

Putting the project-based learning approach into practice

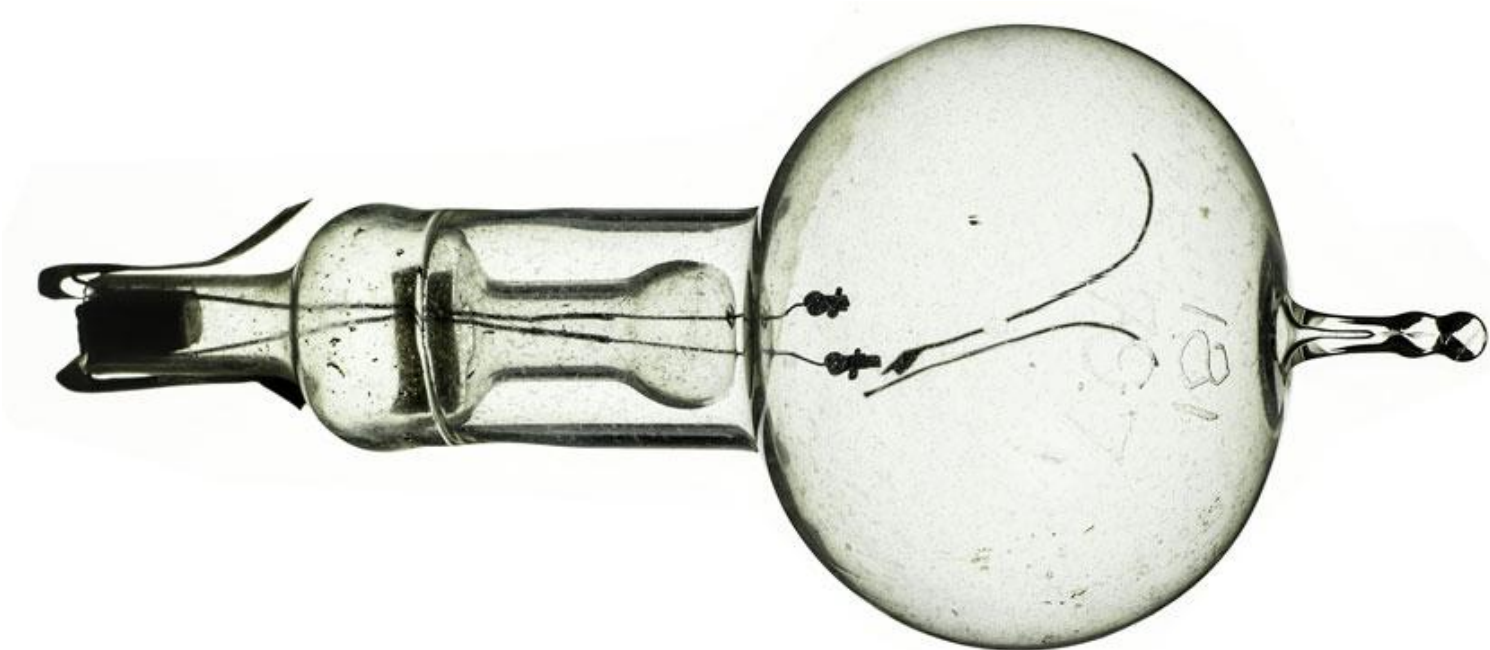


Thomas Edison began serious research into developing a practical incandescent lamp in 1878.

