presentation.  
Identifies the requirements to enhance the content of a multimedia presentation.  
Identifies techniques and skills used in designing content for a multimedia presentation.  
Identifies the content of a multimedia product.  
Identifies when and where authoring templates are used in the design of a multimedia product.  
Identifies the types and purpose of screens available in the production of a multimedia presentation.  
Recognizes tools used in creating a multimedia presentation.  
Explores standard action buttons that appear when running a multimedia presentation.  
Imports text from a text document into presentation.  
Creates the framework for a product promotion presentation using an auto-content tool.

- Customizes the layout of slides for a production promotion presentation.
- Creates a chart in a production promotion presentation.
- Imports numerical data from a spreadsheet into a chart of a presentation.
- Recognizes the types of charts available in a presentation editor.
- Modifies the color scheme used for a chart in a presentation editor.
- Interprets text to determine the purpose of using pictures in a presentation.
- Applies slide transition settings for a production promotion presentation.
- Applies custom animations to objects in a product promotion presentation.
- Uses rehearsal controls to set the timing for automatic advance of a presentation.
- Recognizes different methods of creating a slide in a multimedia presentation editor.
- Applies action settings to objects in a multimedia résumé.
- Applies slide transition timing settings in a multimedia résumé.
- Creates a product promotion presentation that includes charts created by importing data.
- Creates an interactive multimedia Résumé.

**5.5 The student will explore how technical presentations are used in a systems approach.**

- Uses information technology to support a weather presentation.
- Demonstrates how to present a final drawing.
- Identifies a strategy for creating an audio presentation.
- Identifies the function of tools used in creating a digital sound presentation.
- States the process of transferring a computer audio presentation to audio cassette.
- Presents an audio product produced using digital sound technology equipment.
- Demonstrates an interactive multimedia presentation.
- Identifies techniques and skills used in designing content for a multimedia presentation.
- Identifies the types and purpose of screens available in the production of a multimedia presentation.
- Creates a product promotion presentation that includes charts created by importing data.
- Identifies how to include movies and sounds in a multimedia presentation.
- Identifies a tree traversing presentation as interactive.

**5.6 The student will explore why multimedia presentations are superior to presentations using only one medium.**

- Identifies a strategy for creating an audio presentation.
- Makes a presentation to a group on Digital Sound Technology.
- Makes a presentation to a group on Graphics and Animation.
- Makes a presentation to a group on Video Production Technology.
- Identifies tools used in creating a summary screen for a multimedia presentation.
- Identifies the requirements to enhance the content of a multimedia presentation.
- Demonstrates an interactive multimedia presentation.
- Identifies techniques and skills used in designing content for a multimedia presentation.
- States technology used in multimedia devices.
- Identifies the content of a multimedia product.
- Identifies the types and purpose of screens available in the production of a multimedia presentation.
- Creates a hobby presentation that loops and includes text, graphics, scanned images and recorded narrative.
- Identifies the benefits of a multimedia résumé.
- Creates an interactive calendar that uses tables and movies.
- Creates a product promotion presentation that includes charts created by importing data.
- Creates an interactive multimedia Résumé.

**6.1 The student will recognize and understand global differences in availability and utilization of technology.**

- States social, economic, ethical and moral issues raised by new technologies.
- Evaluates the impact of space technology on society.
- Describes how CNC technology can improve manufacturing.
- Documents the technological advances in industrial control.
- States the changes electronics technology has made to society.
- Identifies how manufacturing careers have changed with modern technology.
- Identifies the technology of automated processes in the manufacturing industry.

