

North Carolina State VoCAT Reports

Exploring Technology Systems: Course #8108

1.01 Define technology and its importance to society.

- Outlines how satellite technology is used to gather weather data.
- Defines the term 'technology'.
- Interprets the term Construction Technology.
- Identifies the role of Construction Technology.
- Recognizes how technology has changed drafting.
- Identifies the function of CAD within society.
- Recognizes the impact of technology upon drafting.
- Defines the meaning of the term technology.
- States the general uses of energy in society.
- Investigates the impact of technology on medical treatments.
- Recognizes the impact of technology on health.
- States the impact of technology on health.
- Investigates the impact of orthotics and prosthetics on society.
- States scientific principles of importance to space technology.
- Explores the benefits that new technology has brought to communication systems.
- Recognizes the contribution that electronics technology has made to society.

1.02 Analyze the resources of technology.

- States that energy can be transformed.
- 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 the natural source of energy.
- Identifies a non-renewable energy resource.
- Identifies the problems associated with non-renewable energy resources.
- States the general uses of energy in society.
- Identifies why the property of materials is important for medical use.
- Identifies the properties of the materials used for making denture casts.
- Identifies why the property of materials is important for medical use.
- Compares the hardness of materials to find appropriate solutions for product designs.
- 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.
- Identifies uses of secondary materials for the manufacture of parts.

1.03 Analyze the elements of the universal systems model.

- Describes the action of a computer program when using the computer screen as the output.
- Recognizes the processes required for speech processing.
- Recognizes the way computers regard input information.
- Identifies the mechanical processes in operating a mouse.
- Identifies input procedures.
- Identifies the difference between a computer input device and a computer output device.

Classifies electronic devices as input devices, process devices or output devices and states an appropriate use for them.

Identifies the components providing feedback to a system.

Identifies Input, Process, Output and Feedback devices from a diagram.

2.01 Exhibit safe and appropriate lab and classroom behavior.

States the safety procedures used when operating the maglev system.

Describes safety guidelines when using model rockets.

Describes safety procedure for launching dowel rods.

Identifies the importance of safety procedures when using mechanisms.

States the importance of safety procedures when using mechanisms.

Identifies safety procedures when working with pneumatic systems.

States the importance of safety procedures when using hydraulics.

Explains the importance of safety procedures when using hydraulics.

Identifies safety precautions needed when working with hazardous processes.

2.02 Apply management and communication skills.

Makes a presentation to a group on Health Management.

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 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 Mechanisms.

Makes a presentation to a group on Pneumatics.

Makes a presentation to a group on Hydraulics.

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.

3.01 Describe events in the evolution of technology.

States the development of the transistor.

Examines the early history of motor car development.

Identifies the development of the internal combustion engine.

3.02 Assess the impact of technology.

Recognizes the impact of technology upon drafting.

States the possible impact of transportation systems of the future.

Investigates the impact of technology on medical treatments.
Recognizes the impact of technology on health.
States the impact of technology on health.
Explores the impact of advertising on smoking.
Explores the impact of advertising on drinking.
Investigates the impact of orthotics and prosthetics on society.
Evaluates the impact of space technology on society.
Indicates that the use of fossil fuels harms the environment.
Explores the benefits that new technology has brought to communication systems.

4.01 Analyze the components of a problem-solving method.

Identifies the difference between a computer input device and a computer output device.
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.
Identifies electronic systems in terms of Input, Process and Output.
Describes electronic systems in terms of Input, Process and Output.
Recognizes the stages in the Design and Problem Solving Loop.
Describes the stages in the Design and problem solving loop.

4.02 Apply a problem-solving method to a technological problem.

Interprets a brief to design a bridge.
States the differences between problems solved by invention and by innovation.
States the purpose of research and the design brief.
Creates tables, graphs and flowcharts when conducting research.
Designs a car following a design brief.
Presents a solution to a communication problem.
Explains the processes involved in creating a presentation.
Evaluates the importance of decision making in automation.
Determines the importance of decision making in robot control.
Designs a transmission system for a winch.
Evaluates proposed solutions to a pneumatic problem.
Designs a hydraulic circuit to simulate a sequencing application.
Constructs a fully operational electronic circuit with feedback to monitor and react to temperature changes.
Evaluates suggestions for improvements to a tabletop game.
Designs a tabletop game using thermoplastic parts.

