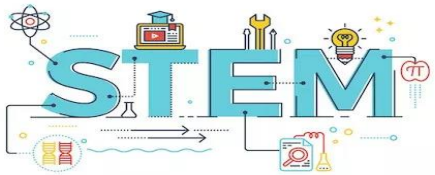
COHEA's Path to Certification



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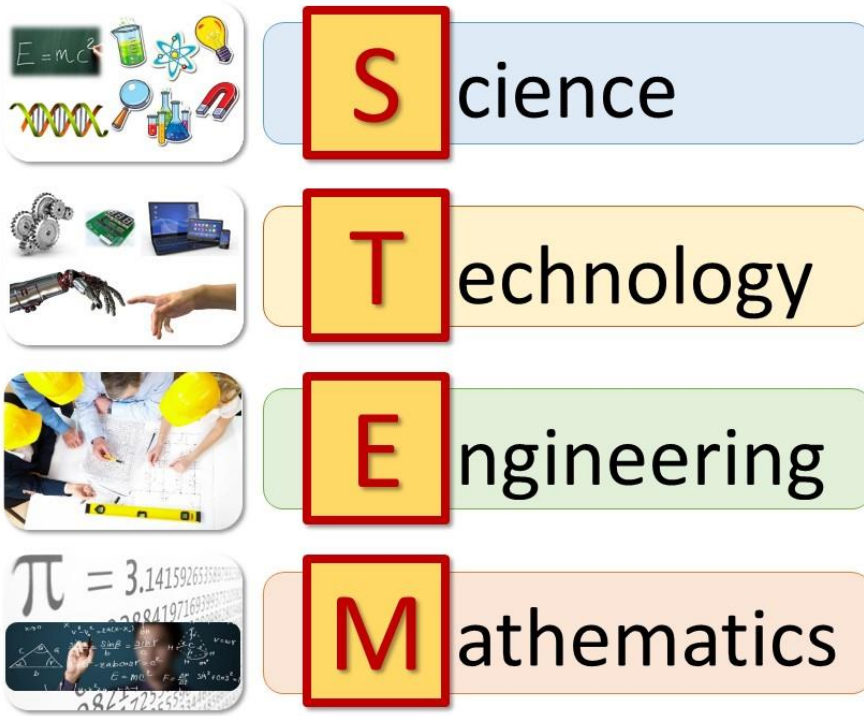
What is STEM? (Science, Technology, Engineering and Math)

- STEM is an approach to teaching that's larger than its constituent parts
- STEM removes the traditional barriers erected between the four disciplines, by integrating the four subjects into one cohesive curriculum

Why STEM?

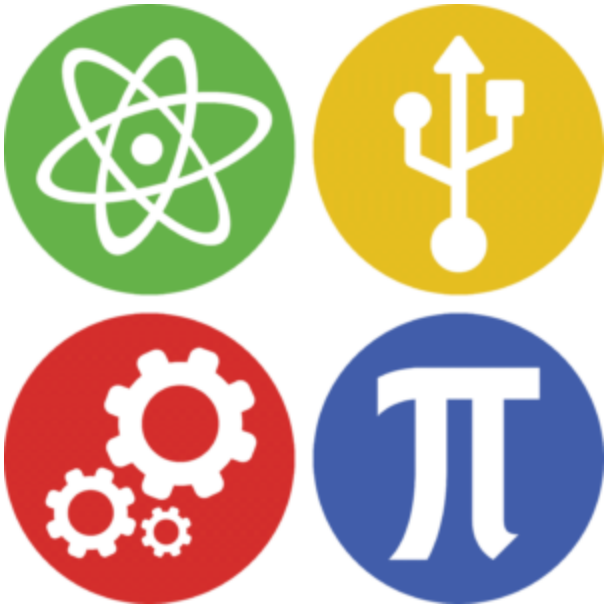
- STEM prepares students for life, regardless of the profession they choose to follow
- STEM Teaches students how to think critically and how to solve problems – skills that can be used throughout life.

- STEM Focuses on:
  - Critical thinking
  - Problem solving ability development
  - Leadership/teamwork development
  - Ethics and responsibility
  - Invention, imagination, and ingenuity
  - Communication skill development



Why STEM?

