WHAT IS STEM?

SCIENCE | TECHNOLOGY | ENGINEERING | MATHEMATICS

PROVE IT!

EMPOWERING STEM STUDENTS THROUGH PROJECT BASED LEARNING

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PROVE IT!
WHY STEM EDUCATION?

- Problem Solving addition to Learning Creativity

2024

- kindergarten-aged children could be taking a graduation trip to Mars by

PROVE IT!

The answer is not just a yes or no, but it is where it’s coming from in your brain and making sure that you have the thought process to prove what your answer is.

Environments that foster collaborative, project-based learning create students that “Prove It!” and don’t just answer it.
"Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty ... after a while. That’s because they were able to connect experiences they’ve had and synthesize new things." - Steve Jobs
Projects are not supplementary; students learn content through the projects solving authentic problems with real-life solutions.

1. REAL WORLD CONNECTION

Students learn to work as teams, as they would in a professional office or workplace.

2. CORE LEARNING

Students have autonomy over their work and improved problem-solving & collaboration skills.

3. STRUCTURED COLLABORATION

Improved problem-solving & collaboration skills.

4. STUDENT DRIVEN

Students perform as well as or better than other students on high-stakes tests.

5. EFFECTS OF PBL

Students are more engaged, self-directed learners.

Teachers act as coaches and facilitators.

Transfer the knowledge they've learned into real-world situations.
PBL OPPORTUNITIES

- Use their problem-solving skills for real-world questions with significance beyond the classroom
- Plan and execute projects that directly affect their immediate environment

PBL OPPORTUNITIES

- Have authentic experiences that prepare them for future science careers
- Develop awareness of ecosystems and the need to protect them

E-PBL doesn’t just benefit a student’s academic performance; this method of instruction helps children to be healthier, motivated, and more compassionate toward the environment.

ENVIRONMENTAL PBL
A raised stream table allows students to experiment with erosion and creation of rivers.

A butterfly garden teaches about cross-pollination and native plants.

REAL WORLD EXPERIENCES

Students learn business, math and science skills as they harvest and sell vegetables and eggs from the greenhouse and chicken house.

Composting & gardening teach about conservation, environmental stewardship, food chains, and life cycles.

LIFE SKILLS

Outdoor Classrooms

Real World Experiences

Interactive learning and natural light for surrounding programs.

Learning concepts in geography and science.

Size and design catered to every grade level.

Composting and recycling teach about:

- Conservation
- Environmental stewardship
- Food chains
- Life cycles
DID YOU KNOW?

SMART ROBOTS JOBS YEAR 2050

TOP TEN JOBS IN STEM FIELDS MACHINES WILL OUTSMART HUMANS BY 2075

DESIGN FOR A MISSION

DESIGN FOR AN EXPERIENCE

Provide a focused STEM curriculum that offers real-world insights and our goal is to help students become creative thinkers and confident communicators.

- School Mission Statement

ELLEN OCHOA STEM ACADEMY AT BEN MILAM ELEMENTARY SCHOOL

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LEARNING...
PROJECT BASED...
INTEGRATION INTO CORE DISCIPLINES

STEM ACADEMY

LIVING MACHINE FOR LEARNING

INTEGRATION INTO CORE DISCIPLINES

HANDS ON
PROJECT BASED LEARNING
I think my favorite element about the school is the open environment, the spaces where so much collaboration can take place. Because we need to get out of the box of the classroom.

District STEM Coordinator

In an open environment… they feel safe messing up, or finding that discovery that they need in order to be successful on a project.

School district

BUILDING AS A TEACHING TOOL

Kids can see not only the world outside, but the world inside. They see the infrastructure of this building. They know that more goes into this than just the plaster and paint on the walls.

District Director of STEM Education

All parts of the building design communicate the STEM focus. When cost reductions were needed, no programs were reduced. Every piece is needed. Every place has a purpose. Every place is necessary.

