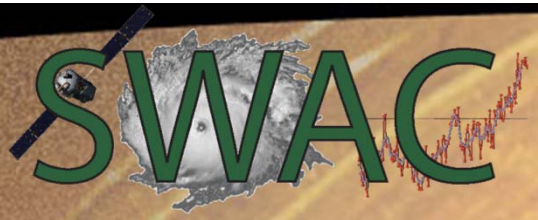





# Project-Based Learning and UbD in Elementary, Middle and High School Classrooms

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# Sort & Mingle Warm-Up!

**Sort**

- **Do you prefer…???**
  - **Hot, humid vs. cold, snowy days**
  - **Cloud watching vs. star gazing**
  - **Rain vs. snow**
  - **Cumulous vs. stratus clouds**
  - **NOAA.Gov or Weather.Com**

# Sorts and Mingle Warm-Up!

**Mingle**

- **What is your favorite place on Earth?**
- **What is your favorite season?**
- **What is your favorite outdoor activity?**
- **What is your favorite weather/climate topic to teach?**
- **What is your least favorite weather/climate topic to teach?**

# The Magic Wand

- What would you do if you just found a **magic wand** that allows you to change three things about the way that science is taught.
- What would you change?
- Why it is important to make these changes?

# Session Objectives

1. What is Project-Based Learning (PBL)?
   - Principles
   - Traditional Classroom vs. PBL Classroom

2. What is Understanding by Design (UbD)?
3. How are PBL and UbD applied to SWAC?

# What do you know...?

- **... about project-based learning?**
- **... about understanding by design?**
- **http://videos.hightechhigh.org/**

# What is Project-Based Learning?

Project-based learning is

- a teaching and learning approach that focuses on the big ideas of a discipline or disciplines,
- involves students in problem-posing, problem solving and other meaningful tasks,
- allows students to work autonomously to build their own learning over an extended period of time,
- and culminates in realistic, student-generated products.

# Project-based learning...

- Deeply involves students in interdisciplinary experiences rooted to subject matter
- Focuses on students discovering questions and answers
- Encourages students to be independent learners with group support
- Allows students to create unique student products that support their understanding

# Principles of PBL

- Learner-centered
- Authentic content and purpose
- Challenging projects
- Product, presentation, performance or exhibition
- Collaborative and cooperative learning
- Incremental and continual improvement
- Teacher facilitated
- Explicit educational goals
- Integrates technology

# How does PBL influence teachers and teaching?

- Teachers are generally enthusiastic, motivated, and successful in their quest to implement project-based learning in their science classrooms (Rosenfield and Ben-Hur, 2001).
- Collaborative PBI curriculum development resulted in positive change in teachers' understanding and practice of science and science teaching (Blumfield, 1994).
- School culture and mission and teacher prior knowledge and experience of PBI played a significant role in teachers successfully implementing PBI in secondary science classrooms (Toolin, 2004).
- PBI presents challenges to teachers in course and assessment design or the revision of existing ones (D'Amico, 1999).

# How does PBL influence student learning and motivation?

- PBL maximizes the use of technological tools for analyzing, presenting, and communicating results (Grant, 2002; Morrison & Lowther, 2005).
- Student motivation and learning science significantly increased in PBL classrooms (Marx, 1994; Stratford & Finkel, 1996).
- Underrepresented HS students' interest in science and science teaching increased as a result of engaging in a PBL summer program (Toolin, 2003).
- Student collaboration and the use of technology increased as teachers enacted several aspects of project-based science in their teaching practice (Marx, 1994).
- Student motivation and commitment to learning heightened while developing ocean software projects. (Yarnell)

# Differences in Traditional and PBL Instruction*

| Feature | Traditional | PBL |
|---|---|---|
| Curriculum | Textbook driven | Problem-solving |
| Sequence | Fixed units | Interdisciplinary |
| Assessment | Test and compare | Criteria based |
| Technology | Peripheral | Central, integral |
| Classroom | Working alone | Works in groups |
| Student role | Receiver | Discoverer |
| Goals | Mastery of facts | Understanding and application |

Source: Buck Institute for Education
http://www.bie.org/pbl/pbloverview/instruction.php

# Curriculum Planning & Backward Design

http://www.youtube.com/watch?v=6Cagh0H7PPA&feature=related

**1. Identify Desired Results**

**2. Determine Acceptable Evidence**

**3. Plan Learning Experiences**

(Adapted from Wiggins and McTighe, 2003)

# Begin with the End in Mind!

- **What will your students know and be able to do as a result of this unit project?**
- **How will they interact and relate to each other and to adults?**
- **How will they think? How will they think about their own learning?**

**Most Importantly……**

- **How will students apply AND transfer their knowledge in the real world?**
- **How will the real world influence your student and your curriculum?**

# What's the Big Idea?

- **What are the enduring understandings or big ideas that students will know and be able to do by the end of the unit project?**
- **Examine national, state, district standards & Principles of Learning (see nylearns.org, eservices.nysed.gov/vls)**
- **Review curriculum expectations and other resources**
- **Establish curricular priorities**

# Create it!

**PBL Planning:**

- **The Vision Stage**
  - Determining the Big Idea
- **Inquiry Stage**
  - What is the desired result and how will students know when they have reached it?
- **Build Stage**
  - Planning the Learning Experiences
- **Reflection Stage**
  - Reflecting on how to improve the project

# Model it!

- **Project Planner**
- **Example from past participant**
  - Sharron M. Prairie

- **If time allows, more from Wiggins…**

- **http://www.youtube.com/watch?v=WsDgfC3SjhM&feature=related**

# Wrap it up!

- **PBL Possibilities are endless**
- **Motivation and excitement for learning will increase**
- **Connected and collaborative learning will occur**
- **Students retain learning beyond testing**
- **Transfer of learning is the ultimate goal.**

# A Tour of the SWAC Website

- uvm.edu/~swac

# References


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