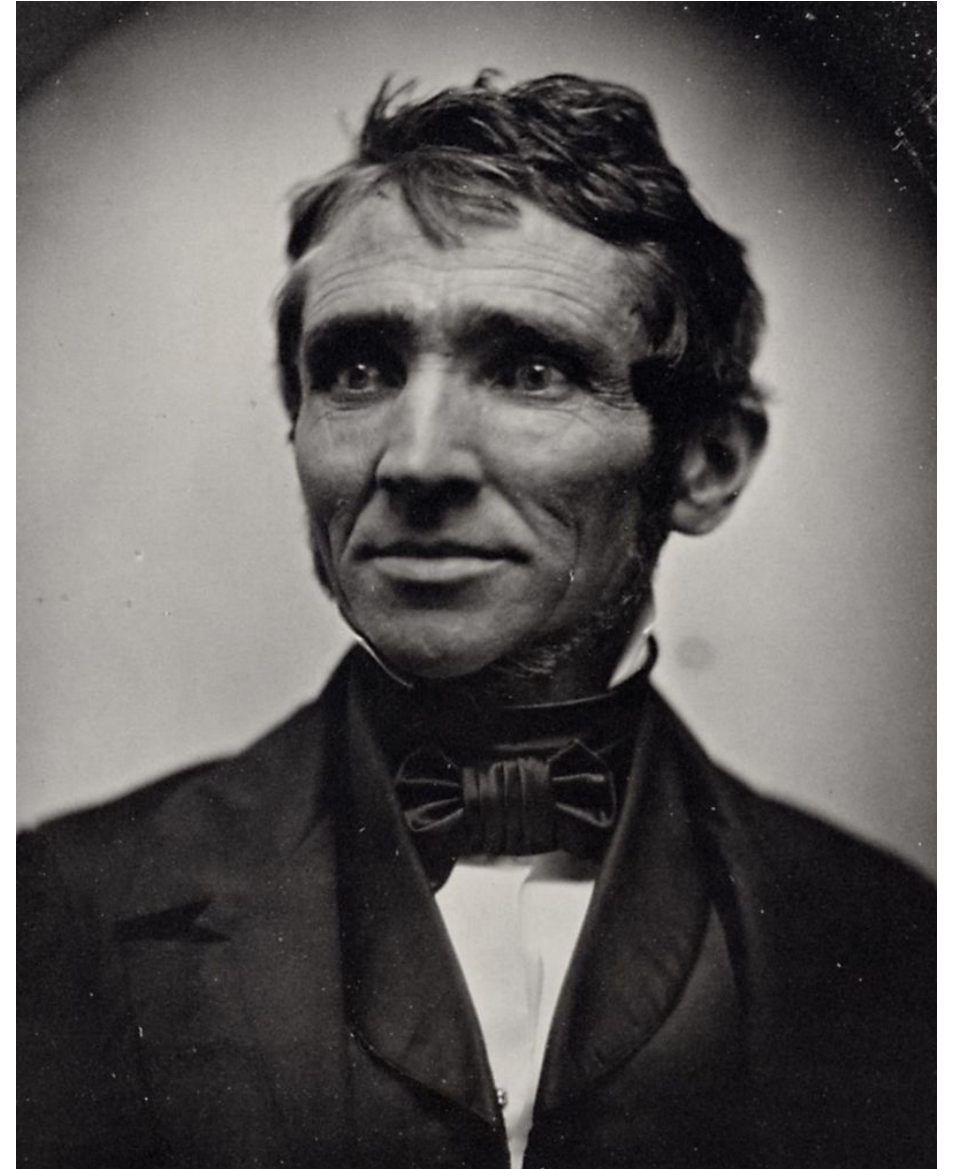
Francis Upton noted that the lamp factory had conducted **2,774 experiments**

The first successful test was on 22 October 1879,^{[37][38]} and lasted 13.5 hours

Discovery marked the beginning of commercially manufactured light bulbs and in 1880



Charles Goodyear (December 29, 1800 – July 1, 1860) - American self-taught chemist and manufacturing engineer who developed vulcanized rubber, for which he received patent



