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#### **PBL Glossary**

#### 21<sup>st</sup> Century Skills-

- Ways of thinking-creativity, critical thinking, problem-solving, decision-making and learning
- Ways of working-communication and collaboration
- **Tools for working-**information and communications technology (ICT) and information literacy
- Skills for living in the world-citizenship, life and career, and personal and social responsibility

**Affinity map-**A simple technique for organizing concepts: it consists of placing related items together. Participants organize ideas by grouping closely related concept words and phrases, written on cards, into cluster.

Benchmark-A standard or group of standards that students master related to the project

**Chalk Talk**-A silent way to reflect, generate ideas, check on learning, develop projects, or solve problems. Because it is done completely in silence, it gives groups a change of pace and encourages thoughtful contemplation.

**Driving Question (DQ)-** The question/problem the student's answer/solve by the end of the project-multiple solutions possible.

**Entry or Launch Document/Event**-Something used to introduce a project. This could be in the form of a paper or digital document, a video, a guest speaker, or other event that kicks off the project in a meaningful and engaging way.

**Feedback**-I like/I wonder/Next Steps: when providing feedback, begin with something you like about the project, follow it with an "I wonder..." that will highlight a concern you have with the project, and finally suggest some next steps that could be taken.

**Know/Need to Know (NTK)**-A chart generated by the class that documents what they know following an entry event, and what they determine they will need to know.

**Problem Statement**-A concise description of the issues that need to be addressed by a problem solving team and should be presented to them (or created by them) before they try to solve the problem.

Project-Based Learning (PBL)-Teaching/learning through real-life projects

Project Description-real world scenario

**Prompt**-1-2 sentences describing what students need to do to solve the problem by contentonly content needed to solve problem.

**Protocols**-The established code of procedure or behavior in any group, organization, or situation.

**Rubric**-A rubric is a checklist of requirements to help students achieve the grade they want. Using a set of criteria and standards (directly tied to the stated learning objectives), educators can assess each student's performance on the deliverables required for the project.

**Scaffolding**-Refers to the idea that specialized instructional supports need to be in place in order to best facilitate learning when students are first introduced to a new subject. Scaffolding pieces could be in the form of workshops (mini lessons) for students that arise from their Need to Knows.

**Think, Pair, Share**-Cooperative discussion strategy. Students first take a few moments to "think" about the question. Students then identify and "share" the answers they think are best, most convincing, or most unique with a partner. Finally, each pair of students "shares" their findings with the class.

**Workshop**-A scaffolding tool used to meet student' needs required skills throughout the course of a project. Just in time mini lesson assigned by the teacher or requested by the students.

# What's the Difference Between "Doing Projects" and "Project Based Learning"?

Projects	Project Based Learning
Can be done at home without teacher guidance or team collaboration.	Requires teacher guidance and team collaboration.
Can be outlined in detail on one piece of paper by the teacher.	Includes many "Need to Knows" on the part of the students and teachers.
Are used year after year and usually focus on product (make a mobile, a poster, a diorama, etc.).	Is timely, complex, covers many TEKS, and takes a team of highly trained professionals significant time to plan and implement.
The teacher work occurs mainly after the project is complete.	The teacher work occurs mainly before the project starts.
The students do not have many opportunities to make choices at any point in the project.	The students make most of the choices during the project within the pre-approved guidelines. The teacher is often surprised and even delighted with the students' choices.
Are based upon directions and are done "like last year."	Is based upon Driving Questions that encompass every aspect of the learning that will occur and establishes the need to know.
Are often graded based teacher perceptions that may or may not be explicitly shared with students, like neatness.	Is graded based on a clearly defined rubric made or modified specifically for the project.
Are closed: every project has the same goal. (As in the example below, the end result is always The Alamo.)	Is open: students make choices that determine the outcome and path of the research.
Cannot be used in the real world to solve real problems.	Could provide solutions in the real world to real problems even though they may not be implemented.
Are not particularly relevant to students' lives.	Is relevant to students' lives or future lives.
Do not resemble work done in the real world.	Is just like or closely resembles work done in the real world.
Do not include scenarios and background information or are based on events that have already resolved.	The scenario or simulation is real or if it is fictitious, is realistic, entertaining, and timely.
Are sometimes based around a tool for the sake of the tool rather than of an authentic question. (Make a Prezi.)	Use technology, tools, and practices of the real world work environment purposefully. Students choose tools according to purposes.
Are turned in.	Is presented to a public audience encompassing people from outside the classroom.
Are all the same.	Is different.
Make a model (or diorama or mobile ) of the Alamo.	Design a fortification that would take your community through a bio (or other non-traditional attack) and make a recommendation to the city council for future planning.