District

BUILDING AS A TEACHING TOOL

Every piece has a purpose. Every piece is necessary.
NATURAL AND DAYLIGHT HARVESTING

REUSING AND RENEWING

"By incorporating the existing gym, we saved on costs and invigorated the design process."

The new facility reinvigorates an aging neighborhood, bringing a sense of pride.

A dedicated facility for understanding and observing the natural world at multiple scales instills passion for the environment in tomorrow’s leaders.
CLASSROOMS

Classrooms are display cases for ongoing student research in the natural sciences, encouraging all students to consider the variety of ecosystems besides their own.

GROWING COMMUNITY PARTNERSHIP

These are spaces to inspire the future workforce, meant to foster collaboration between students, educators and professionals in STEM fields such as engineering.

- Lockheed Martin

WELCOMING THE COMMUNITY

Our mayor and city council are very proud of this facility. At every opportunity, they come here to visit to talk with the students.

- District Superintendent

Flexible, accessible spaces invite the community through the doors of the school.
Our village is a very close community. It starts with our church that's next door and the Boy Scouts who come in and help clean up the outdoor area.

-Academy's STEM Coordinator
The openness in the layout is present to lead the student to a place where they have intrinsic motivation to learn the desired subject or task. Transparency is important as a student must feel that the instructor is placing their best interest at the forefront of all other matters.

- Leslee Shepherd
  District Director of CTE, Keller ISD
OUTDOOR LEARNING

Traffic stop
Outdoor maker space
Science deck
Herb garden

STEM PROGRAMS

KCAL

STEM PROGRAMS

KCAL
Lab and collaborative spaces must have forethought and be integrated into the needs of the STEM program so that project-based learning (PBL) and creative processes flow from it naturally.

To accomplish this, the Keller Center for Advanced Learning (KCAL) integrated learning/collaborative spaces into the STEM areas to allow for all a feeling of integration in all aspects of STEM.

- Leslee Shepherd
  District Director of CTE, Keller ISD

Adjacent Clusters

- The STEM clusters are grouped together with interior Maker space
- Learning spaces equipped for hands on learning & flexible layout
- Power, data and required utilities are provided in each classroom
- Open space for collaboration
- Space for individual reflection

Indoor Maker Space

EDD Lab

One space to build it all

Lab and Collaborative Spaces
LEARNING ANYWHERE

IDEA PRESENTATION

The collaboration spaces are used by the different strands. Students work with other disciplines on projects.

REAL LIFE SIMULATIONS

CROSS CURRICULAR TRAINING

TRANSFER PRACTICES

Traffic stop
Emergency response
Patient transfer
Prescription dispensing

TRAFFIC STOP
HOSPITAL ELEVATOR
EMT
NURSING

Technology Everywhere!

Digital technology is used throughout the facility to enhance the learning experience.
MULTI-USE SPACES

Hive transforms from a workspace to a showcase or competition area.

KEEPING IT RELEVANT

The Architecture, Construction and Engineering strands work together. A fully equipped woodshop helps students turn their vision into reality.
TO PROVE A CASE...
The Criminal justice area has a space for microscopes and evidence processing. The mock crime scene space aids with hands-on learning.

MOCK CRIME AREA
EVIDENCE PROCESS AREA

HANDSON LEARNING
Shared maker spaces between different fields and collaborative work and learning by doing.

The Central Justice area has a state-of-the-art facility, providing students and teachers with hands-on learning opportunities.
NOW THE FUN BEGINS

GROUP ACTIVITY

- Share your thoughts
- Prepare your ideas in your head of paper
- Choose the correct order to share
- Choose the career cluster
- Choose your career specialty

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Popular Careers in 2100:
• Gene Programmer
• Food Engineer
• Bioengineer
• Brain Augmenter
• Weather Controller
• Spaceport Traffic Control
• Human-related Spacecraft Maintenance
• Nature Conservationist
• Ethics lawyer - for memory augmentation, genetic
• Domestic Robot Programmer
• Organ designer
• Water harvester

THANK YOU!