5.01 Identify design criteria.

States the function of components in a model rocket.
States the function of a solar panel transducer.
Identifies the function of the parts of a d.c. motor.
Identifies the function of different parts of an aircraft.
Identifies the function of wind tunnels.
Identifies the function of each part in a microwave communication system.
Identifies pneumatic components and their function from symbols.
Investigates the function of a spring return valve.
Recognizes the use and function of flow restrictors.
Identifies pneumatic components and their function from symbols.

Investigates the function of simple pneumatic components.
Recognizes the three categories of hydraulic valves and their function.
Identifies the function of hydraulic valves.
Recognizes component function from symbols.
Describes the function of a range of electronic components used in an electronic steady hand game.
States the differences between problems solved by invention and by innovation.

5.02 Design a technological product.

Interprets a brief to design a bridge.
Designs a bridge construction.
Follows a design brief to draw a mechanical component.
Designs and creates a poster to inform the public the dangers of smoking tobacco.
Solves a car design problem using computer software.
Designs a car following a design brief.
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.
Designs a tabletop game using thermoplastic parts.

6.01 Analyze the components and types of communication systems.

Demonstrates that voice messages can be sent across a microwave link.
Describes the communication process of a string based communication system.
Demonstrates that radio waves can travel further than sound waves and pass through objects.
Describes the basic process of radio communication.
Identifies the function of each part in a microwave communication system.
Recognizes omnidirectional and unidirectional transmission due to antenna type.
Examines wire communication systems.
Recognizes the frequency, wavelength and amplitude of waves.
Identifies different types of waves.
Use a Web Browser to search for selected information.
Investigates radar technology.
Identifies parts of the human anatomy that allow us to speak and hear.
Records a sentence to a computer using audio software.
Identifies characteristics of a digital speech wave pattern.
Identifies the characteristics of a high volume low pitch sound.
Converts text to speech using computer software.
Alters the sound of a voice using software.
Identifies computer aided publishing as an effective form of communication.
Opens and edits a desktop publishing document.
Investigates the wide range of CAD applications.
Identifies how to draw a three-dimensional object by adding elevation.

6.02 Identify forms of communication technology.

Investigates the wide range of CAD applications.
Creates a CAD drawing using coordinate systems.
Completes a CAD drawing of a kitchen plan.
Draws the top view of a component part.
Draws the front view of a component part.
Explores the principles of orthographic projection.

Identifies how to draw a three-dimensional object by adding elevation.
Draws a three-dimensional mechanical component.
Describes the communication process of a string based communication system.
Describes the basic process of radio communication.
Identifies the function of each part in a microwave communication system.
Demonstrates that messages can be sent along wire cable.
Identifies parts of the human anatomy that allow us to speak and hear.
Records a sentence to a computer using audio software.
Identifies computer aided publishing as an effective form of communication.
Uses resizing tools and design tools to alter a graphic.
Corrects a desktop publishing document.
Identifies the components of a letterpress printing plate.
Uses the correct technical terms for letterpress print.
Identifies letterpress production methods.
Identifies lithographic production methods.
Identifies the components of a lithographic printing plate.
Identifies lithographic print processes.
States the theory used to process color.

7.01 Measure in US and metric increments.

Identifies the units used to measure speed.
Identifies the units used to measure energy and power.
Measures localized weather conditions.
Measures d.c. voltage.
Measures d.c. current.
Measures resistance.
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 chord length of wing section.
Measures the value of an angle using a protractor.
Calculates area and volume using units of measure.
Measures force.