# Project-Based Learning Unit:



Image via Paul Curtis (@paulscurtis)

# Before beginning work on the development of your project there are number of elements that must be present:

- Student centered, student directed
- A definite beginning, middle, and end
- Content that is meaningful to students and directly observable in their environment
- Real-world problems
- Firsthand investigation
- Sensitivity to local culture and culturally appropriate
- Specific goals related to curriculum and school, district, state standards
- A tangible product that can be shared with the intended audience
- Connections among academic, life, and work skills
- Opportunity for feedback and assessments from expert sources within the community
- Opportunity for reflective thinking and student selfassessment
- Authentic assessments (portfolios, journals, etc.)

## Essentials for Structuring Projects

- <u>Situation or problem</u>: A sentence or two describing the issue or problem that the project is trying to address. **Example**: Homes and businesses in a lake watershed affect the lake's phosphorus content, which reduces the lake's water quality. How can businesses and homeowners improve the quality of the lake water?
- <u>Project description and Purpose:</u> A concise explanation of the project's ultimate purpose and how it addresses the situation or problem. **Example**: Student will research, conduct surveys, and make recommendations on how businesses and homeowners can reduce phosphorus content in lakes. Results will be presented in a newsletter, information brochure, community fair, or Web site.
- <u>Performance specifications</u>: A list of criteria or quality standards the project must meet.
- <u>Rules:</u> Guidelines for carrying out the project. Include timeline and short-term goals, such as: Have interviews completed by a certain date, have research completed by a certain date.
- <u>List of project participants and roles assigned</u>: Include project teammates, community members, school staff members, and parents.
- <u>Assessment:</u> How the student's performance will be evaluated. In project-based learning the learning process is being evaluated as well as the final product.
- <u>Run the project first:</u> Always try the project out first before using with students. If it takes you 5 days to complete, it will more than likely take students 10 days.

# **PROJECT BASED LEARNING IN CAREER PATHWAY COURSES**

Project Title: Let's Get Comfortable	•			
Teacher(s):	Email:	Date:		
Course(s):		Level(s):		
Project Days:		Instructional Time:		
	PROJECT DE	SCRIPTION		
Challenging Problem or Driving Que	estion: <u>How can</u>	we enable our clients to experience maximum		
climate comfort in their living space	<u>es?</u>			
You are a (insert real-workplace ro	<b>le).</b> <u>Heating and C</u>	ooling Technician		
You are faced with <i>(insert a probler</i>	<b>m).</b> <u>You are a hea</u>	ting and cooling technician that has received a		
service call requesting a quote on re	eplacing an existir	ng furnace and window air conditioning unit.		
You must (insert what must be done to solve the problem). Visit the home and take measurements of the home's square footage and create a quote on possible options for the homeowner to choose.				
<ul> <li>Literacy Prompt: (List students' required actions): <u>Students will need to know how to research a topic using various media sources, organize findings for evaluation, and select and present valuable findings in written and verbal form.</u></li> </ul>				
• Math Prompt: (List students' required actions): <u>Students will provide measurements in order to</u> calculate total area of the home for heating and cooling needs.				
• Science Prompt: (List stude	nts' required action	ons)		
• 21 <sup>st</sup> Century Prompt: (List students' required actions): <u>Students will create contracts for each</u> position within the group outlining tasks, expectations, and due dates.				
ESSENTIAL STANDARDS				
CTE Technical Standards: CTI-8.4, C	TI-8.5, CTI-9.1			
Literacy Standards: <u>11-12.W.5, 11-12.W.6.1, 11-12.W.6.2, 11-12.SL.2.1, 11-12.SL.2.3, 11-12.SL.4.1</u>				
Math Standards: <u>7.GM.3, 5.M.2, 5.M.3, G.T.8, G.QP.5</u>				
Science Standards:				
21 <sup>st</sup> Century Standards: <u>WBL-2.2, WBL-2.3, WBL-2.8, WBL-2.9, WBL-3.3, WBL-4.4, WBL-4.5, WBL-4.6</u>				
DESIGN PROCESS				
Step 1: Ask/Inquire				
Entry Event and Project Launch: Mr. Caliente has a 28-yr old furnace and a large window air				
conditioning unit. His wife says their system is no longer acceptable. He's not sure why buying a new				

conditioning unit. His wife says their system is no longer acceptable. He's not sure why buying a new

system will be worth the money. He would like for someone to stop by their house and give them a guote and a detailed explanation of exactly what they would be getting and why they need it. (Lee – this is probably a good time to take the laptop out and go through our presentation with the Caliente's)