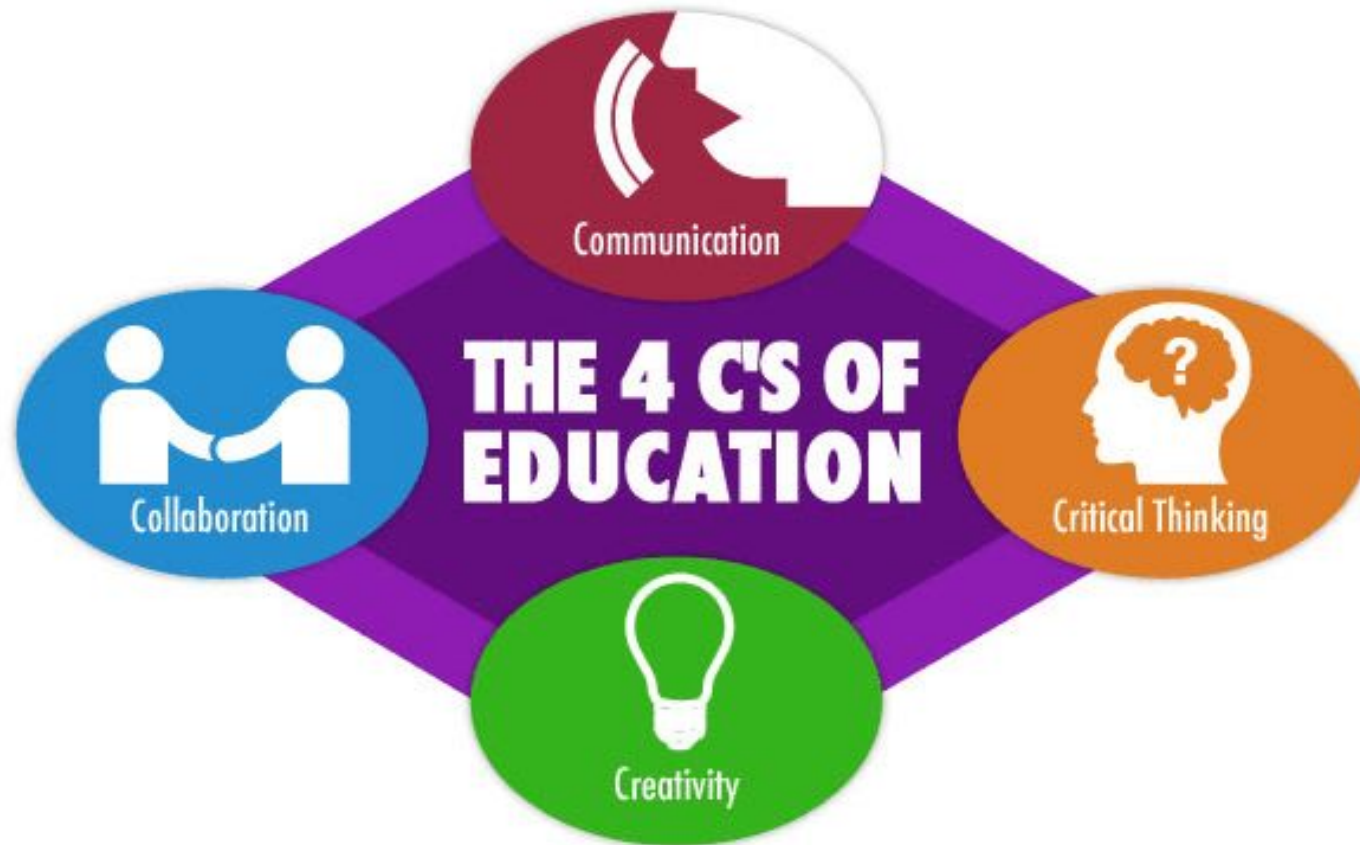




Neuroplasticity of the Brain

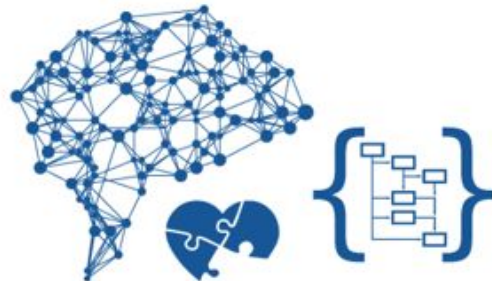


21st Century Skills - 4C



in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility



in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity




Любой ребенок может стать гением - Ласло Полгар



How People Learn ?!

