

Workshop Goals

- ▶ Work collaboratively with your Academy team on Project Design; Network with other Academy teaching teams
- ▶ Understand how a well-designed curriculum can help students meet several key learning outcomes simultaneously
- ▶ Acquire strategies for integrated project design, and project enhancement
- ▶ Use a design framework for developing (or enhancing) rigorous and relevant classroom projects
- ▶ Use a Project Template to design (or begin to design) an integrated project for your Academy
- ▶ Complete a Six A's Poster for your project; Give and Receive Feedback

TIME	TOPIC/ACTIVITY	OBJECTIVE	DELIVERABLES
8:30	Introductions and Overview of Day	Meet presenters; review agenda	
8:35	Success Analysis and Sharing	Reflect, share, and analyze effective teaching and learning strategies	Written reflection on successful (PBL) teaching & learning
8:50	Introduction to PBL: <ul style="list-style-type: none"> ○ Video Clip ○ Mentor Team Presentation ○ PBL PowerPoint 	<ul style="list-style-type: none"> ○ View a exemplary model of integrated PBL ○ Learn from a CPA mentor team about their integrated project work ○ Review what & why of PBL ○ Review 6 A's 	Completed 6 A's Note Taking Worksheets (for video & presentation)
9:50	<i>Break</i>		
10:00	<ul style="list-style-type: none"> ○ Introduction to PBL Design Time (what teams will do; what are our deliverables) ○ Resources available to support your team design work; Review CPA Binder Resources: Teaching and Learning Section 	<ul style="list-style-type: none"> ○ Gain clarity on expectations for Team PBL Design Time and deliverables for the day ○ Peruse resources available in the Teaching and Learning section 	

10:10	PBL Design Time for Team Project	<ul style="list-style-type: none"> Brainstorm project ideas and Identify/ select one project to implement prior to the March CPA Conference; use the PBL Design Template to plan all aspects of your project and develop/enhance your project design Identify how 6A's are incorporated into identified project Identify possible A's for improvement 	PBL Design Template (begin) 6As Poster (including project description) 6 A's Tweaking Tool (optional) Project Storyboard (optional)
11:30	Design 6 A's Poster	<ul style="list-style-type: none"> Create a 6 A's Poster to "exhibit" your PBL Design Work in post-lunch Gallery Walk Post your 6 A's Poster in the Gallery prior to 1 p.m. (when Gallery will open) 	6 A's Poster
12:00	<i>Lunch</i>		
1:00	Gallery Walk of 6 A's Posters	<ul style="list-style-type: none"> Learn from the work of other Academy Project Design Teams Give and receive (post-it) feedback 	Minimum 10 post-it feedback comments on different CPA team projects
1:30	Scaffolding Jigsaw <i>(Each team member chooses different PBL resource/s to review & share. Allow 5 minutes to read/review; 1 minute per team member to share.)</i>	<ul style="list-style-type: none"> Learn about resources to support your PBL design and implementation work; Share information with team members 	
1:45	PBL Design Time for Team Project	<ul style="list-style-type: none"> Revise & refine project design; Prepare to share project design (as a work in progress) with another team. 	
2:35	Pair/Share <i>(Two CPA teams share project designs & story boards with one another; give & receive feedback.)</i>	<ul style="list-style-type: none"> Share PBL design with another Academy team; each team takes a turn as a presenting team; Each "listening" team asks clarifying and probing questions. 	
2:55	Reflection & Closure	<ul style="list-style-type: none"> Reflect on learning from day Next Steps 	Completed reflection handouts

Success Analysis Protocol



The Success Analysis Protocol is designed to help teachers analyze the essential elements of successful teaching & learning. Since time is short (only one day), we are using a much abridged, much modified adaptation of a longer, more structured protocol that is usually done in trios. The protocol has been modified for pairs and redesigned as a quick introductory activity.

NOTE: The full Success Analysis Protocol can be powerful professional development activity for staff meetings or adapted to use with students. If you would like a copy of the longer success analysis protocol, please email Patricia Clark at patricia510@gmail.com.

1) POWERFUL TEACHING/LEARNING SUCCESS REFLECTION

All participants reflect on and write about the following:

Think about a time when you were highly successful as a teacher and when students were highly engaged in their learning. (If possible, write about a powerful PBL teaching and learning experience.) Write a short description of this success. Describe the specifics of the success. Be sure to answer the question: "What about this teaching and learning experience made it so successful?" (If you are not a teacher, think about a time when you were in high school and had a powerful learning experience. Describe that powerful learning experience. What about this learning experience made it so memorable? What conditions did the teacher help create, etc.?) (5 minutes)

After everyone has written about a powerful teaching and learning experience, there will be three "rounds" (one for each presenter (rounds 1 & 2) and a third for shared analysis and reflection) of approximately 3 minutes each.

2) SUCCESS STORY SHARED

When the direction is given, find someone in the room you do not know/have never met before with whom to "pair and share."

- Find a partner. Introduce yourselves. Decide who will go first as "presenter." (1 minute)
- Round One: When the signal is given, the "presenter" will spend three minutes sharing her/his teaching success and describing this in as much detail as possible while the "listener" actively listens, and takes notes about the elements of success. The "listener" should not speak during this time. (3 minutes)
- Round Two: At the end of three minutes, when the signal is given, participants switch roles (the "presenter" from the first round becomes the 2nd round "listener" and the "listener" from the first round becomes the 2nd round "presenter.") Repeat the process with the new presenter sharing the story of her/his teaching and learning success in as much detail as possible and the new "listener" actively listening and taking notes about the elements of success. The "listener" should not speak during this time. (3 minutes)
- Round Three: Participants have a dialogue about what they heard. They may ask one another any clarifying (factual information) &/or probing (interpretative/analytical/why) questions, but primarily each should reflect on what they heard the other say and discuss any common factors that contributed to teaching and learning successes. Discuss: What common factors contributed to teaching & learning success? Are there underlying principles or processes that made for teaching and learning success? How can we consciously create conditions that lead to success? (3 minutes)

Success Analysis Reflection Sheet

REFLECTIONS ON A SUCCESSFUL TEACHING & LEARNING EXPERIENCE

NOTES FROM OTHER PRESENTER'S SUCCESS...

SUCCESS ANALYSIS: COMMON ELEMENTS, CONDITIONS, ETC.

What is Project-Based Learning?

Project-Based Learning grew out of a need to help students make connections between school and life, a need to help students find relevance in academics, a need to help students feel valued and gain deeper understanding of academic and technical concepts. Students and teachers engaged in project-based learning demand greater responsibility for their own learning.

The learning experiences are designed as complex, authentic (real-world) projects. The contexts for many of the projects are found outside the school walls. Projects emerge from needs in the community or home; they arise from social issues, or perhaps physical, emotional, or recreational needs; and from authentic industry or business activities. Fundamentally, the learning of content knowledge and skills is given an opportunity to develop and grow through project-based learning.

Project based learning is a philosophy and a practice; it is what we believe about education and how we act on those beliefs in the classroom.