#### What will you do during this phase of the process?

#### Step 2: Imagine

What will my students do during this phase of the process? List student work & its assessment. Brainstorming-students will create a list of things to consider prior to making the home visit. Possible ideas may be; building materials used for the home, size of home, type of insulation, age of home, bilevel/single level/split level, energy supply at house (electric/gas), lots ability to support a geothermal source, windows (number, square footage of glass, and direction they face), location of ductwork, location and type of present furnace (boiler, under floor, radiant, electric) and average yearly temperatures in the area. Know/Need to Know-brainstorming ideas will be combined and teacher will lead students through the NTW process identifying other possible factors that need to be considered.

#### Step 3: Plan

What will my students do during this phase of the process? List student work & its assessment. Students will research various brands of heating and cooling equipment, identify and understand different price differentials, and suggest equipment choices for potential clients. Mini-lessons by the literacy specialist on writing research papers and technical writing for the quote and by the math specialist on figuring volume and square footage for calculating the size of the home for the heating/cooling unit. Mini-lesson by instructor on usage of the Residential Load Calculation J and D manual for selecting furnace and ductwork needed.

#### Step 4: Create

What will my students do during this phase of the process? List student work & its assessment. Students will develop a quote based on the information gathered from the home visit.

#### Step 5: Experiment/Evaluate

What will my students do during this phase of the process? List student work & its assessment. Students will then test out the data from their quote at the EACC building trades house to measure accuracy. Measurements for total area will be taken, temperature readings will be taken in different rooms and on each level of the home.

#### Step 6: Improve

What will my students do during this phase of the process? List student work & its assessment. <u>Students will apply information gathered to revise quote.</u>

Step 7: Communicate What will my students do during this phase of the process? List student work & its assessment. Student groups will present their quotes to the customer.

#### **STUDENT EVALUATION**

Rubric(s)

Assessment(s)- Written weekly journals to reflect:

- What the student is working on
- What progress he/she has made during the week
- What problems he/she has encountered with the project during the week
- o Questions and comments for the teacher
- During group workdays, participation assessments (on task/not on task) may be utilized
- Weekly group self-assessments using group journaling

Group presentation of research results. Final product should include:

- Oral presentation that supports the answer to the essential question
- Written summary of findings and a recommendation for the best type of comfort system for a heating/cooling customer (could be a PowerPoint or other type of presentation).

#### **INSTRUCTOR REFLECTION**

What went well? What could be improved? How will you modify this project for next time?

#### SUPPORTING MATERIALS

**Equipment/Technology**-<u>computer and projector</u>, Residential Load Calculation Manuals J and D, presentation software

**Materials**-<u>tape measure</u>, <u>blueprint of home</u>, <u>notebooks for each student</u>, <u>product brochures</u>, <u>catalogs</u>, <u>price guides</u>, <u>and spec</u>. <u>sheets</u> (obtained through wholesalers and contractors)</u>, <u>poster boards</u>

# Human Resources

Other

#### **ADDITIONAL COMMENTS**

(Optional)

# Thinking like a Professional: The Professional Notebook (optional)

What are the essential components of the Professional Notebook students will keep for this project?

How will you use the Professional Notebook to assess the work on this project?

