

Wisconsin's Model Academic Standards for Technology Education (High School Level)

A. Nature of Technology

A.12.1 - Contrast the increasing complexities of technology with its ease of use

- Outlines the development of construction technology.
- Recognizes the stages involved in site preparation.
- Calculates the costs involved in excavation.
- Investigates the technology of roof trusses.
- Recognizes the key applications of computers in construction technology.
- Investigates modern bridge technology.
- Evaluates how new technology is used in tunnel construction.
- Explores the procedures involved in the printing of a drawing in CAD.
- Examines the commands involved in adding dimensions to a drawing.
- States the relationship between science and technology.
- Describes the involvement of computers in aerodynamics technology.
- Identifies support systems involved in launching rockets.
- Creates a flow diagram to show the stages involved in launching model rockets.
- Identifies advantages and disadvantages of Fax technology.
- States the processes involved in analog to digital conversion.
- Identifies the processes involved in text to speech conversion.
- Identifies the processes involved in creating a digital sound application.
- Recognizes some of the processes involved before a document can be sent to press.
- Explains the processes involved in creating a control program to run a workcell and count the
- Explains the process involved in creating a fully automatic control program using two sensors as feedback.
- 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.
- Recognizes the advantages and disadvantages of power systems compared to pneumatic systems.
- Explains the process involved in creating the drawings of the animation character.
- Explains the process involved in creating the animation of the lion-beast character.
- Explains the process involved in creating the solutions for car promotional material.
- Recognizes the difficulty of synchronizing speech with lip movement.
- States the advantage of a computer based animation package compared with traditional methods.
- Identifies how manufacturing careers have changed with modern technology.
- Identifies the technology of automated processes in the manufacturing industry.
- Identifies careers involved in the materials and processing industry.
- Predicts advances in technology using Moores law.
- Listens to an explanation of conventional and digital camera technology.
- Explains the process involved in creating the animation for the car publicity material.
- Explains the process involved in copying a computer animation onto video tape.
- Explains the steps involved in conventional film processing.
- Describes the processes involved in creating special effects using conventional photographic

Identifies careers involving photographic technology.
Identifies the steps involved in panning.
Identifies careers involving photographic technology.
Explores car suspension system technology.
Technology: Applies technology to a task.
Applies technology to a task: Understands overall intent and proper procedures for setup and operation of equipment.
Technology: Understands operation of equipment.
Applies technology to a task: Use computer to enter and understand a CNC program.
Selects technology: Chooses procedures related to the technology.
Apply technology to the task of preparing a CNC program using subprograms and manufacturing the part.

A.12.2 - Understand that humans are faced with moral and ethical issues because technology is enabling very significant modifications to the natural world.

Describes the environmental impact of a hydroelectric power scheme.
Evaluates the environmental impact of three potential dam sites.
States the purpose of research and the meaning of 'human factors engineering'.
States the impacts of existing solutions to technological problems.
States the social impacts of the automobile in the early part of the 20th Century.
Identifies the impact of transportation.
States social, economic, ethical and moral issues raised by new technologies.
Recognizes the impact of new technologies on teenage magazines and other publications.
Recognizes the impact of new technologies on methods of working.
Investigates the impact of orthotics and prosthetics on quality of life.
Examines the impact of measurement errors on predictions about rocket flights.
Evaluates the impact of space technology on society.
Identifies the impact of computer viruses on ICT users.
Investigates the impact of communication links on society.
Identifies short term and long term social and environmental impacts of communication systems.
Recognizes some immoral uses and ethical issues of storing information on computers.
Identifies the effect of computer applications on the real world.
Evaluates the social impact of manufacturing.
Identifies the impact of an Automated Manufacturing System.
Identifies the impact of discoveries on human navigation.
Investigates the impact that errors in GPS readings can have.
Identifies the impact of discoveries on human navigation.

A.12.3 - Explain why decisions regarding the use of technology are dependent on the situation, application, or perception of the group using it.