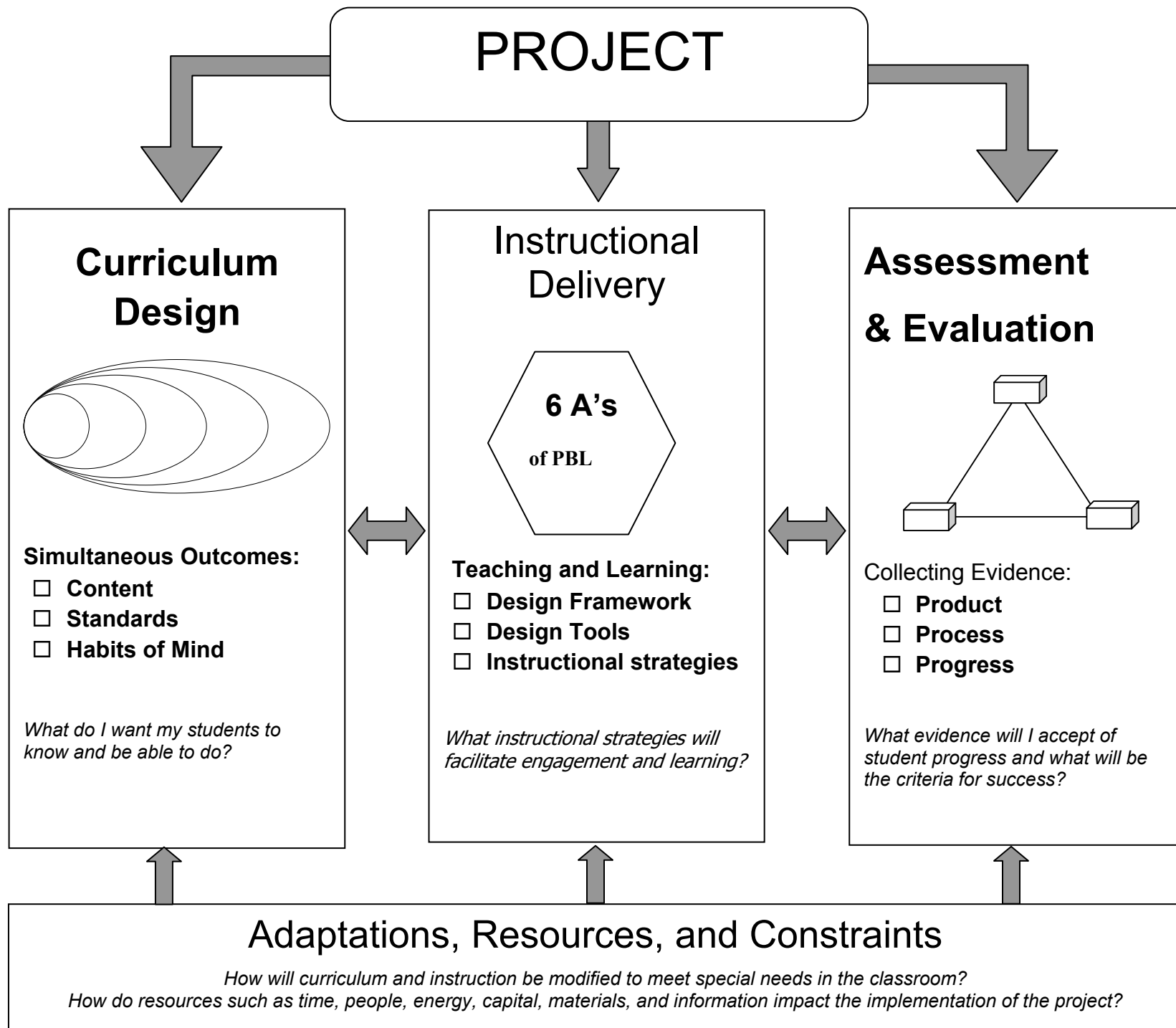
SIX A's NOTE TAKING TOOL *As you watch the video clip of a project-based learning example AND as you listen to a brief presentation on the project-based learning work of one of the CPA Mentor Academies, use the following table to take notes on EVIDENCE OF THE 6 A's.*

	CRITERIA	PBL VIDEO	MENTOR ACADEMY PBL PRESENTATION
AUTHENTICITY	<p>Project emanates from a problem or question that has meaning to student</p> <p>Problem or question is one that might actually be tackled by an adult at work or in the community</p> <p>Students create or produce something that has personal & /or social value beyond school setting</p>		
ACADEMIC RIGOR	<p>Students acquire and apply knowledge central to one or more discipline or content area</p> <p>Students use methods of inquiry central to one or more discipline (e.g., to think like a scientist)</p> <p>Students develop higher order thinking skills and habits of mind (e.g., searching for evidence, taking different perspectives)</p>		
APPLIED LEARNING	<p>Students solve a semi-structured problem (e.g., designing a product, improving a system, or organizing an event) that is grounded in a context of life & work beyond school walls</p> <p>Students acquire & use competencies expected in high performance work organizations (e.g., teamwork, problem solving) Work requires students to develop organizational & self-management skills</p>		

Six A's Note Taking Tool – Continued...

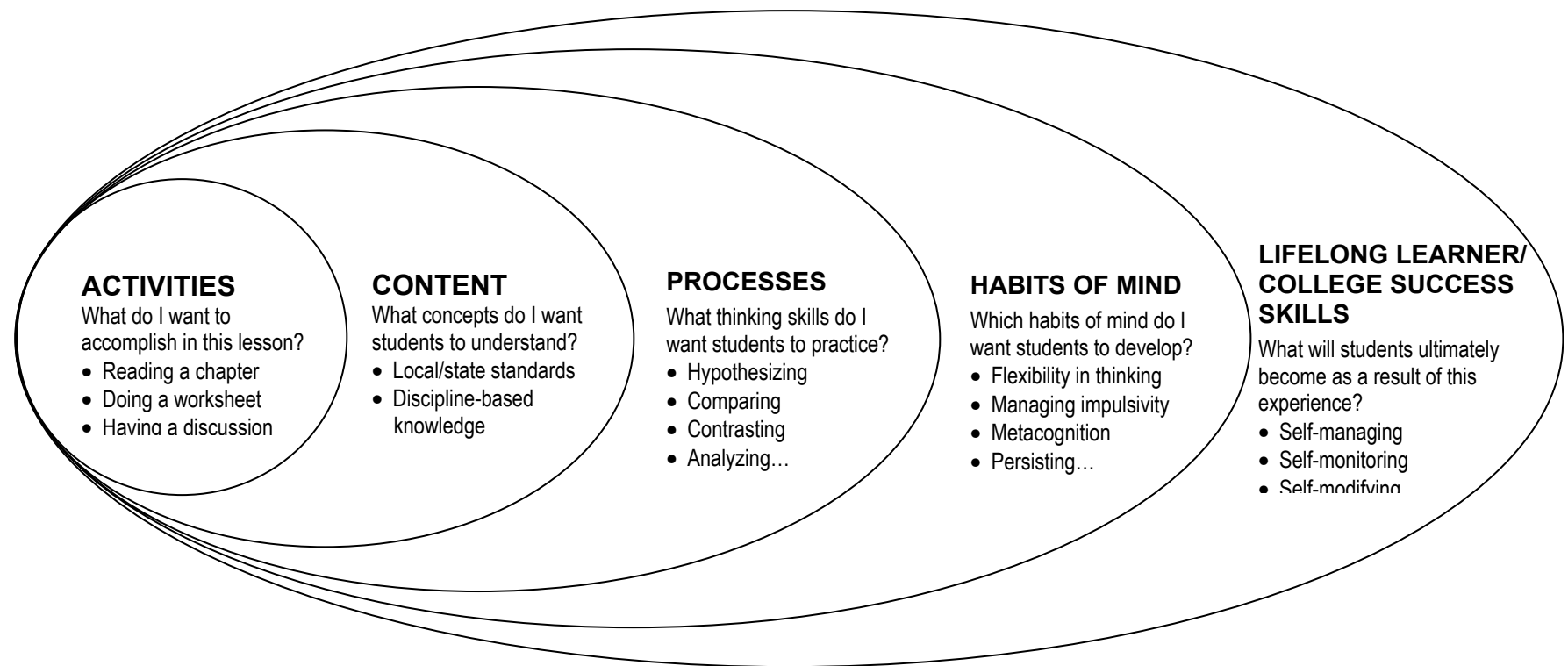
	CRITERIA	PBL VIDEO	MENTOR ACADEMY PBL PRESENTATION
ACTIVE EXPLORATION	<p>Students spend significant amounts of time doing field-based work</p> <p>Students engage in real investigations using a variety of methods, media, and sources</p> <p>Students communicate what they learn through presentations</p>		
ADULT RELATIONSHIPS	<p>Students meet and observe adults with relevant expertise and experience</p> <p>Students work closely with at least one adult</p> <p>Adults collaborate on the design and assessment of student work</p>		
ASSESSMENT	<p>Students reflect regularly on their learning, using clear project criteria that they have helped to set</p> <p>Adults from outside classroom help students develop a sense of the real world standards for this type of work</p> <p>There are opportunities for regular assessment of student work through a range of methods, including exhibitions and portfolios</p>		