## PROJECT BASED LEARNING IN CAREER PATHWAY COURSES

Project Title: Restaurant Wars					
Teacher(s): M. McClain	Email: mmcclain@eklha	art.k12.in.us	Date: 4/14/16		
Course(s): Culinary Arts		Level(s): 2			
Project Days: Instructional Time:			ne:		
	PROJECT DESCR	IPTION			
Challenging Problem or Driving	Question:				
You are an Executive chef at an upscale casual restaurant.					
You are faced with Creating a three course meal for five to six people from a specific region/country with a budget of \$35.00pp.					
You must <b>(insert what must be</b>	done to solve the proble	m).			
• CTE Technical Prompt: develop recipes, create a menu, create & source a shopping list, cost the menu, invite guests, prepare a physical copy of the menu for customer, decorate the dining area, prepare & serve the meal, reflect on the process					
<ul> <li>Literacy Prompt: research region/country and recipes, write a 1-2 page paper on your region/country, include cultural information on foods, cooking techniques, recipes, and why you chose them, two reflective writings at the conclusion of the project on the overall project, including reviews of your peers and a letter to yourself as a 1<sup>st</sup> year student sharing what you wish you had known then</li> </ul>					
• Math Prompt: price out the shopping list and use to determine the cost of your recipe, compare your food cost to the selling price to ensure you are within goal (≤ 30% food cost).					
Science Prompt: research and perform cooking techniques					
21st Century Prompt:					
ESSENTIAL STANDARDS					
CTE Technical Standards:					
ACA-1.3 Demonstrate pro	per selection of equipme	nt and utensils fo	r specific application		
ACA-1.5 Demonstrate pro	per scaling and measurer	nent techniques (	utilizing standard and metric unit		
ACA-1.6 Apply basic math	ACA-1.6 Apply basic math skills to recipe conversions				
ACA-6.1 Examine types of	rood costs, cost control to	pols, and operatir	ng budgets		
ACA-6.2 Determine, establ	ish and monitor food pro	duction and costi	ing		
products	s to promote quality in p	urchasing, receivi	ng, producing, storing and servic		
ACA-6.4 Examine processe	ACA-6.4 Examine processes for managing purchasing and controlling inventory				
ACA-7.2 Identify methods	ACA-7.2 Identify methods for creating a market identity, promoting sales and communications wit				
ACA-7.3 Examine, organize	and create various types	of menus			

ACA-7.5 Compare basic pricing methods of menus

#### Literacy Standards:

Reading Standards for Literacy in Technical Subjects 11-12

11-12.RT.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
11-12.RT.3 Follow precisely a complex multistep procedure when performing technical tasks; analyze the specific results based on explanations in the text.

11-12.RT.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific context relevant to *grades 11-12 texts and topics*. 11-12.RT.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Writing Standards for Literacy in Technical Subjects 11-12

11-12.WT.2 Write informative/explanatory texts, including technical processes.

11-12.WT.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

11-12.WT.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

11-12.WT.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectivity to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

11-12.WT.10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

#### Math Standards:

K.CC.4: Understand the relationship between numbers and quantities; connect counting to cardinality.

K.CC.5: Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered

configuration; given a number from 1-20, count out that many objects.

K.CC.6: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (Groups with up to 10 objects)

K.OA.1: Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or

equations.

K.OA.2: Solve addition and subtraction word problems, and add and subtract within 10,

e.g., by using objects or drawings to represent the problem.

K.MD.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

2.MD.10: Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

3.NF.1: Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

3.MD.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (I). Add, subtract, multiply, or divide to solve onestep word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

5.MD.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05m), and use these conversions in solving multi-step, real world problems.

#### Science Standards:

#### 21<sup>st</sup> Century Standards:

- **Ways of thinking.** Creativity, critical thinking, problem-solving, decision-making and learning
- Ways of working. Communication and collaboration
- **Tools for working**. Information and communications technology (ICT) and information literacy
- **Skills for living in the world.** Citizenship, life and career, and personal and social responsibility

#### DESIGN PROCESS

#### Step 1: Ask/Inquire Entry Event and Project Launch

What will you do during this phase of the process?

Show episode of Top Chef (season 11, episode 9). This is the restaurant wars episode and clearly demonstrates what happens when teams work together and when they don't.

Pass out handout to be completed while viewing the episode.

Pass out main handout explaining project after debriefing video and review.

Step 2: Imagine What will my students do during this phase of the process? List student work & its assessment.

Students will begin researching regions and countries to decide on where they want to cook from. Once their choice is approved (to avoid duplication), they will research their area and write a 1-2 page paper describing the area, foods, techniques, and traditions. They will also submit copies of the recipes they are interested in cooking.

Step 3: Plan

What will my students do during this phase of the process? List student work & its assessment.

Students will plan a menu, plan the execution, create a shopping list of ingredients, create a written menu, and design the décor. They will invite guests to dine. Guests will consist of family members and industry professionals. All of the planning stages have forms to complete and submit.

Step 4: Create

What will my students do during this phase of the process? List student work & its assessment.

Students will create different recipes and design motifs for the restaurant. They are to submit copies of their ideas for final approval.

Step 5: Experiment/Evaluate

What will my students do during this phase of the process? List student work & its assessment.

Students will test their recipes and timetable. They will self-assess and adjust as necessary.

Step 6: Improve

What will my students do during this phase of the process? List student work & its assessment.

