

Connecticut Frameworks - Grades 9-12

Content Standard 1: Economics

Identify how the development and production of products and services are dependent on the transformation of available resources

- Identifies the resources used in construction technology.
- Identifies the products and resources of construction technology.
- Researches computer games using computer and book resources.
- Identifies the manufacturing resources used to assemble a model vehicle.

Content Standard 2: Technological Impacts

Forecast trends in communications, production, transportation and the biorelated technologies, and project their potential impacts

- 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 impacts of transportation.
- Identifies short term and long term social and environmental impacts of communication systems.

Discuss societal and industrial responsibilities for using proper hazardous waste disposal techniques.

- States the alternative energy options available to solve the energy problems facing society today.
- Identifies the risks and problems of dealing with the waste products of nuclear power stations.
- States the acceptable radiation limits of low level nuclear waste.
- States the difference in energy consumption by the industrialized and developing countries.
- Recognizes electrical hazards and the importance of safety in a residential electrical system.
- States social, economic, ethical and moral issues raised by new technologies.
- Designs a remote control pneumatic system for use in a hazardous area.

Content Standard 3: Career Awareness

Identify career opportunities in the areas of transportation, communications, production and biotechnology

- Recognizes the importance of preparing for a career.
- Describes different careers in biomedical technology.
- Defines career options in computer aided publishing.
- Careers in industry and manufacturing
- 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.

Demonstrate an ability to take responsibility for their own actions

- Shares responsibility for producing a module documentary.

Content Standard 4: Problem Solving/Research and Development

Use research techniques to support design development

- 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'.

Shows basic technical ability in the field of Research and Design technology.
Writes a report on Research & Design.
Makes a presentation to a group on Research & Design.
Uses a database to research a given topic.
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 facts about the history of the telegraph.
Researches television signal production.
Researches applications of computers.
Uses the search tools of a World Wide Web simulation to research information about planets.
Researches world music using interactive computer reference material.
Researches computer games using computer and book resources.
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.
Uses a Research Material Fact File to identify facts required for an interactive computer based training presentation.

Develop several alternative design solutions to the same problem

States why the world needs alternative energy.
States the alternative energy options available to solve the energy problems facing society today.
Explains the how alternative energy can be used in building designs.
Describes how some alternative energy sources are more suitable than others.
Explains the how alternative energy can be used in building designs.
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.
Selects appropriate solutions for emergencies, from data held in a database.
States alternative problems that have solutions related to aerodynamics.
Investigates mechanical and alternative power transmission systems.
Compares alternative power transmission systems.
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 the car promotional material.

Present a design idea using multimedia technology

Simulates fires using a multimedia software package and control hardware.
Identifies functions of a multimedia software package using on-line help.
Simulates burglaries using a multimedia software package.
Retrieves information about the workings of a microphone using a multimedia encyclopedia.
Uses a multimedia computer based training application to locate information about events through
Identifies the origins and evolution of Multimedia technology.
Identifies the uses of multimedia applications.
Creates a storyboard for a multimedia presentation from an example product.
Identifies the usage of text, graphics, animation, audio, and video within a multimedia
Produces a title screen for a multimedia presentation.

Uses a multimedia authoring package to create a title screen for a computer based training
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 objectives 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 about the dinosaur time period for a multimedia time line presentation.
Creates a lesson screen about the evolution of man time period for a multimedia time line
Creates voice overs for a multimedia presentation.
Adds voice overs to screens of a multimedia presentation.
Creates a Course Map for a multimedia presentation.
Identifies the requirements to enhance the content of a multimedia presentation.
Demonstrates an interactive multimedia presentation.

Apply biological materials and processes to solve a problem

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.
Identifies materials in Biomedical Technology using a branching key.
Classifies biomedical materials.
Selects suitable materials to design a surgical mask.
Identifies the major types of materials used in Biomedical Technology.
Designs a surgical mask according to specific criteria.
Follows specific criteria for the design of a mask.
Recognizes the importance of simple Biomedical Technology.
Investigates design in Biomedical Technology.
Writes a report on Biomedical Technology.
Makes a presentation to a group on Biomedical Technology.

Content Standard 5: Leadership

Apply organizational skills to classroom and laboratory activities

Maintains and organizes a record of work.

Assume roles within a team environment commensurate with their skills and expertise

Uses problem solving skills to design a glider to given specifications.
Demonstrates design and management skills to co-ordinate the production of documents.
Demonstrates design skills in producing a personal logo.
Describes techniques and skills used in designing content for a multimedia presentation.
Identifies skills required for a career in a photographic field.

