Below are the Connecticut Standards of Learning in Math, Technology, Social Studies, and Science and arranged by competency area and Grade. The Standards are checked (√) to identify the extent to which TRAC PAC 2 modules relate to the Connecticut Standards.

Grade 9/10

MATH - Grades 9/10: Numerical and Proportional Reasoning

The number system extends from natural numbers to include integers, rational numbers, and real numbers

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√	√	√	√	√	√	√	√	√		Investigate the structure of the real number sys., classify sets and subsets of numbers, and use number properties to estimate and solve problems.

Properties of numbers systems are used to develop strategies for computation and estimation and judging the reasonableness of results.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√	√	√	√	√	√	√	√			Select and use appropriate estimation and calculation methods (mental math, paper-and-pencil, calculator, software) to solve problems in a variety of contexts.
√	√	√	√	√	√	√	√	√			Identify and use appropriate operations (addition, subtraction, multiplication, division, powers and roots) and write expressions and equations to solve a variety of m...
√	√	√	√	√	√	√	√	√			Solve problems involving scientific notation and absolute value, and relate the magnitude of numbers to place value and powers of ten.
√	√	√	√	√	√	√	√	√			Develop a variety of strategies, including recursive algorithms and use them to: estimate values of formulas, functions and roots; to recognize the limitations of estimation; to assess the amount of error; and to judge the implications of the results.

Proportional reasoning can be used to make predictions and describe relationships between variables.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√	√	√	√	√		√	√			Estimate an unknown value between data points on a graph (interpolation) and make predictions by extending the graph (extrapolation).
√	√	√	√	√	√		√	√			Solve problems involving direct and inverse variation.

Technology can be used to interpret large sets of numbers.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
											Use technological tools such as spreadsheets, probes, computer algebra systems and graphing utilities to organize and analyze large amounts of numerical information.

MATH - Grades 9/10: Algebraic Reasoning

Tables, graphs, and equations can be used to analyze linear functions as well as non-linear functions, for which the rate of change is not constant.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√		√		√						Identify, describe, create and generalize numerical and spatial patterns with tables, graphs, words, and symbolic rules.
√	√		√								Recognize that although a scatter plot may appear to be linear, the graphing calculator may be used to identify the algebraic representation and type of function.
√	√		√								Find the zeros of a polynomial function using graphical and algebraic methods.

Functions are used in a variety of situations including to model data, to make predictions, and to find the rate of change.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√		√								Model and solve problems with linear, quadratic, and absolute value equations and inequalities.
√	√		√		√						Judge the reasonableness of the results of symbolic manipulations as related to practical models and authentic contexts.
√	√		√								Use a graphing calculator to identify an appropriate symbolic representation for a function that models data displayed in a scatter plot.

MATH - Grades 9/10: Geometry & Measurement

Geometric constructions, either with drawing tools or software, can be used to investigate relationships among plane geometric figures.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√										Use models and constructions to make, test, and summarize conjectures involving properties of geometric figures and use these properties to solve problems.
√	√										Explore and describe how a change in measurement of one or more parts of a polygon or solid may affect its perimeter, area, surface area and volume.

Geometric theorems (statements that can be proven) may be discovered using inductive reasoning and proved using deductive reasoning.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√										Recognize the relationships between a conditional statement and its converse, inverse, and contrapositive.
√	√	√	√	√	√	√	√	√	√		Test the validity of logical arguments.
√	√										Use deductive arguments, including direct and indirect proofs, to develop an understanding of an axiomatic approach to geometry.

Geometric relationships may be verified and proved using synthetic, coordinate, and transformation methods.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√										Interpret algebraic equations and inequalities geometrically and describe geometric relationships algebraically using Cartesian coordinates.
√	√										Analyze geometric transformations both synthetically and in the coordinate plane.

