Project-based Learning emphasizes learning activities that are long-term, interdisciplinary and student-centred. Students organize their own work and manage their own time in a project-based class. It is a dynamic approach to teaching in which students explore real-world problems and challenges, simultaneously developing cross-curriculum skills while working in small collaborative groups. This Meet explores research around PBL, illustrates proven examples and teaches the steps to develop a PBL curriculum.

http://learnnowbc.ca/educators/MoodleMeets/default.aspx • Building a Project-based Course From the Ground Up

**Moderators:**

David LeBlanc: http://mysandbox.net/index.html, leblanc@mysandbox.net  
Sharon Betts: sharonbetts@gmail.com, @sharonbetts  

**Resources:**

ScoopIt. CEET Meet resources (May 2012): Building a Project Based Course From the Ground Up  
(http://www.scoop.it/t/ceet-meet-resources-may-2012-building-a-project-based-course-from-the-ground-up)

#PBLchat. Please join us in CEET (http://ceetbc.ning.com/) to continue the conversation on PjBL and PbBL.

**The Six A’s of Project Design:**

1. Academic rigour  
2. Authentic audience  
3. Applied learning  
4. Active exploration  
5. Adult relationships  
6. Authentic assessment

**Glossary:**

**DL** Distributed Learning (distance learning, online learning, etc.)  
**DPA** Daily Physical Activity (http://www.bced.gov.bc.ca/dpa/)  
**EFL** English as a Foreign Language (Europe)  
**ELL** English Language Learners  
**ESL** English as a Second Language (North America)  
**ISTE** International Society of Technology in Education (http://www.iste.org/welcome.aspx)  
**MATES (STEAM, TEAMS)** Mathematics, Arts, Technology, Engineering and Sciences  
**PBL** Problem-, Project- or Portfolio-based Learning; **PbBL** Problem-based Learning; **PjBL** Project-based Learning; **PfBL** Portfolio-based Learning (Guillermo) (http://eduscapes.com/tap/topic43.htm)  
**PLC (PIN)** Professional Learning Communities or Networks that focus on professional development and support
POL: Project-oriented Learning

RTI (RtI): Response to Intervention. method of academic intervention used in the United States to provide early, systematic assistance to children who are having difficulty learning. RTI seeks to prevent academic failure through early intervention, frequent progress measurement, and increasingly intensive research-based instructional interventions for children who continue to have difficulty. It is believed that students who do not show a response to effective interventions are likely (or, more likely than students who respond) to have biologically-based learning disabilities and to be in need of special education.

STEM: Science, Technology, Engineering and Mathematics

PBL? What is That?:


- Problem-based Learning (PbBL) centres wholly in the process or the undertaking of a problem.
  - It is more focussed than Project-based Learning.
  - Problem-based Learning (Article) (http://online.sfsu.edu/~rpurser/revised/pages/problem.htm)
- Project-based Learning (PjBL) centres on the solution (result) to problems or challenges undertaken.
  - Project-based learning is a bit broader and more open to multiple directions.
    - Solutions vary.
  - Both could take you down similar paths.
    - But Project-based Learning may include many Problem-based Learning examples.

Julie Osteen: PbBL versus PjBL

The Envision Approach to Project-based Learning (Slideshow) (http://www.envisionprojects.org/breeze_projects/)

Examples of Project-based Learning,
- High School Project: Save the Beach (http://youtu.be/cJ5Z53JaivE)
- Project-Based Learning: Adopt-a-Stream project (http://www.youtube.com/watch?v=2CEscBlL_1w)
- PBL-Online Video Library (http://pbl-online.org/video/video2.htm)

Inquiry-based planning model and learning,
- Inquiry-based learning comes more from the scientific method (although it isn't only useful in science).
  - It is driven by questions.
    - These are often student-generated and teacher-assisted.
    - They are answered through a process of collecting and evaluating evidence that leads to a correct conclusion/result.
  - Claims are supported or refuted through evidence.
  - Conclusions are defended with that evidence.
- The students don't have to be engaged in big 'learning projects'.
  - They are engaged in a cycle of questions, explorations, formulation of claims, finding that evidence supports or refute those, making and defending conclusions, wondering where that leads next, asking a new question ....
  - The answers to one question prompts the next question.
- Here are some resources that may help.

What is a Portfolio and What is Portfolio-based Learning? (http://www.ukcle.ac.uk/resources/personal-development-planning/portfolios/one/)
- Portfolio-based Learning can be to Project-based Learning as Project-based Learning is to Problem-based Learning

Projects, Cross-curricula and Personalized Learning:

Students, adolescents in particular, are engaged when they get to talk about and explore their own experiences. They choose the interests and parts of their lives on which they want to focus in keeping with “framing problems about things they already know”.

Teaching students with prescribed packages.
- Often the work returning is minimal at best.
- Students are not engaged in what they are learning.

Infuse choice and open ended projects – more personalized learning.
- The results are amazing. Students are more engaged and interested in what it is that they are learning.
- Try a cross-curricular project, for example, one between English and Social Studies.
- The more personalized the learning, the more engaged the students will be.
• It might be better if the student creates a rubric for how they would like to be marked on their project.
• http://www.personalizedlearningbc.ca/#/1

Thomas Cooper has created some wonderful cross-curricular projects using literature as a starting point. If you follow this link – http://thenetworkedlearner.wikispaces.com/home – and go most of the way down to the bottom of the left panel (Collaborative Projects), you can take a look at some of what he's done. If he's still at the same school, he's often looking for other classes to collaborate with his.