**6.2 The student will explain the ways various countries might cooperate in order to change development in technology.**

- Makes a presentation to a group on Alternative Energy.
- Makes a presentation to a group on Construction Technology.
- Makes a presentation to a group on Computer Aided Design.
- Makes a presentation to a group on Research & Design.
- Makes a presentation to a group on Health Management.
- Makes a presentation to a group on Biomedical Technology.
- Makes a presentation to a group on Aerodynamics Technology.
- Makes a presentation to a group on Space Technology.
- Makes a presentation to a group on Electronic Communications.
- Makes a presentation to a group on Computer Applications.
- Makes a presentation to a group on Robotics and Automation.
- Makes a presentation to a group on CNC Technology
- Makes a presentation to a group on Industrial Control Technology.
- Makes a presentation to a group on Industrial Control Technology.
- Makes a presentation to a group on Materials and Processes.
- Makes a presentation to a group on Automotive Technology.
- Demonstrates an interactive multimedia presentation.
- Writes a report on Alternative Energy.
- Writes a report on Weather Monitoring.
- Writes a report on Construction Technology.
- Writes a report on Computer Aided Design.
- Writes a report on Research & Design.
- Writes a report on Health Management.
- Writes a report on Biomedical Technology.
- Writes a report on Aerodynamics Technology.
- Writes a report on Space Technology.
- Writes a report on Electronic Communications.
- Writes a report on Computer Applications.
- Writes a report on Computer Aided Publishing.
- Writes a report on Robotics and Automation.
- Writes a report on CNC Technology
- Writes a report on Industrial Control Technology.
- Writes a report on Industrial Control Technology.
- Writes a report on Graphics and Animation.
- Writes a report on Video Production Technology.
- Write a report on Multimedia Production.

Write a report on Multimedia Production.  
Writes a report on Electronics Technology.  
Writes a report on Materials and Processes.  
Writes a report on Navigation and GPS.  
Writes a report on Digital Photography.  
Writes a report on Automotive Technology.

**6.3 The student will create an awareness of the importance of developing and maintaining international standards in technology.**

Identifies International System (SI) units.  
Uses the International System (SI) of units.  
Uses the International System of units to calculate volume.

**6.4 Understand how developments in technology impact the international marketplace and affect societies.**

Makes a presentation to a group on Alternative Energy.  
Makes a presentation to a group on Weather Monitoring.  
Makes a presentation to a group on Construction Technology.  
Makes a presentation to a group on Computer Aided Design.  
Makes a presentation to a group on Research & Design.  
Makes a presentation to a group on Health Management.  
Makes a presentation to a group on Biomedical Technology.  
Makes a presentation to a group on Aerodynamics Technology.  
Makes a presentation to a group on Space Technology.  
Makes a presentation to a group on Electronic Communications.  
Makes a presentation to a group on Computer Applications.  
Makes a presentation to a group on Computer Aided Publishing.  
Makes a presentation to a group on Robotics and Automation.  
Makes a presentation to a group on CNC Technology  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Graphics and Animation.  
Makes a presentation to a group on Video Production Technology.  
Demonstrates an interactive multimedia presentation.  
Makes a presentation to a group on Electronics Technology.  
Makes a presentation to a group on Materials and Processes.  
Makes a presentation to a group on Navigation and GPS.  
Makes a presentation to a group on Digital Photography.  
Makes a presentation to a group on Automotive Technology.  
Writes a report on Alternative Energy.  
Writes a report on Weather Monitoring.  
Writes a report on Construction Technology.  
Writes a report on Computer Aided Design.  
Writes a report on Research & Design.  
Writes a report on Health Management.  
Writes a report on Biomedical Technology.  
Writes a report on Aerodynamics Technology.  
Writes a report on Space Technology.  
Writes a report on Electronic Communications.

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Writes a report on Computer Aided Publishing.  
Writes a report on Robotics and Automation.  
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Writes a report on Industrial Control Technology.  
Writes a report on Graphics and Animation.  
Writes a report on Video Production Technology.  
Write a report on Multimedia Production.  
Write a report on Multimedia Production.  
Writes a report on Electronics Technology.  
Writes a report on Materials and Processes.  
Writes a report on Navigation and GPS.  
Writes a report on Digital Photography.  
Writes a report on Automotive Technology.

