

Project-Based Learning



NATIONAL
CENTER FOR
AGRICULTURAL
LITERACY



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Scenarios – Think, Pair, Share

1. The outside dumpsters at your school really smell bad. Most of the smelly waste can be attributed to cafeteria food waste.
2. Landscapes in your town use most of the municipal water. The city park has been renovated with native plants to educate the public on water-wise landscapes, but water use has not decreased?

What's the problem?

How can the problem be turned into a question?

Project-Based vs. Problem-Based Learning

Both are experiential/expeditionary learning and hands-on, but these approaches solve problems!

1. PjBL: product to solve a problem
2. PbBL: process to solve a problem (Problem-Based Learning in Less than Five Minutes [video](#))

Products/processes: code, demo, maps, video, skit, artifact, flow-chart, and more!



Project-based Learning



- ▶ Involves realistic problems and situations
- ▶ Are based on authentic educational goals
- ▶ Include formative and summative evaluation
- ▶ Are learner centered and teacher facilitated
- ▶ Are intrinsically engaging and motivating
- ▶ Are frequently multidisciplinary
- ▶ Improve students' research and problem-solving skills
- ▶ Improves students' ability to work cooperatively with their peers

Projects, Simulations & Project/Problem-Based Learning

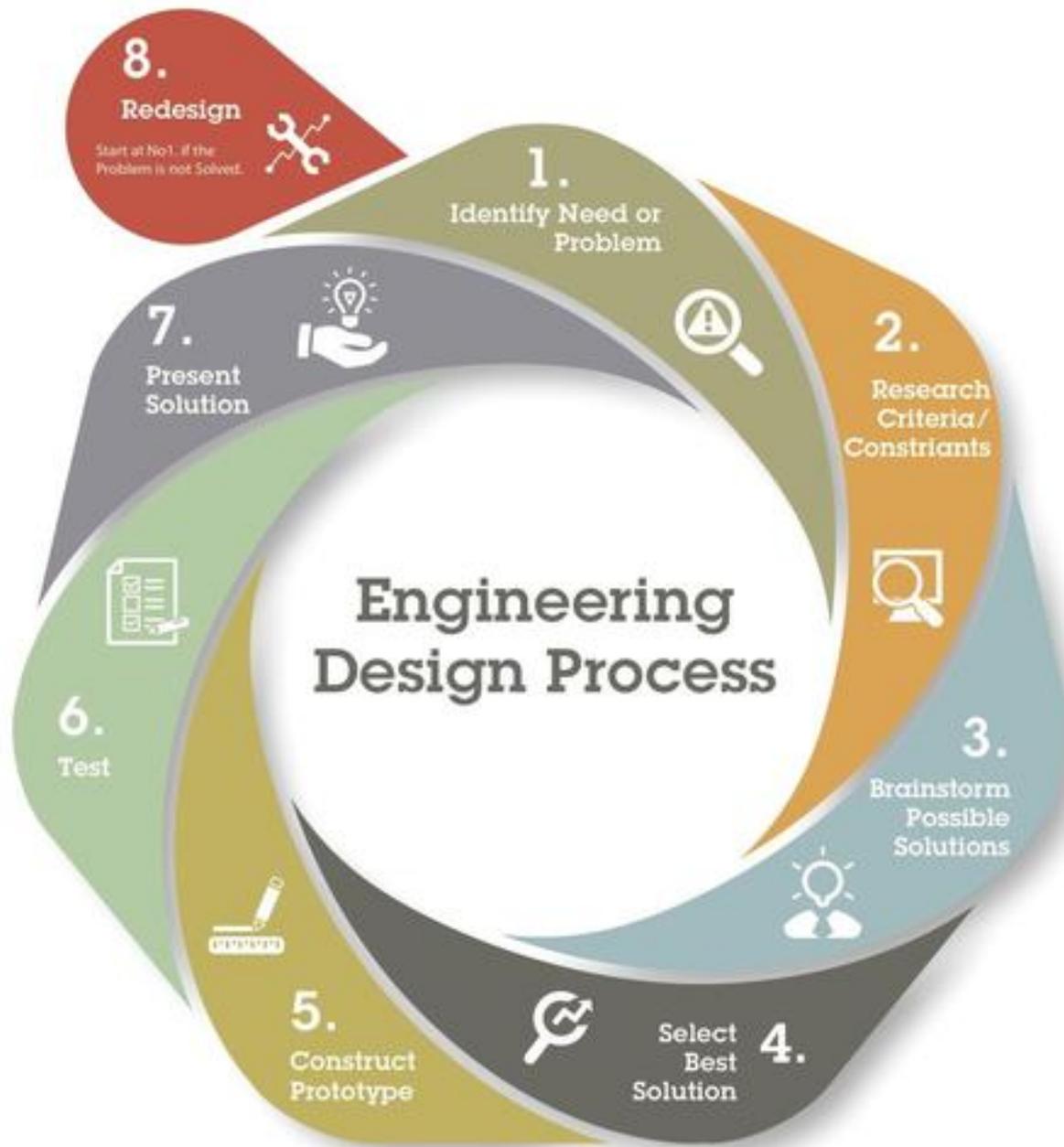
Projects	Problem-Based (Simulations-Case Study)	Project-based Learning
Are often graded based on teacher perceptions that may not be shared explicitly with students.	Grading is based on practical or process-based rubric. Formative and summative evaluations are conducted by students and teacher reflections.	Grading is based on practical or process-based rubric. Formative and summative evaluations are conducted by students and the teacher. The final project is presented publically.
The students do not have many opportunities to make choices/decisions during the "project."	The students make evidence-based decisions based on research to come to a solution engaging with the Engineering Design Process.	The students make most of the choices during the project within the pre-approved guidelines/constraints engaging with the Engineering Design Process.
Are based upon directions and are done "like last year."	Is based upon a current research to solve problems within a scenario.	Is based upon a student generated <i>Driving Question</i> that encompasses every aspect of learning that will occur and establishes the need to know.
Are sometimes based around a tool for the sake of the tool rather than an authentic question/problem.	Use technology, tools, and practices that would be used in the world of work. Students choose tools according to purposes.	Use technology, tools, and practices that would be used in the world of work. Students choose tools according to purposes.
Are basically the same.	Processes are usually different.	Products or processes are usually different.