Makes informed decisions based on both given and researched information.
Recognizes the key applications of computers in construction technology.
Makes informed decisions based on information in a flow diagram.
Identifies another application that uses the Morse Code system.
Researches applications of computers.
Identifies applications of the Internet.
Investigates the various tools available to a news group on the Internet using a computer
Identifies composite materials suitable for a specific application.
States some uses of digital sound applications.

States some applications of voice recognition software.
Creates commands for a voice activated application.
Identifies the properties and applications of coding systems for digital information.
Identifies applications of binary and ASCII codes.
Identifies applications of computers in the police force.
Identifies applications of instant information systems.
Identifies the effect of computer applications on the real world.
Uses ICT based models and simulations to help make decisions.
Analyze factors which influence the application of automation.
Examines the application of first order levers.
Examines the application of second order levers.
Explores the use of sensors in industrial control applications.
Explores the use of actuators in industrial control applications.
Chooses appropriate video technology hardware.
Chooses appropriate lighting for a video.
Uses a computer application to view a demonstration title sequence, utilizing each of the video production elements.
Demonstrates which microphone is suited to which recording situation.
Uses a multimedia computer based training application to locate information about events through
Creates a matching pairs screen for a multimedia application.
Identifies the most suitable camera for various photographic situations.
Uses tools in an image manipulation application.
Thinking: Ability to learn, reason, think creatively, make decisions, and to solve problems.
Selects technology: Chooses procedures related to the technology.
Selects technology: Chooses procedures, tools, or equipment.

A.12.4 - Explore the way in which human adaptive technological systems interact with ideological and sociological systems.

States some of the options available to relieve the energy problems facing society today.
States the social impacts of the automobile in the early part of the 20th Century.
Uses the GET command to write an interactive control program.
States the purpose of research and the meaning of 'human factors engineering'.
States social, economic, ethical and moral issues raised by new technologies.
Evaluates the impact of space technology on society.
Identifies social and health factors that relate to the increasing use of cellular phones.
Investigates the impact of communication links on society.
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.
Uses computer based reference material to research and develop ideas.
States where software is assisting or replacing humans.
Evaluates the social impact of manufacturing.
States the changes electronics technology has made to society.
Evaluates the design process to adapt a product for another use.

A.12.5 - Portray how a society may not be able to exercise full control over their technological systems.

States the social impacts of the automobile in the early part of the 20th Century.
Writes a password protection program to restrict access to a control system.

- Recognizes the concepts of system and control.
- Identifies the impact of computer viruses on ICT users.
- Identifies advantages and disadvantages of using cellular phones.
- Identifies social and health factors that relate to the increasing use of cellular phones.
- Analyzes the merits and drawbacks of various cellular telephone tariffs.
- Determines the basic components of a climate control system.
- Identifies the output of a system from a dry run of a control program.
- Uses analog sensors to monitor conditions and provide data to control information systems.
- Develops sophisticated control systems with accurate commands.
- Recognizes syntax and runtime errors in control programs.
- Fixes syntax and runtime errors in control programs.

A.12.6 - Use accepted methods of forecasting and projecting to develop scenarios of future technology needs and uses.

Explores the future of automated manufacturing systems.

A.12.7 - Explain how scientific and technological research can contribute to improved quality of life and a better standard of living.

- Makes informed decisions based on both given and researched information.
- Applies tests and improvement procedures to check the quality of systems.
- States the relationship between science and technology.
- States the purpose of research and the meaning of 'human factors engineering'.
- Investigates the impact of orthotics and prosthetics on quality of life.
- Researches applications of computers.
- Researches sensor connections 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.
- Identifies that Life Cycle Analysis aids recycling by saving materials and energy.

B. Systems

B.12.1 - Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires.