- ***According to the U.S. Department of Education, STEM jobs are projected to grow 13%.***
  - Between 2017 and 2027, the number of STEM jobs will grow 13 percent, compared to 9 percent for non-STEM jobs—with positions in computing, engineering, and advanced manufacturing leading the way.
  - Since 1990, employment in STEM occupations has grown 79%—increasing from 9.7 million to 17.3 million.



Applied Across Core Content Areas

Math

An emphasis on problem solving and critical thinking as related to real world situations

Science

Provide opportunities for discovery and inquiry through experimentation and projects

Social Studies / History

Study historical research, documents, and artifacts to learn about cultures of the past

English

Connect reading and writing to authentic real world applications through essays, collabora
discussions, and a variety of literary genres.

Teaching STEM

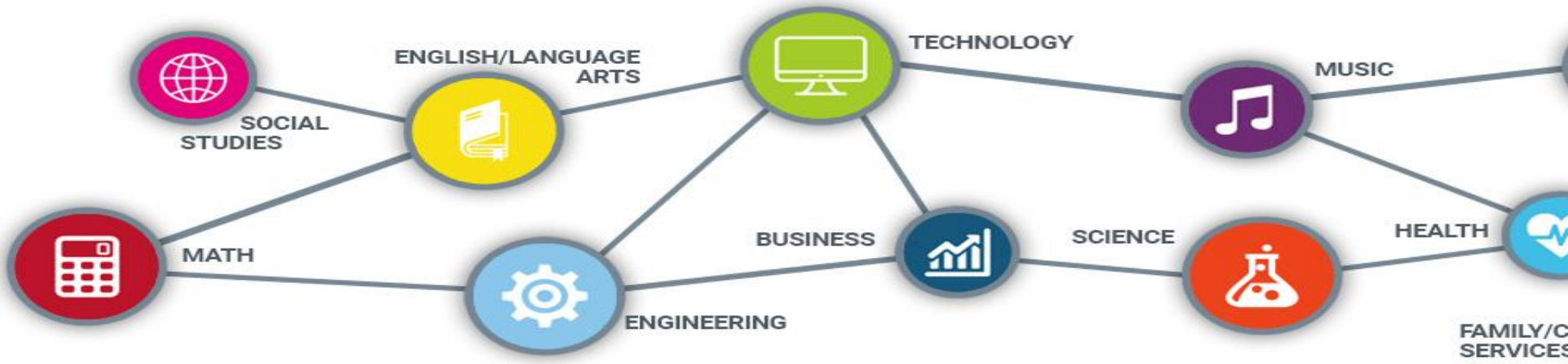
- Pose problems and combine problem solving with project-based learning across disciplines.
- Developing students' critical thinking, communication, assessment, and inquiry skills.

Using Real World Problems (Authentic Learning)

- Real-world problem-solving is the essence of STEM lessons. (Example: ESOL students learning new vocabulary and applying it to everyday life.)
- Solving real-world problems causes students to use/expand higher-order thinking skills.
- Identifying creative, real-world problems for students is the essence of STEM teaching. Example: Ask students how a problem can relate to a specific career.

What Do Students Gain?

- **Creativity** – Thinking on their feet, 'outside the box.' **(Habit 6: Synergize – Explore Third Alternative)**
- **Confidence** – Building confidence needed to thrive in a competitive workplace. **(Finding your Voice)**
- **Problem Solving** –Without realizing it, students are consistently challenged to solve problems. This develops skills in reasoning and understanding. **(Habit 2: Begin with the End in Mind)**
- **Focus** – Balancing listening/contributing involves a great deal of concentration/focus. **(Habit 5: Seek First to Understand, then to be Understood)**
- **Communication** – Defending ideas/theories is a core skill and one that is required throughout life. **(Habit 6: Synergize)**



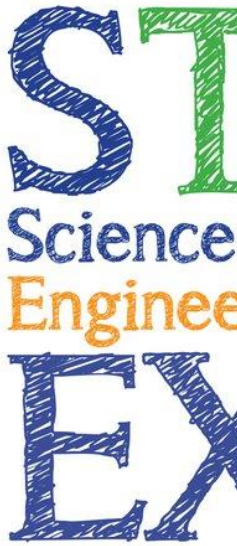
What Do Students Gain?