**7.1 The student will recognize and understand global differences in availability and utilization of technology.**

States the technology used to make a TV weather forecast.  
Uses information technology to support a weather presentation.  
Investigates materials and techniques used in residential plumbing systems.  
Recognizes the key applications of computers in construction technology.  
Investigates modern bridge technology.  
Evaluates how new technology is used in tunnel construction.  
Identifies the major types of materials used in Biomedical Technology.  
Describes the involvement of computers in aerodynamics technology.  
Identifies support processes which are vital to space technology.  
States the benefits and costs associated with space technology.  
Draws a timeline showing the development of satellite technology.  
Investigates the various tools available to a news group on the Internet using a computer simulation.  
Identifies some of the tools available in illustration programs.  
Describes how CNC technology can improve manufacturing.  
Documents the technological advances in industrial control.  
States the changes electronics technology has made to society.  
Identifies the technology of automated processes in the manufacturing industry.

**7.2 The student will explain the ways various countries might cooperate in order to change development in technology.**

Makes a presentation to a group on Alternative Energy.  
Makes a presentation to a group on Weather Monitoring.  
Makes a presentation to a group on Construction Technology.  
Makes a presentation to a group on Computer Aided Design.  
Makes a presentation to a group on Research & Design.  
Makes a presentation to a group on Health Management.  
Makes a presentation to a group on Biomedical Technology.  
Makes a presentation to a group on Aerodynamics Technology.  
Makes a presentation to a group on Space Technology.  
Makes a presentation to a group on Electronic Communications.  
Makes a presentation to a group on Computer Applications.

Makes a presentation to a group on Computer Aided Publishing.  
Makes a presentation to a group on Robotics and Automation.  
Makes a presentation to a group on CNC Technology  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Industrial Control Technology.  
Makes a presentation to a group on Graphics and Animation.  
Makes a presentation to a group on Video Production Technology.  
Demonstrates an interactive multimedia presentation.  
Makes a presentation to a group on Electronics Technology.  
Makes a presentation to a group on Materials and Processes.  
Makes a presentation to a group on Navigation and GPS.  
Makes a presentation to a group on Digital Photography.  
Makes a presentation to a group on Automotive Technology.  
Writes a report on Alternative Energy.  
Writes a report on Weather Monitoring.  
Writes a report on Construction Technology.  
Writes a report on Computer Aided Design.  
Writes a report on Research & Design.  
Writes a report on Health Management.  
Writes a report on Biomedical Technology.  
Writes a report on Aerodynamics Technology.  
Writes a report on Space Technology.  
Writes a report on Electronic Communications.  
Writes a report on Computer Applications.  
Writes a report on Computer Aided Publishing.  
Writes a report on Robotics and Automation.  
Writes a report on CNC Technology  
Writes a report on Industrial Control Technology.  
Writes a report on Industrial Control Technology.  
Writes a report on Graphics and Animation.  
Writes a report on Video Production Technology.  
Write a report on Multimedia Production.  
Write a report on Multimedia Production.  
Writes a report on Electronics Technology.  
Writes a report on Materials and Processes.  
Writes a report on Navigation and GPS.  
Writes a report on Digital Photography.  
Writes a report on Automotive Technology.

**7.3 The student will create an awareness of the importance of developing and maintaining international standards in technology.**

Identifies International System (SI) units.  
Uses the International System (SI) of units.  
Uses the International System of units to calculate volume.  
Uses the International System of units.

**7.4 Understand how developments in technology impact the international marketplace and affect societies.**

Writes a report on Alternative Energy.