Geometric theorems and trigonometric relationships may be used to solve a variety of problems involving one- two- and three-dimensional measurements.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√										Use a variety of strategies to assess the reasonableness of answers to direct and indirect measurement problems.
√	√										Make decisions about appropriate units, scales, degree of precision, and strategies to solve measurement problems.
√	√										Use indirect methods including the Pythagorean Theorem, trigonometric ratios and proportions in similar triangles to solve a variety of measurement problems.
√	√										Use algebraic and graphical methods to estimate and solve problems involving rates and derived measurements such as velocity and density.

MATH - Grades 9/10: Working with Data: Probability and Statistics

Real world problems may be analyzed using statistical techniques.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS_101	Cantilever Beam	Jeopardy	Standard
√	√										Develop, use, and explain applications and limitations of linear models and line of best fit (linear regression) in a variety of contexts.
√	√										Use data from samples to make inferences about a population and determine whether claims are reasonable or spurious.
√	√										Determine and use measures of central tendency and dispersion to describe and compare sets of data.
√	√										Design, conduct, interpret, and justify the results of a probability experiment, sample, or statistical simulation.

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Modules (columns left to right): Bridge Builder, Design & Construction, Environmental, Madlev, Motion, Highway Safety, SimCity, Traffic Technology, GPS 101, Cantilevel Beam, Jeopardy

Principles of probability may be applied in a variety of situations.

BB	D&C	Env	Mad	Mot	HS	SC	TT	GPS	CB	Jeo	Standard
√	√	√	√	√	√	√	√	√	√		Solve realistic problems involving complementary and mutually exclusive events.
√	√	√	√	√	√	√	√	√	√		Explore the concepts of conditional probability and independent events in real world contexts.
√	√	√	√	√	√	√	√	√	√		Compare experimental and theoretical probabilities and apply the law of large numbers (experimental results tend to approach theoretical probabilities after a large number of trials).

TECH ED - Grades 9-12 - Economics

Students will understand the link between tech and the economy, and recognize that link as the force behind societal emergence and evolution.

BB	D&C	Env	Mad	Mot	HS	SC	TT	GPS	CB	Jeo	Standard
						√					Identify how the development and production of products and services are dependent on the transformation of available resources
						√					Identify current global, social and economic trends, and identify their relationship to computer controlled production
						√					Describe the evolution of technological enterprise and its influence on the economy, culture, society and environment;
						√					Describe the characteristics of single ownership, corporations, companies and partnerships
											Compare and contrast ways of financing an enterprise.

TECH ED - Grades 9-12 - Technological Impact

Students will understand the impact that technology has on the social, cultural and environmental aspects of their lives.

BB	D&C	Env	Mad	Mot	HS	SC	TT	GPS	CB	Jeo	Standard
√		√									Forecast trends in communications, production, transportation and the biorelated technologies, and project their potential impacts
√		√									Employ the input, process, output, feedback system model to their evaluation of technological impacts;
											Discuss societal and industrial responsibilities for using proper hazardous waste disposal techniques.
√		√									Evaluate technologies based on their positive and negative outcomes

TECH ED - Grades 9-12 - Career Awareness

Students will become aware of the world of work and its function in society, diversity, expectations, trends and requirements.

BB	D&C	Env	Mad	Mot	HS	SC	TT	GPS	CB	Jeo	Standard
√	√	√					√	√		√	Identify career opportunities in the areas of transportation, communications, production, and biotechnology
	√				√	√					Demonstrate an ability to take responsibility for their own actions.
					√	√		√		√	Explain the need to be a lifelong learner.
√	√	√	√	√	√	√	√	√	√	√	Exhibit appropriate behaviors in both school and work situations.
√	√	√	√	√	√	√	√	√	√	√	Define and demonstrate a personal work ethic.
√	√	√				√					Identify future labor market trends.
√	√		√					√	√		Prepare a preliminary career plan, with connections to high school course selections,
√		√		√							Develop strategies for predicting labor market needs.

TECH ED - Grades 9-12 - Problem Solving/Research and Development

Students will recognize technology as the result of a creative act, and will be able to apply disciplined problem-solving strategies to enhance invention and innovation.