Education Information
Solution Experience
Analysis



Facts are important for thinking and problem solving

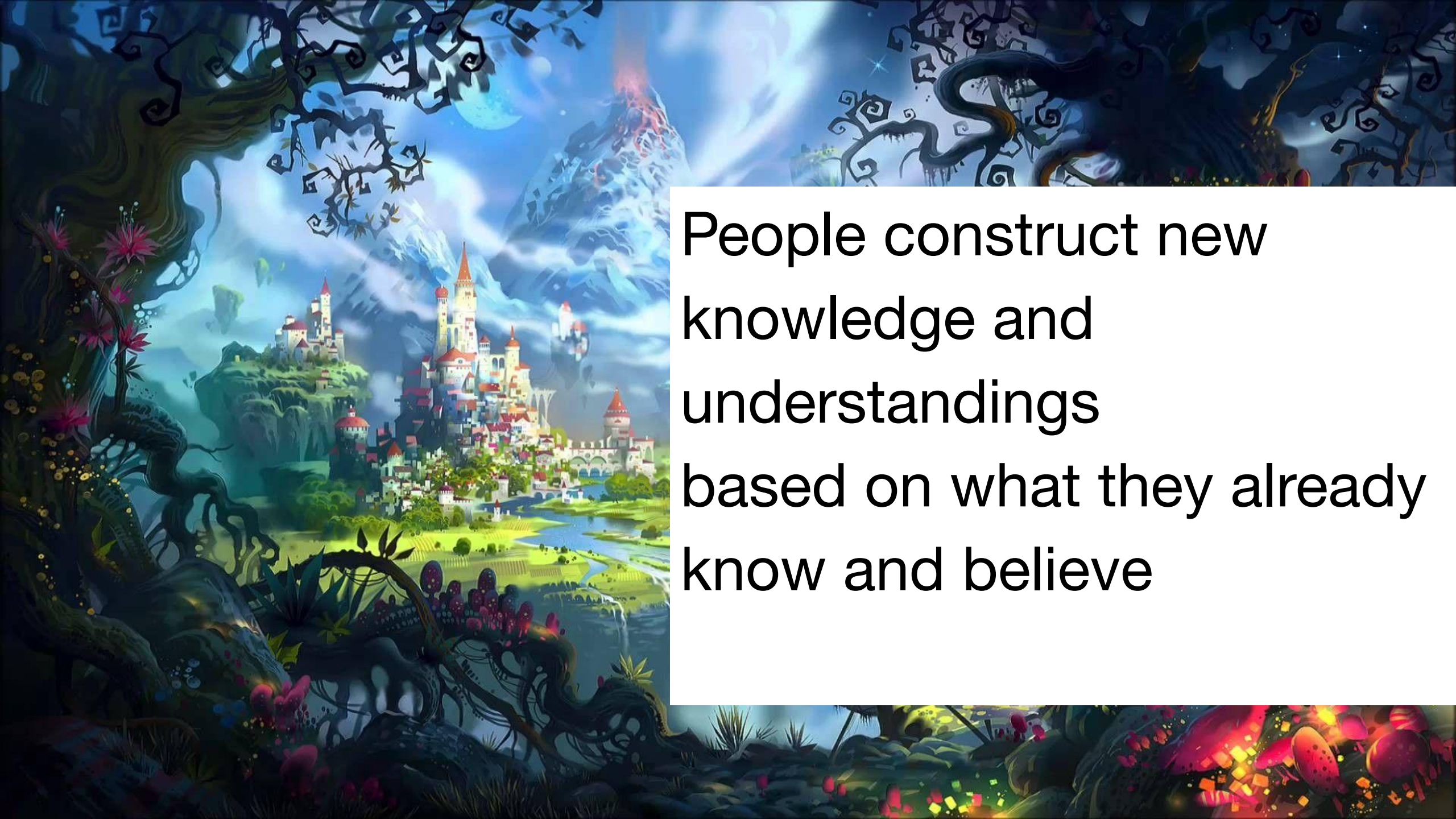
Knowledge



When the knowledge is a large set of disconnected facts, it's becoming ineffective.

To develop competence in an area of inquiry, students must have opportunities to learn with understanding. Deep understanding of subject matter transforms factual information into usable knowledge.

Sixth graders in a suburban school who were given inquiry/project-based physics instruction were shown to do better on conceptual physics problems than eleventh and twelfth grade physics students taught by conventional methods in the same school system.



