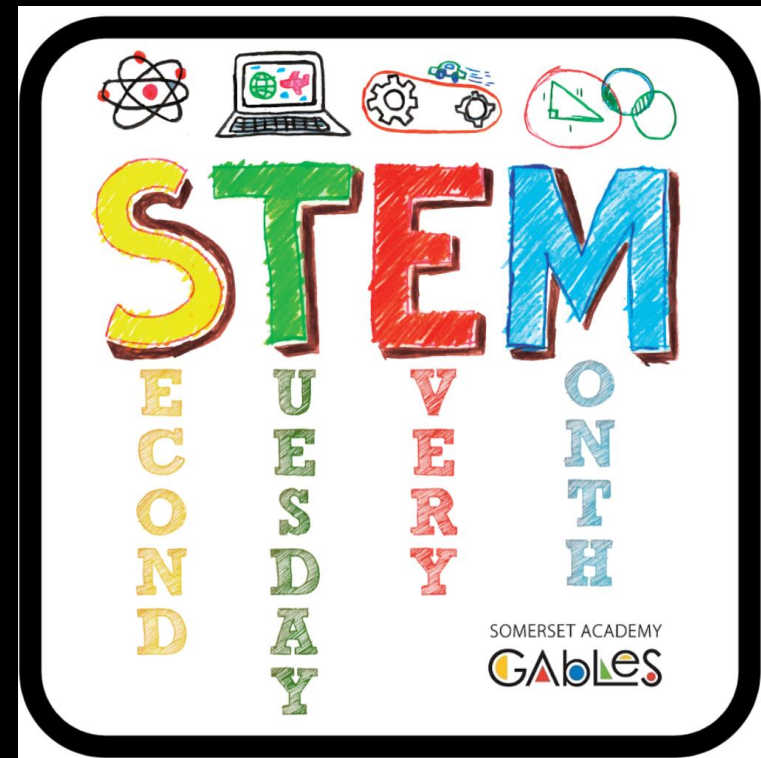


# STEM

Somerset Gables Academy



# WHAT IS STEM?

- To be able to solve problems
- Find and use evidence
- Collaborate on projects
- Think critically
- The key term, when talking about STEM, is *integration*. STEM curriculum intentionally melds these disciplines. It's a blended approach that encourages hands-on experience and gives students the chance to gain and apply relevant, "real world" knowledge in the classroom.
- Project based learning, Inquiry LEarning

