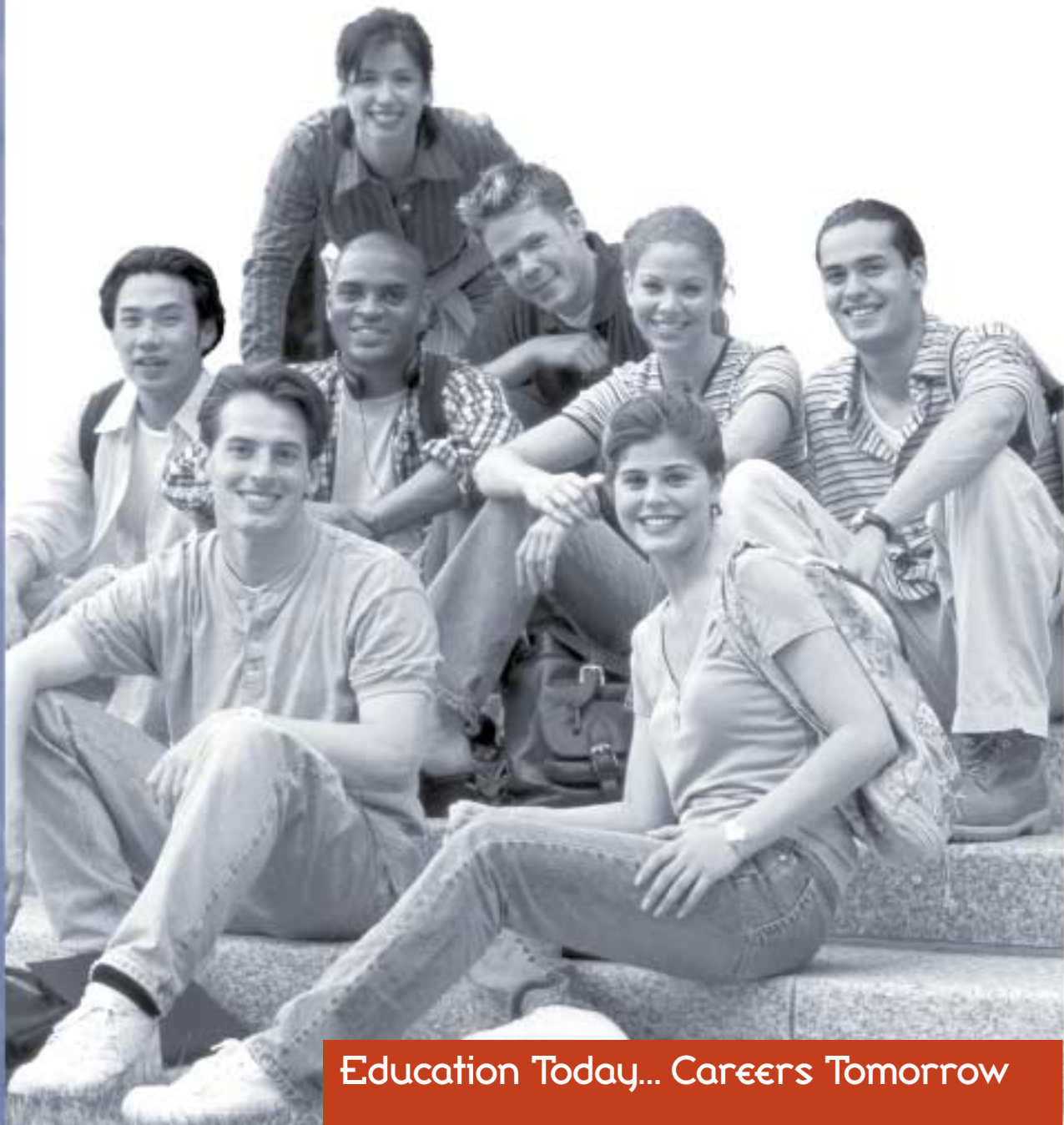
SENIOR
Capstone Project



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Education Today... Careers Tomorrow

What is a CAPSTONE Project?

Capstone projects are a way to organize teaching and learning around authentic student projects integrating technical and academic disciplines. Teachers facilitate connections between academic and technical coursework and challenge students to use prior knowledge and skills to solve real-world problems related to their chosen careers.

What Is the Connection to Career-Technical Education?