- States why the world needs alternative energy.
- States the need for support systems and facilities.
- Identifies the need for immunization.
- Identifies procedures needed to carry out a model rocket launch safely.
- Recognizes different needs when returning space vehicles to earth.
- Identifies the need for voice training in a speech recognition system.
- Identifies the need to automate a security system.
- Identifies the need for automatic systems when working with dangerous substances.
- Uses pulley systems that reduce the effort needed to lift loads.
- Recognizes the need for testing the design of a multimedia product at regular intervals.
- Creates a lesson screen showing how man has evolved.
- Identifies the need to modify a mold design to improve its function.
- Identifies the need for materials with a high strength to weight ratio.
- Identifies the need for recycling, and how this can be done.
- Identifies the impact of discoveries on human navigation.
- 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.

B.12.2 - Demonstrate how systems are planned, organized, designed, built and controlled.

Maintains and organizes a record of work.

Plans an energy efficient house.

Identifies how alternative energy can be used in building designs.

Uses Architectural CAD software to draw an outline plan of a building.

Identifies the various methods used to build structures.

Recognizes the important factors in beam design.

Identifies how buildings can be designed to resist dynamic forces.

Explores the wide range of drawing required to build a structure.

Calculates the area of a kitchen from a floor plan drawing.

Identifies how buildings can be designed to resist dynamic forces.

Follows a design brief to design a new technology lab.

Recognizes the importance of building services.

States that current flow is controlled by circuit components.

States the operating characteristics of a complete computer controlled mechanical system.

Defines technical terms used in the design process.

Describes a design brief and the purpose of specification statements.

States the tests required to assess the effectiveness of the solution in terms of the design brief and the specifications.

States the criteria to be reported on when evaluating a design project.

Uses flowcharts to design a control program.

Tests and evaluates design work.

Writes a report on the tests carried out, and an evaluation of, design work.

Describes the stages in the design and problem solving process.

Analyzes an elevation diagram of a communication system plan.

Justifies choices of communication links in a planning exercise.

Uses and derives specifications, flowcharts and truth tables as part of a systematic design process.

Programs and connects a computerized light level controller.

Describes the workings of a time controlled system.

Identifies the controller in the Robotek workcell.

States the advantages of using programmable digital controllers in automated systems.

Determines the correct sequence for a design process.

Identifies the need to modify a mold design to improve its function.

Evaluates and redesigns a product to fulfill a design criteria.

Evaluates the design process to adapt a product for another use.

Creates a budget plan for a company working with Materials and Processes.

Information: Acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.

Resources: Know how to allocate time, money, materials, and staff associated with the manufacture of the components for the design brief.

Creates bill of materials and develops a production plan.

Recognizes that RoboTEK does not use a position sensor to feedback joint position to the

Designs and builds a motorized winch system.

Identifies key points in the pre-production planning of the ScanTEK Development Video, specifically the use of Outline, Brief and Treatment.

Uses pre-production planning techniques.

Explores the structure of and materials used to build integrated circuits.

Uses capacitors and resistors to build an electronic filter.
Combines electronic building blocks to form an electronic organ circuit.
Designs and builds a logic control system for starting an electric car.
Explores car suspension system technology.
Identifies the function of the transmission system of a motor vehicle.
Interprets text describing the design process of a car.
Identifies how friction affects the systems of a car.

B.12.3 - Explain how enterprises apply technological systems for generating wealth by providing goods and services.