PBL Instructional Design Components



SIMULTANEOUS OUTCOMES

Adapted from the work of Art Costa and Bena Kallick



DEVELOPING A THINKING CURRICULUM:

- ▶ How do we design for content rigor, processes, and thinking development?
- ▶ Are we putting sufficient instructional attention and emphasis on processes, habits of mind, and lifelong learning/college success skills?
- ▶ What do we do to help students understand content standards, processes, and habits of mind? To help all students succeed?
- ▶ Are students made aware of standards and high expectations from the outset?
- ▶ How will we know students are developing in each area?
- ▶ What criteria will we use to make reasonable judgments about what students know and can do? Are our judgments based on multiple measures?

Integrated Project Design



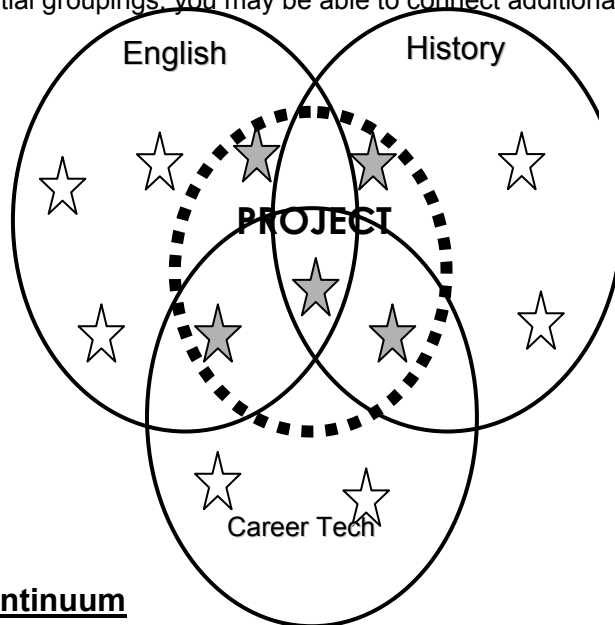
Here are two helpful tools from Swanson and Cosgrave. First, a three-step process for designing integrated projects is suggested to help you sort out how an integrated project can help meet your course goals. At the bottom of the page there is a tool that helps you think about how closely to connect different subject areas as you design classroom projects.

Three-step Integrated Project Design Sequence

1) List essential academic/career technical concepts and standards from each discipline. Think in big categories & try to prioritize the MOST ESSENTIAL concepts from the core of each academic &/or career/technical area of study. More than simply facts & surface information, these elements should be the “big lessons” or important ideas that emanate from the heart of the discipline. Examples might include concepts of democracy, the scientific method, etc. Refer to your course syllabus & state standards documents for ideas, but take care not to get lost in the minutiae.

2) List the essential skill standards from each discipline. This is the same process as above, but this time focused on essential skills. Focus on key problem solving, communication, & thinking skills that are transferable to situations beyond the classroom & that cut across disciplines.

3) Look for natural or logical overlaps. Conduct a side-by-side comparison of essential concepts & skills from each subject area & identify natural or logical groupings. Don’t try to make everything fit together – it is likely that only a few obvious connections will emerge. As you play with ideas within the initial groupings, you may be able to connect additional concepts & skills.



Effective integrated projects require the understanding and use of essential concepts and skills from multiple subject areas.

Integration Continuum

Traditional Projects	Parallel Projects	Interrelated Projects	Integrated Projects
One subject area, connections to other disciplines are haphazard, rare, and unnecessary for completion of project.	Two or more related subject areas aligned or sequenced together, connections are made apparent throughout the project, but products and performances may be separate.	Two or more subject areas aligned and drawn upon during project, knowledge and skills from all areas are used by students to produce quality products or performances.	Two or more subject areas are brought together through the examination of a complex idea, impossible to complete project without knowing & using all areas, nearly impossible to separate out disciplines.

Academy Curriculum Map



Use this tool to map out the big concepts, themes, units, and projects for your Academy this year.

Courses ▼	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
Theme or Project ►				
Essential Skills; Habits of Mind				

Project Design Template



This design template leads you through key areas to address in designing a new project or modifying an existing project. Refer to supporting materials in the second half of the Academy Instructional Design Packet for more information on key sections of the template. (NOTE: This template is from the work of Michelle Swanson and Theron Cosgrave (Swanson and Cosgrave) and Patricia Clark (CASN)).

TEMPLATE DIRECTORY

Section 1.....	Project Vital Statistics
Section 2.....	Initial Brainstorm
Section 3.....	Project Description/Summary
Section 4.....	Big Ideas/Core Concepts
Section 5.....	Essential/Driving Question/s
Section 6.....	Academic Rigor: Content Standards
Section 7.....	Academic Rigor: Thinking Processes and Habits of Mind
Section 8.....	Adult & Community/Workplace Connections
Section 9.....	Planning Exhibitions/Culminating Events
Section 10.....	Assessment – Formative & Summative
Section 11.....	Scaffolding: Meeting a Range of Student Needs/Learning Styles
Section 12.....	Scaffolding: Resources
Section 13.....	Activities, Benchmarks, & Timeline
Section 14.....	How Project Addresses the 6 A's

Section I: PROJECT VITAL STATISTICS

Project title:	
Essential/Driving Question/s	
Academy Name (career pathway/theme) and address	
Grade level(s):	

<p>Subject/Discipline area(s) involved:</p>	
<p>Number of Academy students involved:</p>	
<p>Academy Teacher Team <i>Teacher names, Academy class taught that is part of the integrated curriculum project, & email (s)</i></p>	
<p>Name and work phone for Academy project-lead contact:</p>	
<p>Industry/Community/Post-secondary partner/s involved <i>(if applicable) (role/s):</i></p>	
<p>Use of Technology <i>(What technology is recommended? How will it be used?)</i></p>	
<p>Project duration <i>(# of wks, months involved?) (if appropriate, include start & end dates)</i></p>	

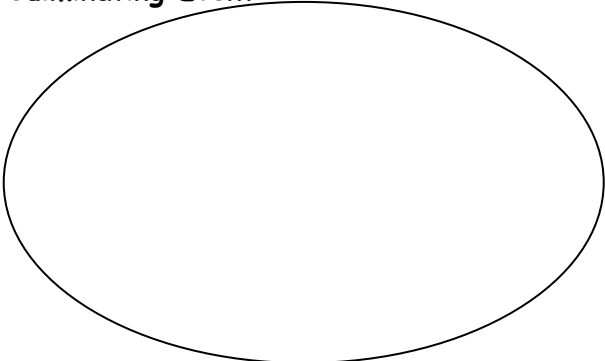
SECTION 2: INITIAL BRAINSTORM OF INTERDISCIPLINARY PROJECT IDEAS FROM CURRICULUM MAP & OTHER SOURCES

Use this space to capture your initial project ideas from your team's Curriculum Map. Your team might also consider the types of projects that professionals in your career-focus area actually do and/or how your Academy curriculum focus might be used to address a community issue or challenge. Use the method that works best for you – draw a "mind map", write a narrative, make a list, etc.