7.02 Identify the geometry used in technical drawings.

Measures distance between lines to show that they are parallel.
States vertical angle measured using protractor and plumb line.
Calculates angles in structural shapes.
Calculates the angle between posts arranged in a circle.
Demonstrates the effect of changing the angle of attack on lift.
Measures angles of wings in airflow.
Measures the value of an angle using a protractor.
Calculates areas of squares and rectangles used by printers.
Identifies basic angles in use on a robot.
Calculates the sum of three angles.
Uses a remote control model car to investigate steering geometry.

- Calculates the circumference of a circle.
- Calculates the difference between the radii of two circles.
- Calculates the diameter of a circle.
- States the number of degrees in a circle.
- States the number of degrees in a circle around the Earth.
- Identifies the properties of a polygon.

7.03 Produce a sketch / technical drawing.

- Creates a CAD drawing using coordinate systems.
- Determines the dimensions and settings for the drawing area.
- Completes a CAD drawing of a kitchen plan.
- Recognizes how to print out CAD drawings.
- Translates 'real world' information into working drawings.
- Identifies landscape features from contour lines by drawing cross sections.
- Determines the center point of an object.
- Distinguishes between the different lines used in drafting.
- Identifies landscape features from contour lines by drawing cross sections.
- Interprets contour lines.

7.04 Produce a computer aided drawing.

- Translates 'real world' information into working drawings.
- Investigates the wide range of CAD applications.
- Identifies menu and toolbar options in a CAD package.
- Follows instructions to open sample CAD files.
- Recognizes the principles of coordinate systems used in CAD.
- Creates a CAD drawing using coordinate systems.
- Explores the role of CAD in the design process.
- Recognizes commands used in CAD software.
- Completes a CAD drawing of a kitchen plan.
- Demonstrates how to use CAD commands.
- Recognizes how to print out CAD drawings.
- Explains how to use CAD commands.
- Constructs CAD images using coordinate systems.
- Identifies the function of CAD within society.
- Examines the use of CAD in architectural drafting.
- Identifies technical terms used in CAD.
- Examines the use of CAD in component drafting.
- Uses CAD to create 3D models.

7.05 Produce a multimedia product.

- Recognizes multimedia applications.

8.01 Describe the types and forms of energy.

- Defines alternative energy.
- States that energy can be transformed.
- Builds and tests a model car powered by solar energy.
- Identifies the device used to convert wind energy to electrical energy.
- States that a device which changes energy from one form to another is called a transducer.
- States that wind energy can be used to generate electricity.

Identifies the processes involved when using nuclear energy to generate electricity.
Identifies the possible dangers of using nuclear energy.
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 the natural source of energy.
Identifies a source of Kinetic energy.
Identifies an application of wind energy.
Identifies a non-renewable energy resource.
Identifies a modern application of an alternative energy source.
Examines how energy is produced by a nuclear power plant.
Identifies the units used to measure energy and power.
States how energy is transferred in a hydroelectric power plant.
Identifies the problems associated with non-renewable energy resources.

8.02 Apply principles of energy and power.

Uses multiplication to work out electricity cost.
Works with algebra to convert watts into kilowatts.
Identifies the types of forces operating in structures.
Identifies forces applied to bridge construction.
Measures the minimum force required to move a vehicle.
Describes the effect of down force.
Measures lift force created by a flat wing section.
Examines the forces produced by rocket motors.
Investigates the relationship between force and motion.
Measures force.
Measures forces on an inclined plane.
Examines force of friction when rolling and sliding loads.
Performs force-pressure-area evaluation on cylinder applications.
States the relationships between force, pressure and area.
Identifies the use of compressing and stretching forces to shape materials.
Examines how energy is produced by a nuclear power plant.
Identifies the units used to measure energy and power.
Calculates the power output of a single generator.
Identifies the source of power used on satellites.
Identifies the correct energy flow in a nuclear power plant.
States the principles of electric power generation.
Identifies a source of Kinetic energy.
States that kinetic energy is energy an object has because it is moving.
Recognizes the difference between potential and kinetic energy.
Gives direct instructions to control movement to identify potential and kinetic energy.