# HOW DO I “STEM” MY CLASSROOM?

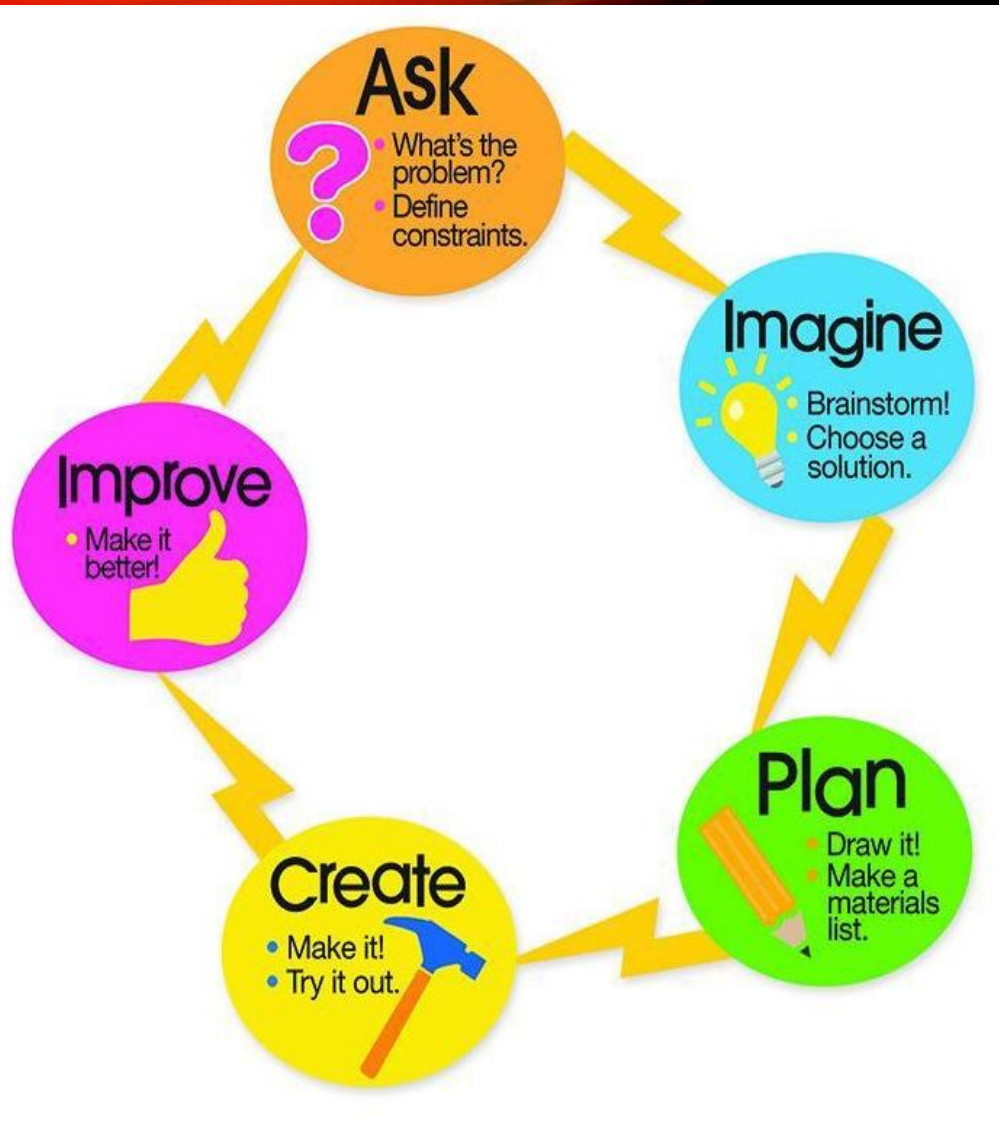
## • K-2

- If you teach younger students, create an environment that encourages observation and asking questions that begin with *Why...?* or *How does...?*
- Classroom Transformations
- Self Directed Activities (*small groups*)
- Go on nature walks.
- Sing “Old MacDonald Had a Farm” and use it as a springboard to think about the ecosystem of a farm.
- Explore how simple classroom machines, like a stapler, work.
- Above all, it’s important to help students to get a solid foundation. Make sure they are fluent in basic skills like addition and subtraction, measurement, or identifying shapes.

# HOW DO I “STEM” MY CLASSROOM?

## • 3-7

- For upper elementary and middle school students, approach lesson using project-based learning.
- Pose problems that students can relate to, can be solved in different ways, and let students to work together and provide evidence of their thinking.
- Most importantly, students need to be able to pull from their learning from different subjects as they work toward an answer.
- Self-Directed Learning (small groups), open-ended problem solving
- Interdisciplinary activities(using different subjects for one project)
- Room Transformations/Escape Rooms
- West Miami (STEM)Field Trips: prior to attending students should complete work to present & scaffold.
- Following up on activities/projects, revise on how to make it better next time
- Data tracking, using i-ready and STEM formal/informal assessments



# Engineering Design Process

The engineering design process encompasses a mindset that emphasizes **open-ended problem solving** and encourages students to **learn from failure**.

Experiencing the engineering design process nurtures students' abilities to create innovative solutions to challenges in any subject!

<https://www.sciencebuddies.org/science-fair-projects/engineering-design-process/engineering-design-process-steps>

