The Challenge is that often Engineering is **NOT** explicitly in the Curriculum

But Engineering is fact the Glue
Continuation of Life on the Planet making our world more Sustainable, Safe, Healthy and Joyful
Advance Personalized Learning

Enhance Virtual Reality

Engineer Better Medicines

Restore and Improve Urban Infrastructure

Provide Access to Clean Water

Manage the Nitrogen Cycle

Develop Carbon Sequestration Methods

Prevent Nuclear Terror

Make Solar Energy Economical

Reverse Engineer the Brain

Advance Health Informatics

Provide Energy from Fusion

Engineer the Tools of Scientific Discovery

Secure Cyberspace
Grand Challenges for Engineering (GCE) are ideal as a Coherent Theme for K-12 Instruction

Cross disciplinary  
Motivation
Context  
Societal Connection
Creativity  
Relevance
A Wide Spectrum of Opportunities

**High Schools**

GCE as an instructional focus that extends through All subjects and through All 4 years

- e.g. Wake STEM Early College High School; Raleigh, NC

A Learning Community within a School

- e.g. Global STEM Challenges Program at Edison High School; Fairfax, VA

A STEM Lab Pathways framed around GCE’s

- e.g. Tesla STEM High School; Redmond, WA
A Wide Spectrum of Opportunities

Middle Schools and After School Programs

GCE in a daily research core class, each grade focusing on different challenges: 6-Water, 7-health, 8-Solar

e.g. STEM Academy at Bartlett Middle, Savannah, GA

Competitions

e.g. Annual competition on themes based on the Grand Challenges (2017 theme is “Engineering the Environment”)

Summer programs

e.g. SEEK (Summer Educational Experience at Kent)
Program and experiences that prepare students (and others) for problems like the Grand Challenges

5 “competencies” of GCSP program:
- Research/creative – solution or project experience on GC like topic
- Multidisciplinarity – understanding through hands-on experience
- Business/entrepreneurship – viable business model for implementation
- Multicultural understanding – through global experience
- Social consciousness - through service learning and outreach activities
Partnering with a University with GCSP

• Grand Challenges Scholars as mentors for K12 students
• Grand Challenges Scholars as TA’s for teachers for delivering lessons on Grand Challenges