9.01 Describe components and modes of transportation systems.

Uses a remote control model car to identify drive and steering systems.
Identifies the transmission, brakes and electrical system of a car.
Investigates the basics of a car's fuel and exhaust system.
Examines the early history of motor car development.
Identifies the development of the internal combustion engine.
Investigates the steering and braking systems used to control a motor car.

Observes airstreams around different wing designs.
Selects a lighter-than-air craft from a list of flying vehicles.
Identifies the function of different parts of an aircraft.
Identifies the application of aerodynamics in aircraft design.
Uses a remote control model car to investigate the function of a motor vehicle suspension system.
Explores car suspension system technology.
Identifies types of suspension system used in modern cars.
Recognizes the basic parts and function of a car suspension systems.
Recognizes the basic parts and function of a car engine.

9.02 Apply principles used in transportation systems.

Identifies the causes of lift and drag.
Identifies the cause of aerodynamic lift.
Describes the process of lift.
Indicates how lift is affected by the angle of attack.
Demonstrates the effect of changing the angle of attack on lift.
Observes the effect of changing wind speed on lift.
Calibrates a wind tunnel lift meter.
Measures lift force created by a flat wing section.
Calculates the effect of adjusting the lift/drag range on meter readings.
Calculates value of lift meter reading.
Measures lift readings to compare different wing types.
States the principles that cause lift.
States the effect that the angle of attack has on lift.
Investigates the effect of gravity on mechanical devices.
Examines the influence of gravity on people.
Performs experiments to demonstrate the effects of gravity.
Uses IT to examine the effect of thrust and mass on a rocket.
Makes an airfoil shaped wing.
Solves problems in aerodynamics to test a glider.
States the principles of aerodynamics.
Identifies the application of aerodynamics in aircraft design.
Writes a report on Aerodynamics Technology.
Makes a presentation to a group on Aerodynamics Technology.

10.01 Identify the components and types of structural systems.

Identifies structural shapes.
Identifies the importance of shape in structures.
Identifies areas of weakness in structures.
Examines material properties.
Relates structural shape and strength.
Identifies areas of weakness in a skyscraper.
Identifies the benefits of bridge construction.
Identifies structural differences between different bridge constructions.
States properties of structures.

10.02 Apply scientific principles used in structural systems.

Identifies compression.
Defines compression.

Identifies compression of gases, liquids and solids using the molecular structure model.
Defines tension.
Identifies tension.
Defines torsion.
Plots and reads a graph of load against beam deflection.
Identifies the types of forces operating in structures.
Uses test equipment to analyze deflection.
Relates structural shape and strength.
Identifies the effect of earthquakes on skyscrapers.
Identifies forces applied to bridge construction.
Calculates structural material quantities.

11.01 Describe the components and types of manufacturing systems.

Identifies suitable applications for robots.
Accounts for the importance of computers in automation.
Indicates key features in flow diagrams.
Evaluates the importance of decision making in automation.
Identifies the wasting and separating processes used to manufacture a wooden spoon.
Identifies the shaping and forming processes used to manufacture a metal spoon.
Identifies the molding processes used to manufacture a plastic spoon.
Uses computer simulation to obtain Brinell hardness figures of metals and plastics.
Compares the hardness of materials to find appropriate solutions for product designs.
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.
Evaluates the heat properties of materials to find appropriate solutions for product designs.
Investigates the materials used in the manufacture of a floppy disk.
Follows written instructions to run a simulated melting point test on a computer.

11.02 Describe advanced technologies used in manufacturing systems.

Investigates the wide range of CAD applications.
Explores the role of CAD in the design process.
Draws the front view of a component part.
Explores the principles of orthographic projection.
Identifies how to draw a three-dimensional object by adding elevation.
Draws a three-dimensional mechanical component.

11.03 Apply current technologies used in manufacturing systems.

Evaluates suggestions for improvements to a tabletop game.
Extracts part information from a diagram to make a tabletop game.
Extracts material information from a table to make a tabletop game.
Designs a tabletop game using thermoplastic parts.

12.01 Identify trends in technology.

Writes a report on Robotics and Automation.
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 Mechanisms.
Writes a report on Pneumatics.
Writes a report on Hydraulics.
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.