Capstone projects capitalize on the most promising aspects of career-focused education and research-based teaching such as:

- Cooperative and group learning
- Integration of academic content standards and technical competencies
- Self-directed learning
- Teacher in the role of facilitator
- Authentic instruction and assessment

Capstone projects in career-technical education apply academic and technical knowledge and skills to complex problems in a career field by allowing students to engage in problem-solving, research, teamwork, interpersonal communication and connections with adults. The capstone project is the culminating experience, demonstrating what a student has learned in his or her career pathway.

"When used well, project-based learning can add meaning and purpose to school assignments, motivate students to learn more advanced material, provide practice for essential skills for lifelong learning and help students see practical applications of what they learn."

— Using Real-World Projects to Help Students Meet High Standards in Education and the Workplace

Southern Regional Education Board

How Does a Capstone Project Work?

The Senior...

- selects or is assigned a problem related to his or her career pathway.
- conducts research related to the problem.
- identifies teachers, business and postsecondary education partners with relevant expertise of the problem and its solution.
- analyzes and synthesizes information to solve the problem.
- maintains periodic reflective journals of the project's progress.
- establishes with teacher checkpoints for assessment to ensure the project time line is on track and he or she is meeting the standards for the project.
- develops a multimedia presentation to adult partners detailing what he or she has learned.

"Students must be creative problem solvers. Would Bill Gates be as successful today if he had not developed this skill?"

— *Promising Practices for Contextual Learning*

Sandra Harwell and William Blank

Hallmarks of Career-Focused Capstone Projects

"A project-based approach to instruction presents students with problem-focused assignments that are meaningful, interesting and valuable. Projects not only reflect student interest but also meet one or more course standards."

— Instructional Strategies: How Teachers Teach Matters

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Research

The student selects a problem related to his or her career pathway. Research is collected and analyzed to begin formulating a solution to the problem or question. The student uses various methods and sources to investigate the problem.

Authenticity

Problems are meaningful to the student and related to the career field. Resources exist within the community and beyond to support this project. The capstone project represents a real problem encountered by individuals in this career field. Working to resolve the problem, the student demonstrates proficiency in technical and academic competencies.

Work-based Learning

The problem is connected to an area within the student's career field. The student selects an adult from an advisory committee, business partner or postsecondary partner to work closely with on the project. Adult partners provide the context for the project.

Academic Rigor

The project is cross-curricular and challenges the student to apply knowledge related to both academic and technical subject areas. The project is aligned with appropriate academic content and technical standards. The student develops high-order thinking skills through research and analysis.

Professional Relationships

The student works closely with adults of content expertise. Adults collaborate with each other and with students on the development and evaluation of projects. Students prepare professional oral and written communications for adult audiences.