8 Essential Elements of PBL

- 1. Knowledge and Success Skills** - Students build competencies valuable for today's world, such as problem solving, critical thinking, collaboration, communication, creativity, and innovation, which are explicitly taught and assessed.
- 2. Challenging Problem or Question** -Project work is focused by an open-ended question that students understand and find intriguing, which captures their task or frames their exploration. (scenario, contrived or emerging)
- 3. Sustained Inquiry** - Students are engaged in an extended, rigorous process of asking questions, using resources, and developing answers. (Typically using the Engineering Design Process)
- 4. Authenticity**- At its core, the project is focused on teaching students important knowledge and skills, to solve authentic "real" problems.



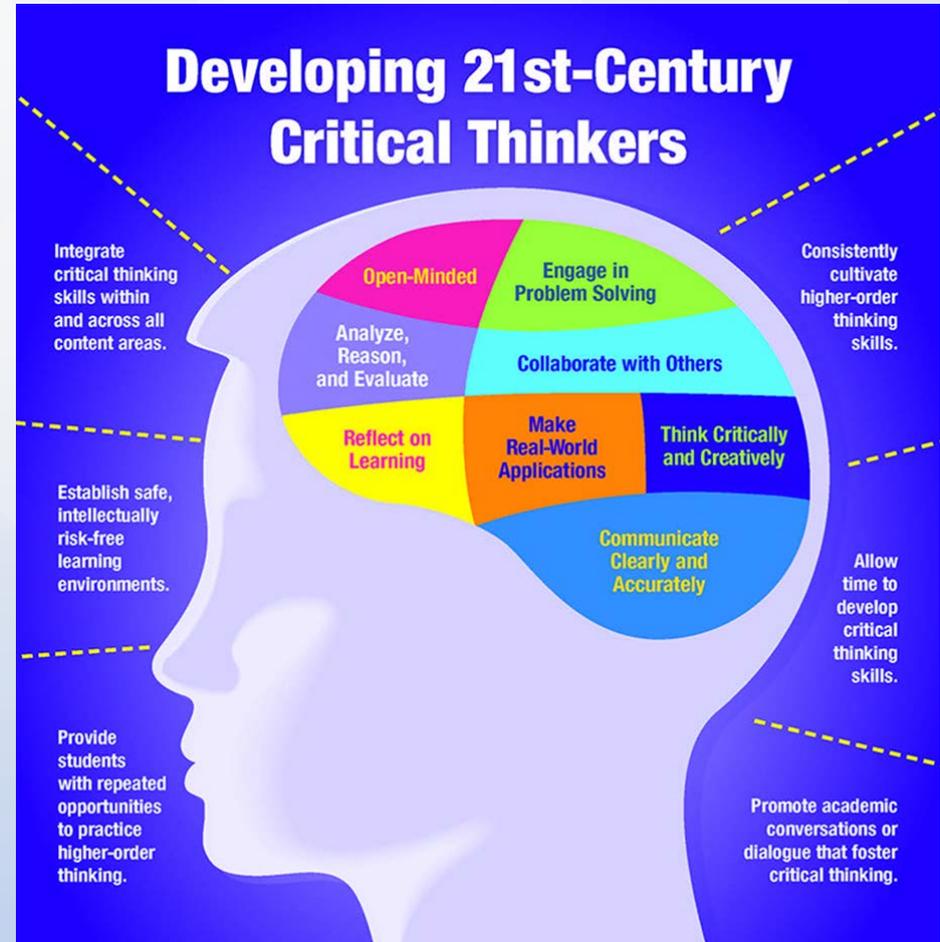
[Eight Essentials for Project-Based Learning \(2015\), by John Lamer and John Mergendoller](#)