Students will adjust their recipes and décor plans to deal with any issues that arose during the testing phase to finalize their plans for execution on service day.

Step 7: Communicate

What will my students do during this phase of the process? List student work & its assessment.

Students will use their plan and ingredients to direct their team in the execution of their menu and service. The assessment will be an evaluation of the meal and service by the instructor and industry guests as well as a completed portfolio.

#### **STUDENT EVALUATION**

#### Rubric(s)

A rubric will be provided to the students at the beginning of the project listing all components of the portfolio.

Assessment(s)

Assessments will include evaluations of the event by students, guests, and instructors and a completed portfolio that will be evaluated using the aforementioned rubric.

**INSTRUCTOR REFLECTION** 

What went well? What could be improved? How will you modify this project for next time?

#### SUPPORTING MATERIALS

Equipment/Technology – students will have access to computers, printers, and all kitchen equipment

Materials – students will be provided with ingredients and basic decorating supplies Human Resources – students will work with a team that will act as their staff Other

#### ADDITIONAL COMMENTS

(Optional)

# Thinking like a Professional: The Professional Notebook (optional)

What are the essential components of the Professional Notebook students will keep for this project?

How will you use the Professional Notebook to assess the work on this project?

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						La cher and	
Assessment Practices	Adult Connections	Active Exploration	Applied Learning	Academic Rigor	Authenticity		New Tech Network
<ul> <li>Students are not provided with clear explanation of the assessment process or and expectations.</li> <li>Assessment to project is summarized into a single final grade.</li> </ul>	<ul> <li>Students have no contacts with adults other than the teacher(s)</li> </ul>	<ul> <li>Little independent research is required.</li> <li>Students gather majority of information from textbooks or encyclopedia-like materials provided by the teacher.</li> </ul>	<ul> <li>New skills and knowledge are not applied toward solution development</li> <li>Students work primarily alone and with little self-management</li> <li>Learning occurs out of context of project</li> </ul>	<ul> <li>The project is not based on content standards</li> <li>Project demands little specific knowledge of central concepts</li> </ul>	<ul> <li>Project has little or no connection with the outside world or other curricular areas</li> <li>The problem or question has little or no meaning to the students</li> <li>Problem has a single correct answer</li> </ul>	UNACCEPTABLE	New Tech Network PROJECT IDEA R
<ul> <li>Students are provided with a clear explanation of the assessment process and expectations in the early stages of the project.</li> <li>Students use structured journals or logs to track progress.</li> <li>Assessment of project includes an evaluation of content skills / knowledge as well as life skills and/or habits or mind.</li> <li>Final product is a culminating exhibition or presentation that</li> </ul>	<ul> <li>Students have limited contacts with outside adults (e.g., guest speakers, parents).</li> <li>Teacher uses role playing or other staff members to simulate "expert contact.</li> </ul>	<ul> <li>Students are required to conduct own, independent research.</li> <li>Students gather information from authentic, but limited number of sources provided by the teacher.</li> <li>Students use raw data provided by the teacher.</li> </ul>	<ul> <li>New skills and knowledge are applied toward solution development</li> <li>Students are required to work in groups where curricular topics and skills are discussed and debated in context of the project</li> <li>Students use self-management skills informally</li> </ul>	<ul> <li>The project is derived from specific learning goals in content area standards</li> <li>Project demands specific knowledge of central concepts</li> <li>Student develop and demonstrate life skills (e.g. collaboration; presentation; writing)</li> </ul>	<ul> <li>Project simulates "real world" activities. Adults are likely to tackle the problem or questions addressed by the project</li> <li>The problem or question has meaning to the students and provides a clear "need to know"</li> <li>Project has several possible correct solution</li> </ul>	ACCEPTABLE	UBRIC
In addition to "Acceptable" attributes: <ul> <li>Students help in establishing assessment criteria.</li> <li>Students have many opportunities for feedback on their progress from teachers, mentors, and peers.</li> </ul>	In addition to "Acceptable" attributes: <ul> <li>Students have multiple contracts with outside adults who have expertise and experience that can ask questions, provide feedback, and offer advise.</li> <li>Students have the opportunity to observe and work alongside adults in a worksite relevant to the project.</li> <li>Outside adults provide students with a sense of the real-world standards for this type of work.</li> </ul>	<ul> <li>In addition to "Acceptable" attributes:</li> <li>Student are required to do field-based or experimental research (e.g., interview experts, survey groups of people, work site exploration)</li> <li>Students gather information from a variety of sources and using a variety of methods (interviewing and observing, gathering and reviewing information, collecting data, model-building, using on-line services)</li> </ul>	<ol> <li>f addition to "Acceptable" attributes:</li> <li>Students apply new knowledge to a realistic and complex problem</li> <li>Students use high-performance work organization skills (e.g., work in teams, use technology appropriately, communicate ideas, collect, organize and analyze information)</li> <li>Students formality use self-imanagement skills (e.g., develop a work plan, prioritize pieces of work, meet deadlines, identify and allocate resources)</li> </ol>	<ul> <li>In addition to "Acceptable" attributes:</li> <li>There is a well defined, clear driving question that is derived from specific national, state or district content standards</li> <li>Project demands breadth and depth of specific knowledge of central concepts.</li> <li>Students develop habits of mind (e.g., concern for evidence, viewpoint, and cause and effect, precision of language and thought, persistence)</li> </ul>	in addition to "Acceptable" attributes: <ul> <li>Entities or persons outside of the school will use the product of student work</li> <li>Students will present and defend solution to a real and appropriate audience for the student work</li> </ul>	EXEMPLARY	AUTHOR:

Adapted from Adria Steinberg's 6 As, Real Learning, Real Work.

## **PBL Essential Elements Checklist**

Whatever form a project takes, it must have these Essential Elements to meet BIE's definition of PBL.

Does the Project?	E)	P	?
FOCUS ON SIGNIFICANT CONTENT At its core, the project is focused on teaching students important knowledge and skills, derived from standards and key concepts at the heart of academic subjects.			
<b>DEVELOP 21st CENTURY COMPETENCIES</b> Students build competencies valuable for today's world, such as critical thinking/problem solving, collaboration, and communication, and creativity/ innovation, which are taught and assessed.			
ENGAGE STUDENTS IN IN-DEPTH INQUIRY Students are engaged in a rigorous, extended process of asking questions, using resources, and developing answers.			
ORGANIZE TASKS AROUND A DRIVING QUESTION Project work is focused by an open-ended question that students understand and find intriguing, which captures their task or frames their exploration.			
<b>ESTABLISH A NEED TO KNOW</b> Students see the need to gain knowledge, understand concepts, and apply skills in order to answer the Driving Question and create project products, beginning with an Entry Event that generates interest and curiosity.			
ENCOURAGE VOICE AND CHOICE Students are allowed to make some choices about the products to be created, how they work, and how they use their time, guided by the teacher and depending on age level and PBL experience.			
INCORPORATE REVISION AND REFLECTION The project includes processes for students to use feedback to consider additions and changes that lead to high-quality products, and think about what and how they are learning.			
INCLUDE A PUBLIC AUDIENCE Students present their work to other people, beyond their classmates and teacher.			

#### **Scaffolding Ideas**

#### Ways to Provide Scaffolding

#### **Direct Instruction**

Training sessions

with follow-up

Films with discussions

Reading assignments

•

•

•

#### **Handouts and Forms**

- Lectures, presentations Checklists
  - Templates
  - Timelines
  - Rubrics
  - Charts
  - Skeletons
  - Outlines
  - Models

#### Orientations

- Cues, labels, signs
- List of steps, rules, roles
- Written examples, samples
- Oral instructions
- Advance organizers
- Rules of order
- Graphic organizers

#### **Guided Practice**

#### . . .

- Rehearsals Pilot tests
- Apprenticeships
- Tutorials
- Training sessions
- Imaging
- Modeling

# Feedback Events

- Apprenticeships
- Tutorials
- Reflection
- opportunities Peer review
- Peer review
- Simulated tryouts
  - Debriefings

# Self-Management Training

- Self-monitoring, reflection
- Planning
- Goal setting
- Self-direction, selfcueing
- Self-reinforcement
- Self-assessment

#### Scaffolding to Build Skills

Group Process

• Rules of order

- Role
   descriptions
- Guidance in listening skills
- Decisionmaking steps
- Problemsolving framework
- Tutorial audio and video tapes

Technology

- "How-to" books
- Overheads

- Time Management
  - Contracting
  - Estimating and recording time allocations
  - Wall "progress" charts
  - Wall calender
  - Time In and Time Out book
- Idea generation techniques

Problem Solving

- techniques (e.g., rules of brainstorming)
- Pre-printed forms with steps and hints

