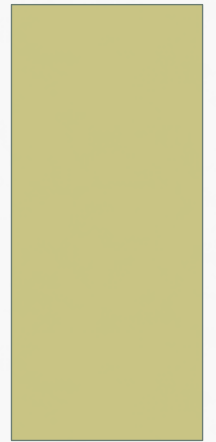
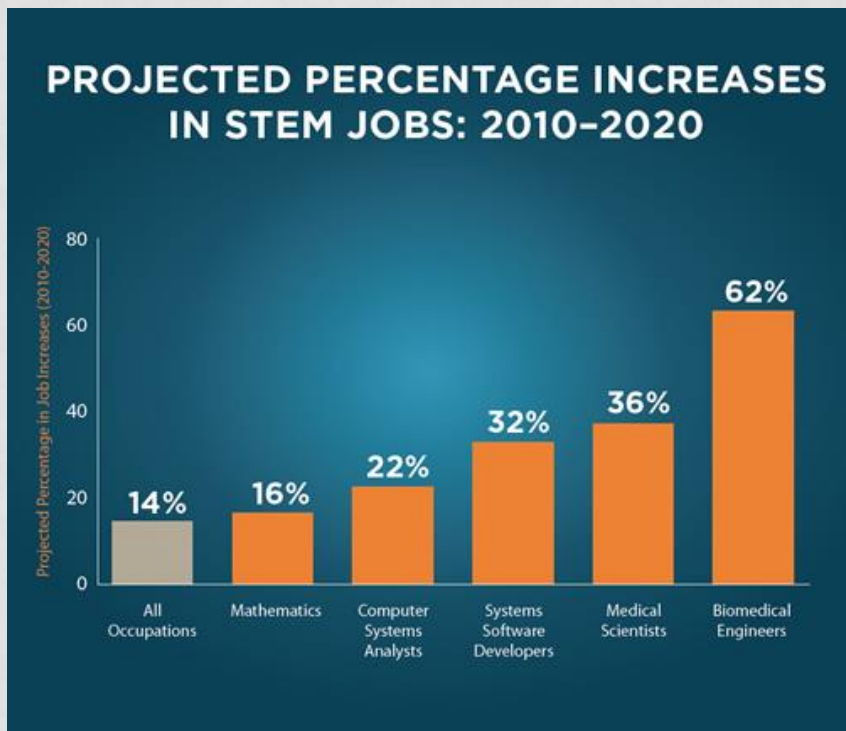


# STEM & THE DESIGN LOOP CHALLENGE

JOANNE LONG – SUPERVISOR OF MATH & SCIENCE (6-12)  
BROOKE GRASSO – ROBMS TEACHER  
MARY MITCHELL – ROBMS TEACHER



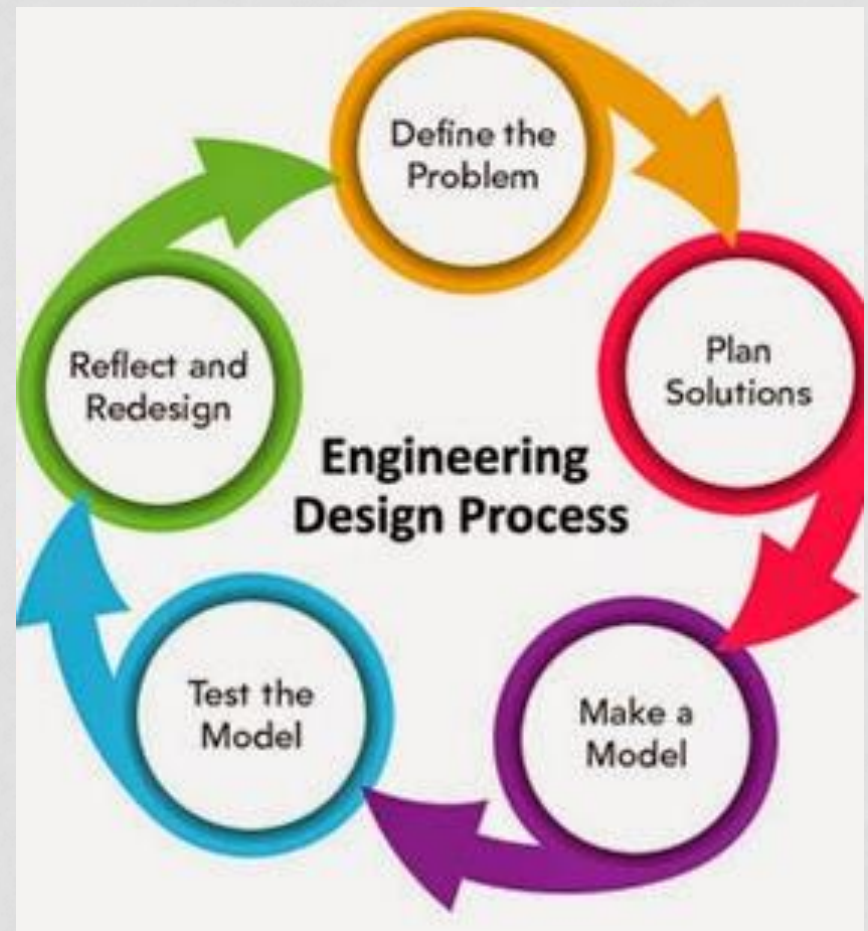
# WHY HAVE A STEM PROGRAM?



- STEM jobs are expected to be the fastest growing sector in the job market in the next 10 years.
- STEM workers typically earn higher salaries than any other graduates (up to 26%)
- The STEM gap is costing the US jobs and money as other nations take on a leading role in design, engineering and other emerging technologies

# WHAT IS STEM & THE DESIGN LOOP?

- STEM is an integrated approach to teaching math & science concepts using technology and engineering design
- STEM should be hands-on and aims to identify and provide solutions to real and relevant problems.
- Students follow the “design loop” to research, imagine, design and refine.



# STEM @ ROBMS



## Grade 6

- “Egg-letes” & Brain Research
  - Students research the brain and its functions as well as head injuries. They are then challenged to design a helmet to protect their “egg-lete”

# STEM @ ROBMS

## Grade 7

- Balloon Powered Cars
  - Using Newton's 3<sup>rd</sup> law as well as principles of combustion and propulsion students must construct an air powered car that travels a minimum distance. Once their prototype works, they redesign the car to carry passengers



# STEM @ ROBMS

## Grade 8

- Bridge Design
  - Students study the engineering principles of bridge design (truss, beam, suspension, arch etc) to construct a bridge from limited resources that can span a set distance and hold a maximum weight.



# CONNECTIONS TO NJCCCS & NGSS

- The program supports the 2009 NJCCCS and the Next Generation Science Standards, which include:
  - NJCCCS 5.1.8 B – Generating Scientific Evidence through Active Investigations
  - NJCCCS 5.2.8 E – Forces & Motion
  - NJCCCS 5.3.8 A – Organization & Development
  - The NGSS include 8 Science & Engineering practices as well as specific disciplinary core ideas in engineering design:
    - ETS1A – Defining and Delimiting Engineering Problems
    - ETS1B – Developing Possible Solutions
    - ETS1C – Optimizing the Design Solution

# LOOKING AHEAD

- We are continuing to seek new activities and challenges that we can implement in the class.
- We have recently won a grant to fund a beginning robotics program through VEX at ROBMS.