INIITIAL BRAINSTORM OF INTERDISCIPLINARY PROJECT IDEAS:

SECTION 3: INITIAL BRAINSTORM OF IMPORTANT UNDERSTANDINGS, BIG IDEAS, & CORE CONCEPTS

Use this space to describe the “big ideas,” “major concepts,” “essential understandings” that will be at the heart of your project. What are the important concepts students will understand (and/or grapple with understanding) in each of the disciplines/subjects involved as a result of having done this project.

INITIAL BRAINSTORM OF IMPORTANT CONCEPTS/UNDERSTANDINGS/BIG IDEAS THAT ARE EMBEDDED IN THE PROJECT:	
English	Social Science
Project Theme/Essential Question/ Culminating Event 	Career/Technical/Lab
Community/Workplace Connections or Other Disciplines	Math/Science

SECTION 4: INITIAL BRAINSTORM OF ESSENTIAL/DRIVING QUESTION/S

*Use this space to capture your initial ideas of the important question/s that will drive your project. Keep in mind that good essential questions are: * open-ended and resist a simple or single right answer; * are deliberately thought-provoking * encourage multiple perspectives * require students to draw upon content knowledge and personal experience; * can be revisited throughout the project to engage students in evolving dialogue and debate * lead to other essential questions being posed by students.*

INITIAL BRAINSTORM OF ESSENTIAL/DRIVING QUESTION/S (and sub-questions):

ESSENTIAL/DRIVING QUESTION/S (and sub-questions) FOR THIS PROJECT:

SECTION 5: PROJECT DESCRIPTION/SUMMARY

Use this space to write up a description or overview of your project. Include an emphasis on what students will learn and do. NOTE: You may wish to wait to write this section until after you have completed the rest of the project design template.

PROJECT DESCRIPTION/SUMMARY:

SECTION 7: ACADEMIC & TECHNICAL RIGOR – THINKING PROCESSES/ HABITS OF MIND

Describe the key thinking processes that students will develop during the project. These processes are generally identified as levels of Bloom’s Taxonomy or as thinking processes central to specific disciplines.

THINKING PROCESSES:

List the habits of mind students will develop through this project along with a description of how students will demonstrate these behaviors. While several habits may apply, try to pick 2-4 key habits that can be explicitly taught and emphasized throughout the project.

The 16 Habits of Mind	
<ol style="list-style-type: none"> 1. Persisting. 2. Managing impulsivity. 3. Listening with understanding and empathy. 4. Thinking flexibly. 5. Thinking about thinking (metacognition). 6. Striving for accuracy. 7. Questioning and posing problems. 8. Applying past knowledge to new situations. 	<ol style="list-style-type: none"> 9. Thinking and communicating with clarity and precision. 10. Gathering data through all senses. 11. Creating, imagining, and innovating. 12. Responding with wonderment and awe. 13. Taking responsible risks. 14. Finding humor. 15. Thinking interdependently. 16. Remaining open to continuous learning.

HABIT OF MIND	HOW STUDENTS WILL DEMONSTRATE
Ex: Thinking about thinking (metacognition)	Ex: Students will regularly reflect on thinking through project journals. Students will write a self-reflection paper at end of project.

SECTION 8: ADULT & COMMUNITY/WORKPLACE CONNECTIONS

Adult Connections: Describe how students will work with Academy industry/postsecondary/community partners and/or other adults beyond the classroom as part of the project. (guest speakers/panelists, guest artists, experts, project coaches/mentors, providing feedback on student exhibitions, etc.)

ADULT CONNECTIONS/ACADEMY PARTNERS INVOLVED:

Intent/Purpose: Describe the reason or purpose for the project, “who” or “what” is the project for? Who or will benefit? Answer the “So what?” question.

PROJECT INTENT/PURPOSE (answer the “so what”?)

Real-World Context Describe how student work will emulate actual work done by adults in the world beyond high school, and especially in the actual career area for which Academy students are preparing

REAL-WORLD CONTEXT FOR STUDENT WORK:

Transferable Skills - List the skills that students develop through the project that are valued in the community and workplace (especially as related to the career focus of the Academy).

TRANSFERABLE SKILLS:

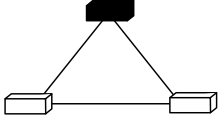
SECTION 9: PLANNING EXHIBITIONS OF PROJECT LEARNING – PRODUCTS, SERVICES & CULMINATING EVENTS

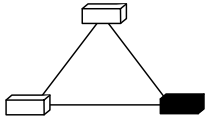
- What products, services, and/or events will be outcomes of this project?

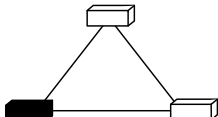
- Questions to consider on Exhibitions (based on work of Coalition of Essential Schools):
 - Will students present their exhibitions as individuals or in groups? (If in groups, how will individual knowledge and skills be assessed? If in groups, how will we assure that each group member has an important role/responsibilities?)
 - What form(s) will the exhibition take? (oral presentation, visual/multimedia element, written products, etc.) Will there be time limits on the presentations? Other criteria?
 - Who should be in the room for the student exhibition of their project learning? How will the audience engage in the process? Where will the exhibition/s occur? When? How will you publicize your event?
 - What sort of feedback will you provide student-presenters about their project/s and presentation/s? How much, when, and in what form(s)?
 - What would a really spectacular exhibition look/sound/be like?
 - What opportunities will students have for formative assessments and other coaching?
 - What are the building blocks of the exhibition? Where are the checkpoints?
 - Does the exhibition you have planned really allow students to demonstrate the knowledge, skills, and understanding that you most value (as expressed in your course outcomes)?
- Describe the Student Exhibition of project learning (& products) you plan. Describe your culminating event.