Makes a presentation to a group on Alternative Energy.  
Writes a report on Weather Monitoring.  
Makes a presentation to a group on Weather Monitoring.  
Writes a report on Construction Technology.  
Makes a presentation to a group on Construction Technology.  
Writes a report on Computer Aided Design.  
Makes a presentation to a group on Computer Aided Design.  
Writes a report on Research & Design.  
Makes a presentation to a group on Research & Design.  
Writes a report on Health Management.  
Makes a presentation to a group on Health Management.  
Writes a report on Biomedical Technology.  
Makes a presentation to a group on Biomedical Technology.  
Writes a report on Aerodynamics Technology.  
Makes a presentation to a group on Aerodynamics Technology.  
Writes a report on Space Technology.  
Makes a presentation to a group on Space Technology.  
Writes a report on Electronic Communications.  
Makes a presentation to a group on Electronic Communications.  
Writes a report on Computer Applications.  
Makes a presentation to a group on Computer Applications.  
Writes a report on Computer Aided Publishing.  
Makes a presentation to a group on Computer Aided Publishing.  
Writes a report on Robotics and Automation.  
Makes a presentation to a group on Robotics and Automation.  
Writes a report on CNC Technology  
Makes a presentation to a group on CNC Technology  
Writes a report on Industrial Control Technology.  
Makes a presentation to a group on Industrial Control Technology.  
Writes a report on Industrial Control Technology.  
Makes a presentation to a group on Industrial Control Technology.  
Writes a report on Graphics and Animation.  
Makes a presentation to a group on Graphics and Animation.  
Writes a report on Video Production Technology.  
Makes a presentation to a group on Video Production Technology.  
Demonstrates an interactive multimedia presentation.  
Write a report on Multimedia Production.  
Write a report on Multimedia Production.  
Writes a report on Electronics Technology.  
Makes a presentation to a group on Electronics Technology.  
Writes a report on Materials and Processes.  
Makes a presentation to a group on Materials and Processes.  
Writes a report on Navigation and GPS.  
Makes a presentation to a group on Navigation and GPS.  
Writes a report on Digital Photography.  
Makes a presentation to a group on Digital Photography.  
Writes a report on Automotive Technology.  
Makes a presentation to a group on Automotive Technology.

**7.6 Estimate probabilities and predict outcomes from actual data.**

- Identifies temperature estimate from graph.
- Uses altitude readings to make predictions about aerial photography.
- Uses route planning software to predict variables for a road journey.
- Compares estimates for the shortest route with the fastest route between two places.
- Uses trip planning software to estimate a road journey between two cities.
- Uses software to make estimates about routes that involve several legs.
- Estimates the rise in the cost of a journey caused by an increase in the price of fuel.
- Distinguishes between actual and estimated journey information.
- Uses a route planning software to compare cost estimates of delivery routes.

**7.7 Use graphing programs to organize and display quantitative information.**

- Determines radiation emission levels from a half-life decay graph.
- Interprets information on heat insulating materials presented graphically.
- Plots a graph of temperature against time to compare single and double glazing.
- Identifies temperature estimate from graph.
- Places weather symbols in the correct geographic location.
- Plots a graph to chart the progress of a construction project.
- Interprets graph of turning force produced by various propellers.
- Identifies an axis on a graph used for measuring gravitational acceleration.
- Interprets readings on a Radar pulse graph.
- Describes readings on a Radar pulse graph.
- Obtains information from a graph of a sound wave.
- Plots a graph showing how effort needed to pull a load up a ramp changes as the ramp becomes steeper.
- Evaluate key points of a cost against production graph.
- Uses geographical information systems software to obtain data on places.

**7.9 Apply algebraic formulas while solving problems.**

- Calculates the answers to algebraic equations.
- Identifies how boolean algebra can be used to solve control problems using combinations of logic gates.

**7.10 Calculate and explain how mass and force affect transportation vehicles.**

- Recognizes different types of force.
- Investigates how force, mass and acceleration are related.
- Describes the link between forces and motion and their relationship to energy.
- Measures turning forces produced by propellers.
- Interprets graph of turning force produced by various propellers.
- Calculates the lift force produced by one rotor blade.
- Identifies drag forces created by models of structures.
- Calculates forces acting on structures.
- Measures aerodynamic forces on a ballistic object.

**7.11 Explain and understand how mathematical principles are used in the areas of construction, manufacturing, information, and physical systems.**

- Creates a digital filter using a mathematical matrix.

**7.12 Select and use appropriate instrumentation to design and conduct investigations.**

- Investigates precipitation.

