**Project-Based Learning (PBL)**

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**Why PBL?**

Project-based learning is an effective and enjoyable way to learn because students develop deeper learning competencies required for success in college, career and civic life. True PBL naturally provides opportunities for students to engage in math, science, and engineering practices, which include the 4 C's (critical thinking, collaboration, communication, and creativity).  Reasons for considering PBL include:

* Today’s students often find school to be boring and meaningless.  PBL engages their minds and provides real-world relevance for learning.
* Students learn, retain, and apply new content knowledge and skills in a variety of contexts
* Students understand content more deeply, take responsibility, build confidence, solve problems, work collaboratively, and communicate ideas
* PBL provides an effective way to address Common Core and next Generation Science standards.
* Teachers and students can use technology to connect with experts, partners, and audiences around the world
* PBL allows teachers to work with active, engaged students doing high-quality, meaningful work, reinvigorating the joy of learning

**Why is PBL unique?**

* Helps students think, learn, and operate by challenging them at deeper levels
* Teaches students to find, process, understand, and share information
* PBL is well-aligned with the practices of science and engineering because they involve tasks and activities, such as investigations, that are team-based, long term, and can be wide in scope

**Elements of PBL:**

* 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.
* 21st century competencies - Students build competencies valuable for today’s world, such as problem solving, critical thinking, collaboration, communication, and creativity/innovation, which are explicitly taught and assessed.
* In-Depth Inquiry - Students are engaged in an extended, rigorous process of asking questions, using resources, and developing answers.
* 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.
* Need to Know -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.
* 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.
* Critique and Revision - The project includes processes and mechanisms for students to give and receive feedback on the quality of their work
* Public Audience -Students present their work to other people, beyond their classmates and teacher.

**PBL Teams:**

Groups vs. Teams

* Groups – students sit together, talk, plan, share and do work
* Groups follow vague sets of classroom norms
* Teams – high performance focus, operating on explicit ethic of service to others, listening, attentiveness, and shared leadership
* Teams produce highest quality products based on team member effort
* Teams work under a contract (written agreement) regarding operations and responsibilities

**PBL facilitators should:**

* Set aside time for establishing and reinforcing team ethic
* Use a detailed collaboration and teamwork rubric
* Distinguish between working groups and teams.  Working groups can do individualized tasks with no mutual accountability or joint product (no contract)
* Help students focus on commitment to each member of the project team using reflection, discussions, and encouragement.  PBL allows for the production of great work through sharing strengths via cooperation

**Process for establishing high performance:**

* Ask them to discuss their respective strengths and weaknesses. What will each of them bring to the team?
* Identify and address sources of conflict.  What differences exist between team members? Do they see the project differently? Do they agree on the product?
* Have them define the task and identify an approach
* Challenge teams with fresh information on a regular basis.
* Encourage "hang out" time and celebration. All good teams like to see and celebrate success.