SECTION 10: ASSESSMENT PRACTICES – FORMATIVE & SUMMATIVE

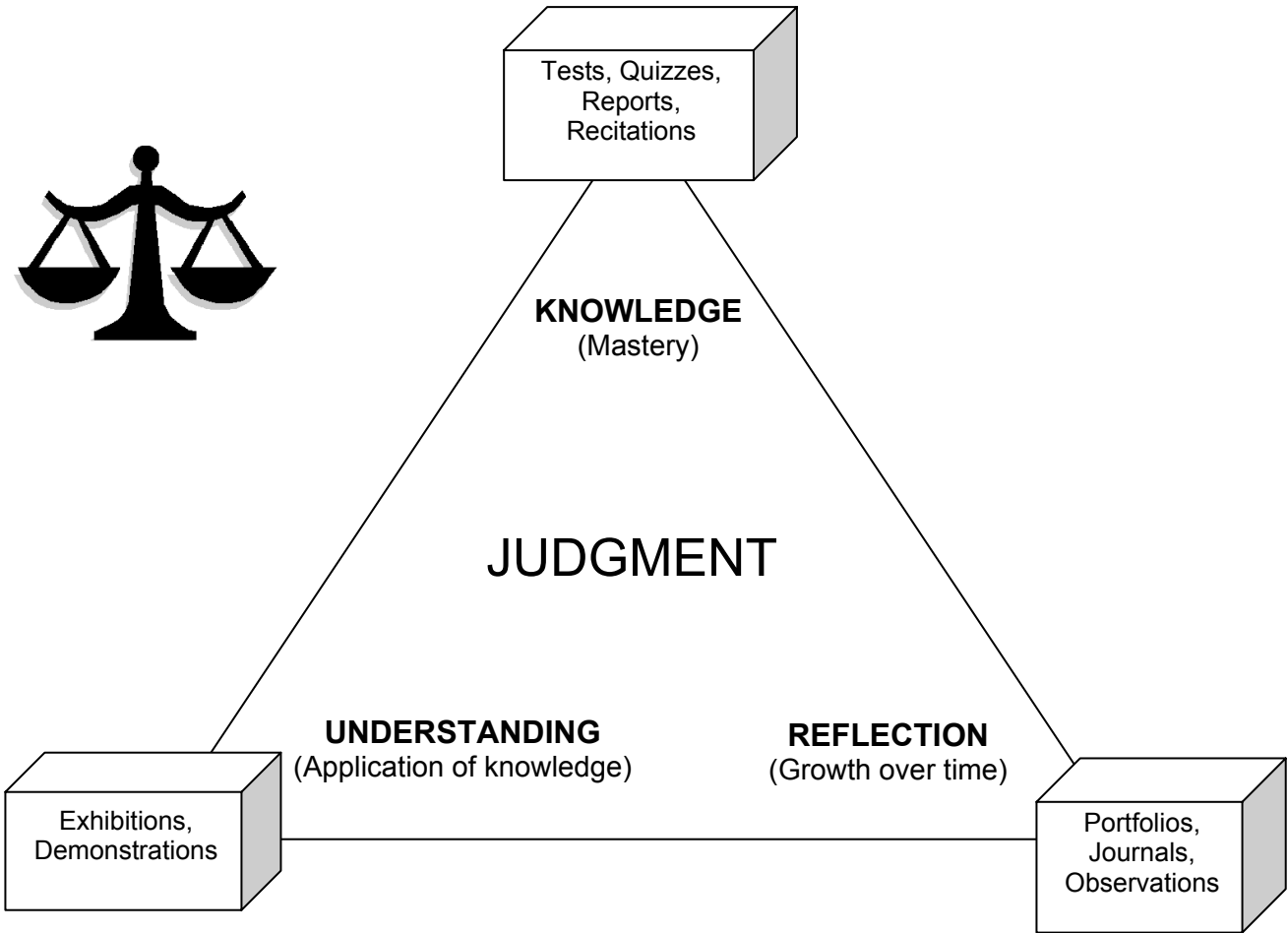
Briefly describe how you will provide both formative (“dip-stick” assessments along the way, during the project) and summative (final/end of project) feedback for students to evaluate their mastery, growth, and understanding. For example, will you use a project portfolio, use rubrics, etc.? (NOTE: see next page)

<p>ASSESSING FOR <u>MASTERY</u></p> <p><i>Examples: Quizzes, tests, reports, exhibitions, etc.</i></p> 	
<p>FORMATIVE</p>	<p>SUMMATIVE</p>

<p>ASSESSING FOR <u>GROWTH</u></p> <p><i>Examples: Observations, journals, portfolios, etc.</i></p> 	
<p>FORMATIVE:</p>	<p>SUMMATIVE:</p>

<p>ASSESSING FOR <u>APPLICATION</u></p> <p><i>Examples: Exhibitions, demonstrations, performance tasks, etc.</i></p> 	
<p>FORMATIVE:</p>	<p>SUMMATIVE</p>

Assessment and Evaluation



SECTION 11: SCAFFOLDING – DIFFERENTIATED TEACHING AND LEARNING TO MEET A RANGE OF LEARNING NEEDS/STYLES

Use this part of the template to write down strategies you will use to meet diverse student learning needs.

Learning Needs

- ▶ *Students who require structural adaptation.*
- ▶ *Students who require adapted instruction.*
- ▶ *Students who read/write/calculate significantly below grade level.*

Language / Socio-cultural

- ▶ *Students whose primary language is not English.*
- ▶ *Students from challenging life circumstances that may impact school achievement.*

Transience

- ▶ *Students who enter after instruction/project has begun.*

Enrichment and Extension

- ▶ *Students who bring special talents to their project work.*
- ▶ *Students who want to explore more deeply or connect additional learning.*

SECTION 12: SCAFFOLDING – RESOURCES

Material Resources:

List the material resources that will be needed to accomplish this project including research materials, technology, production equipment, room space, community resources, and instructional supplies.

MATERIAL RESOURCE NEEDS: (what technology will be used, etc.)

Human Resources:

List the human resources that will be needed to accomplish this project including teachers, classroom aides, guest speakers, mentors, on-line experts, and guest artists.

HUMAN RESOURCE NEEDS:

Financial Resources:

Calculate the capital resources that will be needed to cover the costs of the resources mentioned thus far.

FINANCIAL RESOURCE NEEDS:

SECTION 13: PROJECT TIMELINE – (continued)

Chart the flow of your project over time using the graphic organizer below.

INTRODUCTION – INVESTIGATION – BRAINSTORM – PRODUCTION – REVISION – EXHIBITION – EVALUATION – REFLECTION

STANDARDS & HABITS
OF MIND EMPHASIZED

LEARNING ACTIVITIES

WEEKS 1



STUDENT PRODUCT/SERVICE
PRODUCTION PHASE

ASSESSMENTS: FORMATIVE

ASSESSMENTS: SUMMATIVE

TEACHER TASKS/ROLES
INSTRUCTIONAL STRATEGIES

COMMUNITY PARTNER TASKS/ROLES

SECTION 14: Criteria for the 6 A's as Addressed in the Project

For each of the 6 A's, describe how it will be addressed in your project.

Six A's & Criteria	How the Project Addresses Each A
AUTHENTICITY Project emanates from a problem or question that has meaning to the student Problem or question is one that might actually be tackled by an adult at work or in the community Students create or produce something that has personal and/or social value beyond the school setting	
ACADEMIC (& Technical) RIGOR Students acquire and apply knowledge central to one or more discipline or content area Students use methods of inquiry central to one or more discipline (e.g., to think like a scientist) Students develop higher order thinking skills and habits of mind (e.g., searching for evidence, taking different perspectives)	
APPLIED LEARNING * Students solve a semi-structured problem (e.g., designing a product, improving a system, or organizing an event) that is grounded in a context of life & work beyond the school walls * Students acquire and use competencies expected in high performance work organizations (e.g., teamwork, problem solving) * Work requires students to develop organizational & self-management skills	
ACTIVE LEARNING * Students spend significant amounts of time doing field-based work * Students engage in real investigations using a variety of methods, media, and sources * Students communicate what they learn through presentations	
ADULT CONNECTIONS * Students meet and observe adults with relevant expertise and experience * Students work closely with at least one adult * Adults collaborate on the design and assessment of student work	
ASSESSMENT * Students reflect regularly on their learning, using clear project criteria that they have helped to set * Adults from outside the classroom help students develop a sense of the real world standards for this type of work * There are opportunities for regular assessment of student work through a range of methods, including exhibitions and portfolios	

Keeping it Real (or Designing for Authenticity)



While all of the 6 A's are important, "authenticity" arguably has the greatest potential to transform instruction. Below you'll find useful definitions of the concept, examples of how it can transform instruction, and tips for making student work more "real."

WHAT IS AUTHENTICITY?

- ▶ Authentic project work emanates from issues that have meaning to students.
- ▶ Authentic project work embodies problems or questions actually tackled by adults in the "real world."
- ▶ Students engaged in authentic project work create products that have personal and/or social value beyond the school setting.