Calculates the costs involved in excavation.
Investigates the technology of roof trusses.
Calculates the cost of a roof truss.
Evaluates cost effectiveness of residential double glazing.
Recognizes the importance of building services.
Calculates the costs of various types of communication links.
Calculates total communication link costs made up of various linking systems.
Calculates the cost of a boat winch system.
Calculates the cylinder specification and operating costs for a pneumatic system.
Identifies the cost and energy saving benefits of different thickness of insulation.
Identifies the cost and energy saving benefits of different glazing methods.
Investigates cost definitions in manufacturing.
Calculates cost savings of using less material to produce objects.
Identifies methods of cost reduction in material processing industries.
Identifies the cost of labor in a manufacturing process.
Identifies costs from a budget plan, and income and profit statement.
Calculate costs and profit from a production budget.
Evaluate key points of a cost against production graph.
Identifies how costs of manufacturing impact on the production process.
Estimates the rise in the cost of a journey caused by an increase in the price of fuel.
Uses a route planning software to compare cost estimates of delivery routes.
Constructs a detailed cost analysis of a route using appropriate software.
Resources: Know how to allocate time, money, materials, and staff associated with the manufacture of the components for the design brief.
Explains how profit is calculated for a delivery route plan.
Evaluates the operation of bus services on a GPS bus tracking system simulation.
Interprets data from a graph relating to energy costs.
Identifies the effect of population size on the cost effectiveness of forms of energy.
Identifies the problem of cost in trying to conserve energy.
Determines the total cost of installing energy efficient devices.
Determines the total cost of installing energy efficient devices.
States the benefits and costs associated with space technology.
Identifies advantages and disadvantages of Fax technology.
Identifies advantages and disadvantages of using cellular phones.
Calculates the costs of various types of communication links.
Calculates total communication link costs made up of various linking systems.
Calculates the cost of broadcasting a radio presentation.
Lists the advantages of modern publishing.

Identifies that Life Cycle Analysis aids recycling by saving materials and energy.

B.12.4 - Illustrate how resources are essential to technological activity but that their availability and quality vary extensively throughout the world.

Identifies the resources used in construction technology.
Identifies the products and resources of construction technology.
Applies tests and improvement procedures to check the quality of systems.
Identifies the manufacturing resources used to assemble a model vehicle.
Creates bill of materials and develops a production plan.
Investigates the impact of orthotics and prosthetics on quality of life.
States the operating parameters and essential components of an automated system.
Identifies the essential components of an automatic system from text.

B.12.5 - Assess the impact new and improved products and services have had on the quality of life; explain how the development of new tools, materials, and processes is necessary to maintain and improve high productivity and quality.

Describes the environmental impact of a hydroelectric power scheme.
Evaluates the environmental impact of three potential dam sites.
Outlines the development of construction technology.
Examines the use of concrete as a construction material.
Identifies the properties of materials and how they effect its use.
Investigates materials and techniques used in residential plumbing systems.
States the impacts of existing solutions to technological problems.
States the categories of transportation systems and the processes within them.
Identifies the impact of transportation.
Applies tests and improvement procedures to check the quality of systems.
Investigates the impact of communication links on society.
Identifies short term and long term social and environmental impacts of communication systems.
States the social impacts of the automobile in the early part of the 20th Century.
Identifies the impact of transportation.
Recognizes the impact of new technologies on teenage magazines and other publications.
Recognizes the impact of new technologies on methods of working.
Investigates the impact of orthotics and prosthetics on quality of life.
Evaluates the impact of space technology on society.
Identifies methods of improving early communication systems.
Identifies the impact of computer viruses on ICT users.
Investigates the various tools available to a news group on the Internet using a computer
Recognizes tools used to create digital sound applications.
Identifies the impact of an Automated Manufacturing System.
Uses logic gates to improve the operation of an electro-pneumatic sequenced circuit.
Evaluates the social impact of manufacturing.
Recognizes tools used in creating a multimedia presentation.
Identifies the need to modify a mold design to improve its function.
Identifies how costs of manufacturing impact on the production process.
Investigates the impact that errors in GPS readings can have.
Identifies the impact of discoveries on human navigation.

B.12.6 - Show how new knowledge is usually, by design or otherwise, an outcome of technological activity that contributes to the exponential growth of technological knowledge.

Summarizes the areas of knowledge required to create photographic lenses.

Uses efficient learning techniques to acquire and apply new knowledge and skills.
Develop CNC programs using knowledge acquired throughout the module.
Demonstrates knowledge of early wind powered generators, gained from research in a book.
Demonstrates a knowledge of graphics tablet hardware used in Computer Aided Publishing.
Demonstrates a knowledge of hardware devices used in Computer Aided Publishing.
Demonstrates a knowledge of graphic input devices used in Computer Aided Publishing.