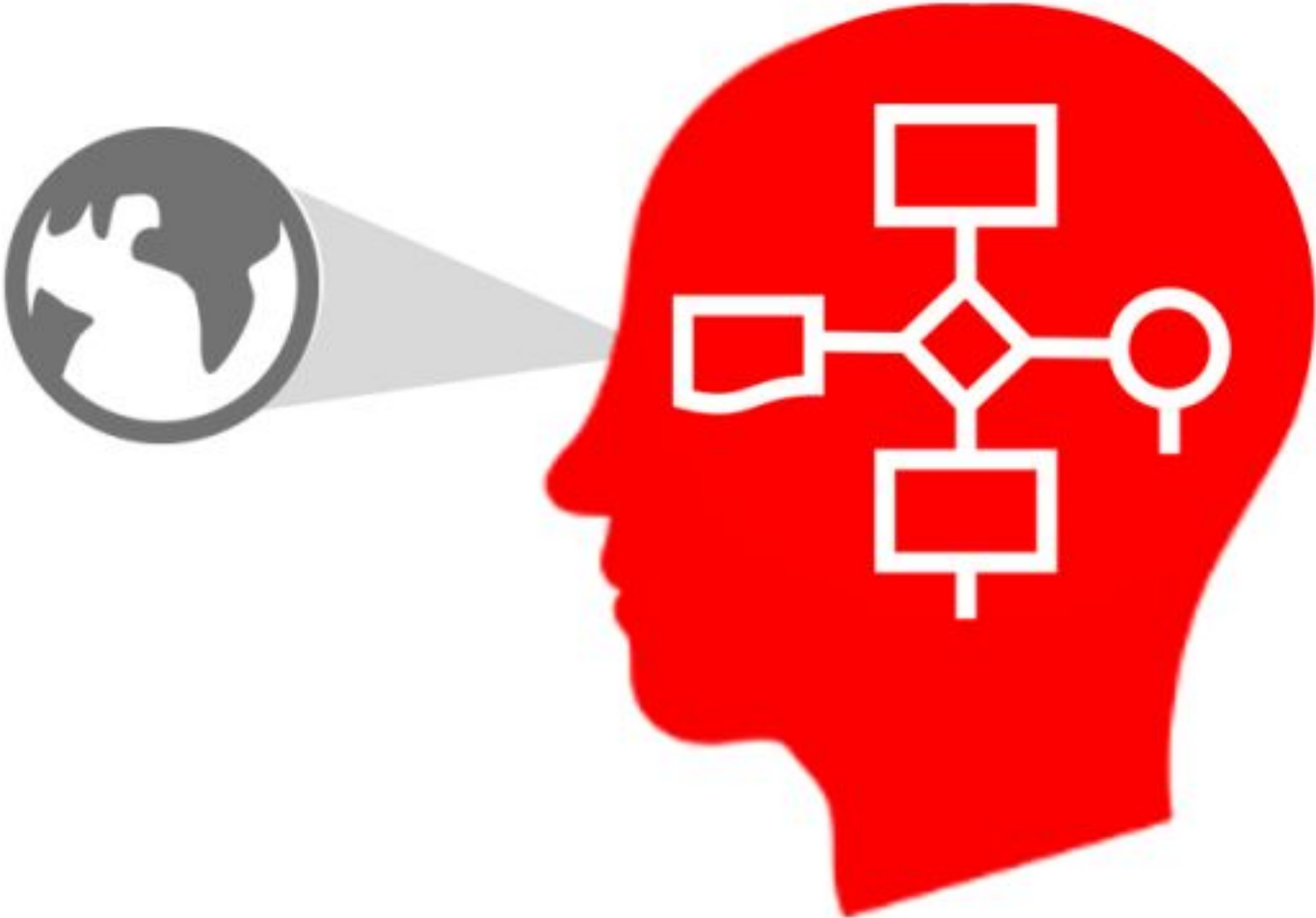
People construct new knowledge and understandings based on what they already know and believe

Need to pay attention to the incomplete understandings, the false beliefs, and the naive renditions of concepts that people bring with them to a given subject

Fish Is Fish (Lionni, 1970)



Mental Model



Metacognition - people's abilities to predict their performances on various tasks/self-assessment, and reflection on what worked and what needs improving

Dunning-Kruger effect



These meta-cognitive monitoring activities are an important component of what is called **adaptive expertise**

**Link learning to
other aspects of lives.**

How creativity works !



Divergent Thinker

Convergent Thinker

Thinks of
all possible
ways to
reach
a solution.



Thinks for
a final
solution.





Why is
**CRITICAL
THINKING**
Important?

It enhances
**problem-solving
ability.**

Refine your
research skills.