12.02 Identify occupational opportunities in relation to trends in technology.

Describes different careers in biomedical technology.
States some career opportunities in the computer aided publishing industry.
Identifies some career roles associated with computer aided publishing.
Identifies experiences required for a digital photography based career.
Identifies the working situations of careers based on digital photography.
Extracts photographic career details from a newspaper advertisement.
Identifies careers and applications involving digital photography.
Identifies jobs provided by the alternative energy industries.
Identifies the job title for a person employed in the DTP industry.
States the responsibilities of personnel working in therapeutic services.

Fundamentals of Technology: Course #8110

001.01 Assess the importance of technology to society.

Outlines how satellite technology is used to gather weather data.
Identifies the role of Construction Technology.
Identifies the importance of shape in structures.
Identifies the role of 'Construction Technology'.
Identifies the function of CAD within society.
Investigates the impact of technology on medical treatments.
Recognizes the impact of technology on health.
Explores the benefits that new technology has brought to communication systems.
Accounts for the importance of computers in automation.
Accounts for the importance of sensors in manufacturing.
Recognizes the contribution that electronics technology has made to society.
States the benefits and costs associated with space technology.
Evaluates the impact of space technology on society.
Investigates the impact of communication links on society.
Evaluates the changes in employment due to changes in manufacturing technology.

Evaluates the changes in employment due to changes in manufacturing technology.
Identifies how manufacturing careers have changed with modern technology.

001.02 Analyze major historical developments in technology.

Explores the history of industrial control.
Examines the early history of motor car development.
Extracts historical information about electrical devices from a text book.
Identifies contributions by individuals throughout the history of aerodynamics.
Identifies facts about the history of the telegraph.
Identifies facts about the history of the telephone.
Investigates the history of the Fax machine.
Identifies major historical advances in photographic technology.
Draws a timeline showing the development of satellite technology.

001.03 Explain the Universal Systems Model.

Calculates output/input as a percentage.
Identifies the input-process-output elements of human control systems.
Reads a diagram showing an input-output sequence for a manual control task.
Identifies the input-process-output elements of computer control systems.
Reads a diagram showing an input-output sequence for a computer control task.
Classifies electronic devices as input devices, process devices or output devices and states an appropriate use for them.
Constructs an electronic circuit with feedback to monitor and react to temperature levels.
States the operation of individual components in a temperature controlled system with feedback.
Identifies the components providing feedback to a system.
Identifies Input, Process, Output and Feedback devices from a diagram.
Describes the action of an electronic system to monitor temperature and provide feedback from a motor controlled fan.
Identifies electronic systems in terms of Input, Process and Output.
Describes electronic systems in terms of Input, Process and Output.
Identifies the input to and output from a mechanical system.
Recognizes operations of Input/Output devices.
Uses software to write a semi-automatic control program using feedback from two sensors.
Uses software to write a fully automatic control program with feedback from two sensors.
Investigates inputs and outputs of an automated control system.
Identifies the input and output part of systems.

002.01 Apply management and communication skills.

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 & 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 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 Video Production 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.

002.02 Apply the steps of a formal problem solving method.

Solves problems in a circuit during testing.
Solves problems involving an electronic alarm circuit.
Solves problems in a circuit during testing.
Solves problems involving an electronic alarm circuit.
Recognizes 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.
Investigates the problem of slippage in pulley belt systems.
Solves problems involving gear ratios.
Evaluates proposed solutions to a pneumatic problem.
Uses logic to solve electro-pneumatic control problems.

002.03 Demonstrate safe laboratory and classroom behavior.

Operates hydraulic equipment safely.
Operates hydraulic equipment safely.
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.
Operates the mechanical systems trainer safely.
Identifies the importance of safety procedures when using mechanisms.
Identifies safety procedures when working with pneumatic systems.
States the importance of safety procedures when using hydraulics.
Explains the importance of safety procedures when using hydraulics.
Identifies safety precautions needed when working with hazardous processes.
Identifies procedures for using a thermoplastic injection molder safely and accurately.
Identifies safety precautions needed when working with hazardous processes.
Recognizes electrical hazards and the importance of safety in a residential electrical system.
States the importance of safety in the home.
Extracts information from text to highlight safety hazards in the home.
Describes safety guidelines when using model rockets.
Identifies procedures needed to carry out a model rocket launch safely.

