Unique & Compelling
Internet Applications for
Science & Math Education

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CIESE Background

- Established 1988
- Pioneer (1993) in Internet in education
- Over $20 million in grants and contracts
- Programs in AZ, OH, FL, NJ, NY & Latin America
- Over 18,000 educators trained
Curriculum Expertise

Inquiry-based
Real-time data
Engaging problems
Telecollaboration
Authentic Learning
Essential Question:

How are educators using the Internet as an educational tool?
Internet-based Applications

- Finding Lesson Plans
- e-Pal Exchanges, Telecollaborative projects
- Publishing Student Lab Reports online
- Simulations
- Publishing Student Stories to the Web
- WebQuests
- Using Online Quizzes
- Historical Diaries
- Virtual Labs (Interactive Frog Dissection)
- Online Textbook
- Weather Satellite images
- Real-time data
Internet-based Applications

21st Century Workforce Skills

- Basic
- Partially Proficient
- Proficient
- Advanced Proficient

Skill Level

- Unique and Compelling
  - Real-time Data
  - E-Pal / Telecollaborative
  - Student Web Page
  - Historical Diary
  - Web Quests
  - Virtual Labs
  - Simulations
  - Online Textbook
  - Lesson Plans
  - Online Quizzes
  - Traditional

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Internet applications can provide a revolutionary new instructional tool that can create opportunities for students to engage in more authentic learning.

**Unique**
Cannot be done without Internet technology

**Compelling**
Provides students with real world learning experiences
Unique and Compelling Internet Applications

- Telecollaborative Projects
- Real-Time Data
- Web Publishing
- Primary Source Materials
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Use the Internet as a Communication Tool to connect with experts & other students from around the world:

- Ask-An-Expert
- Telementoring
- Telecollaborative Projects
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Use the Internet to...
Access Real Time Data
to problem-solve and think critically:

- Weather Satellite Images
- Remote Sensing Data
- Scientific Databases
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Use the Internet to...

Publish Student Work

Students can engage real audiences about what they are learning and doing.
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Use the Internet to...
Access Primary Source Materials

Historical documents from the Library of Congress and National Archives

- Diaries
- Historical Photographs
- Multidisciplinary Lessons
Unique and Compelling Internet Applications

Was it Unique?
- Cannot be done without Internet technology

Was it Compelling?
- Provides students with real world learning experiences
Savvy Cyber Teacher®

- Teacher professional development program
- Enhances science & math education
- Focus on content and implementation of unique & compelling resources
Evaluation Findings

*Savvy Cyber Teachers® report:*

- Better at teaching problem-solving skills
- Spend less time lecturing
- Teach complex concepts
- Conduct small group learning activities
- Implement cooperative learning
- Manage diverse learning styles

SOURCE: Harcourt Educational Measurement
Evaluation Findings

• Student Impact Study conducted in Spring 2002 in Cleveland, Miami, & Phoenix
• 35 teachers, 4 computer specialists, 1389 students in grades 2-11
• Measured student pre- & post-test scores during implementation of unique & compelling project
• Student Impact Study Results:
  - 86% of students showed noteworthy gains in science and mathematics learning objectives

SOURCE: Harcourt Educational Measurement
“Eighth-graders whose teachers had students use computers for simulations and models or for data analysis scored higher, on average, than eighth-graders whose teachers did not.”
Research Findings

National Assessment of Educational Progress Data

Average Scores by Types of Computer Use, Students Taking Science Courses, Grade 12: 2000

“Twelfth-grade students who reported using computers to collect data, download data, or analyze data had higher average scores than students who reported never doing so.”
CIESE Recognition
For More Information

CIESE Web Site
http://www.k12science.org

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