Engagement, authenticity and motivation as it relates to curriculum design.
The best projects are those that require students to use skills from a number of disciplines.

Project- and Problem-based Learning can often be the key to engaging reluctant learners or those with special learning needs.

• Engage students and make learning authentic for them. Give them the opportunity to get their hands dirty.
• I found this took on a bit of life of its own.
  ○ For teachers who require a great deal of direct control, PBL is not for you.
• I found I had to be far more fluid with what we were doing.
  ○ That said, the discussions were rich and extended beyond the class

How do you write curriculum from a project-based approach compared to the way it was written in the past 25–30 years? What are the key differences?

• http://www.edutopia.org/blog/pbl-how-to-write-driving-questions-andrew-miller
• http://elschools.org/

I'm interested in PBL primarily because I've found over the years that my students are more engaged with content in classroom when it is connected directly to the world around them. In the past, I've found this technique to be very time consuming to create, so I'm hoping to learn how to be a more efficient planner in this regard.

Introductions – Resources and Quotes:

Building a Learning Commons, by David Loertscher (http://lmcsource.com/Catalog/buildingalearnin.html)
Project-based Learning in Hand: An Overview (http://learninginhand.com/pbl12)
Online Resources for PBL (http://pbl-online.org/)
Checklists to Support Project Based Learning and Evaluation (http://pblchecklist4teachers.org/index.shtml)
Small Changes; BIG RETURNS Project-Based Learning Tools and Resources (http://small-changes-big-returns.wikispaces.com/Project+Based+%28PBL%29)
PBL in Primary. Making Up the Rules (http://plpnetwork.com/2012/02/13/pbl-in-primary-making-up-the-rules/)
From Worms to Wall Street. Projects Prompt Active, Authentic Learning (http://youtu.be/2HyFVEpZyEy)
Five-Year-Olds Pilot Their Own Project-Based Learning (http://www.edutopia.org/kindergarten-project-based-learning-video)
Project-based Learning at the Buck Institute for Education (http://www.bie.org/)
Project Exchange. A place for teachers to share project-based high school curriculum (http://www.envisionprojects.org/cs/envision/print/docs/750)
My Science Box. Hands-on science curriculum for the adventurous teacher (http://www.mysciencebox.org/)
Flat Classroom Projects: Adding global collaboration to your middle and senior high school curriculum (http://www.flatclassroomproject.org/)

Great resources and huge lists of online tools come from the Webheads, an EVO (Electronic Village Online) community (http://baw2012.pbworks.com/w/page/46616453/FrontPage)

Questions:

- How do you set up an experience to ensure that every student comes away with a transferable understanding of the concepts you are teaching, such as area and perimeter?
- Do your students work in groups, and, if so, how do you design the activity so that the actual thinking isn't just done by one student, with the other students following suit?

Take a look at:

- Math and Project-based Learning (http://www.pblassociates.com/Math_and_Project_Based_Learning.htm)
- Math (infographics) as a storytelling tool!
- Critical Thinking Consortium has a really interesting approach to Inquiry in the Math class that is applicable to PBL (http://macoun.edublogs.org/2011/06/29/thoughts-on-critical-inquiry-from-ide2011/)
- Math Project Journal (http://www.mathprojects.com/ProjectBook/)

Projects tend to be organic and require very careful scaffolding to make sure the students learn what you need them to learn.

- PBL needs to be built on a firm foundation of progressive pedagogy.
- Projects take a lot of time and it becomes difficult to cover the curriculum if you include too many projects.
- Plan out the year as a series of projects and map learning outcomes to these projects.
- Key is the importance of picking tasks that have a low level of entry (so everyone in the class can get started), but a high ceiling so that students can go into as much depth and complexity as they are able.
- Everyday subject may not take centre stage in a particular project but its components would play a vital role to the project's story or outcome.
- PBL works if the focus of the Project is to learn and communicate what you are learning.
  - It is not just rich problem-solving.
- Problem-based Learning Defined, Explained and Troubleshooted (http://www.cotf.edu/ete/teacher/teacherout.html)
- This paper shows how basic skills were improved through PBL when measured on Standardized tests (http://www.teacherscollege.sj.org/resources/publications/PBL%20for%20the%2021%20Century.pdf)
- I envision the teacher as a resource who instructs on the necessary skill set as it becomes necessary during a project.

Alice. An educational software that teaches students computer programming in a 3D environment (http://alice.org/)

Edmodo could be a nice platform for the “base camp” on a PBL unit. Education Gamification group code in Edmodo is mli8d0.

Many developers have attempted to make an educational area which is safer for their products.

- Voicethread, YouTube, Glogster all come to mind.
- Facebook, Pinterest, etc. are not yet there.
- Advice: teach, teach, teach – from the earliest ages on how to use social sites and what is and is not for
They also need to know what to do if the wrong links/images come up on their screens.

*Put me in coach* ideas to get others on board in a large traditional high school.

