C&S†TEM

SCIENCE∗TECHNOLOGY∗ENGINEERING∗MATHEMATICS

STEM IMPLEMENTATION CONTINUUM

Level 1

- Awareness of STEM
- STEM learning is limited to a single class, course, or program
- Students "DO" Science
- Basic Math and Science integration
- Basic technology proficiency

Level 2

- Understanding of STEM
- Students do labs and experiments frequently
- Collaboration with a couple of teachers in the school regarding STEM
- STEM Clubs – Science, Olympiad, Robotics, Math Team
- Science Fair for interested students
- Students are engaging in engineering challenges (these are loosely or topically aligned to science or math standards)
  - Students build or construct items
  - Follow Engineering Design Process
  - Challenges lack rigor, contain elements of "fluff"
  - Limited data collection
  - Limited or no revision

Level 3

- Deep understanding of multiple aspects of STEM process
- Regular collaboration among teams of teachers on STEM
- Multiple STEM clubs/team and enrichment opportunities for students
- Most/All students do science fair
- Students engage in rich science and math instruction which incorporate science practices and standards of mathematical practice.
- Current science & math standards are tightly aligned to singular STEM challenges that integrate science, math, and/or technology.
  - Follow engineering design process
  - Challenges are rigorous
  - Multiple trials to collect data to evaluate the designs
  - Redesign process based on data
  - Highlighting STEM field/career

Level 4

In addition to all of Stage 3:

- Teachers regularly collaborate to reflect on STEM practices and methods of improvement
- STEM Challenges are:
  - Broader in scope and scale – building over an entire 9 weeks or semester or year
  - Require the application of multiple standards from each content area
  - Require students to:
    - be producers of digital media/resources/data
    - to argue from evidence
    - engage in deep data analysis
    - understand & articulate how the math and science they are learning are related to the real world
    - collaborate with community partners or people in STEM fields
    - communicate their findings with peers or the community
    - think critically at school and at home