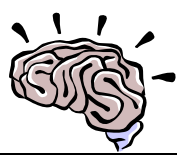
HOW DOES IT WORK?

The grid below contains several examples of assignments that were reworked to build in greater authenticity. As you look over the samples, imagine the impact on student engagement and work quality.

ORIGINAL ASSIGNMENT	REFINED ASSIGNMENT	
Biology students examine teacher-prepared slides of organic substances under microscope as part of lab assignment.	➔	Students collect water samples from wells, streams, and lakes in the community; make comparative analysis of their findings; and present their findings & recommendations to city council.
Foreign language students create skits to simulate conversational situations.	➔	Students each complete a service learning project in which they act as interpreters at local non-profit agencies.
Students in P.E. class study nutrition and complete short-answer questions on an end-of-unit test.	➔	Students incorporate into their nutrition unit a review of school lunch menus & snack bar offerings & make a formal proposal to school board, suggesting healthy (& tasty) changes.
Students learning how to make web pages in a computer class create sites on their favorite bands and sports teams.	➔	Students work with adult "clients" in the community to create real web pages for businesses and non-profit agencies.
Government students participate in an in-class elections simulation, complete with candidates, party platforms, budgets, and campaign advertisements.	➔	Students produce video campaign ads based on real candidates & issues, & show work to real voters on day before the election.
WHERE CAN WE START? * Build Upon Existing Success * It's a Beautiful Day in the Neighborhood (local issues as powerful curricular connections) * Making School More Like Work * Focus on Products and Audience * Authenticity Loves Company (Collaborating with a new partner)		

Choose an Important Concept or Skill. Then ask, what are the related issues that students find interesting or engaging? How do adults in the community engage in work that incorporates these skills and concepts? What real-world products or services can students produce? Who can serve as an authentic audience for student work? *What are our Authentic Project Ideas?*

Habits of Mind *in Brief*

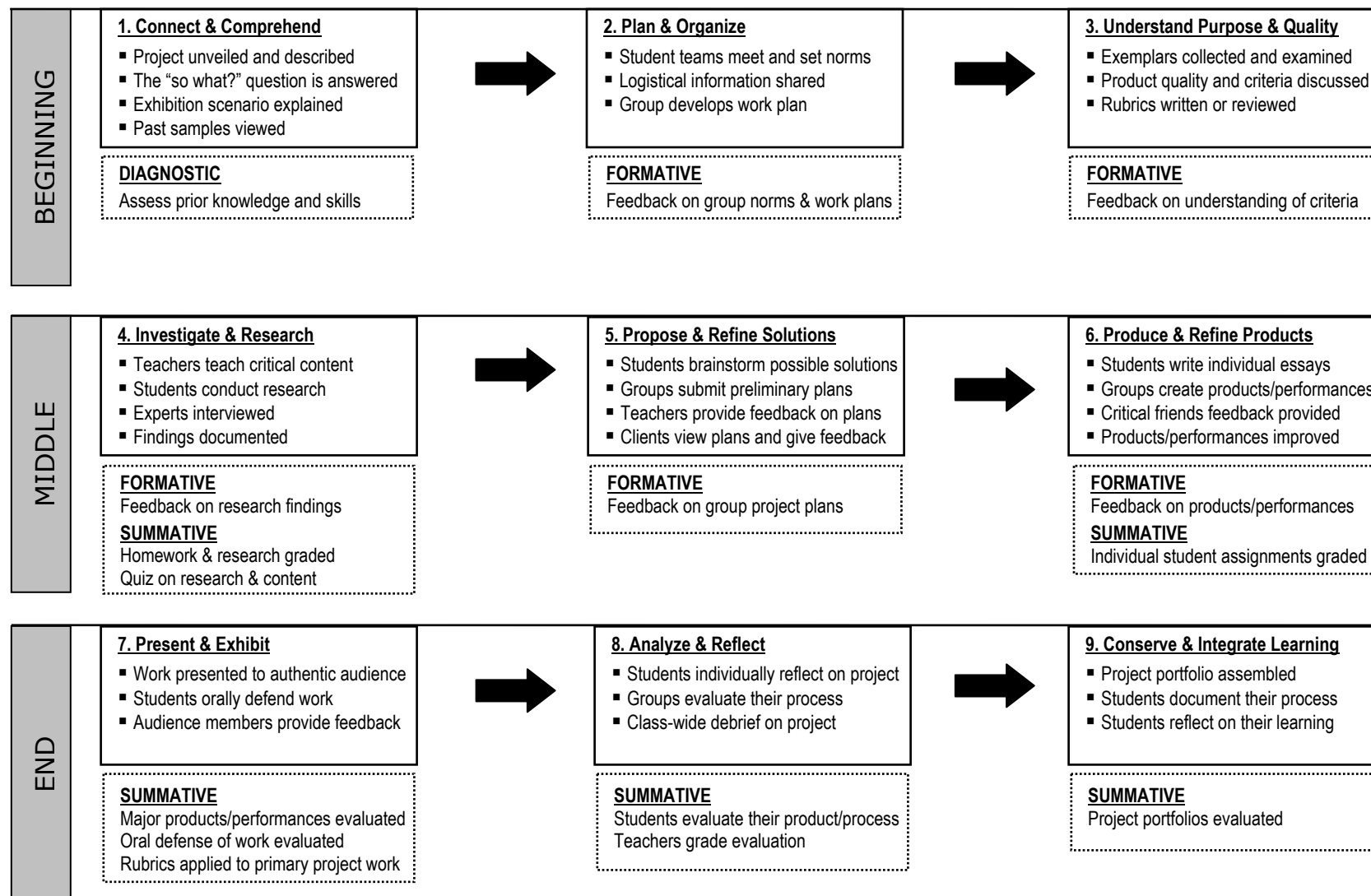


Art Costa's "Habits of Mind" (a.k.a. "Intelligent Behaviors") provide a powerful set of research-based behaviors that effective people exhibit when they are acting intelligently. Below is a list of the habits along with abbreviated definitions, taken from "Discovering and Exploring Habits of Mind," Arthur Costa and Bena Kallick, ASCD, ©2000, p. xvii For more on Costa's work, visit www.habits-of-mind.net.

- 1. Persisting.** Stick to it. See a task through to completion, and remain focused.
- 2. Managing impulsivity.** Take your time. Think before you act. Remain calm, thoughtful, and deliberate.
- 3. Listening with understanding and empathy.** Seek to understand others. Devote mental energy to another person's thoughts and ideas. Hold your own thoughts in abeyance so you can better perceive another person's point of view and emotions.
- 4. Thinking flexibly.** Look at a situation another way. Find a way to change perspectives, generate alternatives, and consider options.
- 5. Thinking about thinking (metacognition).** Know your knowing. Be aware of your own thoughts, strategies, feelings, and actions – and how they affect others.
- 6. Striving for accuracy.** Check it again. Nurture a desire for exactness, fidelity, and craftsmanship.
- 7. Questioning and posing problems.** How do you know? Develop a questioning attitude, consider what data are needed, and choose strategies to produce those data. Find problems to solve.
- 8. Applying past knowledge to new situations.** Use what you learn. Access prior knowledge, transferring that knowledge beyond the situation in which it was learned.
- 9. Thinking and communicating with clarity and precision.** Be clear. Strive for accurate communication in both written and oral form. Avoid overgeneralizations, distortions, and deletions.
- 10. Gathering data through all senses.** Use your natural pathways. Gather data through all the sensory paths: gustatory, olfactory, tactile, kinesthetic, auditory, and visual.
- 11. Creating, imagining, and innovating.** Try a different way. Generate novel ideas, and seek fluency in originality.
- 12. Responding with wonderment and awe.** Let yourself be intrigued by the world's phenomena and beauty. Find what is awesome and mysterious in the world.
- 13. Taking responsible risks.** Venture out. Live on the edge of your competence.
- 14. Finding humor.** Laugh a little. Look for the whimsical, incongruous, and unexpected in life. Laugh at yourself when you can.
- 15. Thinking interdependently.** Work together. Truly work with and learn from others in reciprocal situations.
- 16. Remaining open to continuous learning.**

The Nine Steps of Project Delivery (w/ Assessment) (one approach to PBL process ... fr. Swanson & Cosgrave)

Error!Error!