		Communication	
Decision Making	Research	Skills	Technical Writing
<ul> <li>Training in the use of decision-making models</li> <li>Checklists</li> </ul>	<ul> <li>Training in specific research techniques</li> <li>Pre-printed data forms with strategies and questions indicated</li> </ul>	<ul> <li>Films on how to conduct a telephone survey</li> <li>Role-playing exercises</li> <li>Telephone scripts</li> </ul>	<ul> <li>Skeleton forms to guide descriptive writing</li> <li>Cue cards</li> <li>Half-finished examples</li> </ul>
Persuasive Writing	Complex Operations	Self-Evaluation	Metacognition
<ul> <li>Advance organizers</li> <li>Outlines</li> <li>Cue cards</li> <li>Say it, then write it</li> </ul>	<ul> <li>Reciprocal teaching (taking turns playing the roles of teacher and giving guidance and feedback)</li> </ul>	<ul> <li>Models of other students' evaluation forms</li> <li>Checklists</li> </ul>	<ul> <li>Coached apprenticeship</li> <li>Testifying in group settings</li> <li>Telling without showing</li> </ul>

#### Chalk Talk

Chalk Talk is a silent way to do reflection, generate ideas, check on learning, develop projects or solve problems. It can be used productively with any group—students, faculty, workshop participants, committees. Because is it done completely in silence, it gives groups a change of pace and encourages thoughtful contemplation. It can be an unforgettable experience. Middle Level students absolutely love it—it's the quietest they'll ever be!

#### Format

Time: Varies according to need; can be from 5 minutes to an hour. Materials: Chalk board and chalk or paper roll on the wall and markers.

#### Process

- The facilitator explains VERY BRIEFLY that chalk talk is a silent activity. No one may talk at all and anyone may add to the chalk talk as they please. You can comment on other people's ideas simply by drawing a connecting line to the comment. It can also be very effective to say nothing at all except to put finger to lips in a gesture of silence and simply begin with #2.
- 2. The facilitator writes a relevant question in a circle on the board.

Sample questions:

- What did you learn today?
- So What? or Now What?
- What do you think about social responsibility and schooling?
- How can we involve the community in the school, and the school in community?
- How can we keep the noise level down in this room?
- What do you want to tell the scheduling committee?
- What do you know about Croatia?
- How are decimals used in the world?
- 3. The facilitator either hands a piece of chalk to everyone, or places many pieces of chalk at the board and hands several pieces to people at random.
- 4. People write as they feel moved. There are likely to be long silences—that is natural, so allow plenty of wait time before deciding it is over.
- 5. How the facilitator chooses to interact with the Chalk Talk influences its outcome. The facilitator can stand back and let it unfold or expand thinking by:
  - circling other interesting ideas, thereby inviting comments to broaden
  - writing questions about a participant comment
  - adding his/her own reflections or ideas
  - connecting two interesting ideas/comments together with a line and adding a question mark.

Actively interacting invites participants to do the same kinds of expansions. A Chalk Talk can be an uncomplicated silent reflection or a spirited, but silent, exchange of ideas. It has been known to solve vexing problems, surprise everyone with how much is collectively known about something, get an entire project planned, or give a committee everything it needs to know without any verbal sparring.

6. When it's done, it's done.

### Think/Pair/Share

- Before introducing the Think-Pair-Share strategy to the students, decide on your target for this lesson. You may choose to use a new text that the class will be reading, or you might want to develop a set of questions or prompts that target key content concepts that you have been studying.
- Describe the strategy and its purpose with your students, and provide guidelines for discussions that will take place. Explain to students that they will (1) think individually about a topic or answer to a question;(2) pair with a partner and discuss the topic or question; and (3) share ideas with the rest of the class.
- Using a student or student(s) from your classroom, model the procedure to ensure that students understand how to use the strategy. Allow time for students to ask questions that clarify their use of the technique.
- Once students have a firm understanding of the expectations surrounding the strategy, monitor and support students as they work through the steps below. Teachers may also ask students to write or diagram their responses while doing the Think-Pair-Share activity.
- Think: Teachers begin by asking a specific higher-level question about the text or topic students will be discussing. Students "think" about what they know or have learned about the topic for a given amount of time (usually 1-3 minutes).
- Pair: Each student should be paired with another student. Teachers may choose whether to assign pairs or let students pick their own partner. Remember to be sensitive to learners' needs (reading skills, attention skills, language skills) when creating pairs. Students share their thinking with their partner, discuss ideas, and ask questions of their partner about their thoughts on the topic (2-5 minutes).
- Share: Once partners have had ample time to share their thoughts and have a discussion, teachers expand the "share" into a whole-class discussion. Allow each group to choose who will present their thoughts, ideas, and questions they had to the rest of the class. After the class "share," you may choose to have pairs reconvene to talk about how their thinking perhaps changed as a result of the "share" element.