Professional Learning Communities

- Students have a half hour block at the beginning of the day for either
  - a tutorial session with a subject specific teacher, or
  - a session of daily physical activity.
- Teachers form teams that rotate on a bi-weekly basis.
  - The first group of teachers supervise the above activities.
  - The second group meet in collaborative teams to discuss assessment, curriculum development, and department/subject specific planning (chance to collaborate with our fellow teachers on our own directed points for a week every other week).

Blocking (censoring) sites (http://www.pearsschoolsystems.com/blog/?p=424, http://edudemic.com/2012/02/5-tips-for-using-pinterest-in-your-classroom/)

The ART of Powerful Questions: Catalyzing Insight, Innovation, and Action (http://www.theworldcafe.com/pdfs/aopq.pdf)

1: PBL – What is it and why use it?

From PBL-online – PBL is a systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and tasks.

From Edutopia – PBL is a growing body of authentic hands-on and research-learning in schools that engages students, cuts absenteeism, boosts cooperative learning skills, and improves test scores. Those benefits are enhanced when technology is used in a meaningful way in the projects.

1a: PBL Research Summary:

Studies validate Project-Based Learning (http://www.edutopia.org/project-based-learning-research)

- Research shows the efficacy of an authentic form of education that expects students to immerse themselves in a topic and meaningfully demonstrate acquisition of skills and knowledge.
- Emphasis is on learning by doing.
  - Teamwork, technology, and hands-on work are important elements of project-based learning.
  - Laptop use: a shift from lectures and other teacher-centred forms of delivery to lessons that are more collaborative and project-oriented (facilitation).
    - Technology–using students outperform non–technology–using students in communication skills, teamwork, problem solving, content, design, attention to audience, engagement, analytic abilities, likelihood to apply high–order thinking skills, responsibility for learning, peer collaboration skills, and achievement gains.
    - Schools employing problem–based learning and technology show:
      - a decrease in absenteeism, and
      - an increase in students transferring to the school.
Effectiveness of computers in the classroom depends on how they are used.
  • If they are used for drill or practice, they typically have a negative effect on student achievement.
  • If they are used with real-world applications, such as spreadsheets, or to simulate relationships or changing variables, student achievement increases.

Yet there are no significant differences in the standardized test scores of laptop-using and non-laptop-using students. Two possible explanations for the lack of significant improvement in this area:
  1. Standardized tests are not designed to reflect the types of learning that laptops support.
  2. Because the students had been using their laptops for less than two years, it might have been too soon to see noticeable gains in areas that are covered by standardized tests.

Team-based Learning (http://www.teambasedlearning.org/)

You can get the F2F feel using immersive technology in the virtual world. It could be a great way to get students engaged and to meet – through cybernet worlds which is very accessible. I know some DL teachers who use this effectively.

Structural school reform works only under certain conditions:
  • Students must be engaged in activities that build on prior knowledge and allow the students to apply that knowledge to new situations.
  • Students must use disciplined inquiry.
  • School activities must have value beyond school.
  • Even innovative school improvements, such as portfolio assessment and shared decision making, are less effective without accompanying meaningful student assignments based on deep inquiry.

PBL gives space for differentiated instruction.
  • Student-created Learning Games (http://theresourcefulteacher.com/index.php/learning-activities/65-students-creating-learning-games)
    ○ Game-board Instructions (http://theresourcefulteacher.com/index.php/teacher-resources#ecwid:category=2389056&mode-product&product=10315148) (cost $0.99)
    ○ EDTEC 670 – Exploratory Learning Through Educational Simulation and Games (http://edweb.sdsu.edu/courses/edtec670/)
      1. Choose what topic you want your board game to be about (English, Vocabulary, Spelling, Science, History, etc.).
         • Students work in groups to create a game about something they are learning about.
           ○ Each group explores a different topic, or
           ○ Groups jigsaw different subtopics, creating a “larger” topic game.
      2. Plan your game – how do you play, are you going to use a die, spinner, etc., how do you know who goes first, how do you know who wins, what is the name of your game, what is your game board’s theme or story.
      3. Write down instructions for your game.
      4. Decide how players will interact with your game. You can use cards, tokens, buttons, or other objects or pieces, any of which you can create.
      5. Design your board based on your theme. Make it colourful and fun.
      6. Decorate your game board and game box.
1b: Why Do Project-based learning?:

The Envision Approach to Project-based Learning (Slideshow) ([http://www.envisionprojects.org/breeze_projects/](http://www.envisionprojects.org/breeze_projects/))

- Transform learning about something to learning to be something.
- Deepen demonstration and relationships.

10: Measuring What Counts:


2: Theoretical Foundation:

In this section, we examine the theoretical framework for PBL.

As with anything in the classroom, the best laid plans are, well, they are constantly evolving.