Investigates the climate.  
Investigates the technology of roof trusses.  
Investigates the effect of dynamic forces on structures.  
Investigates materials and techniques used in residential plumbing systems.  
Investigate construction project management.  
Investigates modern bridge technology.  
Investigates how to add layers to a drawing.  
Investigates how to load line types in CAD.  
Investigates charge storage ability of a capacitor and the battery.  
Investigates how force, mass and acceleration are related.  
Investigates vehicle structures.  
Investigates how engines convert energy and transform motion.  
Investigates the personal development of a child under the age of 4.  
Investigates the personal development of an adolescent.  
Investigates the risks to health from drinking alcohol.  
Investigates the risks to health from smoking tobacco.  
Investigates the risks to health from misusing drugs.  
Investigate the exchange of blood gases in the circulatory system.  
Investigates the mechanism for controlling blood flow in the body.  
Investigates design in Biomedical Technology.  
Investigates the cause and effect of signal errors on an electronic communication link.  
Uses a computer and electronic simulation to investigate binary signals used by modems.  
Investigates time taken to transfer files using floppy disks.  
Investigates the impact of communication links on society.  
Investigates the microwave penetration and reflection properties, using several composite materials.  
Investigates the various tools available to a news group on the Internet using a computer simulation.  
Investigates mechanical and alternative power transmission systems.  
Investigates the use of ratchet mechanisms.  
Investigates the use of clutch and brake mechanisms.  
Investigates different forms of motors.  
Investigates gear box design.  
Investigates the functions and operations of an automated control system.  
Investigates the functions and operations of sensors.  
Investigates the compression of gases.  
Investigates a design problem and solution for a commercial animation movie.  
Investigates documentary recordings.  
Investigates the basic function and operation of a counter IC.  
Investigates the function and application of an OR gate.  
Investigates the function and application of an XOR gate.  
Investigates the function of 2 and 4 bit binary decoder circuits.  
Investigates different types of electronic circuit diagrams.  
Investigates the methods of navigation used by explorers in the sixteenth century.  
Investigates the impact that errors in GPS readings can have.  
Investigates the use of software as an aid to planning routes.  
Uses a troubleshooting flow chart to investigate problems in a car's starting and ignition systems.  
Investigates the output signal produced by an automotive temperature sensor.  
Uses a multimeter to investigate problems in a car's cooling system electronics.  
Carries out fault finding to investigate a problem in the air bag system of a vehicle.

Uses an engine testing simulation to investigate the performance of a poorly tuned engine.  
Investigates alternative automotive fuels.  
Investigates turbocharger and supercharger technology and how they boost engine performance.

**7.15 Develop and present a research proposal on the proper use and removal of biological and chemical waste.**

Writes a report on Alternative Energy.  
Makes a presentation to a group on Alternative Energy.  
Writes a report on Construction Technology.  
Makes a presentation to a group on Construction Technology.  
Writes a report on Biomedical Technology.  
Makes a presentation to a group on Biomedical Technology.  
Writes a report on Materials and Processes.  
Makes a presentation to a group on Materials and Processes.

**7.16 Explain the steps and processes that occur during the lift of vehicles.**

Shows how lift is limited by the stall point of a wing.  
Demonstrates lift created by a pitched blade for helicopter application.  
Calculates the lift force produced by one rotor blade.  
Calculates the work done when lifting a vehicle with a screw jack.  
Designs a uni-directional speed control system for a hydraulic lift.

**7.17 Analyze a variety of persistent technological issues and dilemmas facing various cultures.**

Predicts environmental problems caused by a hydroelectric power station.  
States some of the options available to relieve the energy problems facing society today.  
Identifies the risks and problems of dealing with the waste products of nuclear power stations.  
Identifies the problem of cost in trying to conserve energy.  
Describes the problems pollution causes.  
Describes some issues affecting the Earth's climate.  
States social, economic, ethical and moral issues raised by new technologies.  
States alternative problems that have solutions related to aerodynamics.

**8.1 The student will understand the positive or negative impact of technology on the environment.**

Describes the environmental impact of a hydroelectric power scheme.  
Evaluates the environmental impact of three potential dam sites.  
Predicts environmental problems caused by a hydroelectric power station.  
Completes an Environmental Impact Assessment table.  
Identifies short term and long term social and environmental impacts of communication systems.

