PTSA ACADEMIC BOOSTER PROGRAM NOTES
Dave Beedy, District 205 STEM Coordinator
5-3-2018

Dave Beedy oversees the pathways for science, technology, engineering, math (STEM), PLTW (Project Lead the Way), Family & Consumer Science, and Health/PE.

Parent questions included:

- Can you speak to the requests for tutors in freshman Geometry and Biology Honors?
  - This question was presented to REACH PTA 2 years ago and it was found that while many students obtained tutors, less than 5% of these students pursued long term tutoring. This is a question that could be easily repeated and would be valuable information.
- Is there a district rule against homework in lower levels?
  - Homework should be meaningful and the student should be able to complete it without support.
- A parent expressed concern with the reduction in middle school science time, whereby it appears students would be receiving 18 weeks less science classroom instruction time, and how will this prepare students for high school classes?
  - This time change was explored by comparing the change from class times of 42 minutes every day to block times of 75 minutes 2-3 times per week. So while overall minutes of science time have decreased 10-15% (30 minutes), the District has actually created more productive, deeper class time, giving teachers more time to prepare hands-on science experiments and delve into content.
  - Some of our approaches to middle school science instruction in the past have been counterproductive. An example is assuming kids have no prior knowledge at the start of the year because we have been asking them to memorize facts. Without hands-on experience, memorized facts are largely not retained - up to 90% are forgotten after the class finishes.
  - Facts can be looked up, but having an experience cannot.

Please see the attached link to Mr. Beedy's presentation slides:

District goals are shifting our students from learning ABOUT the world to EXPLAINING the world.

- Why and How something happens, centered around an engaging phenomenon.
- Students are learning this from the bottom up by asking questions, investigating and using evidence.
- The teacher's role is to engage the group in figuring it out, not explaining it for them.

The goal is to build knowledge coherently from year to year, starting in elementary school.

- Making more time for science by incorporating interdisciplinary work
- Focus on BIG ideas (e.g. waves)
- Discover powerful,l big ideas by *investigation* that cover how to explain phenomenon

Science units are created around a productive phenomenon that engages kids.

- When teachers feed them the right kind of experiences the students can actually figure out the science.
- A coherent curriculum across the district is the goal, so that by 12th grade all students are receiving the same core principles.
- Wave example is in the attached presentation slides
  - Demonstrate a phenomenon, then ask them what they think is happening step by step. How do waves work? How does sound travel through the air?
  - In the waves example with the phonograph, they would be asked to form a hypothesis about what is happening at the needle, in the air, at the ear…
  - Then, they would be asked to create a class consensus model, but *only* for that which they have evidence
    - If they don't have evidence, they can design an experiment to figure it out.
  - Deeper understanding will continue to build from year to year from elementary school to high school.

<u>Teacher Training:</u>

5 teachers at every grade level 6-12 have been trained in Next Generation Science Standards, with the last few days focused on instruction and unit design.

There is a 5 year instructional training plan for middle and high school. Some 6th grade classes will be piloting the first unit in 2018/19. First unit should be rolled out at all middle/high schools by 2020. Expect full implementation in middle school in 2022.
He expects they will need to develop 4 science units for the middle schools.

Regular biology classes at high school level will be implemented first, some classes are using these units already. Regular chemistry and physics classes will be following the same path as the middle school, with some piloting the first unit this next school year.
Honors and AP courses probably won't change right away (partly due to AP having specific curriculum that is required by the College Board).

Project Lead the Way (PLTW)

Initial semester length courses offered at middle school:

- Computer Science – app development for makers
- Design and Modeling - basics of engineering design, hands-on project work with CAD

- More options to be added including Automation/Robotics
- High School – need to evaluate what exists already vs. what PLTW offers, and what the university connections are. Some engineering schools are looking for PLTW-certified students. Certification is based on completing certain PLTW pathways as along with specified AP courses.
- York's proposed manufacturing lab is NOT related to PLTW.

We were unable to continue a discussion of Project Lead the Way, as we ran out of time. PTSA Academic Boosters will schedule a presentation with Mr. Beedy on this topic early in the 2018-19 school year.

To follow what's going on with STEM in District 205 follow Dave Beedy at -

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stemd205 on Instagram