Identifies the common safety features employed in automatic systems.
States the importance of safety procedures when using mechanisms.
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.

003.01 Define terms and tools used in Customary and SI measurement systems.

Identifies the units used to measure speed.
Identifies the units used to measure energy and power.
States the unit of measure for light.
States how to use a multimeter to measure physical quantities in an electronic circuit.
States the units used to measure work, heat and power.
Defines SI units of length.
Defines pressure as force per unit of area.

003.02 Measure using Customary and SI measurement systems.

Measures d.c. voltage.
Measures d.c. current.
Measures resistance.
Measures distance between lines to show that they are parallel.
Uses the wind tunnel to measure drag.
Measures chord length of wing section.
Measures angles of wings in airflow.
Measures the value of an angle using a protractor.
Calculates area and volume using units of measure.
Measures force.
Measures distance using a map scale.
Measures angles of elevation using the 'Altiscan' Altitude Indicator.
Determines actual size from measured using a scale.
Measures actual dimensions on a component and converts this information into a 2D working drawing.
Uses a clinometer to measure altitude.
Measures the length of an aerial photograph in millimeters.

004.01 Describe electronic components and basic circuits.

Classifies electronic devices as input devices, process devices or output devices and states an appropriate use for them.
Classifies electronic devices as input devices, process devices or output devices and states an appropriate use for them.
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.
States the operation of individual components in a temperature controlled system with feedback.
Identifies the components providing feedback to a system.
Identifies the correct circuit symbols for a range of electronic components.
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.
- States the function of electronic components.
- States the function of electronic circuits.
- Recognizes the basic principles of electric circuits.
- Identifies components of a solar collector.
- Investigates the operation of parallel connected switch circuits.
- Compares series and parallel circuits.
- Describes how resistors control voltage and current in electronic circuits.

004.02 Access, communicate and store information using a computer.

- Follows instructions to open sample CAD files.
- Solves a car design problem using computer software.
- Use a Web Browser to search for selected information.
- Extracts information about communications technology using a Web Browser.
- Converts text to speech using computer software.
- Uses a simple word processor to read and write information to disk.
- Locates information in a variety of media.
- Opens and edits a desktop publishing document.
- Opens a computer file using menu options on a menu bar.
- Opens desktop publishing templates.
- Creates titles for a video film using computer software.
- Opens and explores AutoCAD files.

004.03 Use control technology to operate a system.

- Uses the computer as a device to control external equipment via the parallel port.
- Identifies use of computers in control of external devices.
- Follows a program sequence to control a robot.
- Observes the operation of a Work-Cell controlled by a PLC program.
- Creates a latch function in a ladder logic program.
- Completes a program to latch two components using infrared sensors.
- Completes a program to sort bobbins on a work-cell.
- Creates a program to control a conveyor belt with a timed sequence.
- Programs and tests a prototype security system.
- Programs and tests a fire detection and warning system.

005.01 Apply techniques used in sketching.

- Uses symbols to draw a pneumatic circuit diagram.
- Creates drawings of an animation character.

005.02 Produce technical drawings using a CAD system.

- Creates a CAD drawing using coordinate systems.
- Completes a CAD drawing of a kitchen plan.
- Draws the top view of a component part.
- Draws the front view of a component part.
- Draws a three-dimensional mechanical component.
- Draws an orthographic projection of a 3D model.
- Constructs CAD images using coordinate systems.
- Uses CAD to create 3D models.
- Uses Architectural CAD software to draw an outline plan of a building.