# THE ENGINEERING DESIGN PROCESS

**COMMUNICATE**  
your solution

**ITERATE**  
to improve  
your prototype

**TEST**  
and evaluate  
your prototype

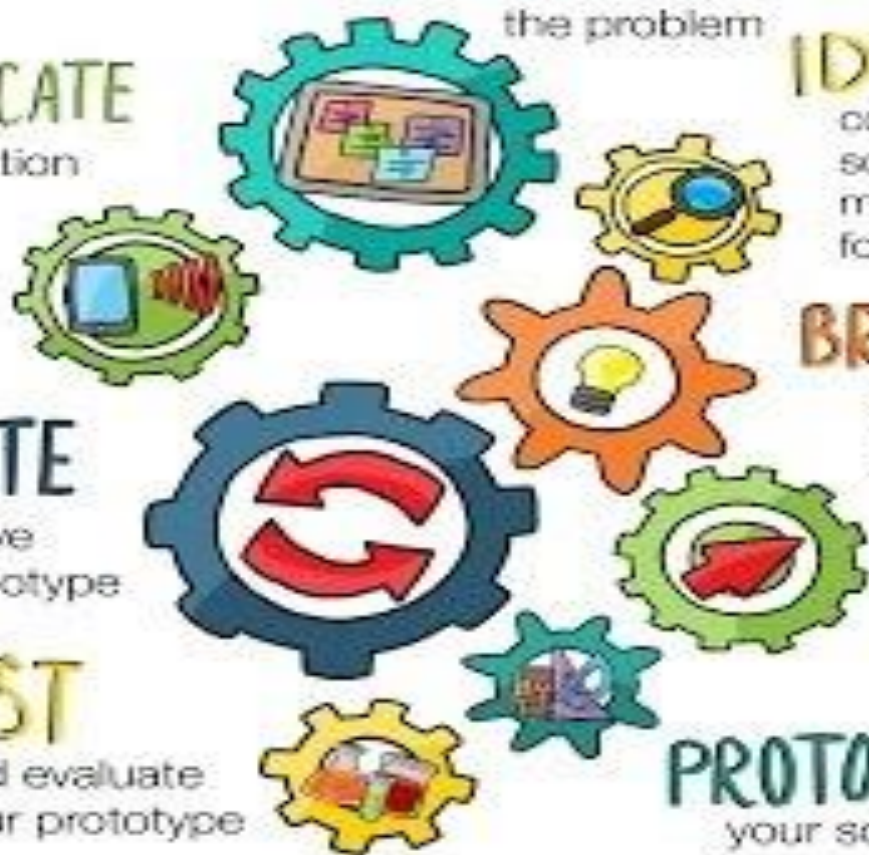
**DEFINE**  
the problem

**IDENTIFY**  
constraints on your  
solution (e.g. time, money,  
materials) and criteria  
for success

**BRAINSTORM**  
multiple solutions  
for the problem

**SELECT**  
the most  
promising solution

**PROTOTYPE**  
your solution



# WHAT ARE CHOICE BOARDS?

- Choice boards (some instructors call them *learning menus*) are activities or assignments that give students the option of choosing what they will do to meet the your requirements. As a general rule, these boards outline a variety of instructional options that are targeted towards a specific academic goal. You as the teacher direct the choice board, but your students are given control over their choices and may select the option(s) that appeal most to them.
- Students with higher abilities will most likely implement these choice boards as more of an extension tool to hone and refine their knowledge while struggling kids can use these activities as a way to review or practice concepts.

# CHOICE BOARD FOR MULTIPLE INTELLIGENCES

- Verbal/Linguistic – keep a journal, write a poem, or write instructions.
- Logical/Mathematical – compare and contrast, design a map, create a pattern.
- Visual/Spatial – create a poster, create a diagram, or create a comic strip.
- Interpersonal- tell a story, conduct a survey, interview a friend.
- Free Choice.
- Body Kinesthetic - conduct an experiment, construct a model, or make up a game.
- Musical – make up a dance, write a song, play an instrument.
- Naturalist – take a field trip, categorize data, experiment.
- Intrapersonal – keep a journal, write about the future, review or visualize.



# CHOICE BOARD INSTRUCTIONS

1. **ASK Define the problem:** What is the problem or need? Who has the problem or need? Why is it important to solve?
2. **IMAGINE Do Background Research:** Plan to research how your product will work and how to make it. Brainstorm and choose a solution.
3. **PLAN Develop the Solution:** Make a materials list. Design your product.
4. **CREATE Build a prototype:** Build your product to the best of your ability.
5. **IMPROVE Test and Redesign:** Test your solution, find new problems, make changes, and test new solutions before settling on a final design.
6. **FINAL REPORT Communicate Results:** To complete your project, communicate your results to others in a final report and/or a display board.

# CHOICE BOARD JOURNALS

## STEM journals

- Composition book
- Students use STEM journals for choice board/STEM activities.
- Choice boards ,instructions and procedures will be glued into STEM journals.
- Students are to take their STEM journal to every class and should have time to work on their Choice Board/STEM activity in every class.
- Use STEM journals for cross curricular STEM activities. Each STEM activity should require students to work with almost every subject area.

# MAKER MAT

**Make a  
bridge.**

**Plan a  
Halloween  
Party.**

**Make a  
haunted  
house.**

**Make a  
poster for  
a new  
type of  
candy.**



**Make a  
treat  
bag.**

**Make a  
mask.**

**Make a  
spider  
web.**

**Design a  
robot.**