

STEM Connections

This is a year-long course taught in the eighth grade. Throughout the course, the integration of sciences, technology, engineering, and math are used together in project-based learning experiences that apply these principles to real world applications rather than abstract concepts. The STEM connections to such topics as nutrition and wellness, fashion and interior design, finance, and human growth and development are addressed in the course. Students develop communication, teamwork, organizational, time management, research, problem solving, decision making, and leadership skills that better prepare them for high school. STEM career opportunities are explored.

Family and Consumer Sciences (FACS) content knowledge and skills are strongly associated to the STEM focus. The FACS field represents many disciplines including consumer science, nutrition, food preparation, parenting, early childhood education, family economics and resource management, human development, interior design, textiles, apparel design, as well as other related areas. These areas are included in the career pathways in the Human Services, Education and Training, and Hospitality and Tourism Clusters. The career pathways are also based in the disciplines of biology, economics, chemistry, design, sociology, psychology, anthropology, business, architecture, engineering, communication and media, nutrition, microbiology, food safety, ecology and physics. In this course, students will participate in learning experiences as well as projects that apply to the content standards below. Students will master the content knowledge and skills of the content standards utilizing the disciplines areas listed above.

Family, Career and Community Leaders of America (FCCLA), an integral part of the curriculum, provides opportunities to apply instructional competencies and workplace readiness skills, enhances leadership development skills, and provides opportunities for community service.

STEM Skills

Students will:

1. Apply analytical skills by researching a topic and developing a project plan and timeline, and drawing conclusions from research results.
2. Demonstrate science skills by breaking down a complex scientific system into smaller parts, determining cause and effect relationships, and defending opinions using facts.
3. Utilize mathematic skills for calculations and measurements.
4. Apply attention to detail by following a standard blueprint or technical directions, recording data accurately, and/or writing instructions.
5. Demonstrate technical skills by troubleshooting to identify the sources of a problem utilizing appropriate technology.
6. Utilize communication (written and verbal) and cooperation skills to listen to customer's needs or interact with project partners.
7. Apply teamwork skills for successful project completion.
8. Apply creative abilities to solve problems and develop new ideas.

9. Utilize leadership skills to lead projects or help customers.
10. Demonstrate organizational skills by keeping track of different information.
11. Utilize time management skills to function efficiently.

Asking Questions and Defining Problems

12. Ask questions that arise from careful observation of phenomena, model, or unexpected results, to clarify and/or seek additional information related to content knowledge and skills in the areas of food, wellness, and dietetics; fashion; housing and interior design; early childhood development and services; family and community services; financial literacy and consumer services; restaurant, food, and beverage services; lodging; recreation, travel, and tourism; early childhood education; teaching and training and careers in human services, education and training, and hospitality and tourism.
13. Ask questions to define the problem to be solved and to elicit ideas that lead to constraints and specifications for its solution that relate to content knowledge and skills in the areas of food, wellness, and dietetics; fashion; housing and interior design; early childhood development and services; family and community services; financial literacy and consumer services; restaurant, food, and beverage services; lodging; recreation, travel, and tourism; early childhood education; teaching and training and careers in human services, education and training, and hospitality and tourism.

Developing and Using Models

14. Develop, and/or use a model, diagrams, physical replicas, mathematical representations, analogies, and computer simulations, to predict and/or describe phenomena that relate to content knowledge and skills in the areas of food, wellness, and dietetics; fashion; housing and interior design; early childhood development and services; family and community services; financial literacy and consumer services; restaurant, food, and beverage services; lodging; recreation, travel, and tourism; early childhood education; teaching and training and careers in human services, education and training, and hospitality and tourism.
15. Use science models to represent a system (or parts of a system) under study, to aid in the development of questions and explanations, to generate data that can be used to make predictions, and communicate ideas to others.
16. Evaluate and refine models through an iterative cycle of comparing their predictions with the real world and adjusting them to gain insights into the phenomenon behind the model.
17. Use models to analyze a system to see where or under what conditions flaws might develop, or to test possible solutions to a problem.

Planning and Carrying Out Investigations

18. Conduct scientific investigations to describe a phenomenon, or to test a theory for how the world works.

19. Conduct investigations to find out how to fix or improve the function of a technical system or to compare different solutions to see which best solves a problem.
20. Plan an investigation individually, collaboratively, and in the design: identifying independent and dependent variables and controls, researching what tools will be needed to do the gathering, analyzing how measurements will be recorded, and determining how much data will be needed to support a claim.
21. Conduct investigations that have a stated goal for the investigation, prediction of outcomes, and a planned course of action that will provide the best evidence to support conclusions.

Analyzing and Interpreting Data

22. Interpret data through tabulating, graphing, and/or statistical analysis.
23. Analyze a design by creating a model or prototype and collecting extensive data on how it performs.

Utilizing Mathematics and Computational Thinking

24. Identify patterns in large data sets by using mathematical concepts to support explanations and arguments.
25. Use digital tools (e.g., computers) to analyze very large data sets for patterns and trends.
26. Use mathematical representations to describe and/or support scientific conclusions and design solutions.
27. Create algorithms (a series of ordered steps) to solve a problem.
28. Apply mathematical concepts and/or processes (e.g., ration, rate, percent, basic operations, simple algebra) to solve real world problems.

Constructing Explanations and Designing Solutions

29. Demonstrate understanding of the implications of a scientific idea by developing explanations of phenomena, whether based on observations made or models developed by the student, that engages the student in an essential part of the process by which conceptual change can or may occur.
30. Construct a scientific explanation using models or representations.
31. Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
32. Apply scientific ideas, principles, and/or evidence to construct, revise and/or use an explanation for real-world phenomena, examples, or events.

Engaging in Argument from Evidence

33. Construct a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).
34. Construct, use, and present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Obtaining, Evaluating, and Communicating Information

35. Read scientific texts to determine the central ideas and/or obtain scientific and/or technical information to describe patterns in and/or evidence about the natural and designed world(s).
36. Communicate scientific and/or technical information (e.g., about a proposed object, tool, process, system) in writing and/or through oral presentations.