Present information in a clear, concise and appropriate manner

Makes a presentation to a group on Alternative Energy.
Use 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.
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 Aerodynamics Technology.
Makes a presentation to a group on Electronic Communications.
Calculates the cost of broadcasting a radio presentation.
Identifies the format of an audio presentation.
Deduces the content type of an audio presentation.
Plans a strategy for creating an audio presentation.
Identifies the function of tools used in creating a digital sound presentation.
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 on troubleshooting in a professional manner.
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 Video Production Technology.
Creates a storyboard for a multimedia presentation from an example product.
Identifies the usage of text, graphics, animation, audio, and video within a multimedia
Makes a presentation to a group on Electronics Technology.
Makes a presentation to a group on Digital Photography.

Content Standard 6: Materials and Processes

Describe the physical structures and properties of materials used in technological systems

Assesses the properties of insulating materials for effectiveness and value for money.
Tests the insulating properties of double glazing.
Compares the insulating properties of single and double glazing.
Describes the properties of water.
Determines properties of materials from tensile test data.
Identifies how the properties of various materials affect their use.
Recognizes how the properties of wood effect its use in construction.
Investigates the properties of concrete.
Identifies the properties of materials and how they effect its use.
Identifies insulation as a property of a construction material.
Determines lamp properties from a table.
Identifies properties of halogen bulbs from a text book.
States the functions and properties of light and sound sensors when used as system inputs.
Investigates vehicle structures.
Recognizes the properties of X-Rays as electromagnetic waves.
Locates information about heart structure from printed text.
Identifies the properties and function of elements of the human foot.
Recognizes that the various material properties of a running shoe serve a particular purpose.
Identifies the properties of the materials used in dental modeling.
Explains the importance of medical material properties.

Positions objects in the wind tunnel to test aerodynamic properties.

Content Standard 7: Communications Systems

Describe electronic publishing and give examples of this technology

Compares modern publishing techniques with traditional publishing techniques.
Lists the advantages of modern publishing.
Defines words and terminology used in Computer Aided Publishing projects.
Defines terminology used to describe words and pictures in Computer Aided Publishing.
List principle computer hardware components required for Computer Aided Publishing.
List principle software requirements for Computer Aided Publishing
Compares different types of printers used for Computer Aided Publishing.
Interprets measurements used in Computer Aided Publishing.
Interprets information about Computer Aided Publishing.
Interprets a color wheel used in Computer Aided Publishing.
Lists the main parts of a scanner used in Computer Aided Publishing.
Compares different types of scanners used in Computer Aided Publishing.
Demonstrates a knowledge of graphics tablet hardware used in Computer Aided Publishing.
Demonstrates a knowledge of hardware devices used in Computer Aided Publishing.
Lists the advantages of different types of hardware used in Computer Aided Publishing.
Demonstrates a knowledge of graphic input devices used in Computer Aided Publishing.
Solves math problems in Computer Aided Publishing.
Shows a basic technical ability in the field of Computer Aided Publishing.
Writes a report on Computer Aided Publishing.
Makes a presentation to a group on Computer Aided Publishing.

Send and access information through a network

Identifies connections required to connect telephones on a telephone network.
Describes function, merits and operation of different types of computer networks.
Describes various communication transmitters, receivers and carriers used in communication systems and networks.
Demonstrates the role of electronic communication systems and networks in information
Describes various communication transmitters, receivers and carriers used in communication systems and networks.
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 Web Page Editor simulation to create a Web Page about digital signals.
Identifies the main components of a Web Page.
Uses a Web Page Editor simulation to create a Web Page about Binary Code.
Designs and produces a simulated Web Page advertisement for an electronic communication
Demonstrates a page on Binary code that they have created using a Web Page Editor simulation.

Operate a computer-aided drafting (CAD) system

Determines the use of CAD in architectural drafting.
Determines the use of CAD in component drafting.
Interprets instructions found in a CAD manual.
Recognizes the features CAD provides to aid the accuracy of a drawing.
Writes a report on Computer Aided Design.
Uses Architectural CAD software to draw an outline plan of a building.
Identifies the benefits of CAD in the construction industry.

- Opens and explores AutoCAD files.
- Explores the procedures involved in printing a drawing in CAD.
- Identifies the specific areas of a CAD screen.
- Completes a CAD drawing using cartesian coordinates.
- Recognizes the processes involved in printing a drawing in CAD.
- Calculates the angles used on an isometric grid in CAD.
- Calculates the angles used for polar coordinates in CAD.
- Extracts information from a CAD drawing.
- Recognizes how commands are presented in AutoCAD.
- Determines what grips are in CAD.
- Recognizes what the regenerating drawing command achieves in CAD.
- Recognizes symbols that are used in CAD.
- Investigates how to load line types in CAD.
- Prepares a CAD file for a component drawing.