21st Century Skills

The term '21st-century skills' is generally used to refer to certain core competencies such as creativity, communication collaboration, critical thinking, digital literacy, and problem-solving that advocates believe schools need to teach to help students thrive in today's world.

*Terms used synonymously:
professional skills, executive skills, life skills, success skills and a few more.*



What does PBL look like in the Classroom?



[Middle School Project: Public Art \(YouTube, 7 minutes\)](#)

College & Career Awareness

PBL Engagement Activities

Approved Lesson Plans

One Project to Be Completed Each Trimester or Quarter

<https://www.uen.org/cte/cca/>

- A Better Granola Bar
- Career Gaming
- Cord Mess
- Culinary Concepts: Utah's Own
- Edutainment
- Know and Glow
- Utah STAYcation
- Biomechanical Surgery: Artificial Limbs and Prosthetics
- The Business of Breakfast
- Restaurant Simulation

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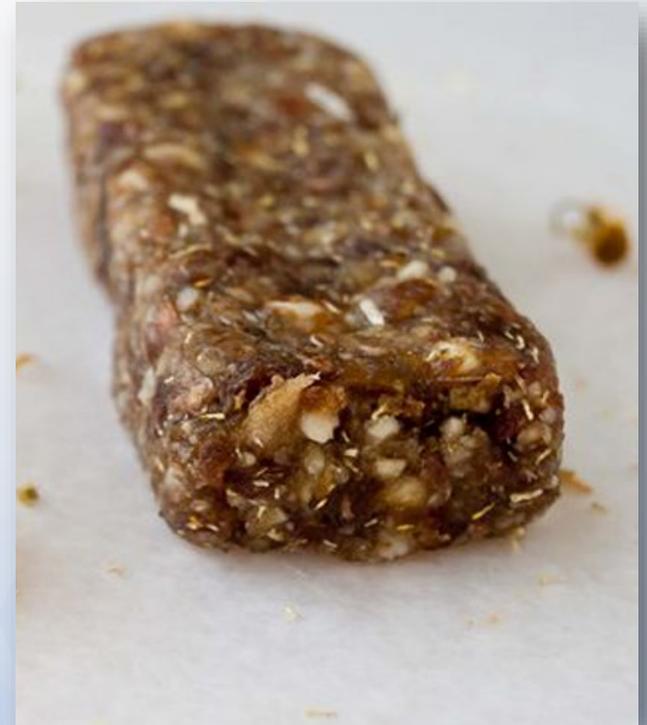
PBL Project Idea

A Better Granola Bar

Students will use project-based learning to develop a recipe for an energy bar that is healthy, made from easy-to-find ingredients, and simple to prepare. They will then design the marketing and branding of this new energy bar. A box will be constructed to display the marketing and branding of the product. Finally, teams will present their finished product to a group.