Six Affirmations for PBL Teachers ([http://www.edutopia.org/blog/affirmations-for-pbl-teachers-andrew-miller](http://www.edutopia.org/blog/affirmations-for-pbl-teachers-andrew-miller))

1. PBL Teachers Collaborate with Each Other
   - integrate projects with teachers of other disciplines
   - share and critique ideas

2. PBL Teachers Give Power to Students
   - move from structured to guided to open inquiry, voice, group contracts, learning logs and more to give students ownership of not only how they show their learning, but of how they spend their time moving toward those learning goals

3. PBL Teachers are Learning Environment Designers
   - create engaging experience for all students, big package, nitty gritty, variety of different learning activities and lessons that will arm students with the skills they need to perform well on the project
   - constantly innovate engaging learning environments
   - do not replicate

4. PBL Teachers are Student-centred
   - create engaging entry events to hook students on the project
   - focus on real-world relevance in the topic
   - provide contexts for students to connect their lives to this work
   - provide challenging student-friendly language
   - provide differentiation space

5. PBL Teachers Honour 21st Century Skills
   - teach the skills of critical thinking, collaboration and communication by targeting instruction and assessment to specific content and 21st Century skills

6. PBL Teachers Really Plan
   - majority of the planning occurs on the front end
   - design a plethora of critical components, driving questions, rubrics and assessments
   - make sure all elements of the machine are ready to go before kicking off the project
   - ensure that they can work with students during implementation
   - much planning goes into making the projects meaningful, engaging, and rigorous
PBL creates a real love for learning (so I've heard)

- PjBL and PbBL motivate both students and teachers to be more engaged with the content on all sorts of levels.
- A certain baseline of skills need to be acquired before authentic problems or projects can be tackled.
- Reading, writing, artistic abilities, math skills are all valid tools to use to engage material and present learning.
- Key to successful projects is careful planning, scaffolding (or selective backing off) and mentoring by the teacher.
- Both PbBL and PjBL approaches should never be attempted on the fly. They are a lot of work for the teacher because of the planning and careful crafting that goes into setting up the problem/project to ensure that learning outcomes are addressed and that students are adequately supported.
- The differences between the two PBLs is subtle. PjBL will result in students encountering problems to solve, albeit probably smaller problems than in PbBL.
- Problem and Project Based Learning and Assessment (http://youtu.be/F0iyUEH4Aog)

Students learn transferable skills through PBL

- PBL helps our students to contextualize the facts and skills they are learning. They are no longer “regurgitating random facts” but making meaning and connections with what they are learning.
- One of the great assets of PBL is actual learning and retention. Students have so many facts at their fingertips today, what they need is deeper understanding, and PBL can help them achieve that.
- PBL in high school is harder to implement because of all those silly learning outcomes which prevent deeper analysis in order to meet content, ie quantity over quality.
- That was always one of my peeves with "standards" in general. They are often written way too specifically and become the driver for memorization rather than learning.
- The biggest struggles that PBL might face is collaboration (getting students to get along with their peers) and self-motivation (it’s almost like a Montessori program with it’s self-directed learning).
- PBL deals with students being more “active” in their learning which means the teachers' role becomes that of facilitators. This takes more planning on the part of the teacher; and more self regulation in the role of the student.

- So often, when children leave their home learning environment and enter school, we take the authenticity away and move to “book learning”.
- Public presentation highlights the value of student work and the real-world contribution they make all the while fulfilling their own learning requirements.
- Description of process: modelling, scaffolding, fading and coaching, gradual release of responsibility.

I have found learning the same thing but from a different perspective or with a different focus changes what is learned.

- Often times more can be gleaned from a single source just by wearing a different hat.
- A clear example of this is reading and reflecting on the same article in different classes, each class asking for different take-aways from this article. It is literally like reading a completely different article.
- Studying a book or other item in ELA, first for pleasure, then for characterization, then for ..., can be a powerful experience for those who embrace and realize the experience. (I always thought this is how ELA should be taught, rather than all things, chapter after chapter.)
- This is where I think (both types of) PBLs shine, by differentiating and revisualizing what is learned. We all see the World differently; why not put these different views and understandings to action?
Here are the “Ten Lessons the Arts Teach” compiled by Elliot Eisner, one of the country's leading art educators.

1. The arts teach children to make good judgements about qualitative relationships. Unlike much of the curriculum in which correct answers and rules prevail, in the arts it is judgement rather than rules that prevail.

2. The arts teach children that problems can have more than one solution and that questions can have more than one answer.

3. The arts celebrate multiple perspectives. One of their large lessons is that there are many ways to see and interpret the world.

4. The arts teach children that in complex forms of problem solving, purposes are seldom fixed, but change with circumstances and opportunity. Learning in the arts requires the ability and willingness to surrender to the unanticipated possibilities of the work as it unfolds.

5. The arts make vivid the fact that words do not, in their literal form or number, exhaust what we can know. The limits of our language do not define the limits of our cognition.

6. The arts teach students that small differences can have large effects. The arts traffic in subtlety.

7. The arts teach students to think through and within a material. All art forms employ some means through which images become real.

8. The arts help children to say what cannot be said. When children are invited to disclose what a work of art helps them feel, they must reach into their poetic capacities to find the words that will do the job.

9. The arts enable us to have experiences we can have from no other source and through such experience to discover the range and variety of what we are capable of feeling.

10. The arts' important position in the school curriculum symbolizes to the young what adults believe is important.

I experienced these types of fun classroom learning activities as a student – with chicks, salmon and frogs – but had no idea that we were doing project based learning.

You must be mindful of learning theory when designing instruction, whether it be whole courses or individual lessons.