BB	D&C	Env	Mad	Mot	HS	SC	TT	GPS	CB	Jeo	Standard
√	√	√	√	√	√	√	√	√	√		Use research techniques to support design development.
√	√	√	√		√						Develop several alternative design solutions to the same problem.
	√	√	√								Apply the descriptive statistics of average, percentage, correlation and graphing to design outcomes.
√	√	√	√								Use a communication technology to visualize a design idea
	√	√	√								Know the laws related to copyrights, trademarks and patents.
√	√	√	√								Present a design idea using multimedia technology
	√	√	√								Prepare and document a design brief.
√	√	√	√								Select appropriate technical processes and fabricate a prototype.
√	√	√	√								Design and conduct a technical experiment.
			√								Apply biological materials and processes to solve a problem.

TECH ED - Grades 9-12 - Leadership

Students will identify and develop leadership attributes and apply them in team situations.

BB	D&C	Env	Mad	Mot	HS	SC	TT	GPS	CB	Jeo	Standard
√			√								Apply organizational skills to classroom and laboratory activities.
											Develop a personal time management plan.
			√		√				√	√	Assume roles within a team environment commensurate with their skills and expertise.
√			√							√	Present information in a clear, concise and appropriate manner.

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Grade 9/10

Column headers (left to right): Bridge Builder · Design & Construction · Environmental · Madley · Motion · Highway Safety · SimCity · Traffic Technology · GPS 101 · Cantilever Beam · Jeopardy

TECH ED - Grades 9-12 - Materials and Processes

Students will know the origins, properties and processing techniques associated with the material building blocks of technology.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS 101	Cantilever Beam	Jeopardy	
√	√	√				√					List the techniques used to extract raw materials from the environment.
√	√	√	√			√					Describe the physical structures and properties of materials used in technological systems.
√	√	√				√					Classify raw materials according to their physical and mechanical properties.
√	√	√				√					Distinguish between organic and inorganic materials.
√	√	√				√					Experiment with the alteration of material characteristics, natural and artificial materials.
√	√	√				√					Research, plan and participate in recycling activities.
√	√	√	√			√					Identify secondary materials and processes through product analysis.
√	√	√				√					Produce products with raw and recycled materials by separating, forming, combining, conditioning, and finishing.

TECH ED - Grades 9-12 - Communication Systems

Students will understand and be able to effectively apply physical, graphic and electronic communications techniques in processing, transmitting, receiving and organizing information.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS 101	Cantilever Beam	Jeopardy	
											Describe electronic publishing and give examples of this technology, of the terminology associated with electronic publishing, graphic arts and computers.
											Identify and describe component functions of a microcomputer electronic publishing system.
											Apply accepted design principles of text and graphics to the layout of printed and electronically published materials.
											Operate a scanner and digitize a video image using appropriate software.
											Demonstrate skills in marketing printed products.
											Send and access information through a network.
											Design and produce a video and multimedia production.
									√			Capture a signal from an orbiting satellite.
								√			Transfer information using laser transmission technology.
								√			Communicate using fiber optic cables.
											Operate a computer-aided drafting (CAD) system.
											Generate a computer image of an object in 3D format.
											Render an object to include texture, density, lighting and rotational movement,
											Export and import images in a variety of forms.