B.12.7 - Explain how new and higher quality products require new and higher quality materials and processing techniques.

Recognizes advanced construction techniques.
Applies tests and improvement procedures to check the quality of systems.
Applies line production techniques to the assembly of a model vehicle.
Distinguishes between traditional animation techniques.
Applies problem solving techniques to develop an animation character.
Identifies how the use of coloring techniques can enhance an animation.
Identifies suitable uses for conventional and digital cameras according to quality and time
Compares image quality between conventional and digital cameras.
Shows how to remove red-eye from a photograph using digital techniques.
Describes the processes involved in creating special effects using conventional photographic
Removes people from a photograph following the standard problem solving cycle and using image manipulation techniques.
Identifies various photographic techniques.
Uses efficient learning techniques to acquire and apply new knowledge and skills.
Uses quality control to verify that the product is within specifications.

B.12.8 - Select and apply appropriate processes to transform information into its most useful format.

Investigates how engines convert energy and transform motion.
Identifies the effect of various image transformations.
Describes the methods by which energy transformation can be measured.
Identifies the effect of various image transformations.
Evaluates appropriate image transformations.

C. Human Ingenuity

C.12.1 - Implement and evaluate strategies to solve technological problems that are likely to be successful.

States the impacts of existing solutions to technological problems.
States the criteria to be reported on when evaluating a design project.
Tests and evaluates design work.
Recognizes and applies the white box testing strategy to find and remove syntax errors.
Recognizes and applies the white box testing strategy to find and remove run-time errors.
Recognizes and applies the black box testing strategy.
States that logic can be used to solve simple control problems.
Uses logic to solve electro-pneumatic control problems.
Appreciates that testing materials aids their successful use.
Applies color information to solve filtration problems.
Acquires and evaluates information related to fundamental principles of milling.
Thinking: Ability to learn, reason, think creatively, make decisions, and to solve problems.
Information: Acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.

Identifies the use of successful forming processes for different materials.
Use design principles presented to complete a successful design brief.
Solves hydroelectric power problems using worked examples.
States the tests required to assess the effectiveness of the solution in terms of the design brief and the specifications.
States alternative problems that have solutions related to aerodynamics.
Retrieves information using keywords on a database in order to solve simulated crimes.
Communicates a hydraulic system solution using a circuit diagram.
Investigates a design problem and solution for a commercial animation movie.
Defines a stage in the problem and solution cycle for an animation task.
Creates a range of solutions to publicize the release of fictional car.
Explains the process involved in creating the solutions for car promotional material.

C.12.2 - Measure, collect, and analyze data in order to solve a technological problem.

States the impacts of existing solutions to technological problems.
Uses the maglev system to measure impact.
Uses a trip computer to analyze the performance of a vehicle under different load conditions.
Describes the units of measure relating to velocity.
Identifies and analyzes components required to transmit and receive voices along wires.
Uses a File Transfer Protocol simulation to analyze the process of down loading software from the Internet.
Uses graphs to analyze a simple pneumatic circuit.
Recognizes pressure as a measurement of force in fluids.
Uses graphical methods to analyze control systems.
Measures the Izod Impact Strength of acrylic using a software simulation program.
Measures the amount of material used to create various plastic products.
States the units used to measure work, heat and power.
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.
Measures national weather conditions.
Measures actual dimensions on a component and converts this information into a 2D working
Measures voltage and current in a circuit.
Calculates the multimeter range setting required to measure the voltage across batteries in series.
Identifies how to measure forces using the Aerostream Monitor.
Measures lift created by wings at various angles of attack.
Examines the impact of measurement errors on predictions about rocket flights.

C.12.3 - Defend solutions to technological problems and opportunities.

States the impacts of existing solutions to technological problems.
States the tests required to assess the effectiveness of the solution in terms of the design brief and the specifications.
Investigates a design problem and solution for a commercial animation movie.
Defines a stage in the problem and solution cycle for an animation task.
Creates a range of solutions to publicize the release of fictional car.
Explains the process involved in creating the solutions for car promotional material.
Selects appropriate solutions for emergencies, from data held in a database.