The Inquiry Page (http://www.inquiry.uiuc.edu/)

• The Inquiry Page is a dynamic virtual community where inquiry-based education can be discussed, resources and experiences shared, and innovative approaches explored in a collaborative environment. Here you can.
  ○ Search a growing database of inquiry units, and you can also build your own.
  ○ See pictures of inquiry-based activities and learn more about some of the partners who use inquiry methods.
  ○ Learn how to assess and evaluate inquiry-based education.
  ○ Look for more inquiry resources to support what you're doing.
  ○ Find out more about what inquiry and The Inquiry Page are all about.

• Project-based and Problem-based learning are inquiry-based learning methods. Explore this site by clicking the link above. After your exploration, contribute your thoughts and impressions in our learning theories discussion (http://moodlemeets.learnnowbc.ca/mod/forum/view.php?f=169).

Project–, Problem–, and Inquiry–based Learning (http://eduscapes.com/tap/topic43.htm)
David Thornburg on Evolving Classroom (http://www.edutopia.org/david-thornburg-future-classroom-video)
InnoSight Institute Michael Horn Keynote CUE 2011 (http://www.innosightinstitute.org/who-we-are/staff/michael-horn/)


- Printing off the slides from David LeBlanc's "Inspecting the Foundation" talk.

An overview of 3 constructivist theories. TILT Episode 11 – Technology for Thinking (http://tilttv.blogspot.ca/2006/06/tilt-episode-11-technology-for.html)

When you have a broad range of learners and workers, authentic to one can be plastic to another.

PBLs embody the saying “Work smarter, not harder”.

- What does deeper learning look like? (http://youtu.be/6kRpQAoCWWs)
  - This is a very inspirational video as to what PBL can accomplish.

- For those looking for the “fast route”, some of the current processes may be their answer. But for those trying to learn and UNDERSTAND the topic, PBL is better.

- Being able to be a TEAM player, where Together Everyone Achieves More, is an important skill to add to any resume.
  - A wonderful thing about PBL is that it gets students working together ... something that happens EVERYDAY IN THE REAL WORLD.
  - Every day when we are at work we are working with and collaborating with other people. This is such an awesome skill to instill in children.
  - It is about using each others' strengths, focusing on our one part of the job, and everyone getting the job done together.

- When students undertake projects (individually or in groups, and regardless of age) and have creative license with their projects.
  - They develop deeper thinking and questioning skills which they will need in the real world.
  - They acquire a strong sense of ownership and engagement.
  - Teachers become facilitators and can assist in guiding the process, but students do the core work.

- PBLs boost understanding while they use and teach critical thinking skills that are so important.

It is important for teachers and students alike to know how they learn best.

- I do wonder about overloading the 'left brain' students with group project work.
  - I work with some very left brain students who are nearly overwhelmed by group work and their parents' don't always see the value of it when weighed against the stress their student experiences.

- I imagine it will take balancing like so many other educational tools that are in the tool box.
  - We always need a combo of units for all our students.
  - Projects and roles can be made to meet learning styles.
    - Incorporate Blooms' taxonomy higher level thinking skills.
3: A Framework for Developing PBL Curriculum:

Criteria for Authentic PBL in the Classroom (http://www.rmcdenver.com/useguide/pbl.htm)

- A local issue or problem, deeply affecting almost everyone in a community, would be a great topic for students to work on.
- Create a "hook" or question that is appropriate across grade levels. Create this hook from common themes in grade level curricula.
- The project must replace something they are already doing. It is not an add-on to what they already do.
- Blended K-12 Education meets Project Based Learning (http://sloanconsortium.org/conference/2012/blended/blended-k-12-education-meets-project-based-learning)
- PBL-online: Design Principles (http://pbl-online.org/pathway2.html)
  - PBL-Online will guide you through the development of engaging, standards-focused projects.
  - When you are ready,
    - You can download a Project Planning Form (http://pbl-online.org/ProjectPlanning/PlanningForm.htm) to write down your project plan.
    - Or you can log in to the PBL-Online Collaboratory (http://pbl-online.org/CoLab/PBLCL-01.login.php) to record your project ideas and share them with others.
- The Project Approach (http://www.projectapproach.org/)
  - This site is a comprehensive resource for project-based learning.

PBL and DL (http://moodlemeets.learnnowbc.ca/mod/forum/discuss.php?id-986)

- Without the personal contact and face-to-face groups, it is different to work with PBL.
- Here are ways to communicate with DL students.
  - Skype, classes, field trips, Moodle forums in online units and courses, email, telephone, Moodle messaging, wikis, one-on-one tutoring, drop-ins, Voicethread, end of term conferences, Illuminate, WiziQ or Google Hangouts. Google and Yahoo groups, having virtual "office hours" when they can contact you with questions/ideas.
- Here are collaborative tools and activities DL students can use.

PBL and Assessment (http://pblchecklist.4teachers.org/intell.shtml)

- 4Teachers offers many resources, including checklists to support Project-based Learning and evaluation.
- Imagine the importance behind the driving question and the detail in the preparation to launch the project.
With a clear driving question, launching activity and clear rubrics, PBL can lead to in-depth learning experiences for all ages.

I have found that developing a GREAT rubric can be quite time consuming. However, once you put the time into creating just one you have an excellent template to feed off of for other rubrics.

Creating rubrics for PBL (http://rubistar.4teachers.org/)

• Qualitative Ratings: Awesome!, You've got me thinking., Great idea., Very informative., Good to know.

