

# Science & Technology: A Natural Partnership

METC Conference



## Introduction

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## Today's Agenda

- Today's Science Classroom
- Role of the Science Teacher
- Services, Tools and Online Resources
  - Research and Development
  - Delivery



## Unimaginable Science?

- Do you remember when?
- Science & Technology
  - symbiotic relationship



## Today's Kids



## Different Types of Learning Environments

### Traditional Learning

- Teacher-centered instruction
- Single-sense stimulation
- Single-path progression
- Single media
- Isolated work

### New Learning

- Student-centered instruction
- Multi-sensory stimulation
- Multi-path progression
- Multimedia
- Collaborative work

National Educational Technology Standards for Teachers, ISTE 2000

## Different Types of Learning Environments

### Traditional Learning

- Information delivery
- Passive learning
- Factual, knowledge-based learning
- Reactive response
- Isolated, artificial context

### New Learning

- Information exchange
- Active/exploratory/inquiry-based learning
- Critical thinking, informed decision making
- Proactive/planned action
- Authentic, real-world context

National Educational Technology Standards for Teachers, ISTE 2000

## What Is The Role of the Science Teacher?

- Facilitate the learning process
- Teach the scientific method and key science concepts
- Provide an environment for exploration
- Expose students to real world tools and experiences
- Encourage high-level thinking skills
- Introduce students to online tools and resources
- Expose students to new experiences



## How does technology impact student achievement in science?



## How can technology have a greater impact on learning?



- **Aligning of the stars:** It depends on...
  - What outcomes are targeted
  - How technology is integrated into instruction
  - How teachers assess student performance
    - How teachers adjust instruction
- **Let's look at some resources that impact instruction and learning!**

## What technology tools, services and resources are available?



## Take Your Pick

- **Planning**
- **Searching**
  - Searching Tools
- **Research/Development**
  - Organizations
  - Lesson Plans
  - Project Warehouses
  - Tools
    - Website Authoring
    - Productivity
  - Assessments
    - Pre and post
    - Assess progress
- **Delivery**
  - Instructional Tools
  - Learning Tools
  - Project Tools
    - Communication
    - Collaboration
    - Sharing Data
  - General Resources
- **Professional Development**

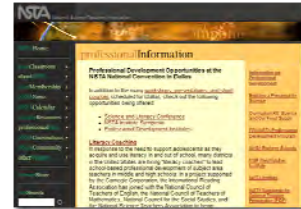


# Research & Development



# Good Place to Begin

- National Science Teachers Assoc.
  - <http://www.nsta.org>
  - Workshops, presentations and resources



# National Perspective

- Edutopia (George Lucas Foundation)
  - Online info and resources for innovative teaching
    - <http://www.edutopia.org/>
  - Teaching Modules
  - Video gallery
  - Case studies
  - Online community



# Data Transparency

- Just for the Kids
  - <http://www.just4kids.org/en/texas/>
- Strengths of this site
  - Provides “opportunity gap” info
  - Has Best Practices information
  - Gives concrete examples of school implementation

## Building a Science Community

- Weebly
  - <http://www.weebly.com/>
  - WYSIWYG (what you see is what you get) website building tool for non-techies offers a one-step process for adding online content.
  - Add RSS feed readers that will display headlines that link back to the latest posts on your favorite blogs



## Communication and Collaboration

- Airset
  - [www.airset.com](http://www.airset.com)
  - Setting up a learning community



## Communication and Collaboration

- Windows Live
  - <http://get.live.com/WL/all>



## Online Science Resources

- NASA for Kids
  - <http://kids.msfc.nasa.gov/>
- NASA for Students (5-8)
  - <http://www.nasa.gov/audience/forstudents/5-8/features/index.html>



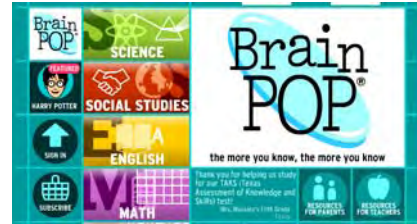
## Virtual Museums

- Smithsonian Institute
  - For students
    - <http://www.smithsonianeducation.org/students/>
  - For Teachers
    - <http://www.smithsonianeducation.org/educators/>



