STEM Learning Studios

Nevada STEM Smart Workshop
September 19, 2012

Learn more at nctaf.org
Learning is no longer preparation for a job...
learning is the job
– teamwork is the way the job gets done.

Learning Studios
Team Up for Deeper Learning
STEM Learning Studios
Prepare for 21st Century Learning
College, Careers, and Civic Engagement

Learning Studios: Deeper Learning for Students and Teachers with meaningful Community Engagement

Next Generation Learning

Knowledge & Skill

Expert

Novice

S/T
Studio Goals & Outcomes

• **Deeper Student Learning:** learning that matters and work that makes a difference – genuine preparation for college, careers, and citizenship.

• **Deeper Teaching:** from good teachers to great teaching.

• **Deeper Community Engagement:** skilled volunteers team up with teachers and students to develop innovative solutions to complex learning challenges.
STEM Learning Studios
Studios Support Learning Teams

➢ **Artisan Teacher:** Solo Professionals.

➢ **Professional Learning Communities:** (Guilds and Independent Teams) Artisan Teachers Collaborate to Improve Individual Capacity & Professional Performance.

➢ **Learning Teams:** Interdependent Teams of Teachers, Students, and STEM Experts Orchestrate their Diverse Knowledge and Skill to Achieve Well-Defined Learning Objectives. Individual and Organizational Capacity Develop in Tandem.
Learning Studio Principles
Team Up for 21st Century Teaching and Learning
STEM Teachers in Professional Learning Communities
www.NCTAF.org

Strong Leadership Support & Pressure to Improve

Time & Space to Develop Individual Talent and Organizational Capacity

Shared Goals

Self-Directed Reflection & Review of Individual and Organizational Performance

Collective Responsibility Roles & Game Plan

Authentic Assessment Real-time Feedback
Studio Teams are Redesigning Education

Fix
Artisan Teaching

Prototype
Learning Studios

Remodel
Collaborative Learning Culture

Transform
Schools to Learning Studios
Patuxent Valley MS, Howard County MD
How does land use impact the environment?

- The Learning Studios classes visited the construction site outside their school to discuss with engineers how they approach the issue of human impact on the environment.

- The students and engineers worked together to solve math problems as related to the slope and erosion occurring at the construction site.
Central MS, Anne Arundel

How do humans impact the Chesapeake Bay watershed?
Climate Change Website Project

Purpose: You will be working with students from Mrs. Holt’s Introduction to Biology class to create a website on Climate Change. You will be developing skills in organizing content using 21st century communication technology and presenting information in a logical and aesthetically pleasing manner.

Theme: Climate Change and You

Content: Your partner from Mrs. Holt’s Intro to Bio class and yourself will collect data and research information about climate change using given appropriate resources and scholarly articles. The content you will be providing in your website should be divided into these sections:

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Change Background</td>
<td>Give specific details in your own words about the main topics</td>
<td>A minimum of one page in your website. Include:</td>
</tr>
<tr>
<td></td>
<td>• What is Climate Change?</td>
<td>• Diagrams</td>
</tr>
<tr>
<td></td>
<td>• What are the causes?</td>
<td>• Charts</td>
</tr>
<tr>
<td></td>
<td>• Is it true as Global Warming?</td>
<td>• Pictures</td>
</tr>
<tr>
<td></td>
<td>• What are greenhouse gases and the greenhouse effect? How is related?</td>
<td>• Text (paragraphs &amp; bullet points)</td>
</tr>
<tr>
<td>What We Believe</td>
<td>Write an argumentative claim on your beliefs about Climate Change.</td>
<td>A minimum of one page in your website. Include:</td>
</tr>
<tr>
<td></td>
<td>• Do you believe climate change is just a natural cycle or is it real?</td>
<td>• Diagrams</td>
</tr>
<tr>
<td></td>
<td>• You must have a one-sentence clear and concise claim and at least 3</td>
<td>• Charts</td>
</tr>
<tr>
<td></td>
<td>scholarly resources to back your claim</td>
<td>• Pictures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Text (paragraphs &amp; bullet points)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minimum of 5 scholarly resources cited</td>
</tr>
<tr>
<td>Personal Effects</td>
<td>Each student in the group will complete a carbon footprint test and</td>
<td>A minimum of one page in your website. Include:</td>
</tr>
<tr>
<td></td>
<td>report back their findings. Also, each student will write a paragraph</td>
<td>• Pictures</td>
</tr>
<tr>
<td></td>
<td>on several ways that they personally affect the environment. Include relevant pictures.</td>
<td>• Text (paragraphs &amp; bullet points)</td>
</tr>
<tr>
<td>Vocabulary/Terminology</td>
<td>Write in your own words the definitions of the attached vocabulary/</td>
<td>A minimum of one page in your website. Include:</td>
</tr>
<tr>
<td></td>
<td>terminology related to Climate Change</td>
<td>• Vocabulary/Terms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Definitions (written in your own words)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pictures</td>
</tr>
<tr>
<td>(Your choice)</td>
<td>Be creative! Choose one other section to add to your website that has to</td>
<td>Varies.</td>
</tr>
<tr>
<td></td>
<td>do with Climate Change. You can make a video and embed it. You can</td>
<td></td>
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<td></td>
<td>make an animation. You can make a collection of links and resources</td>
<td></td>
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<tr>
<td></td>
<td>about climate change. The possibilities are endless!</td>
<td></td>
</tr>
</tbody>
</table>
Centennial HS Energy Audit

Conserve Energy Pamphlets

nctaf.org
Central HS, Prince George’s County
Is solar energy economical for our school?

- The team held a STEM day to model a scientific conference where students conducted investigations related to their solar energy challenge.

- Scientists from the Department of Energy worked with the groups of students and provided expert knowledge.

- Students worked in groups at stations, then compared results with other groups doing the same experiment, and then defended their findings to the entire audience at the end of the day.
As students in the ecology club worked to restore the greenhouse on their campus, they discovered broken glass had contaminated the compost pile.

They challenged the Tech Ed class via video to build a device to filter the glass from the soil.

A local business owner donated the materials and helped guide the students through the design process.
Old Mill MS, Anne Arundel County,
Water, Water Everywhere,
What is it? Why do we Care?
What is Wellness?

“Wellness is a multidimensional state of being describing the existence of positive health in an individual as exemplified by quality of life and a sense of well-being.” (Charles B. Corbin)

- ARTISTIC/CREATIVITY
- ENVIRONMENT
- FITNESS/NUTRITION
- SOCIAL/EMOTIONAL

Community Partner Visits

Arts - Presentation- Friday, March 2
Kathy Parsonnet - artist

Social & Emotional Well-Being Presentation- Monday, March 5
Abigail Jarvis - Headrest
Nicole Carrier - Yoga Instructor
Todd Heatherton - Dartmouth Psych Professor

Nutrition & Fitness - Presentation- Wednesday, March 7
Dianne Estes - nutrition, fitness, wellness
Kristine Flythe - Lebanon Parks and Recreation

Environment Presentation- Monday, March 12
Andrew Gast-Bray
Larry Danyluk - CRREL
Chrissy Morely
Learn More...

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