Content Standard 8: Production Systems

Describe the significance of architectural drawings, specifications and contracts in the construction industry

- Uses an architects scale to investigate construction drawings.
- Uses Architectural CAD software to draw an outline plan of a building.
- Uses the appropriate commands to edit an architectural drawing.
- Calculates the area of a door panel in an architectural drawing.
- Recognizes how to lay out an architectural drawing.
- Completes an architectural drawing using tiled viewports.
- Determines the use of CAD in architectural drafting.
- Describes a design brief and the purpose of specification statements.
- Identifies from text examples of 'specification statements'.
- Interprets the specifications in a bridge design brief.
- Uses and derives specifications, flowcharts and truth tables as part of a systematic design process.

Demonstrate the safe and accurate use of layout, forming, separating, combining, treating, and finishing tools and procedures in building a shelter or structure

- 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.
- Uses IT to communicate instructions and safety precautions in the form of a leaflet.
- Identifies an automatic door as a safety critical system.
- Explains the common safety features employed in automatic systems.
- Explains the importance of safety procedures when using mechanisms.
- Operates hydraulic equipment safely.

Content Standard 9: Transportation Systems

Identify and describe the historical innovations in the evolution of transportation systems and their impact on our society, economy and environment

- States the social impacts of the automobile in the early part of the 20th Century.
- Identifies the impacts of transportation.
- States the definition of energy and the type of energy sources used in transportation systems.
- States the modes of operation of the proposed Rapid Transit System.

States the categories of transportation systems and the processes within them.
Identifies from text the output and processes of transportation systems.
Designs and tests a computer program to simulate a transport system operating in continuous
Interprets information given in a flowchart relating to a transportation control system.
Performs an energy analysis on a transportation system.
Recognizes propulsion systems used in transportation.
States the types of transportation systems.

Understand the principles of aerodynamics

Recognizes how aerodynamic design is influenced by the general public.
Positions objects in the wind tunnel to test aerodynamic properties.
Identifies contributions by individuals throughout the history of aerodynamics.
Measures aerodynamic forces on a ballistic object.
Relates subjects within ballistics to aerodynamics technology.
Describes the content of a technical aerodynamic report.
Designs aerodynamic panels for a bridge.
Explains the technical content of a report on an industry that uses aerodynamics.
Describes basic principles involved in aerodynamics.
Describes the involvement of computers in aerodynamics technology.
States how the angle of attack can affect the aerodynamic properties of a wing.
Relates aerodynamic theory for supersonic flight to practical applications.
States alternative problems that have solutions related to aerodynamics.
Shows basic technical ability in the field of Aerodynamics Technology.
Extracts information from a passage of text and set of instructions about the aerodynamics of
Describes the involvement of computers in aerodynamics technology.

Explore and experiment with traditional and alternative fuels

Identifies the operating parameters of a fossil fuel powered generating station.
Calculates average velocity and fuel consumed for a model rocket from given data.
Calculates the mileage range on one tank of fuel.
Calculates the required range from one tank of fuel.
Uses manual controls to move the fuel rods.
Uses software to write a control program to automatically load a simulated nuclear reactor with
States why the world needs alternative energy.
Describes the principles of a solar cell.
Measures current output of solar cell.
Calculates power output of a solar cell using the equation $W = A \times V$.
States the alternative energy options available to solve the energy problems facing society today.
Identifies components of a solar collector.
Calculates the savings made by a solar collector.
States the principles behind solar power.
States the principles of wind power.
Explains how modern water power is obtained.
Explains why energy conservation is important.
Describes how some alternative energy sources are more suitable than others.

Content Standard 10: Enterprise

Explore company responsibilities toward employees, community and the environment

- Describes the environmental impact of a hydro-electric power scheme.
- Evaluates the environmental impact of three potential dam sites.
- Predicts environmental problems caused by a hydro electric power station.
- Identifies short term and long term social and environmental impacts of communication systems.
- Recognizes social, economic and environmental advantage and disadvantages of electronic communication systems.

Content Standard 11: Engineering Design

Differentiate between the problem solving and engineering design processes

- States the purpose of research and the meaning of 'human factors engineering'.
- Describes the stages in the design and 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.
- Defines stages in the classic problem solving loop.
- 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.

Describe the detail design phase of the engineering design process

- Defines technical terms used in the design process.
- Uses and derives specifications, flowcharts and truth tables as part of a systematic design process.
- Determines the correct sequence for a design process.
- Identifies the number of stages in the animation design process.
- Compares animation techniques in the design process.
- States the purpose of research and the meaning of 'human factors engineering'.