# **Getting Your Thoughts in Order**

Goal: Guiding your own learning



Knows- What I understand and want to remember for later	•
movs. What I and stand and want to remember for mes	
Need-to-knows: What I need to know more about?	
Next Stens: What do I need to do next?	



# The Charrette Protocol

Developed by Kathy Juarez, Piner High School, Santa Rosa, California; revised by Gene Thompson-Grove, January 2003, and by Kim Feicke, October 2007.

#### Purpose

The Charrette is a term and process borrowed from the architectural community. Its purpose is to improve a piece of work. As described by Carol Coe at Puyallup High School, Washington, Charrettes are used to "kick up" the level of performance. Individuals or teams call for a Charrette when they are "stuck" — when the members of the team have reached a point in the process where they cannot easily move forward on their own. They bring their current ideas, or the actual work in progress, to the Charrette, and then ask the group to "work on the work" for them.

#### Time

20-50 minutes

#### Roles

A group, ranging in size from three to six people, is formed to look at the work. The moderator or facilitator is chosen from among the participants. It is the facilitator's job to help the group stay focused on the requesting team's/individual's questions or issues, observe the Charrette, record information that is being created, ask questions along the way, and occasionally summarize the discussion.

#### Using the Protocol

Charrettes are not normally held after the completion of a project. Instead, they are held in a low stakes/no stakes environment, where the requesting team has much to gain from the process and virtually nothing to lose. In short, Charrettes are used to scrutinize and improve work while it is still in progress, before it is ever placed in a high stakes environment. They can be used whenever an individual or small group has a design problem or issue.

One other consideration: the Charrette is used only when there is sufficient trust present in a group, and when the prevailing atmosphere is one of cooperation rather than competition. Underlying the successful use of the Charrette are 2 fundamental beliefs:

- 1. Individuals or groups working together can usually produce better work than individuals or groups working in isolation ("none of us is as smart as all of us"), and
- 2. There is no piece of work that with more time, thought and effort couldn't be improved ("with learning there is no finish line").

#### Process

1. The requesting team/individual presents its "work in progress" while the group listens. (There are no strict time limits, but this usually takes 5 or 10 minutes.)

- 2. The requesting team/individual states what it needs or wants from the Charrette, thereby accepting responsibility for focusing the discussion. This focus is usually made in the form of a specific request, but it can be as generic as "How can we make this better?" or "What is our next step?" Sometimes, the invited group needs to ask 2 or 3 clarifying questions before moving on to Step 3.
- 3. The participants then discuss while the requesting team/individual listens and takes notes. There are no hard and fast rules here. Occasionally (but not usually) the requesting team/individual joins in the discussion process. The emphasis is on improving the work, which now belongs to the entire group. The atmosphere is one of "we're in this together," and our single purpose is "to make a good thing even better."
- 4. When the requesting team/individual knows it has gotten what it needs from the group, they stop the process, briefly summarize what was gained, thank the participants and moderator, and return to the "drawing board."
- 5. Debrief the process as a group.

#### Resources

*Elements of this guidebook were created utilizing resources from the following links and websites. Additional resources for support and implementation of PBL can also be found at many of these links.* 

Buck Institute for Education- http://bie.org/

Education Northwest- http://educationnorthwest.org/

friEdTechnology- http://www.friedtechnology.com/

Magnify Learning- <a href="http://magnifylearningin.org/">http://magnifylearningin.org/</a>

National School Reform Faculty-Harmony Education Center- http://www.nsrfharmony.org/

New Tech Network- http://www.newtechnetwork.org/

Ohio Resource Center- http://ohiorc.org/standards first/

Peer Tutoring Resources Center- <u>http://www.peertutoringresource.org/2014/07/a-quick-start-guide-to-using-project-based-learning-pbl-in-the-classroom/</u>

Prism hosted by Rose-Hulman- http://www.rose-prism.org/moodle/

Read/Write/Think- <u>http://www.readwritethink.org/professional-development/strategy-guides/using-think-pair-share-30626.html</u>

School Reform Initiative- http://www.schoolreforminitiative.org/

Southern Regional Education Board-Technology Centers That Work (TCTW)http://www.sreb.org/technology-centers-work

Student Guide- http://www.studentguide.org/the-complete-guide-to-project-based-learning/