Pathways Explored

- Technology Engineering
- IT
- FACS
- Business & Marketing



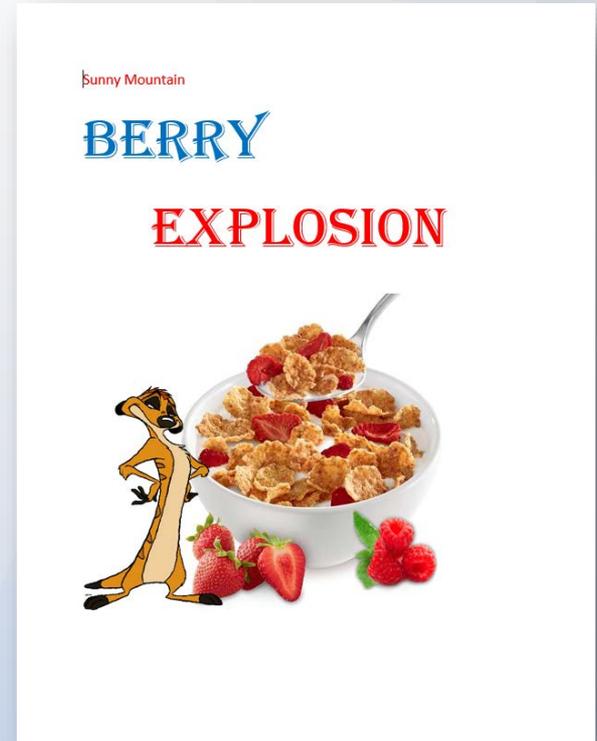
PBL Project Idea

The Business of Breakfast

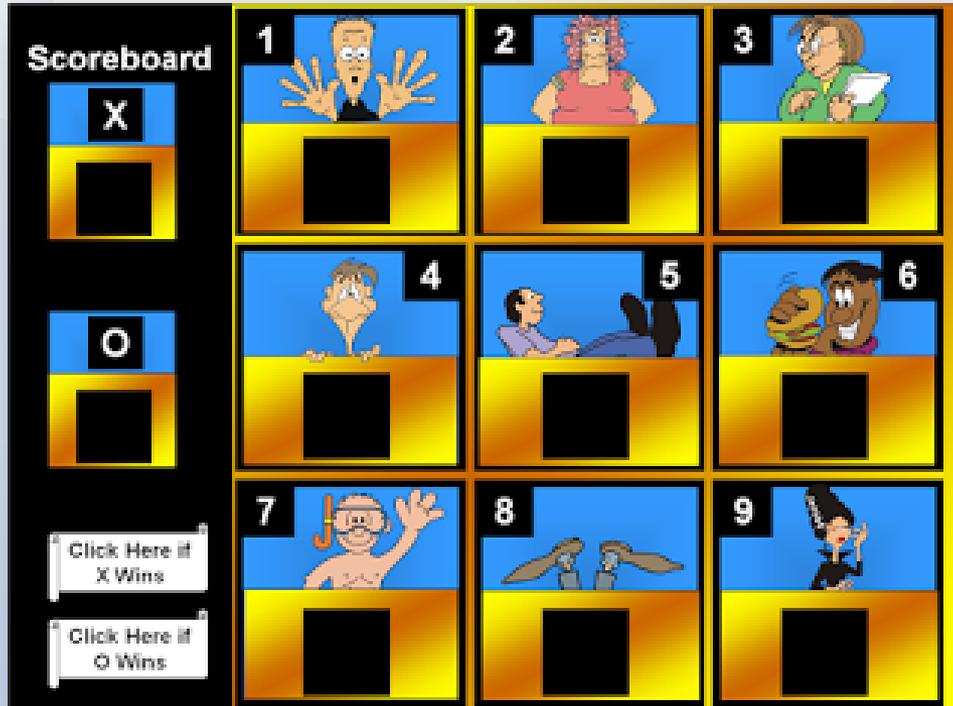
Students will be put into groups of 2-3 students. Each team will come up with an idea for a new cereal including: name of the cereal, type of cereal, company name, logo, slogan, and mascot. After decisions are made they will create a cereal box (front and back) and an advertisement for their cereal. The cereal and commercials will then be shown to all classes and they will vote on the *best*.

Pathways Explored

- Business
- Marketing
- FACS
- IT
- Agriculture



PBL Project Idea



Hollywood Squares game board by Mark E. Damon

Career Gaming

Students design games that will assist others with identifying a variety of careers, possible emerging careers, the education required for career options, and the types of salaries that can be expected in each career.

Emphasized Pathways

- All Pathways

PBL Project Idea

Career Gaming

Students design games that will assist others with identifying a variety of careers, possible emerging careers, the education required for career options, and the types of salaries that can be expected in each career.

Question?

“Can we design games that would help others students learn about career opportunities?” “

Task

- ▶ Working in groups and using resources available to you, create a game to help others explore many careers.
- ▶ Be prepared to share your game with the group.
- ▶ Resources: Electronic Devices that you have with you, poster board, 3x5 cards, dice, markers, paper clips and binder clips, etc.
- ▶ [Career Gaming Project-Based Learning Plan](#)



PBL Project Idea



Culinary Concepts: Utah's Own

Students will use project-based learning to develop a unique retail food product that includes ingredients (51%) that have been sourced in Utah to create a new "Utah's Own" company. Students will work in teams to design a product that could be created with Utah products. The resulting food product could be sold in retail outlets and/or be served in school cafeterias.