- **Receiving Constructive Feedback** – Feedback is part of learning/part of life. (Habit 5: Seek First to Understand, then to be Understood)
- **Collaboration** – Students work together, share responsibility, and compromise with others to accomplish a common goal.
- **Dedication** – Students practice developing healthy work habits (on-time, prepared, respecting the contributions of others).
- **Accountability** – Understanding that their actions affect other people.

STEM Team Membership Eligibility

- To be considered for STEM membership, a student must meet ALL the requirements:
- • Student must be working at grade level or receiving grades of C or better in all classes, as determined by school records.
- • Student must be able to participate in and contribute to cooperative learning and academic enrichment activities.
- • Student must show an interest in technology, math and science, as evidenced by class participation or extra-curricular involvement.
- • Student must exhibit good behavior and good school citizenship, as determined by school records and recommendations from school staff.

COHEA STEM Nights



- COHEA STEM Nights bring together students, their families, and community members in an expo-style event by club members.
- Students and STEM club leaders demonstrate interactive STEM activities and projects.
- Ideally, community partners are invited and organize hands-on STEM activities and informational displays relating to college readiness. For parents and guardians, it's a time to learn about the club their child has joined, and for the students, it's a time to exhibit leadership in the program.

Teacher Expectations

- STEM Bulletin Board to show off student work relating to STEM
- STEM Design Process laminated board
- STEM Lesson Plan

COHEA

CAREER & COLLEGIATE ACADEMY

FOUNDER OF THE CIVICA NETWORK

COHEA Weekly Lesson Plan

Date: _____ Teacher Name: _____ Course: _____ Perio

Standard(s):

Student Objective(s):

Essential Question(s):

ESOL Accommodations:

- ◻ Audiovisual
- ◻ Individual Help
- ◻ Summarizing
- ◻ Choral Reading
- ◻ Manipulatives
- ◻ Making Notes
- ◻ Demonstration
- ◻ Modeling
- ◻ Think/Pair/Share
- ◻ Extended Time
- ◻ Oral Testing
- ◻ Underlining/ Highlighting
- ◻ Graphic Organizer
- ◻ Verbal Response
- ◻ Repetition
- ◻ Write Key Words
- ◻ Illustrations & Diagrams
- ◻ Rephrasing & Simplifying
- ◻ Other

IEP/504 Accommodations

- ◻ Flexible Presentatio
- ◻ Flexible Recording
- ◻ Flexible Response
- ◻ Flexible Scheduling
- ◻ Flexible Setting
- ◻ Other

Students:

S.T.E.M. Instructional Component Type:

- Problem Solving Task
- Model Eliciting Activity
- Engineering
- Real-World Situation

Materials Needed:

S.T.E.M. Activities Categories:

Teacher Led Activities:

- Direct Lecture and Notes
- Guided Discussions
- Guided Technology/Support

Student Engaged Activities

- Problem solving task
- Projects
- Real world solution concept maps, clusters, posters, PPT, etc

Student Group Led Activities

- Creating/Building Models
- Researching/Problem Solving
- Collaborative Presentation

STEM Process:

Goal:

Ask:

- What is the problem
- What are possible
- What have others

Imagine:

- What are the possi
- What else can be
- What is the best so

Plan:

- Is the plan possible
- Where should I star
- What materials are

Create:

- Can a model be m
- Have I followed the
- Does it meet the g

Improve:

- Does it work?
- What will make it b
- What can be done

Communicate:

- Are changes need
- What do others thi
- Is the problem solv

Teacher Notes:

Vocabulary:

Day 1

Agenda

1. Bellringer:
2. Lesson Activities:
3. Closing/Exit Slip:

Assessment

Home Learning:

Day 2

Agenda

1. Bellringer:
2. Lesson Activities:
3. Closing/Exit Slip:

Assessment

Home Learning:

Day 3

Agenda

1. Bellringer:
2. Lesson Activities:
3. Closing/Exit Slip:

Assessment

Home Learning:

Create a lesson plan based on one of the 7 Habits

Habit 1: Be Proactive

Habit 2: Begin with the end in mind

Habit 3: Put First Things First

Habit 4: Think Win/Win

Habit 5: Seek first to understand then to be understood

Habit 6: Synergy

Habit 7: Sharpen the saw