States alternative problems that have solutions related to aerodynamics.
Communicates a hydraulic system solution using a circuit diagram.

C.12.4 - Select materials and other resources for a technological design and develop practical solutions.

Identifies the resources used in construction technology.
Determines the properties of materials from tensile test data.
Identifies how the properties of various materials influence their use.
Identifies the properties of materials and how they effect its use.
Investigates materials and techniques used in residential plumbing systems.
Identifies the products and resources of construction technology.
Recognizes how the properties of materials influence their use in construction.
Selects information from text relating to technological systems.
States the impacts of existing solutions to technological problems.
States the tests required to assess the effectiveness of the solution in terms of the design brief and the specifications.
Investigates the concept of microwave penetration on various materials.
Identifies composite materials suitable for a specific application.
Justifies choices of composite materials for a specified communication system within a fixed
Uses computer based reference material to research and develop ideas.
Identifies the manufacturing resources used to assemble a model vehicle.
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.
Creates a range of solutions to publicize the release of fictional car.
Explains the process involved in creating the solutions for car promotional material.
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 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.
Identifies the use of successful forming processes for different materials.
Identifies careers involved in materials and processes.
Documents the technological advances in industrial control.

C.12.5 - Identify constraints present in a given technological process.

Identifies suitable uses for conventional and digital cameras according to quality and time
Recognizes the difficulty of synchronizing speech with lip movement.
Recognizes that forces cause structures to deform.
Identifies how buildings can be designed to resist dynamic forces.
Identifies types of computer crime and crime prevention.

C.12.6 - Design and/or create solutions that are functional, aesthetically pleasing, demonstrate quality, have value greater than the investment, and meet a societal want or need.

Recognizes aesthetic values in construction.
Uses quality control to verify that the product is within specifications.
States some of the options available to relieve the energy problems facing society today.
Assesses the properties of insulating materials for effectiveness and value for money.

Calculates the value of power saved by an energy efficient house.
Applies tests and improvement procedures to check the quality of systems.
States social, economic, ethical and moral issues raised by new technologies.
Investigates the impact of orthotics and prosthetics on quality of life.

C.12.7 - Present a design solution that accounts for production of a device; how the device would be operated, maintained, replaced, and disposed of; and, who will sell and manage it.

Determines the total cost of installing energy efficient devices.
Investigate construction project management.
Demonstrates design and management skills.

C.12.8 - Know that design solutions may have effects that were not predicted.

Predicts environmental problems caused by a hydroelectric power station.
Predicts the consequences of a heat wave on major cities in the U.S.
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.
Predicts the output motion produced by cams.
Predicts a ladder logic output using branches.
Predicts a ladder logic output using latches.
Uses route planning software to predict variables for a road journey.
Predicts the effects of changing input variables when using route planning software.
Predicts advances in technology using Moores law.

C.12.9 - Apply basic engineering concepts in the design and creation of solutions to various problems or opportunities.

States the purpose of research and the meaning of 'human factors engineering'.
Recognizes the concepts of system and control.
Identifies the basic concepts associated with lighter-than-air and heavier-than-air flight.
Examines the concept of escape velocity.
Investigates the concept of microwave penetration on various materials.
Investigates the concept of microwave polarization, used in satellite television systems.
Investigates the concept of pressure.
Identifies the fundamental concepts behind lenses.

C.12.10 - Evaluate a technological solution and make necessary improvements if needed.

Applies tests and improvement procedures to check the quality of systems.
Uses logic gates to improve the operation of an electro-pneumatic sequenced circuit.
Improves the operation of a pneumatic sorting machine.
Identifies the need to modify a mold design to improve its function.
States the impacts of existing solutions to technological problems.
States the improvements which could be made to a diet.

C.12.11 - Select and apply appropriate processes to alter the characteristics of material to make it useful in different situations.