TECH ED - Grades 9-12 - Production Systems

Students will understand and be able to demonstrate the methods involved in turning raw materials into usable products.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS 101	Cantilever Beam	Jeopardy	
√			√								Describe the relationship between the universal systems model and production technology.
√	√		√								Differentiate between manufacturing and construction systems.
										√	Trace the historical development of the construction industry.
√	√		√								Differentiate between residential and commercial construction systems.
√	√										Describe the significance of architectural drawings, specifications, and contracts in the construction industry.
	√										Describe and apply the process of site selection and preparation.
√	√										Demonstrate an ability to read and interpret architectural renderings.
√			√								Demo the safe and accurate use of layout, forming, separating, combining, treating, and finishing tools and procedures in building a shelter or structure.
						√					Identify, describe and apply the structural elements used in commercial floor, wall, and roofing systems.
						√					Identify and describe the nonstructural characteristics of plumbing, electrical systems, and environmental systems used in construction.
											Complete a cost estimation, create a critical path network, and construct a small full-scale shelter or structure.
√			√								Discuss advanced construction systems and the role they play in future societies.
√			√								Discuss the problems and possibilities of construct practices in the alternative environmental colonization settings of submarine, space and extra planetary.
√			√							√	Trace the historical evolution of manufacturing.
√			√								Discuss the advantages of environmentally conscious manufacturing.
											Demonstrate an ability to safely and accurately use the layout, form, separate, combine, treat, and finish tools and processes in manufacturing a product.
											Distinguish between custom, just-in-time and flexible manufacturing techniques.
											Generate and operate a computer numerical control (CNC) program.
											Describe computer-integrated manufacturing (CIM).
											Describe space industrialization and list several products that are manufactured from secondary materials produced in a microgravity environment.

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Module columns (left to right): Bridge Builder · Design & Construction · Environmental · Madley · Motion · Highway Safety · SimCity · Traffic Technology · GPS-101 · Cantilever Beam · Jeopardy

TECH ED - Grades 9-12 - Transportation Systems
Students will understand transportation systems and the environments used to move goods and people, and the subsystems common to each.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
√	√	√	√	√	√	√	√	√	√	√	Identify and describe the historical innovations in the evolution of transportation systems and their impact on our society, economy and environment.
											Understand the principles of aerodynamics.
√	√										Design, fabricate, test and evaluate a land, atmospheric, marine and space transportation system.
√	√	√						√			Identify and explore solutions to future global transportation.
											Explore and experiment with traditional and alternative fuels.
√	√	√									Describe how pneumatic, hydraulic, mechanical and electrical energy are used in transportation systems.

TECH ED - Grades 9-12 - Enterprise
Students will demonstrate the techniques of enterprise and how they relate to product and service production, economics, human and material resources, and technology.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
											Design a simulated enterprise and participate in a variety of roles within the organizational structure.
√		√		√							Explore company responsibilities toward employees, community, and the environment.
											Discuss the current and historical significance of unions.
√		√									Design a product based on customer need, available materials, tools, equipment and fiscal resources.
											Develop a floor diagram and flowchart.
											Define and use the quality control measures of pre-inventory inspection, statistical; process control and total quality management.
√		√									Discuss the required modifications if a product were to be manufactured in a nontraditional environment.
											Calculate the cost of producing a manufactured product and determine a retail price.
											Develop a marketing plan and successfully distribute a product.

TECH ED - Grades 9-12 - Engineering Design
Students will be able to apply the engineering design process to achieve desired outcomes across all technology content areas.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
√	√	√	√	√				√	√		Differentiate between the problem solving and engineering design processes.
√	√	√	√	√				√	√		Describe the detail design phase of the engineering design process.
√	√	√	√	√				√	√		Demonstrate an ability to complete a detail design for any given embodiment design.
√	√	√	√	√				√			Apply a variety of creativity-enhancing techniques in completing a conceptual, embodiment, and detail design solution.
√	√	√	√	√				√			Apply the full engineering design process to produce a product on time that meets all initial criteria, using appropriate tools and material resources.

SOCIAL STUDIES - Grades 9-12 - Historical Thinking
Students will develop historical thinking, including chronological thinking and recognizing change over time; contextualizing, comprehending and analyzing historical literature; researching historical sources; understanding the concept of historical causation understanding competing narratives and interpretation; and constructing narratives and interpretations.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
						√					Formulate historical questions and hypotheses from multiple perspectives, using multiple sources.
						√					Evaluate data within the history, social, political and economic context in which it was created, testing its credibility and evaluating its bias; and
						√					Describe the multiple intersecting causes of events.

