Fitchburg Public Schools Transition to NGSS Plan

The Team

Andre Ravenelle  Superintendent
Paula Giaquinto  Asst. Superintendent
Danette Day  AALI coach, McKay
Christine DiMauro  AALI coach, Longsjo
Michael Koski  STEM Support Specialist
Albert Mercado  Asst. Principal Freshman Transition & Curriculum
Eileen Spinney  Technology Director
Donna Sorila  Math Director
Martha Wiley  Asst. Principal, Reingold
The Fitchburg Public School District will aspire to develop college and career ready graduates who are STEM literate. Through the creation of meaningful partnerships, students will have opportunities to apply their STEM skills to solve relevant issues and build a stronger community.
STEM @ FPS today

- Engineering is not integrated into all science subjects
- Computer Science (programming/CAD) is not integrated into all science subjects
- Many elementary teachers don’t currently possess the knowledge needed to teach STEM content
- Most instruction is content focused and neglects to offer students opportunities to practice/apply skills which will be the piece that they will carry over to adult working life. (data analysis, experimental design/problem solving, communication...)
Challenge = Opportunity

The working world waits for FPS (and all of us) to become STEM educational leaders!
GOAL #1 Improve Teacher STEM knowledge and pedagogy

- Provide STEM PD
- Create a communication link to all Science teachers
- Integrate Engineering, Programming, Math and ELA skills into Science
- Equal status for Science with ELA & Math
GOAL #1 Improve Teacher STEM knowledge and pedagogy

Highlights –

- PD, PD, PD
- Tech/Engineering integration
- Pedagogy - Student centered lessons
- Increased Rigor
GOAL #2 Make improvements orderly and incrementally

- Planned schedule
  - 2014-2015  K & 1
  - 2015-2016  2 & 3 (begin planning with grades 5-12)
  - 2016-2017  4 (finish planning with grade 5-12)
- Begin improvements where the need is greatest (& resistance least)
- Begin programming in K-4
GOAL #2 Make improvements orderly and incrementally

Highlights –

- Communication - Science Champions in each grade K-4 at each school
- Grades K-4 focused PD on Science Practices and Content
- Grades 5-12 focus on Practices
- Computer Science for Integration-
  - Scratch & Inventor (CAD drawing)
GOAL #3 Focus on Practices First, then Content

- Grades K-12 focus on Integrated Practices
- Use non-fiction ELA reading in the service of Science content
- Use Science experiences as a reason to write
**Math**

- **M1**: Make sense of problems and persevere in solving them
- **M2**: Reason abstractly & quantitatively
- **M6**: Attend to precision
- **M7**: Look for & make use of structure
- **M8**: Look for & make use of regularity in repeated reasoning
- **M4**: Model with mathematics
- **M5**: Use appropriate tools strategically

**Science**

- **S1**: Ask questions and define problems
- **S2**: Develop & use models
- **S5**: Use mathematics & computational thinking
- **S7**: Engage in argument from evidence
- **S8**: Organize, evaluate, & communicate information

**ELA**

- **E1**: Demonstrate independence in reading complex texts & writing about them
- **E2**: Build a strong base of knowledge through content rich texts
- **E5**: Read, write, & speak grounded in evidence
- **E6**: Use technology & digital media strategically & capably
- **E3**: Obtain, synthesize, and report findings clearly & effectively in response to task & purpose
- **E4**: Construct viable arguments & critique reasoning of others
- **E7**: Come to understand other perspectives and cultures through reading, listening, and collaborations

**Commonalities Among the Practices in Science, Mathematics, and English Language Arts**

Based on work by Tina Chuek ell.stanford.edu

[NGSS@NSTA STEM STARTS HERE](www.nsta.org/ngss)
GOAL #3 Focus on Practices First, then Content

Highlights –

- Simplify Science Skills for K-4
  - Observation
  - Data
  - Record/Measure
  - Analyze
  - Communicate

- Outside STEM speakers
- Middle School Science Fair
Implementation

2014

- Professional Development K-8
- Computer Science in grades 3-8
- Develop Common Science DDM’s 5-8
- Implement NGSS K & 1

2015

- Professional Development K-8
  - Standardize 1 STEM unit/grade/year K-4
- Computer Science in grade K - 2
- Create a local STEM knowledge team
- Implement NGSS Grade 2 & 3 (begin 5-12 planning)
Implementation

2016
- Implement NGSS Grade 4
- Plan Grade 5-12 implementation
- Formalize a K-PG STEM pathway

2017
- Full NGSS implementation K-12
Resources

- WPI Program: STEM Integration for District Leaders
- Many initiatives are low/no cost ex. changing attitudes about STEM and STEM instruction
- Classroom STEM resources/PD are needed
- Continued Tech support for programming (tech para’s)
Evaluation

- Collect artifacts re: STEM student products – Science Fair, competitions
- Survey PD participants
- Integrate STEM into other subjects
- Evidence of student-centered lessons
- Student success – MCAS, Galileo benchmarks
Thank you to our NGSS STEM Transition Team!

Questions?

Comments

Koskim@fitchburg.k12.ma.us