## Online Curriculum

- BrainPOP
  - <http://www.brainpop.com/>



## Online Learning for Students

- Exploratorium
  - <http://www.exploratorium.edu>



## Virtual Experiments

- Schlumberger Labs
  - [http://www.seed.slb.com/en/scictr/lab/index\\_virtual.htm](http://www.seed.slb.com/en/scictr/lab/index_virtual.htm)



## Online Experiments

- EdHeads
  - <http://www.edheads.org/index.htm>



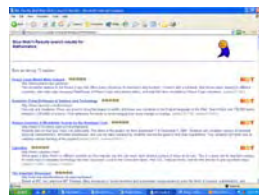
## Assessment Generators

- 4Teachers.org
  - <http://4teachers.org/>
  - Teachers' resources and tools site



## Online Science Projects

- Blue Web'n
  - <http://www.kn.pacbell.com/cgi-bin/listApps.pl?Mathematics>
  - Lesson plans
  - Hotlists
  - Activities
  - Projects



## Online Science Curriculum

- Kathy Schrock's Guide to Science
  - <http://school.discovery.com/schrockguide/science.html>
  - Lesson plans
  - Web resources



## Online Instructional Resources

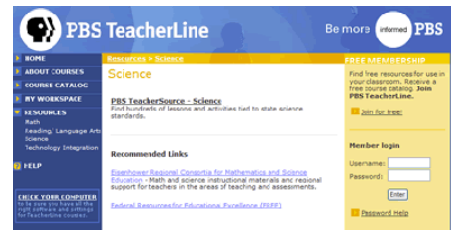
### ■ PBS TeacherSource

- [http://www.pbs.org/teachersource/sci\\_tech.htm](http://www.pbs.org/teachersource/sci_tech.htm)
- Lesson plans
- Web resources
- Best practices



## PBS TeacherLine: Science

Free online resources  
<http://teacherline.pbs.org/teacherline/resources/science.cfm>



## Online Tool: Always Site Your Source

### ■ Slate Citation Machine

- <http://citationmachine.net/>



## Assessment

*"When the cook tastes the soup,  
that's formative. When the guests  
taste it, that's summative!"*

• Robert Stake

## Types of Assessment Tools

- Observations
- Authentic assessment
  - Rubrics
- Exit cards
- Self and peer assessment
- Interviews
- Record keeping
- And more...



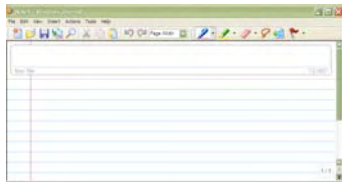
## Teacher Tools

- 4Teachers.org
  - [www.4teachers.org](http://www.4teachers.org)



## Windows Journal: Assessment

- Windows Journal enables you to take notes in your own handwriting via a pen.
- You can vary the size and color of the pen point, change it to a highlighter, and change it to an eraser - all with a tap of the pen.



## Delivery



## Student Collaboration Tools

- Google Docs

- <https://www.google.com/accounts/ServiceLogin?service=writely>



## Virtual Math Manipulatives

- National Library of Virtual Manipulatives

- <http://nlvm.usu.edu/en/nav/vlibrary.html>



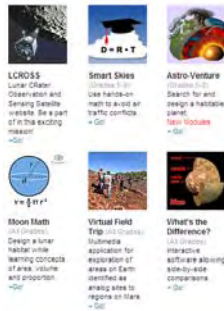
## Online Science Projects

- Problem-solving activities

- NASA Quest

- Web-based, interactive explorations designed to engage students in authentic scientific and engineering processes.

- <http://quest.nasa.gov/>



## Plug & Play Science Projects

- Keypals

- electronic pen pals
    - ePals

- [www.epals.com](http://www.epals.com)

- Data Collecting

- two or more classes
    - study a common topic
    - share information or their findings

- Example:

- Project FeederWatch
    - <http://birds.cornell.edu/PFW/>





## PD Services

- Harcourt Connected Learning
  - [www.harcourtcl.com](http://www.harcourtcl.com)
- PBS Teacherline
  - <http://teacherline.pbs.org/teacherline/>
- Teachscape
  - <http://www.teachscape.com/html/ts/public/html/index.htm>

## NSTA Professional Development

- <http://www.nsta.org/professionalinfo>
- Workshops, presentations and resources



## Thank you for attending!