SOCIAL STUDIES - Grades 9-12 - Local, United States and World History
Students will use historical thinking skills to develop an understanding of the major historical periods, issues and trends in United States history, world history, and Connecticut and local history.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
											Demo an understanding of major events and trends in world history, United States and local history from all historical periods and from all the regions of the world.
											Locate the events, peoples and places they have studied in time and place (e.g., on a timeline and map) relative to their own location; and
						√					Explain the relationships among the events and trends studies in local, state, national and world history.

SOCIAL STUDIES - Grades 9-12 - Historical Themes
Students will apply their understanding of historical periods, issues and trends to examine such historical themes as ideals, beliefs and institutions, conflict resolution; human movement and interaction; and science and technology in order to understand how the world came to be the way it is.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
						√					Demonstrate an understanding of the ways that cultural encounters and the interaction of people of different cultures in pre-modern as well as modern times have shaped new identities and ways of life.
											Identify various parties and analyze their interest in conflicts from selected historical periods.
											Describe, explain and analyze political, economic and social consequences that came about as the resolution of a conflict.
							√				Analyze the causes and consequences of major technological turning points in history, e.g., their effects on people, societies and economies.
√	√	√	√	√	√	√	√	√	√	√	Evaluate the economic and technological impact of the exchange of goods on societies throughout history and
											Explain the multiple forces and developments (cultural, political, economic and scientific) that have helped to connect the peoples of the world.

SOCIAL STUDIES - Grades 9-12 - Applying History
Students will recognize the continuing importance of historical thinking and historical knowledge in their own lives and in the world in which they live.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
										√	Initiate questions and hypotheses about historic events they are studying.
						√					Describe and analyze, using historical data and understandings, the options which are available to parties involved in contemporary conflicts or decision-making.
											Be active learners at cultural institutions such as, museums and historical exhibitions.

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Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
										√	Display empathy for people who have lived in the past; and
										√	Describe relationships between historical subject matter and other subjects they study, current issues and personal concerns.

SOCIAL STUDIES - Grades 9-12 - U.S. Constitution and Government

Students will apply knowledge of the United States Constitution, how the U.S. system of government works and how the rule of law and the values of liberty and equality have an impact on individual, local, state and national decisions.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
											Apply an understanding of historical and contemporary conflicts over constitutional principles.
						√				√	Analyze, using historical and contemporary examples, the meaning and significance of the ideal of equal protection under the law for all persons; and
											Explain why state and federal courts powers of judicial review reflect the United States idea of constitutional government.

SOCIAL STUDIES - Grades 9-12 - Rights and Responsibilities

Students will demonstrate knowledge of the rights and responsibilities of citizens to participate in and shape public policy, and contribute to the maintenance of our democratic way of life.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
	√	√				√					Evaluate whether or when their obligations as citizens require that their personal desires, beliefs and interests be subordinated to the public good.
											Establish, explain and apply criteria to eval rules and laws, and take a pos on a current policy issue and attempt to influence its formation, develop and implementation.

SOCIAL STUDIES - Grades 9-12 - Political Systems

Students will explain that political systems emanate from the need of humans for order, leading to compromise and the establishment of authority.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
						√					Compare two or more constitutions and how they promote the principles of their respective political systems and provide the basis for govt.
						√					Explain how purposes served by government have implications for the individual and society; and
						√					Provide examples of legitimate authority and exercise of power without authority.

SOCIAL STUDIES - Grades 9-12 - International Relations

Students will demonstrate an understanding of how the major elements of international relations and world affairs affect their lives and the security and well-being of their community, state and nation.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
											Analyze and evaluate the significance of major U.S. foreign policies and major international events and conditions over time.
						√					Identify and analyze the various domestic, political economic and social interests which play roles in the development of foreign policy; and
											Describe and analyze the process by which foreign policy decisions are developed and executed.

