



**Oregon Department of Education  
Office of Educational Improvement and Innovation  
Program Brief on**



## **Applied Academics**

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### **Overview**

Applied academics is instruction that helps students understand academic content such as mathematics, language arts, or science by linking that content to its application in careers. In Oregon, this often takes one of two forms:

- **Academic Content with a Career Focus** - In this approach, a teacher may teach the academic content in a course that has a specific career focus. Historically this would include courses such as Principles of Technology, Applied Communications, or Applied Mathematics developed by the Center for Occupational Research and Development (CORD). Individual teachers have used the same strategy to develop courses such as Construction Math or Agricultural Science.
- **Infused Academic Content** - Another approach is to infuse the academic content into Career and Technical Education (CTE) technical courses. Examples of this infused or contextualized approach are often the result of local development involving collaboration between CTE and academic teachers. The Oregon Department of Education has sponsored professional development to support this approach.

### **Math Instruction in Career and Technical Education (CTE)**

Since 2006, the Oregon Department of Education (ODE) has supported specific professional development on elevating the level of mathematics instruction in CTE. The Math-in-CTE project, which started as a single workshop provided in collaboration with Lane Education Service District, helps CTE teachers partner with math teachers to identify the math that naturally occurs in CTE courses. The CTE teacher also learns how to bring that math forward and link it to the mathematics taught in typical math classes.

CTE teachers have used opportunities such as building a wooden stool, designing a marketing plan, or creating three dimensional drawings to reinforce mathematical concepts in algebra and geometry. They have also found many opportunities to strengthen understanding in the basic mathematical ideas needed for Algebra I including fractions, measurement, and whole number operations.

### **Program Results**

With the help of the National Research Center for Career and Technical Education at the University of Louisville and partnerships with local education agencies such as Lane ESD, participation in Math-in-CTE has continued to grow and gain recognition. As of January 2009 that growth has resulted in:

- Professional development for 63 teachers in 26 different schools that creates partnerships between academic and CTE teachers to increase mathematics instruction,
- Additional mathematics instruction to students in manufacturing, marketing, drafting, and culinary classes,

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- Expansion of the professional development to over 30 new schools and 100 new teachers through 5 regional workshops offered around the state starting in 2009, and
  - Recognition of Oregon as a national leader in Math-in-CTE by the National Research Center for Career and Technical Education.

Additionally, a national study of teachers who received Math-in-CTE professional development showed that 75% of those teachers have continued to teach mathematics in their CTE classrooms after the initial training.

### **Effective Practices and Models**

Oregon schools are developing strategies for applied academics as a means of providing learning opportunities beyond traditional academic courses. Some high schools offer applied academic options that are relevant to students and maintain the rigor necessary to meet academic requirements for Oregon's new diploma.

- Hermiston High School issues Biology credit to students who successfully complete agricultural science courses. Recently 71% of the students who took the agriculture option passed the OAKS science test as compared to 58% of the students enrolled in more traditional courses.
- Students at St. Helens High School can earn math credit at or above Algebra I through courses in metals and automotive technology.
- A large national study demonstrated that students in classrooms taught by teachers who had received Math-in-CTE professional development performed almost 10% better on nationally recognized mathematical assessments than a control group of students.

ODE has published a set of guidelines for districts developing relevant and rigorous applied academics instruction. These guidelines stress the importance of teaching to academic standards, assessing academic performance, and collaboration between CTE and academic content teachers.

### **Related Links and References**

- The National Research Center for Career and Technical Education <http://www.nrccte.org/>
- Lane Career Focus <http://www.lanecareerfocus.org/mathincte/index.html>
- ODE Guidelines for applied academics <http://www.ode.state.or.us/teachlearn/certificates/diploma/appliedacademiccredit.pdf>

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