Emphasized Pathways

- Agriculture
- FACS
- Business & Marketing
- IT

PBL Project Idea

Culinary Concepts

Students will use project-based learning to develop a unique retail food product that includes ingredients (51%) that have been sourced in Utah to create a new "Utah's Own" company. Students will work in teams to design a product that could be created with Utah products. The resulting food product could be sold in retail outlets and/or be served in school cafeterias.

Question?

"How can you become a "Utah's Own" entrepreneur for a food based company with these ingredients: wheat/flour, honey, salt, eggs, milk, butter, cheese, jams and seasonings?"

Task

- ▶ Working in groups, use the worksheet to go come up with a food product that could be made with Utah's Own products.
- ▶ Be prepared to share your ideas with the group.



Agricultural Ideas

Project-Based Learning

- Scenarios that emerge from questions that can be translated into a project to solve a problem.

Problem-Based Learning

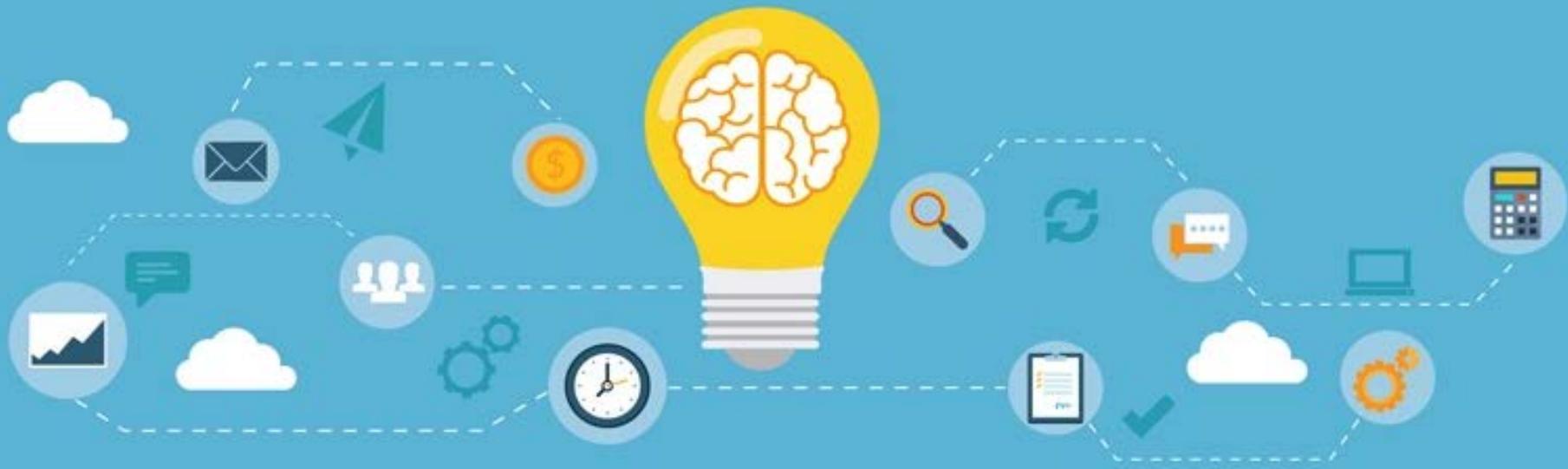
- Shortage of Agricultural Workers (robotics?)
- Shortage of Agricultural Scientists (career intervention?)
- Cafeteria Waste
- Landscape Problems
- Farm Mapping - Agrotourism
- Culinary Concepts - State Agricultural Projects
- An Advanced Energy Bar
- Growing Food for Space
- Irrigation Problems
- Water Quality
- School Gardens
- Community Hunger
- Aquaculture/Aquaponics
- Hydroponics/Aeroponics
- Biofuel
- Embryology



Resources

- College & Career Awareness “Open” PBL Site: <http://bit.ly/CCAPBL>
- Resources and Assessment: <http://bie.org>
- [Edutopia YouTube Playlist](#)





In PBL the focus is on the skills to develop processes and products to solve problems

Project-based learning is authentic, it represents the world of work. In the real-world, we address problems by opening or developing projects that will hopefully result in effective products or processes addressing problems.

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