SOCIAL STUDIES - Grades 9-12 - Places and Regions

Students will use spatial perspective to identify and analyze the significance of physical and cultural characteristics of places and world regions.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
											Explain and describe the natural and cultural characteristics of one place to distinguish it from another.
√		√			√	√					Explain why places and regions are important to human and cultural identity and stand as symbols for unifying society; and analyze ways different groups in society view places and regions differently

SOCIAL STUDIES - Grades 9-12 - Physical System

Students will use spatial perspective to explain the physical processes that shape the Earth's surface and its ecosystems

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
		√				√					Analyze the distribution of ecosystems by interpreting relationships between soil and climate, and plant and animal life.
		√				√					Evaluate ecosystems in terms of biodiversity and productivity and show how they are dynamic and interactive; and
		√				√					Use geographic tools to represent and interpret Earth's physical and human systems.

SOCIAL STUDIES - Grades 9-12 - Human Systems

Students will interpret spatial patterns of human migration, economic activities and political units in Connecticut, the nation and the world.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
						√					Explain and analyze how various populations and economic elements interact and influence the spatial patterns of settlement.
						√					Explain and analyze the causes of change in the political, social and economic division of the Earth's surface at different scales.
						√					Use geographic tools to represent and interpret Earth's physical and human systems; and
						√					Draw a freehand map demonstrating political, cultural or economic relationships.

SOCIAL STUDIES - Grades 9-12 - Human and Environmental Interaction

Students will use geographic tools and technology to explain the interactions of humans and the larger environment, and the evolving consequences of those interactions.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
		√				√					Use maps, globes, charts and databases to analyze and suggest solutions to real-world problems.
		√				√					Create appropriate maps and other tools to solve, illustrate or answer geographic problems; and
		√				√					Apply concepts of ecosystems to understand and solve environmental problems.

SOCIAL STUDIES - Grades 9-12 - Limited Resources

Students will demonstrate that because human, natural and capital resources are limited, individuals, households, businesses and governments must make choices.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	SimCity	Traffic Technology	GPS-101	Cantilever Beam	Jeopardy	Standard
√	√	√	√	√	√	√	√				Analyze the impact of economic choices on the allocation of scarce resources.
√	√	√	√	√	√	√	√				Define, defend and predict how the use of specific resources may impact the future; and
√	√	√	√	√	√	√	√				Analyze how technological change can affect long-range productivity.

Below are the Connecticut Standards of Learning in Math, Technology, Social Studies, and Science and arranged by competency area and Grade. The Standards are checked (√) to identify the extent to which TRAC PAC 2 modules relate to the Connecticut Standards.

Module columns (left to right): Bridge Builder · Design & Construction · Environmental · Madley · Motion · Highway Safety · Traffic Technology · SimCity · GPS 101 · Cantilever Beam · Jeopardy

SOCIAL STUDIES - Grades 9-12 - Economic Systems

Students will demonstrate that various economic systems coexist, and that economic decisions are made by individuals and/or governments, influenced by markets, cultural traditions, individuals and governments in the allocation of goods and services.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS 101	Cantilever Beam	Jeopardy	Standard
					√						Evaluate economic systems by their ability to achieve broad societal goals, such as efficiency, equity, security, employment, stability and economic growth.
											Interpret important statistics about the national economy: the inflation rate, unemployment rate, Gross Domestic Product and its growth rate.
					√						Analyze the impact of government taxing and spending actions and changes in the money supply and interest rates on the national economy.
		√			√						Explain reasons for government action in the economy, including providing public goods and services, maintaining competition, redistributing income, promoting employment, stabilizing prices and sustaining reasonable rates of economic growth; and
√	√	√	√	√	√	√	√	√	√	√	Analyze the impact of specific government actions in the economy on different groups, including consumers, employees and businesses.

SOCIAL STUDIES - Grades 9-12 - Economic Interdependence

Students will demonstrate how the exchange of goods and services by individuals, groups and nations, creates economic interdependence and how trade results in change.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS 101	Cantilever Beam	Jeopardy	Standard
											Evaluate the effects of national policies (e.g., on trade, immigration and foreign investments, as well as fiscal and monetary policies) on the international exchange of goods, services and investments.