Interdisciplinary Curriculum Exemplar: Overview of BRIDGE BUILDER - an interdisciplinary Engineering Unit from ConnectEd California



Subunit 1 Overview

Form and Function (& Curriculum Materials)

Lesson 1.1	Principles of Engineering	<p>Introduction to Bridges</p> <p>Students are introduced to the unit and the culminating project. Students begin the unit with an introduction to the four major types of bridges, how they differ structurally, and their comparative advantages and disadvantages.</p> <p><i>(Curriculum Materials: Lesson Plan, PowerPoint: Intro to Bridges; Lab: Mini-Models; Worksheet: Bridge Classification & Scavenger Hunt)</i></p>
Lesson 1.2	English Language Arts	<p>Great Bridges</p> <p>Students read and discuss excerpts from David McCullough's novel, <u>The Great Bridge: The Epic Story of the Building of the Brooklyn Bridge</u>. Each student selects and researches the history of famous bridge. Students synthesize their research into a historical narrative about their selected bridge.</p> <p><i>(Curriculum Materials: Lesson Plan, Reading: The Great Bridge, Handout: Historical Narratives)</i></p>
Lesson 1.3	U.S. History	<p>Growth in the Gilded Age</p> <p>Students examine historical maps of New York City to identify the patterns of New York City's rapid urbanization in the 19th Century and use those patterns to justify the need for bridges at specific locations.</p> <p><i>(Curriculum Materials Lesson Plan; Maps: New York City 1642-1916; Reading: Bridging the East River; Reading: The Big Bridge Scheme)</i></p>
Lesson 1.4	English Language Arts	<p>Site Selection</p> <p>Students break into groups to read and analyze the site selection reports from a number of different bridges. Through interpretation of these technical reports, students will identify key factors that affect the selection of a site for bridge construction.</p> <p><i>(Curriculum Materials: Report: Columbia River Crossing Study; Handout: Interpreting the Table of Contents)</i></p>
Lesson 1.5	Biology or Earth Science	<p>Environmental Mitigation</p> <p>Students learn about various environmental factors that must be considered when beginning a major bridge construction, both in where the bridge is placed and what impact the bridge will have on the surrounding environment. Students also study the process by which environmental mitigation is planned to offset the impact of the construction.</p> <p><i>(Curriculum Materials: Lesson Plan, Demonstration: Wetland Sponge, Reading:</i></p>

Wetland Compensatory Mitigation)

Subunit 2 Overview

Structural Support

Lesson 2.1 Physics or Mathematics

Science of Bridge Structure
Students are introduced to the physics and math associated with calculating the forces on a truss bridge. This lesson covers content previously taught in Principles of Engineering lesson 5.1, but it can be covered by either the physics or math teacher.
(Curriculum Materials: Lesson Plan, PowerPoint: Truss Bridge, Lab: Reaction Forces; Worksheet: West Point Bridge Design)

Lesson 2.2 Algebra

Estimating Live Loads
Students estimate and graph the number of cars and busses that would fill a bridge span given the average lengths of each type of vehicle. They express the relationship between the number of different vehicles and the live load on the bridge as a graph and an equation. The class then finds the range of live load that the bridge would be expected to withstand.
(Curriculum Materials: Lesson Plan, Lab: How Many Vehicles?, Worksheet: Estimating Live Loads)

Lesson 2.3 Chemistry

Rusty Truss
Students investigate the corrosion of metals in a lab in order to identify various factors that contribute to the corrosion process.. Students conclude by researching and reporting on how actual bridges are protected and maintained from corrosion.
(Curriculum Materials: Lesson Plan, Lab: Corrosion Chemistry, Reading: Steel Bridge Corrosion)

Lesson 2.4 English Language Arts

Bridge Disaster News Report
Students watch footage of the Tacoma Narrows Bridge collapse and read newspaper accounts of the event. Students will then research a different bridge collapse and write their own news accounts of the disaster and the subsequent investigation.
(Curriculum Materials: Lesson Plan, Video: Tacoma Narrows Bridge, Handout: Reporting the News)

Subunit 3 Overview

Build Your Bridge

Lesson 3.1 U.S. History

Building the Brooklyn Bridge
Students investigate how the political machine of the era influenced building projects like the Brooklyn Bridge. Students also analyze the dilemmas facing American workers seeking to improve working conditions in the 19th century by researching and role-playing the caisson workers strike during the construction of the Brooklyn Bridge.
(Curriculum Materials: Lesson Plan, Handout: 19th Century Commercials: Reading: Bridge Innovations; Handout: Bridge Strike Role play)

Lesson 3.2 Principles of Engineering

Bridge Blueprints
Students are provided with the design constraints for the culminating project. Students design their bridges using 3D modeling software, and use the software to conduct stress analysis on their design. Students revise and retest their designs before building in-class building begins.
(Curriculum Materials: Lesson plan, Handout: Truss Designs, Handout: Bridge

Project Design Brief)

Lesson 3.3 Principles of Engineering Opening Day
 Students build their bridge designs out of balsa wood and test them for strength against their classmates.
(Curriculum Materials: Lesson Plan)

National Standards Alignment

English Language Arts	Mathematics	Social Studies	Science	Engineering		
<i>NCTE</i>	<i>NCTM Algebra</i>	<i>NCHS World History</i>	<i>NRC Physical Science 9-12</i>	<i>ITEA</i>		
Standard 1	Understand patterns, relations, and functions	Era 8, Standard 2	Objects change their motion only when a net force is applied. Laws of motion are used to calculate precisely the effects of forces on the motion of objects. The magnitude of the change in motion can be calculated using the relationship $F = ma$, which is independent of the nature of the force. Whenever one object exerts force on another, a force equal in magnitude and opposite in direction is exerted on the first object.	Standard 1		
Standard 3		Era 8, Standard 4		Standard 2		
Standard 4		Era 9, Standard 1		Standard 3		
Standard 5		Era 9, Standard 2		Standard 4		
Standard 6		Era 9, Standard 3		Standard 8		
Standard 7	<i>NCTM Geometry</i>	<i>NCHS U.S. History</i>			Standard 9	
Standard 8					Era 8, Standard 3	Standard 10
Standard 11					Era 9, Standard 2	Standard 11
Standard 12					Era 10, Standard 1	Standard 18
						Standard 20

Strong Models Across Disciplines The guide's professional contents and appearance derive in part, says High Tech High biology teacher Jay Vavra, from their teachers' decision to begin with students examining strong models from across the disciplines.

For a pilot project last year, Tom Fehrenbacher's humanities class read *The Log from the Sea of Cortez*, a 1940 travel log written by John Steinbeck and his friend Ed Ricketts, director of Pacific Biological Laboratories. "It mirrored our project, in creating an eclectic field guide," said Vavra, "not just about the creatures but more about how we can interact with organisms and also see ourselves in them." This year students pored over Jared Diamond's *Collapse*, applying its benchmarks for the decline of societies to the current situation of the San Diego Bay.