4: Examples for Your Perusal:

Project examples for PBL in databases.

• Teach 21 (http://wveis.k12.wv.us/teach21/public/project/MainMenu.cfm?tsele1=2&tsele2=107)
• The Project Exchange (http://www.envisionprojects.org/cs/envision/print/docs/750)
• PBL Camp. Ideas for Projects (http://www.edutopia.org/groups/project-based-learning/23617)

My Science Box – all grades (http://www.mysciencebox.org/)

• Complete, scaffolded lesson plans to teach a 4-6 week middle school science unit through activities, projects, and field trips.
• Every lesson has been kid-tested with students at Archway School (http://www.archwayschool.org/).
• Create a printable version of any lesson plan or even a whole teaching box by clicking the “printer friendly version” button at the bottom of any page. If you use these lessons or have feedback, please register and post a comment for other teachers to view.

Envision Project – Greenback or Greenspace (http://www.envisionprojects.org/cs/envision/view/env_p/88)

• How can we use math to reconcile the tensions in land use decisions?
  • This project is an adaption of the culminating assessment for the 9-week Interactive Mathematics Program’s Meadows or Malls unit.
  • It asks students to use matrices and linear algebra to develop a recommendation for the mayor of San Francisco of how to best use 550 acres of donated land for either recreation or development.
  • Recommendations must adhere to constraints and improvement costs given by the city council for each type of land use.

Rube Goldberg and DaVinci Machines

• Last year I did a successful forces and motion project in which my 9th grade students designed a Rube Goldberg machine.
• Since at my school we are not allowed to repeat a project, this year the students are building models of historically important inventions – DaVinci machines, etc.
• Another teacher at the school has had success with siege equipment – catapults and the like.
• Have the students design and build different joints based on levers.

Science and Ancient Greek Mythology

• I have taught a lot of science topics using Ancient Greek Mythology.
• The kids LOVED becoming the gods and goddesses, heroes and heroines responsible for (or associated with) lightning/electricity, echoes, volcanic eruptions, hurricanes, vegetation, day and night, etc.
  • Chaos is the god of matter, Hermes is the god of motion, Echo is the god of sound, Prometheus (fire) is related to heat, Apollo is the sun god and Herea is the goddess of light, Narcissus sees his reflection (light). Zeus is
lightning/electricity, Demeter and Persephone explain the cycles of seasons/growth ... there are mortal characters who relate as well.

- We had a mini-Greek festival with costumes (symbols and evidence of learning required) food and grape juice, and ‘olympic games’ to finish off our unit of study ... you know, in honour of Dionysus, god of parties and of wine!

Who We Are

- Kids can actively become student archivists and learn more about the history of where they live.
- They can document their efforts to preserve this history and keep the community involved, perhaps through a museum.
- They could even become guides for the museum after learning about all the artifacts in it.
- This can easily turn into a multidisciplinary project. For example, Science and Social Studies can be used to protect historic areas and educate the community on their significance.
- Part of the project could also involve students looking at their community and landscape (type) and how it has been reflected in literature.

Integrating Documentaries into Global Project-based Learning

- Have a selection of documentaries and media to give students a choice in topic.
- Collaborate with other students to form global teams to research and develop a blog or ning.
  - A blog or ning could offer a chance to bring in experts for video conferencing and pool together links and student learning in a central location.
  - A blog or ning can merge information researched, advocacy ideas, action steps, philanthropy opportunities or wherever the students' passion takes them together.
  - The audience is authentic and the topic relevant on a broader scale.
- This could be an enrichment project where groups form based on interest to make multi-aged teams.
- The culminating project could be a digital piece that is aired on the web, local television, at a film festival, or in an Oracle’s Thinkquest competition.
- This is a larger project in that you start in August/September and submit a finished project in March.
- Examples.
  - Design for Change (http://www.dfcworld.com/)
  - Pollinators LIVE (http://pollinatorlive.pwnet.org/)
  - Co-nect (http://exchange.co-nect.net/)
  - ISTE and NASA developed a PBL for the MMS Mission. NASA MMS Challenge (http://www.livebinders.com/play/play_or_edit?id=330317)
  - Jason Project (http://www.jason.org/)

Lori Jones. 3d modelling and animation course (http://moodlem eets.learnnowbc.ca/mod/forum/discuss.php?d=1000)

- Re-adjusting my expectations (assessment). What do you do when they blow your expectations right out of the water?
  - Moodle allowed me to post screencasts with skills instructions and layout the scaffold projects in a very visual and clear way.
Students could access the basic skills whenever they needed them via screencasts and that left me open to really help them with specific skills in the classroom.

- Students took the basics and ran with it.
  - They created things with skill sets I would never have imagined we would attain in a single term.
  - Their own motivation and drive and the incremental pushes set up by the scaffolding produced some incredible projects.