SCIENCE - Grades 9-12 - Motion and Forces

Newton's laws predict the motion of most objects

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS 101	Cantilever Beam	Jeopardy	Standard
				√			√				When forces are balanced, no acceleration occurs; thus an object continues to move at a constant speed or stays at rest.
				√			√				The law $F = ma$ is used to solve motion problems that involve constant forces.
				√			√				When one object exerts a force on a second object, the second object always exerts a force of equal magnitude and in the opposite direction.
				√			√				Applying a force to an object perpendicular to the direction of its motion causes the object to change direction.
				√			√				Circular motion requires the application of a constant force directed toward the center of the circle.
				√			√				Newton's laws are not exact but provide very good approximations unless an object is small enough that quantum effects become important.

SCIENCE - Grades 9-12 - Conservation of Energy and Momentum

The laws of conservation of energy and momentum provide a way to predict and describe the movement of objects

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS 101	Cantilever Beam	Jeopardy	Standard
			√	√	√		√				Kinetic energy can be calculated by using the formula $E = (1/2)mv^2$.
			√	√	√		√				Changes in gravitational potential energy near Earth can be calculated by using the formula (change in potential energy) = mgh.
			√	√	√		√				Momentum is calculated as the product mv.
			√	√	√		√				Momentum is a separately conserved quantity different from energy.
			√	√	√		√				An unbalanced force on an object produces a change in its momentum.
			√	√	√		√				The principles of conservation of momentum and energy can be used to solve problems involving elastic and inelastic collisions.

SCIENCE - Grades 9-12 - Heat and Thermodynamics

Energy cannot be created or destroyed, although in many processes energy is transferred to the environment as heat

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS 101	Cantilever Beam	Jeopardy	Standard
			√	√	√						Heat flow and work are two forms of energy transfer between systems.
		√	√	√							The work done by a heat engine that is working in a cycle is the difference between the heat flow into the engine at high temperature and the heat flow out at a lower temperature.
		√	√	√							The internal energy of an object includes the energy of random motion of the object's atoms and molecules. The greater the temperature of the object, the greater the energy of motion of the atoms and molecules that make up the object.
			√	√	√						Most processes tend to decrease the order of a system over time, so that energy levels are eventually distributed more uniformly.

SCIENCE - Grades 9-12 - Waves

Waves have characteristic properties that do not depend on the type of wave

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS 101	Cantilever Beam	Jeopardy	Standard
											Waves carry energy from one place to another.
											Transverse and longitudinal waves exist in mechanical media, such as springs and ropes, and in the earth as seismic waves.
											Wavelength, frequency, and wave speed are related.
											Sound is a longitudinal wave whose speed depends on the properties of the medium in which it propagates.
											Radio waves, light, and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in a vacuum is approximately 3×10^8 m/s, and less when passing through other media.
											Waves have characteristic behaviors such as interference, diffraction, refraction and polarization.

SCIENCE - Grades 9-12 - Electric and Magnetic Phenomena

Electric and magnetic phenomena are related and have many practical applications.

Bridge Builder	Design & Construction	Environmental	Madley	Motion	Highway Safety	Traffic Technology	SimCity	GPS 101	Cantilever Beam	Jeopardy	Standard
			√				√				The voltage or current in simple direct current (DC) electric circuits constructed from batteries, wires, resistors, and capacitors can be predicted using Ohm's law.
			√				√				Any resistive element in a DC circuit dissipates energy, which heats the resistor.
			√				√				The power in any resistive circuit element can be calculated by using the formula Power = I^2R.
			√				√				Charged particles are sources of electric fields and are subject to the forces of the electric fields from other charges.

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Bridge Builder	Design & Construction	Environmental	Maglev	Motion	Highway Safety	SimCity	Traffic Technology	GPS 101	Cantilever Beam	Jeopardy	
			√				√				Magnetic materials and electric currents are sources of magnetic fields and are subject to forces arising from the magnetic fields of other sources.
			√				√				Changing magnetic fields produce electric fields, thereby inducing currents in nearby conductors.