Uses a trip computer to analyze the performance of a vehicle under different load conditions.
Compares the strength of different shaped columns.

States the operating characteristics of a complete computer controlled mechanical system.
Performs an experiment to investigate the reflection of microwaves on different materials.
Describes function, merits and operation of different types of computer networks.
Combines different rotary transmission systems.
Makes predictions about systems that combine different rotary power transmission systems.
Compares the efficiency of different winch systems.
Designs a pneumatic system to sort different colored parts.
Defines characteristics of ladder logic programming code.
Selects appropriate tools to enhance the realism of an animated space shuttle launch.
Identifies how movement characteristics can be used to enhance realism in animation.
Identifies forming processes for wood, metals and plastics.
Identifies the uses of materials relating to their impact resistance characteristics.
Identifies the uses of materials relating to their strength characteristics.
Evaluates the use of different cameras for a sports photo finish.
Identifies the most suitable camera for various photographic situations.
Identifies the appropriate use for various image capture methods.
Identifies the purpose of different types of photographic filters.
Describes the characteristics of visible light images.
Describes the characteristics of liquid precipitation.

D. Impact of Technology

D.12.1 - Evaluate technologies based upon various sources of information.

Explores car suspension system technology.
Investigates the technology of roof trusses.
Recognizes the key applications of computers in construction technology.
Investigates modern bridge technology.
Evaluates how new technology is used in tunnel construction.
Selects information from text relating to technological systems.
States the impacts of existing solutions to technological problems.
States the definition of energy and the type of energy sources used in transportation systems.
Identifies the action of a computer controlled mechanical system, from information given in a
States the criteria to be reported on when evaluating a design project.
Defines key points in the origin of satellite technology.
States the technology used to make a TV weather forecast.
Uses information technology to support a weather presentation.
Outlines how satellite technology is used to gather weather data.
Identifies the use of new technologies in medical administration.
Recognizes the impact of new technologies on teenage magazines and other publications.
Recognizes the impact of new technologies on methods of working.
States social, economic, ethical and moral issues raised by new technologies.
Recognizes the importance of simple Biomedical Technology.
Investigates design in Biomedical Technology.
Identifies advances in technologies within the field of aviation.
Relates subjects within ballistics to aerodynamics technology.
Describes the involvement of computers in aerodynamics technology.
Identifies support processes which are vital to space technology.
Draws a timeline showing the development of satellite technology.

States scientific principles of importance to space technology.
Identifies similarities and differences between model rocketry and space technology.
Evaluates the impact of space technology on society.
Identifies advantages and disadvantages of Fax technology.
Outlines key points during the history of manufacturing technology.
Documents the technological advances in industrial control.
Chooses appropriate video technology hardware.
Identifies the origins and evolution of Multimedia technology.
Identifies the technology used in compact disc production and use.
States technology used in multimedia devices.
Explores electronic display technology.
States the changes electronics technology has made to society.

D.12.2 - Illustrate how a technology can become controversial when people think the cost of the technology is not being equally shared by those who will benefit most from the technology.

Calculates the costs involved in excavation.
Recognizes the benefits of a geodesic dome construction.
Evaluates cost effectiveness of residential double glazing.
Identifies the benefits of using CAD in the construction industry.
Calculates the costs of various types of communication links.
Calculates total communication link costs made up of various linking systems.
Justifies suitable communication links for a landscape within a given budget.
Justifies choices of communication links in a planning exercise.
States some of the benefits of storyboards.
Identifies the cost and energy saving benefits of different thickness of insulation.
Investigates cost definitions in manufacturing.
Calculates cost savings of using less material to produce objects.
Identifies methods of cost reduction in material processing industries.
Evaluate key points of a cost against production graph.
Calculate costs and profit from a production budget.
Identifies how costs of manufacturing impact on the production process.
Estimates the rise in the cost of a journey caused by an increase in the price of fuel.
Explains how profit is calculated for a delivery route plan.
Resources: Know how to allocate time, money, materials, and staff associated with the manufacture of the components for the design brief.
Interprets data from a graph relating to energy costs.
Identifies the effect of population size on the cost effectiveness of forms of energy.
Assesses the properties of insulating materials for effectiveness and value for money.
Identifies the problem of cost in trying to conserve energy.
States the benefits and costs associated with space technology.
Demonstrates some of the benefits of modern publishing.