**8.2 The student will understand the responsible use of technology as it relates to the environment.**

Describes the environmental impact of a hydroelectric power scheme.  
Evaluates the environmental impact of three potential dam sites.  
Predicts environmental problems caused by a hydroelectric power station.  
Completes an Environmental Impact Assessment table.  
Describes some issues affecting the Earth's climate.  
Identifies short term and long term social and environmental impacts of communication systems.  
Recognizes a social, economic and environmental advantage or disadvantage of electronic communication systems.

**8.3 The student will understand the prevention of waste of environmental resources.**

Writes a report on Construction Technology.

Makes a presentation to a group on Construction Technology.  
Writes a report on Materials and Processes.  
Makes a presentation to a group on Materials and Processes.

**8.5 The student will understand the safe application of materials and products of technology.**

Recognizes electrical hazards and the importance of safety in a residential electrical system.  
Extracts information from text to highlight safety hazards in the home.  
Identifies a traffic control system as a safety critical system.  
Identifies an automatic door as a safety critical system.  
Identifies the common safety features employed in automatic systems.  
Makes a plastic safety cap for rods or poles.  
Uses a checklist to identify the actions needed to make an aircraft takeoff safely.  
Uses a checklist to identify the actions needed to make an aircraft land safely.  
Investigates the basic safety warning system circuit of a motor vehicle.

**9.1 The student will gather product information from brochures, internet data, and periodicals.**

Extracts information from a precipitation distribution map of the map U.S.  
Measures actual dimensions on a component and converts this information into a 2D working drawing.  
Extracts historical information about electrical devices from a text book.  
Extracts information from text relating to the dangers of overexposure to the sun's rays.  
Extracts information from text regarding the dangers of excessive alcohol consumption.  
Researches information to be included in a leaflet advertising a drug awareness day.  
Extracts information from text to highlight safety hazards in the home.  
Extracts information from text and pictures of a dental procedure.  
Makes informed decisions based on information in a flow diagram.  
Extracts information about aircraft flight plans from Radar readings.  
Uses the search tools of a World Wide Web simulation to research information about planets.  
Extracts information from Web Pages on a simulated Web.  
Extracts information about communication links from maps and tables.  
Obtains information from a graph of a sound wave.  
Extracts information about spectrograms from a passage of text.  
Selects information from a table of phonetic symbols.  
Retrieves information about the workings of a microphone using a multimedia encyclopedia.  
Extracts information on heating systems from computer based reference material using keywords.  
Extracts information for a time table from a computer database.  
Extracts information for a time table from a computer database.  
Uses software to write a quality control program which uses information automatically gathered from sensors.  
Extracts information as to the purpose of adding actors into an animation.  
Extracts information about the Mayan civilization, paper, and the Roman empire.  
Extracts information about Charles Darwin, Thomas Edison, and The Gettysburg Address.  
Extracts information about Space Shuttle, the Moon Landing, and Rock 'n' Roll.  
Extracts information from tables to create a résumé.

**9.2 The student will research and analyze shopping venues (stores, TV home shopping networks, the Internet, Web auctions, and other advertising medias).**

Selects appropriate target areas to advertise safe sunbathing.  
Researches information to be included in a leaflet advertising a drug awareness day.  
Uses ICT to produce a leaflet advertising an event.

Identifies applications of the Internet.

Uses the search tools of a World Wide Web simulation to research information about planets.

Extracts information from Web Pages on a simulated Web.

Uses a File Transfer Protocol simulation to analyze the process of down loading software from the Internet.

Uses a Web Page Editor simulation to create a Web Page relating to digital signals.

Identifies the main components of a Web Page.

Uses a Web Page Editor simulation to create a Web Page about Binary Code.

Investigates the various tools available to a news group on the Internet using a computer simulation.

Demonstrates a page on Binary code created using a Web Page Editor simulation.

Describes and demonstrates how to use a Web Browser simulation as an electronic book with hot links.

Describes how to use hot links in a Web Browser software package.

Demonstrates a simulated Web Page advertisement for an electronic communication system.