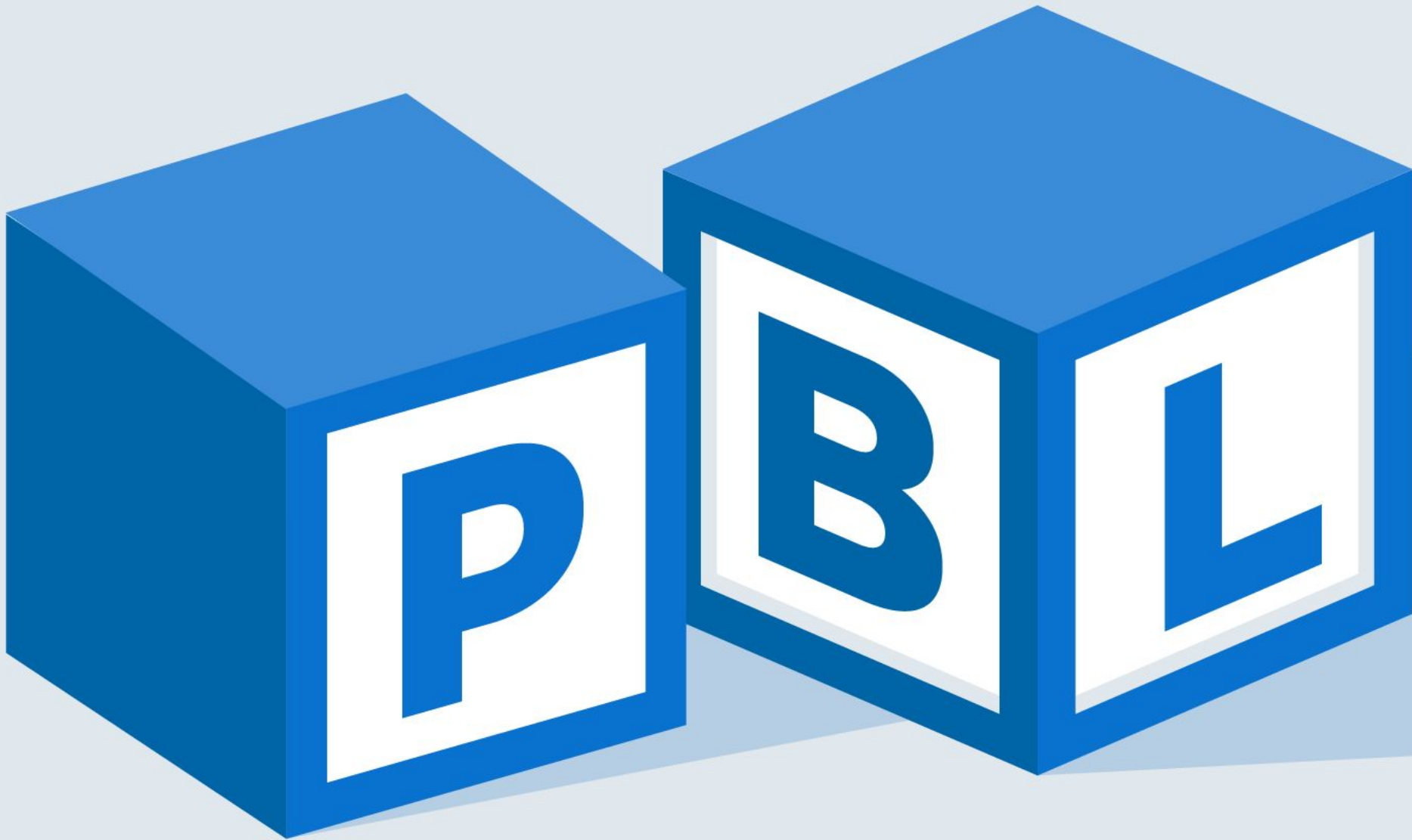
Polishes your
creativity.

Stimulates
curiosity.

Helps to improve
**decision
making.**

You can't learn swimming theoretically!