- Here are some sample student portfolios they said I could share:
  - The Art of Xavier Cherry (http://xaviercherry.weebly.com/)
  - Callum’s Cornucopia of Computerized Curiosities (http://callumscornucopia.weebly.com)
  - The Tocher Models and Animation Portal (http://ldstportfolio.weebly.com)
  - DJC Animations (http://djcanimations.weebly.com/index.html)

Andrea Brown – Tragedy in Prince George, B.C. Lakeland Sawmills PBL

- The fire at Lakeland Sawmills here in Prince George deeply affects almost everyone in our community.
- I thought it would be a great topic for students to work on a PBL based on this tragedy.
- Rationale:
  - The fire presents a great opportunity for an inquiry project that could incorporate question-development, interviews, use of local information sources, and sharing information with an authentic audience.
- End Goals:
  - Awareness on how victims, survivors and the Prince George economy are impacted.
  - Fundraising Funds for Employees of Lakeland Mills.
- Questions that can be used as a basis for steering projects:
  - How does this tragedy affect the Prince George Economy?
  - How does this tragedy affect the individual victim’s and their families?
  - How does this tragedy make trades people feel about working in the Forest Industry?
  - How does this tragedy affect other Sawmills in British Columbia?
  - (Some project questions might be geared more towards community members while others might be geared more towards business members within the community.)
- Getting Started:
  - Have the student’s share what they know and where they got their information.
  - That will likely lead to questions and ideas about where they could get more information and what else they would like to know.
- Presentation Ideas:
  - PowerPoint presentation, Video, Poster, Skit or Drama presentation, Tableau Personal stories (with pictures and audio from families, friends and survivors), Website, Blog, Graphic Novel, Art Piece, Class Newspaper
- Formative Assessment Cycle:
  - Instructional input
  - Opportunity to practice
  - Assessment of the skill (teacher, peer and self)
  - Feedback about successful learning and the next step
  - (Cycle continues until the project is completed)
- Your students strengths and weaknesses, as well as the PLOs (Prescribed Learning Outcomes) being covered, would ultimately affect the question being posed and the presentation/outcome of the assignment to the
authentic audience.

- Another great thing about PBLs is that a wide variety of PLOs can be met.

- Some of the resources I used are below.

- After students talk about what they know.
  - Students develop in-depth understanding of the topic based on an information retrieval plan.
  - Students work with others to monitor understandings of the topic and sensitivities to the topic.
  - Students are specifically taught skills for reading and evaluating complex informational texts.
  - Students use the Internet, with guidance and instruction from the teacher.
  - Students are specifically taught interviewing skills that consider the appropriate protocol for each situation.
  - Teacher provides a choice of notes or graphic organizers for students to record information.
  - Students are specifically taught note-taking skills, including highlighting techniques.
  - Teacher assists students in modifying and adapting their topics.
  - Students create a report or presentation based on guidelines provided in the planning phase and in response to the needs and interests of the intended audience.
  - Students use technology appropriately to enhance their presentations and reports.
  - Students share the final report/project with larger groups, with other classes, in the community, with family.
  - Teacher identifies and shares evaluation criteria for the process and the product.
  - Students can play a role in setting evaluation criteria for the process and the product.
  - Students understand evaluation criteria for the process and the product.
  - Students learn and apply appropriate peer-evaluation skills.
  - Students share their feelings and progress each class.
  - Teacher monitors progress at the end of each class.
  - Students talk about what went well and what was challenging.

Taking our students' passions and making them come alive is at the very heart of PBL.

- Check out this article and video (http://cainesarcade.com/) of a little boy in LA who used his passion of arcades to make an amazing arcade out of cardboard.
  - No learning outcomes at the beginning but at the end I could count SO many!

- One of the big things that I love about PBL is that you really get to know students and the passions that breathe life into them.
  - Once in University, we were studying Biomes and the prof told us that we could present the findings of our Biome in ANY way that we wanted.
  - My passion has always been dance. I did a dance to a narration of me talking about my Biome.
  - It was my most memorable assignment as it really moved me (literally).
Introducing a project:

- I had a great time helping a friend (new teacher) with their class using Pinterest and a Global Warming project.
- We began by posting various pics re industry, lifestyle, consumerism, weather/climate, etc ...
- We had students add whatever they wanted to it (not really any guidance other than it had to relate in some way to what they saw and had to be appropriate) ...
- Even with that limited intro, themes began to emerge, discussions developed and THEY, the students, came up with topics related to Climate Change and Global Warming all on their own.
- I think the only direct hint we used was a picture of Al Gore up on the crane in his presentation showing global climate changes on a wall projection.
- ALL the other pictures tended to get framed around what they want or don't want – sustainability, global population trends, financial stability globally, etc ...
- It was great. (I followed the online discussions of the class and debriefed with my friend every day or two).
- However, it does require a level of faith and risk trying these things ...
  - When they work, it is great ...

It would be very interesting to add cross-cultural web meetings, where children from one country could meet and chat, or even work in some particular project, with those of another:

- When I was like 13 years old, I once subscribed to a pen-pal service.
- It was a very exciting moment to open the mail box and see a letter coming from someone of a foreign country, be it France, Germany or some other “exotic” place!
- It was a real pleasure to exchange ideas and points of view about life.
- Letters used to come with pictures from the place she/he lived, small dried flowers or some small item.
- As a side-effect, this also motivated the hobby of stamp-collecting, some stamps had such wonderful designs!
- That experience, along with the opportunities I had to travel, I think allowed me to be more open to look for and enjoy meeting people from “outside”, something that wasn't evident from others of my age.