Uses layers to draw a residential layout plan.
Completes a CAD drawing using cartesian coordinates.
Draws the third angle orthographic projection of a dice.
Completes a drawing using polar coordinates.
Adds linear dimensions to a drawing.
Adds radial dimensions to a drawing.
Adds dimensions to component drawing.
Follows a design brief to draw the left view of a mechanical component.
Draws an isometric view from an orthographic projection.
Draws a mechanical component according to the specifications of a design brief.

006.01 Produce a technical report on an aspect of 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 Basic Electricity.
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 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 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 Video Production Technology.
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.

006.02 Deliver a formal presentation with supporting graphics.

Demonstrates a multimedia presentation.
Explains the processes involved in creating a multimedia presentation.
Identifies types of media used in a multimedia presentation.
Identifies the purpose of a storyboard for multimedia presentation production.
Identifies steps to create a multimedia presentation.
Identifies the purpose of hyperlinks in a multimedia presentation.
Completes a weather presentation.
Makes a weather presentation in a professional manner.

Makes a presentation on troubleshooting in a professional manner.

008.01 Explain terms and principles associated with tool and machine use.

Identifies the function of the heat controller on a thermoplastic molder.

Locates input parts and accessories of a thermoplastic molder.

Locates process parts and accessories of a thermoplastic molder.

Identifies the parts of an injection molder.

Assembles and uses a stepped pulley and belt system.

Investigates the problem of slippage in pulley belt systems.

Uses the mechanical trainer to investigate pulley systems.

Builds and tests a moveable pulley system.

Demonstrates mechanical advantage using first order levers.

Makes inferences based on experiments using first order levers.

Builds and uses 2nd and 3rd order lever systems.

Measures forces on an inclined plane.

Describes the uses of pulleys.

Identifies lever systems.

Describes the uses of pulleys.

Identifies lever systems.

States the relationships between force, pressure and area.

Recognizes the hydraulic lever principle.

Applies the hydraulic lever principle.

Evaluates a hydraulic lever.

Recognizes different types of force.

Assembles and uses a stepped pulley and belt system.

Calculates output speeds of pulley belt systems.

Calculates speed changes for timing pulley systems.

Applies the gear ratio formula to a timing pulley system.

Examines the effort gained using fixed pulleys to raise loads.

Calculates Mechanical Advantage for pulley systems.

Uses pulley systems that reduce the effort needed to lift loads.

Calculates mechanical advantages for moving pulley systems.

Performs tests with first order lever systems.

Examines the application of first order levers.

Performs tests with second order lever systems.

Calculates moments of forces for lever systems.

Examines the application of second order levers.

Performs tests with third order lever systems.

Identifies the type of lever used in applications.

Explores applications of screws as motion converters.

008.02 Use selected tools and machines to solve technological problems.

Creates solid plastic from thermoplastic granules.

Follows instructions to obtain an extrusion of molten plastic from an injection molder.

Forms a token using an injection molder with a mold.

Follows instructions to make a plastic doorknob using a mold and an injection molder.

Makes a plastic safety cap for rods or poles.

Makes lengths of plastic extrusion.

Cuts lengths of plastic and wood to a specified length.
Creates a plastic model car with an intentional fault.

009.01 Explain terms and principles associated with materials and their use.

Selects different plastics in a set of sample materials from given descriptions.
Selects different metals in a set of sample materials from given descriptions.
Identifies the shaping and forming processes used to manufacture a metal spoon.
Identifies the wasting and separating processes used to manufacture a wooden spoon.
Identifies the molding processes used to manufacture a plastic spoon.
Uses computer simulation to obtain Brinell hardness figures of metals and plastics.
Identifies that wood, metal and plastic are shaped using a variety of manufacturing processes.
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.
Identifies uses of secondary materials for the manufacture of parts.
Evaluates the heat properties of materials to find appropriate solutions for product designs.
Identifies the use of compressing and stretching forces to shape materials.
Evaluates the densities of materials to find appropriate solutions for product designs.
Identifies how thermoplastic molding processes are used in manufacturing.
Selects different plastic and metal sample materials using descriptions.
Identifies forming processes for wood, metals and plastics.
Identifies the uses of materials relating to their impact resistance characteristics.
Measures the Izod Impact Strength of acrylic using a software simulation program.
Identifies the density of copper and PVC.
Investigates copper and PVC to discover their electrical properties.
Investigates copper and PVC to discover their thermal properties.
Investigates copper and PVC to discover their resistance to an impact.
Investigates copper and PVC to discover their hardness index.
Investigates copper and PVC to discover their tensile strength.
Calculates the strength to weight ratios for sample materials.
Calculates the strength to weight ratio of a material using division, and correcting the value to 3 decimal places.