In biology class, students read and critiqued some twenty other guides for naturalists, "pulling out what they thought was interesting and appropriate for a field guide," Vavra said. Several calculus students in Rod Buenviaje's math class last year used Fourier analysis to schedule school-day research trips so they coincided with the necessary low-low tides. And using a National Science Foundation grant to two local colleges, professors taught the student researchers how to use Geographic Information System technology.

The investigation itself was unglamorous, even grueling. But students made the smallest task their own, coloring their scientific entries with vivid or irreverent observations. The great blue heron's call is low and heavy, like "an old rusty car door opening," they write. Snowy egrets "also feed on crustaceans, frogs, and if you're at Sea World, churros." Some raptors "even steal the nests and habitats of other birds because they do not feel like creating ones for themselves." Advice on a family tour to the Boat Channel reads, "Integrate sunbathing activities on the broken slabs of sharp concrete walls with the identification of different vermin that live along and among those slabs."

Whether writing about sponges or pelicans, sea lions or the homeless human population that frequents the Bay, the student authors also cast a thoughtful eye on interdependence and sustainability in San Diego's turbid mix of the military, industry, tourism, and nature. One section describes the effects of boat paints on marine life; one takes note of how Coronado Island's socioeconomic elite isolates itself from the city's pressing problems.

Even the students' poetry evokes interconnectedness; from the Boat Channel, Khoa Tran writes: "I cast my feet and hands into the sea / Let my head lie by the dry sand / Wither away wither away / I have barely made a scratch / 'will I be remembered?' echoes in the far distant / From where my reality came..." In the existential sense, this young poet may have a point. But from the evidence High Tech High students have put forward in *Perspectives of the San Diego Bay*, they need not worry that anyone will forget them soon.

Go to http://www.whatkidscando.org/specialcollections/student_research_action/makingaguide/index.html and Click to:

Download a PDF (2.7 MB) of excerpts from *Perspectives of the San Diego Bay: A Field Guide*.

Download a PowerPoint (1.4 MB) detailing the team's research methods and data collected.

Read a WKCD interview with teacher Jay Vavra.

Read student reflections on the project.

Connect to *Perspectives of the San Diego Bay* at Next Generation Press.

To Do ... Create a 6 A's Project Design Poster

Purpose This “6 A’s” Project Design Poster activity is intended to showcase the work your team has done thus far on your project design. Please feel free to add any additional information you feel is important to help your colleagues understand your project design and your thinking.

Procedures Each Academy team will create an Academy Project Poster that includes a brief description/ overview of your project, including theme/topic &/or essential/driving question; activities; outcomes (including any significant student products/services); ways in which project will address the 6 A’s; etc. Also, include duration of your project; breadth (three/four classes/disciplines, blending academic-technical, interdisciplinary, etc.) of your project; how you will assure rigor and relevance; any uses of technology; etc. You might also describe how you plan to scaffold the project for student success. What elements of your project design support success for every student and help to ensure high quality student work? What sort of exhibition of student and/or culminating work do you plan? How will you involve students in reflecting on what they have learned as a result of doing this project?

By 1 p.m. all of the Project Design Posters will be posted on our Gallery Walls & featured in a Gallery Walk during which all participants will use post-it comments to give and receive feedback.

As part of your poster content, be sure to describe how the project addresses each of the 6 A’s:

<p>ACADEMIC RIGOR</p> <ul style="list-style-type: none"> <input type="checkbox"/> What is the central question addressed by the project? <input type="checkbox"/> What knowledge areas and central concepts will it address? <input type="checkbox"/> What learning standards will the project address? <input type="checkbox"/> What habits of mind and/or SCANS skills will students develop?
<p>AUTHENTICITY</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where in the “real world” might an adult tackle the problem or question addressed by the project? <input type="checkbox"/> How do you know the problem or question has meaning for your students? <input type="checkbox"/> Who might be appropriate audiences for the students’ work?
<p>APPLIED LEARNING</p> <ul style="list-style-type: none"> <input type="checkbox"/> What will the students do to apply the knowledge they are learning to a complex problem? <input type="checkbox"/> Which of the competencies expected in high-performance work organizations does the project provide opportunities for students to develop? (e.g., working in teams, using technology appropriately, communicating ideas; collecting, organizing, and analyzing information) <input type="checkbox"/> Which self-management skills does the project require students to use? (e.g., developing a work plan, prioritizing aspects of work, meeting deadlines, identifying & allocating resources)
<p>ACTIVE EXPLORATION</p> <ul style="list-style-type: none"> <input type="checkbox"/> What field-based (outside the classroom) activities does the project require students to conduct? (e.g., interviewing expert(s) or participating in a worksite exploration) <input type="checkbox"/> Which methods and sources of information are students expected to use in their investigations? (e.g., interviewing and observing, gathering and reviewing information, collecting data, model-building, using on-line search engines/web sites)
<p>ADULT CONNECTIONS</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do students have access to at least one outside adult with expertise and experience relevant to their project who can ask questions, provide feedback, and offer advice? <input type="checkbox"/> Does the project offer students the opportunity to observe and work alongside adults during at least one visit to a worksite with relevance to the project? <input type="checkbox"/> Does at least one adult from outside the classroom help students? <input type="checkbox"/> Develop a sense of the real-world standards for this type of work?
<p>ASSESSMENT PRACTICES</p> <ul style="list-style-type: none"> <input type="checkbox"/> What are the criteria for measuring desired student outcomes (disciplinary knowledge, habits of mind, and skills/applied learning goals)? <input type="checkbox"/> How are students involved in reviewing or helping to establish the Project criteria? <input type="checkbox"/> Which methods of structured self-assessment are students expected to use? (e.g., learning journals/learning logs, peer conferences, teacher or mentor/consultant conferences, rubrics, periodic review of progress)

- How students receive timely feedback on their “project in progress” from teachers, mentors/consultants, peers?
- Do students prepare a culminating exhibition or presentation at the completion of the project that demonstrates their ability to apply the knowledge they have gained?

If there is time, DO a second poster. DESIGN A PROJECT STORYBOARD THAT YOU CAN USE WHEN YOU INTRODUCE THE PROJECT TO YOUR

STUDENTS (or introduce the project to parents and/or partners). Use your creativity & colored markers to design a storyboard or ‘map’ of the project that will help students understand key elements of the project and the project ‘flow.’

Purpose Design a visual representation of your project using pictures, words, and diagrams. Receive written feedback on your project from colleagues who view your storyboard.

Format As a team, create a project “storyboard” on a large piece of chart paper. Use colored markers and try to make it visually stimulating! Possible visual formats include:

- Timeline
- Flow chart
- Game board
- Diagram
- Map

Things to Include Remember that your team will receive feedback on your project from your storyboard, so make it detailed enough for people to understand the key components of your project design! You may want to include items such as:

- The “big idea” of the project
- Essential questions that focus the project
- Courses that are integrated for the project
- Basic logistics (project length, structure of student teaming, etc.)
- Exhibition details
- Sketches of student products
- Benchmarks along the way that break the project up into smaller chunks
- Assessment strategies
- Scaffolding & support strategies
- Resources needed for the project
- How the project will meet each of the Six A’s:
 - Academic Rigor
 - Authenticity
 - Adult Connections
 - Active Exploration
 - Applied Learning
 - Assessment Practices
- Key questions that remain for which your team would like feedback

WORKSHOP REFLECTION: THE 5 MINUTE PAPER

What were the most useful or meaningful things you learned during this session?



What questions remain uppermost in your mind as we end this session?



Action Planning: What will be your next step/steps?