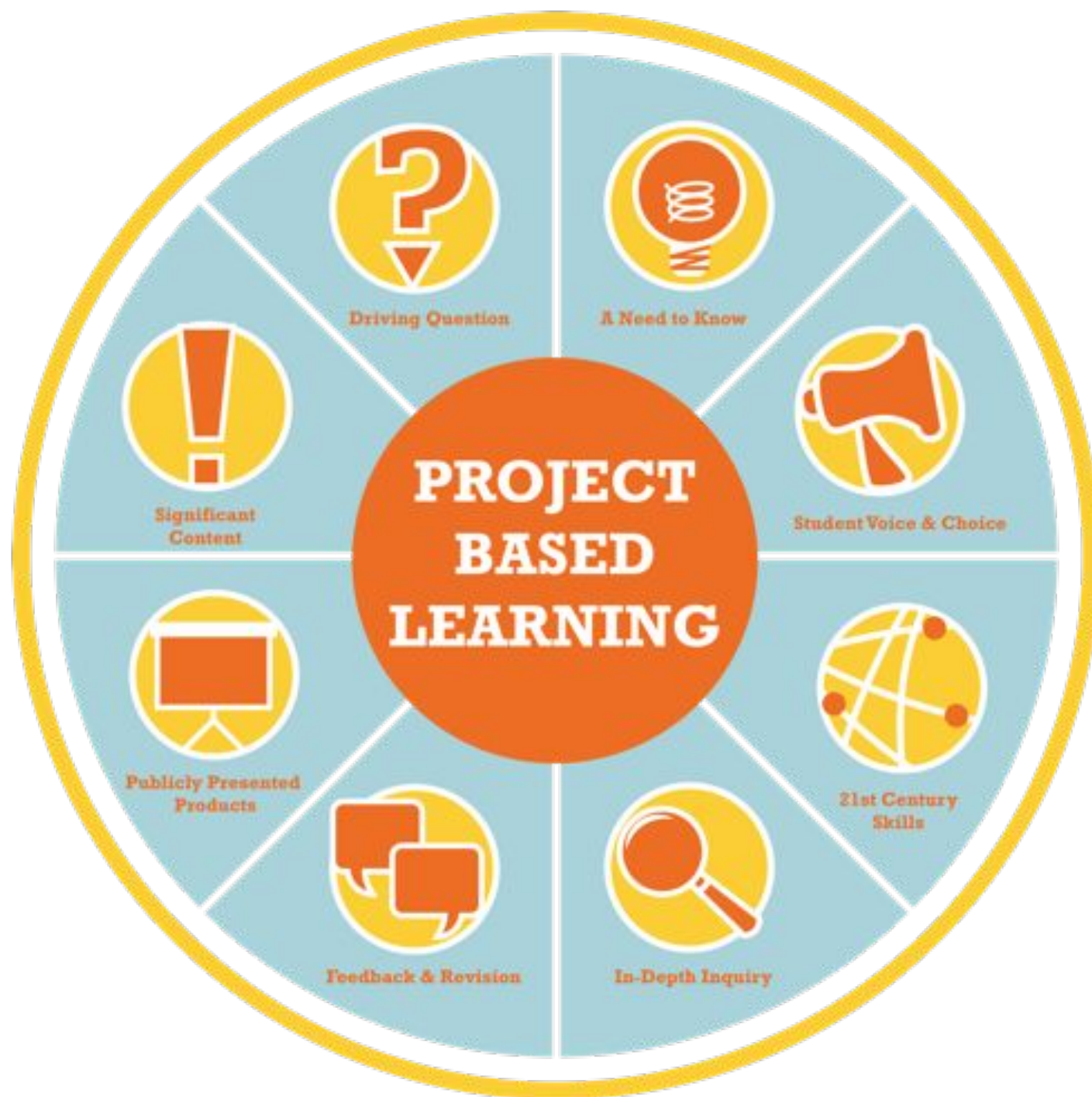
A graphic with a dark blue background. In the center, a white-bordered rectangle contains the text "Project Based Learning" in white. Surrounding the rectangle are various icons: a blue airplane at the top, a glowing lightbulb at the top right, a pink brain on the right, a green stick figure running at the bottom, a blue eye at the bottom left, a lightning bolt on the left, and a round-bottom flask with green liquid at the bottom left.

Project Based Learning



John Dewey

Effective education came primarily through doing and social interactions and that the school setting should be considered a social institution



DOES THE PROJECT MEET THE CRITERIA?			
 <p>KEY KNOWLEDGE, UNDERSTANDING, AND SUCCESS SKILLS The project is focused on teaching students key knowledge and understanding derived from standards, and success skills including critical thinking/problem solving, collaboration, and self-management.</p>			
 <p>CHALLENGING PROBLEM OR QUESTION The project is based on a meaningful problem to solve or a question answer, at the appropriate level of challenge for students, which is operationalized by an open-minded, engaging driving question.</p>			
 <p>SUSTAINED INQUIRY The project involves an active, in-depth process over time, in which students generate questions, find and use resources, ask further questions, and develop their own answers.</p>			
 <p>AUTHENTICITY The project has real-world context, use real-world processes, tools and quality standards, makes a real impact, and/or is connected to students' own concern, interest, and identities.</p>			
 <p>STUDENT VOICE & CHOICE The project allows students to make choices about the products they create, how they work, and how they use their time, and guide by the teacher and depending on their age and PBL experience.</p>			
 <p>REFLECTION The project provides opportunities for students to reflect on what and how they are learning, and on the project's design and implementation.</p>			
 <p>CRITIQUE & REVISION The project includes processes for students to give and receive feedback on their work, in order to revise their ideas and products or conduct further inquiry.</p>			
 <p>PUBLIC PRODUCT The project requires students to demonstrate what they learn by creating a product that is presented or offered to people beyond the classroom.</p>			

DESSERT
"DOING A PROJECT"

An add-on to the traditional instruction; at the end (or alongside) of the unit

Follows direction of the teacher

Focused on product

Often unrelated to standards and skills

Can be completed alone and/or at home

Remains within the school world

End result of project displayed in the classroom



MAIN COURSE
PROJECT BASED LEARNING



Instruction integrated into the project (The project is the unit!)