009.02 Explain terms and principles associated with material processes.

Identifies the parts of an injection molder.
Identifies pine wood as the processing material on an operation sheet.
Selects different plastic and metal sample materials using descriptions.
Identifies forming processes for wood, metals and plastics.
Identifies that a band saw is used to cut out the flat shape to make a wooden spoon.
Calculates the weight of quantities of sample materials.
Identifies the uses of materials relating to their strength characteristics.
Identifies how welding is used to permanently join metals in vehicle manufacture.
Identifies the mechanical fastenings, and their tools, used in the fabrication of furniture.
Identifies that scrap metal is recycled as cast iron products.
Identifies plastics from a range of sample materials.
Identifies the uses of various types of plastic.
Identifies woods from a range of sample materials.
Identifies 'malleability' as the property that lets a material be pounded, rolled and formed into sheets.
Identifies the structure of gasses and liquids.
Identifies the thermal and electrical properties of a sample range of materials.

Identifies composite and ceramic material from a set of samples.
Identifies the properties and uses of ceramics.
Describes the use of thermoplastic, thermoset and composite materials.

009.03 Use selected materials to solve technological problems.

Creates solid plastic from thermoplastic granules.
Follows instructions to obtain an extrusion of molten plastic from an injection molder.
Forms a token using an injection molder with a mold.
Uses a design loop in making a plastic doorknob suitable for fixing with a metal screw by changing part of the mold.
Makes a plastic safety cap for rods or poles.
Cuts lengths of plastic and wood to a specified length.
Makes lengths of plastic extrusion.
Follows defined steps to mold a plastic product.
Creates a plastic model car with an intentional fault.
Adapts a smart mold design to produce a screwdriver.
Designs a doorknob that has a good finger grip.
Evaluates and redesigns a product to fulfill a design criteria.
Designs and manufactures a corn-cob holder.

010.01 Explain energy sources and energy conversion processes.

States that energy can be transformed.
States that a device which changes energy from one form to another is called a transducer.
States that wind energy can be used to generate electricity.
Identifies the processes involved when using nuclear energy to generate electricity.
Identifies the possible dangers of using nuclear energy.
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 the natural source of energy.
Identifies a source of Kinetic energy.
Identifies an application of wind energy.
Identifies a non-renewable energy resource.
States how energy is transferred in a hydroelectric power plant.
Identifies the problems associated with non-renewable energy resources.
Recognizes the difference between potential and kinetic energy.
States the forms and types of energy.

010.02 Apply energy conversion processes to solve technological problems.

Builds and tests a model car powered by solar energy.
States that wind energy can be used to generate electricity.
Builds a motor support structure and uses an appropriate alternative energy source to drive it.
Evaluates compressed air as a medium for transferring energy in fluid power systems.

012.01 Identify occupational opportunities in relation to trends in technology.

Identifies jobs provided by the alternative energy industries.
Describes different careers in biomedical technology.
Describes different careers in biomedical technology.
Identifies the job title for a person employed in the DTP industry.
States some career opportunities in the computer aided publishing industry.

Identifies some career roles associated with computer aided publishing.
Identifies experiences required for a digital photography based career.
Identifies the working situations of careers based on digital photography.
Extracts photographic career details from a newspaper advertisement.
Identifies careers and applications involving digital photography.
Recognizes the importance of preparing for a career.
Identifies career pathways in industry and manufacturing.
Identifies careers involved in materials and processes.
Identifies photographic careers.
Identifies skills required for a career in a photographic field.
Extracts photographic careers from a chapter of text.
Identifies careers involving photographic technology.