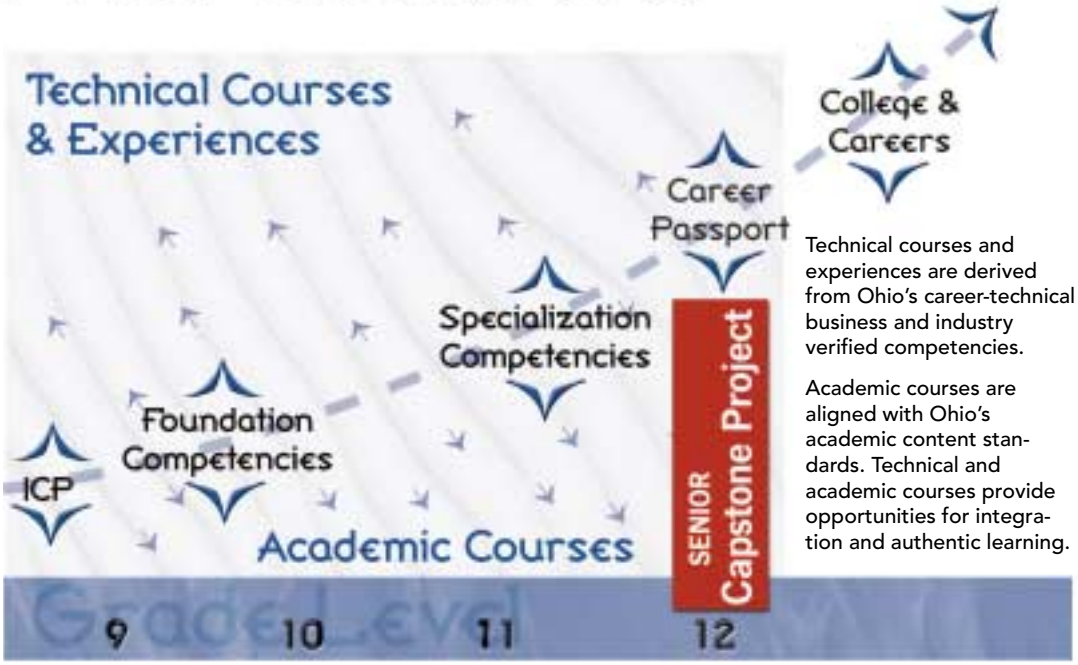
Presentation

The student produces a multimedia presentation detailing problem identification, research and the student's solution or recommendation. The presentation is the culminating experience in which the student demonstrates what has been learned.

Assessment

Project criteria is communicated to the student and is used to gauge learning. Assessment is formative, with multiple checkpoints along the way, providing feedback to the student. Adults outside the classroom help the student develop a sense of real-world standards. The student's project is documented in a Career Passport.

CHARTING The Course



Technical courses and experiences are derived from Ohio's career-technical business and industry verified competencies.

Academic courses are aligned with Ohio's academic content standards. Technical and academic courses provide opportunities for integration and authentic learning.

Career Pathway

"Ideally, every senior should complete a capstone project, perform an internship, complete a research project, participate in community service or take college-level courses."

— *Raising Our Sights*
National Commission on the High School Senior Year

Terms Defined

A **Career Pathway** is series of academic and technical coursework and other educational experiences with a career focus. The pathway prepares students for a goal-oriented future and puts purpose in learning.

An **Individual Career Plan (ICP)** is a planning document initiated by the learner, with input from parents/guardians, teachers and counselors, prior to the ninth grade and reviewed every year thereafter.

A **Career Cluster Foundation** is a course within a career cluster that provides core and cluster competencies as well as information on professional, technical and entry-level career pathway possibilities within the career cluster.

Specialization Competencies are what students should know and be able to do in specific occupations, as verified by business and industry. The attainment of these competencies could lead to entry-level positions, exit credentialing and/or continued education.

A **Career Passport** is a document designed to help students make the transition to the next step beyond high school. The career passport is similar to a portfolio and is usually developed with help from teachers and guidance counselors.

Capstone Project Examples

Health Services Cluster

- Research a problem related to ethics in human cloning. (Biotechnology Program)
- Develop a disaster response plan for a hospital emergency room located near a chemical manufacturing plant. (Therapeutic Systems Cluster Health Program)

Environmental and Agricultural Systems Cluster

- Conduct an environmental impact study on the surrounding community of a proposed egg production farm. (Environmental Technology Program)
- Research a farmer's cropping plan to help improve yields. (Agriculture Production Program)

Business and Management Cluster

- Develop a marketing plan for a newly developed hair care product that will be marketed and sold via the Internet. (E-commerce Marketing Program)
- Develop a computer-generated presentation, including animation, which promotes a Career-Technical program to prospective students and their parents. (Interactive Media Program)

Human Resources/Services Cluster

- Develop an instructional unit for teaching Ohio's mathematics content standards to middle school students. (Career Paths for the Teaching Profession Program)
- Research a new fingerprinting technology to aid in criminal investigation. Provide training in the process to a local law enforcement agency. (Criminal Justice Program)

Industrial and Engineering Systems Cluster

- A local food manufacturer is experiencing a high-rate of packaging failures of its condiment products. Troubleshoot the packaging failure and develop a more durable package. (Industrial Manufacturing Program)
- Design a residential heating/air conditioning system for a 1500 square foot house in Cleveland, Ohio. (Heating, Ventilation, Air Conditioning/Refrigeration Program)

Arts and Communication Cluster

- Develop a public service campaign to promote involvement in the arts for your city and surrounding community. (Radio and TV Broadcasting Program)
- Design and present a creative packaging concept for a new fruit-flavored cereal product that appeals to young children. (Commercial Art Program)

Where do I get more information?

TERC Projects
www.terc.edu/projects/projects.html

Cornell Youth and Work Program: Learning Through Projects
www.uman.cornell.edu/youthwork/ptools/learn/

Collaborative Learning Environments Online
http://cleo.terc.edu/cleo/cleo-home.cfm

***High Schools That Work* Outstanding Practices**
www.sreb.org

Jobs for the Future
www.jff.org

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