D.12.3 - Analyze how the values and beliefs of different people can influence their perceived risks and benefits of a given technology.

Identifies the risks and problems of dealing with the waste products of nuclear power stations.
Interprets a contour map and issues a warning to sites at risk from flooding.
Investigates the risks to health from drinking alcohol.
Investigates the risks to health from smoking tobacco.
Investigates the risks to health from misusing drugs.

Investigates the risks to health and well being.

D.12.4 - Evaluate the relative appropriateness of a given technology by comparing the risks with the benefits or the advantages with the disadvantages.

Recognizes the benefits of a geodesic dome construction.
Identifies the benefits of using CAD in the construction industry.
Identifies advantages and disadvantages of Fax technology.
Identifies advantages and disadvantages of using cellular phones.
Recognizes a social, economic and environmental advantage or disadvantage of electronic communication systems.
Recognizes some advantages and disadvantages of electronic communication systems.
Recognizes the advantages and disadvantages of power systems compared to pneumatic systems.
Identifies the advantages of using electronics with pneumatics.
States some of the benefits of storyboards.
States the advantage of a computer based animation package compared with traditional methods.
Identifies the cost and energy saving benefits of different thickness of insulation.
Identifies the cost and energy saving benefits of different glazing methods.
Identifies the risks and problems of dealing with the waste products of nuclear power stations.
Agrees on an appropriate dam location.
Interprets a contour map and issues a warning to sites at risk from flooding.
Investigates the risks to health from drinking alcohol.
Investigates the risks to health from smoking tobacco.
Investigates the risks to health from misusing drugs.
Selects appropriate solutions for emergencies, from data held in a database.
Selects appropriate ICT equipment and software for specific purposes.
Investigates the risks to health and well being.
Recognizes the appropriate uses of different types of forensic evidence.
Describes advantages and disadvantages of various wind tunnel designs.
Identifies the advantages and disadvantages of using a spoiler.
Distinguishes advantages and disadvantages of drag.
States the benefits and costs associated with space technology.
Identifies advantages and disadvantages of Fax technology.
States some advantages and disadvantages of speech recognition.
Lists the advantages of modern publishing.
States the advantages of using programmable digital controllers in automated systems.
Identifies the advantages of closed over open loop control.
Identifies the advantages and disadvantages of using robots.

D.12.5 - Describe the current challenges and project the future challenges of governing a technology once it has become an integral part of the way people live, work, and play.

States how vehicle choice is governed by practical requirements.
States some of the rules governing safety when using and building electrical systems.

D.12.6 - Show how the effects of a given technology may be unacceptable under one set of circumstances but acceptable under a different set of circumstances.

Identifies the properties of materials and how they effect its use.
Investigates the effect of dynamic forces on structures.
States the tests required to assess the effectiveness of the solution in terms of the design brief and the specifications.
Uses techniques to reduce the effect of errors.

Investigates the cause and effect of signal errors on an electronic communication link.
Identifies the effect of computer applications on the real world.
Estimates the effect of reducing path length upon an animation.
Identifies sound effects and their use in enhancing a space shuttle launch animation.
Recognizes that apparent movement can be the result of the view point changing or the object
Uses a flight simulator to explore the effect of making an aircraft maneuver with a range of pitch attitudes.
Uses a flight simulator to explore the effect of making an aircraft maneuver with a range of bank
Predicts the effects of changing input variables when using route planning software.
Identifies the effect of various image transformations.
Creates special effects using digital manipulation tools.
Applies a water-color effect to a photograph.
Describes the processes involved in creating special effects using conventional photographic