ITEEA Affiliate Representative Resource Book

Section 5: Curriculum and Research

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STEM⌖Center for Teaching and Learning

The STEM⌖Center for Teaching and Learning/STEM⌖CTL (formerly the Center to Advance the Teaching of Technology & Science/CATTS) was established in 1998 to strengthen professional development and advance technological literacy. Center initiatives are directed toward four goals: development of standards-based curricula; teacher enhancement; research concerning teaching and learning; and curriculum implementation and diffusion.

STEM⌖CTL is the professional development arm of the International Technology and Engineering Educators Association (ITEEA). ITEEA is the largest professional educational association, principal voice, and information clearinghouse devoted to enhancing technology and engineering education through experiences in our schools (K–12). Its membership encompasses individuals and institutions throughout the world with primary membership in North America.

STEM⌖CTL promotes the use of *Standards for Technological Literacy*, created from ITEEA's Technology For All Americans Project, a nationally supported initiative designed as a basis for curriculum and resources pertaining to the study of technology.

STEM⌖CTL provides teacher enhancement opportunities through selected programs, workshops, and conferences ranging from the elementary to university level.

STEM⌖CTL conducts research on teaching and learning through directed programs designed for quality teaching practices and assessment, development of resource materials, and support of teaching environments.

STEM⌖CTL develops and disseminates educational materials through Consortium work involving participants from states/provinces through local educational agencies or groups. Consortium participants receive quality products and services specific to their local and professional development needs.

STEM⌖CTL promotes partnerships with agencies, organizations, and other associations to advance technological studies in order to achieve common goals for developing technological literacy and improving student achievement.

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Engineering byDesign™

STEM⌖Center for Teaching and Learning

The *STEM⌖Center for Teaching and Learning* utilizes a Consortium as a national advisory group to identify needs, develop interest, generate support, and maintain a commitment to advance the teaching of science, technology, engineering, and math (STEM.) Through the Consortium, organizations and agencies can build alliances and pool resources, expediting solutions to their respective needs for high-quality professional development. Alliances established among public agencies, institutions, organizations, and private businesses facilitate the development of relevant products and services. A contractual agreement and fee entitles Consortium members to receive specified deliverables. Grants are also used to support STEM⌖CTL's activities and to supplement the Consortium's low fees.

A complete listing of the STEM⌖CTL Consortium of States and their official representatives can be found at www.iteea.org/EbD/CATTS/cattsconsortium.htm.

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For more information about how your state can become a leader in the profession, and details about membership in the Consortium, contact:

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Designing Human Exploration Project (HEP)

Designing Human Exploration: People, Education, and Technology

Standards-based curricular units for elementary, middle, and high school

As part of ITEEA's STEM⌖Center for Teaching and Learning, HEP has developed curricular units for elementary, middle, and high school. The units are stand-alone, but they are also designed to coordinate with Engineering byDesign™ (EbD™) curricular offerings.

All curricular units:

- Are Based Upon the Technological Literacy Standards
- Coordinate with Science and Mathematics Standards for Middle and High School
- Coordinate with Science, Mathematics, Language Arts, and Social Studies Standards for Elementary School
- Utilize a Standards-Based Development Approach
- Focus on Space Exploration
- Stand Alone and Coordinate with ITEEA- STEM⌖CTL Engineering byDesign™ Curricular Offerings
- Reflect a unique partnership between NASA scientists and engineers and education professionals
- Incorporate leading edge insight and practical experiences for students on how NASA works and plans.

For more information, contact Shelli Meade, ITEEA Research Projects Director, at smeade@iteea.org or via telephone at 540-382-4804.

ITEEA's Invention, Innovation, and Inquiry (I^3/I-cubed) was a four-year project funded by the National Science Foundation to develop technological literacy units for Grades 5 and 6. The units are based on *Standards for Technological Literacy: Content for the Study of Technology* (ITEEA/ITEA, 2000/2002/2007), approved by the National Research Council and endorsed by the National Academy of Engineering as vital in the education of every child. ITEEA's STEM⌖CTL coordinates the project implementation.

Project activities included designing thematic units that develop technological literacy in students; developing teaching and learning resources based on selected technological and science literacy standards; and disseminating the units to teachers in training workshops and distance learning. Unit resources were developed for two overarching themes: The Design and Innovation unit examines ways in which inventions and innovations are developed and how they affect us personally, socially, and economically. Technological Systems acquaints students with ways systems are developed, produced, controlled and assessed. Medical, agricultural and biotechnology, energy and power, manufacturing, communications and construction systems will be introduced. Each unit has a standards-based content, suggested teaching approaches, and detailed learning activities including brainstorming, visualizing, testing, refining, and assessing technological designs. Students will have an opportunity to learn how inventions, innovations, and systems are created and how technology becomes part of people's lives.