Picturing Women

- Juxtaposing Art and Artifacts from the past and present, we ask:
  - What constitutes Female Identity?
  - How is it Culturally Constructed in images, artifacts and texts?
  - What roles have these artifacts played in Defining Women's Places in society, how they have been pictured Historically and are pictured Today?
- Explore These Questions and others of your own imagining on this Web site and in your daily lives, as you recognize the Picturing of Women all around you.
- Visit the following Website: Picturing Women (http://picturingwomen.org/)

- My Reflections
  - What did you find interesting at the Website?
  - What parts of the Website did you find the most interesting? Why?
  - Do you think you might use the site in after this assignment is done? If so, how? If not, why not?
  - Do you notice any usability problems or technical bugs? If so, please describe them in detail, and note the kind of computer and Web browser you are using.
  - Was there anything you found confusing about the site?
- Spend about one hour or more going through each section of the site.
- Interact with the site by participating in some of the activities.
  - Append any entry you may have there by responding to the My Reflections questions,
  - Create your own juxtaposition (http://picturingwomen.org/jp_choose_objects.php), or
  - Add your comments to a discussion forum at the site.
- Whichever activity you decide to do, copy the URL of your work and put this in your assignment submission.
  - It's a good idea to look at the juxtapositions created by others at the site to gain an understanding of how these work.
  - Creating a forum entry may be a simple as expressing why a certain image or juxtaposition engaged your curiosity and caused you to think.
- Participate with others in our class by starting a discussion thread or responding to what others have said about their impressions of the Picturing Women site.
  - Be sure to include links to either your juxtaposition and/or your forum participation at the Picturing Women site.
- Use our Google search box to explore other Websites on the Internet.
  - Create either a short presentation (ie. PowerPoint) or Word document collage to tell a short story of a theme that interests you about how women are depicted in art or media.
  - Use the upload tools at the bottom of the page to submit this part of your project.

Through the Eyes of an Archeologist
- There are few remains of Minoan culture – no religious text, literature, philosophy, nor music.
  - However, archeologists have learned about Minoan culture and society from their architecture, art, and artifacts.
  - We can also learn about the Mycenaean culture from the ruins of Mycenae.
- You will assume the role of an archeologist.
  - Search the Internet for examples of Minoan and Mycenaean art, architecture and artifacts.
  - Examine these examples and decide what they tell us about these two societies.
  - Do your findings tell us anything about:
    - social organization
    - attitude towards women
    - leisure activities
    - occupations
    - politics
    - religion / beliefs
    - any other aspect of life
  - Record your findings in a three-row format. (Paste a picture of the artifacts that you are examining onto your file).
    - Columns: Minoan Culture, Mycenaean Culture
    - Rows: Leisure Activities, Attitude towards women, Beliefs

Guess who's coming to dinner?
- From the death of Augustus in 14CE to the end of Diocletian rule in 305CE, the Roman Empire was ruled by a succession of Emperors.
- Review pages 200–218 of your textbook and refer to the following links.
Suppose that you had to invite all of these leaders to dinner.

- What would the seating arrangement look like?
- You must clearly defend your seating plan.
- Do your guests share similar views in religion, social policy, the military?
- Or will you seat individuals with vastly different views together so that they learn from one another?

Ecosystems

- It is expected that you will understand the organizational levels of the biosphere.
- It is expected that you will understand the types of interactions that are seen within an ecosystem.
- It is expected that you will understand what effect humans have on the ecosystem and biodiversity.


The Center for Educational Technologies, at Wheeling Jesuit University (http://www.cotf.edu/ete/, http://www.cotf.edu/ete/modules/modules.html)

Danger: “The Wave” is about how a “high school teacher's unusual experiment to demonstrate to his students what life is like under a dictatorship spins horribly out of control when he forms a social unit with a life of its own”. This is PBL in action.

Theatre production, “Good Timber”, blends songs and storytelling with museum archived images and video footage to portray what early forestry was like in BC (http://youtu.be/4p89UkOYeCM, http://www.otherguystheatre.ca/)

“Pay it Forward”

Posing Questions:

- If only we could help students imagine amazing questions. There is no doubt they can come up with amazing solutions and answers.
  - Shawn Urban
- We often overlook the importance of questioning and the critical thinking it can inspire.
  - David Le Blanc
- Imagining rich questions is probably the most overlooked skill our students miss out on. It is critical to true independent and productive learning and doing. I have been fascinated by this topic since I first considered teaching and that fascination has grown with each year.
  - Unpacking “imagining rich questions” can lead to strategies in how to teach people how to ask questions. In fact, this could easily form a meta-interdisciplinary PjBL challenge.
  - I imagine several points to start the unpacking,
    - observation (including realization of patterns and gaps in patterns)
    - recognition of issues (as part of observations)
- curiosity (how does, how do (I), what if, what is, ...)
- finding questions (a previous #mathchat topic, showing that I am not the only one curious about this topic)
- posing questions (a book was written on this, I think by Brown)

- Perhaps you're referring to “The ART of Powerful Questions. Catalyzing insight, Innovation, and Action.”
  (http://www.theworldcafe.com/pdfs/aopq.pdf)
  – David

  – Shawn

- Conditions of Learning (http://mathhombre.blogspot.ca/search/label/Conditions%20of%20Learning)
- If you only had a year to live, what would you teach? (http://twitter.com/stefras/statuses/280794603337183232)