Driven by student inquiry

Focused on product and process

Aligned to academic standards and success skills

Involves collaboration with students and in-class guidance from teacher

Has a real-world context and application

Results of project shared beyond the classroom with a public audience

P R O J E C T D E S I G N : O V E R V I E W

Name of Project:	Duration:	
Subject/Course:	Teacher(s):	Grade Level:

Other subject areas to be included, if any:

Key Knowledge and Understanding (CCSS or other standards)			
Success Skills (to be taught and assessed)	Critical Thinking/Problem Solving		Self-Management
	Collaboration		Other:

Project Summary
(include student role, issue, problem or challenge, action taken, and purpose/beneficiary)

Driving Question

Entry Event

Products	Individual:	Specific content and success skills to be assessed:
	Team:	Specific content and success skills to be assessed:

Deplastify the Planet: How to Master the Sustainable Transition

Featured Projects



How might we use Microsoft Services & Technology to reduce plastic pollution?



Create an IoT system that can assist households in their ecological effort



How might we find a way to give a second life to our makeup containers that are too small to be recycled with the existing system?



How might we find clever ways to recycle cross-linked materials from the foam of shoe soles into valuable products that have an equal or lower carbon footprint than the first life?



How might we reduce plastic packaging used to ship car parts?



Use the wastes generated by a Whole Foods store to create soap or packaging for soap to be used by method

Deplastify the Planet 2021 : Renault's car parts packaging

Brief

The Renault–Nissan–Mitsubishi Alliance together sells more than 1 in 9 vehicles worldwide. Each car counts around 30 000 parts delivered in a plastic packaging. 9 millions cars are sold each year generating thousand of tons of plastic waste.

Objective

How might we reduce the plastic packaging used to ship car parts?

Solution

Replace the plastic trays in which car parts are delivered with a molded pulp either reusable or recyclable. Plastic waste decreased by blending upstream and downstream strategies (recycled & reused).



RENAULT NISSAN MITSUBISHI

Problem - something that causes difficulty or that is hard to deal with !

ЧТО-ТО, ЧТО ВЫЗЫВАЕТ ТРУДНОСТИ ИЛИ С ЧЕМ ТРУДНО СПРАВИТЬСЯ



Как мы питались раньше

1. Покупали продукты
2. Шли на Базар или в Супермаркет
3. У людей было больше времени
4. Приготовление занимало большое количество времени и сил
5. Но существовали рестораны с доставкой еды почему они не смогли заменить доставку еды ?

Отсутствие систем заказа и доставки,
высокая стоимость, оптимизация доставки

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Darbar

[View Menu](#)



LYFE Kitchen

[View Menu](#)



Howie's Artisan
Pizza

[View Menu](#)



Taipan

[View Menu](#)



Kanpai Sushi

[View Menu](#)



Oren's Hummus

[View Menu](#)



Patxi's Pizza

[View Menu](#)



Sprout Cafe

[View Menu](#)



Tamarine

[View Menu](#)



Garden Fresh



Siam Royal



Asian Box

Stanf
Univer

1. No problem
2. Problem, but manageable
3. Problem, some help appreciated
4. Major problem, *help seeked*
5. They're dying, workaround built

Проблема

Поиск Информации

Проблемы со временем

Комфорт и трата сил

Знания в данной области, как готовить еду

Финансовые затраты

Нервы



Phubber

Инновация - Это значительно улучшенные или абсолютно новые продукты, процессы, сервисы, бизнес модели

Упражнение

<https://www.mentimeter.com/app/presentation/1d4d3871b16ef553905b6fa38ca398dd/54e9d9ed540a>

Использование разных методологий брейнштурминга для создания абсолютно новой или улучшенной идеи

1. Time Travel
2. The Role of the Leading Innovators

Оценка и самооценка идей на предмет инновационности

Упражнение

<https://www.mentimeter.com/app/presentation/7ad23bd9c5cba3cac1693853bddc7515/cea8808689f5>

<https://www.mentimeter.com/app/presentation/fb23f6800ef1e436187035f984a10c9a/3ac40bbef62b>

Thanks !

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