Science Learning and Learning in Science

An Update on the Science Education in Westwood Public Schools

PTO General Meeting, November 14, 2016

What's the "Vision"?

Students in the Westwood Public Schools engage in an inquiry-based approach to science: they ask good questions, and the systematic pursuit of answers leads them to more questions.

Students work in teams to observe and analyze, design and refine, and they use a wide array of technologies and tools to support their creations and investigations.

Students discover and draw on the connections among the sciences as well as the connections between science and other disciplines. In addition to learning science concepts, they learn to think, listen, read, write and speak like scientists.

Most importantly, students enjoy exploring their world and universe through science. They follow the trail of their curiosity as they investigate questions and problems that matter both locally and globally. Science Curriculum Review Committee, May 2016

What's new?

- New Massachusetts Curriculum Frameworks for Science and Technology/Engineering
- Focus on big concepts in science
- Application to real-world observations, situations, and problem-solving
- STEMscopes science curriculum
 - Inquiry, exploration, hands-on, project-based
 - > Offers engineering design challenges that encourage collaboration

What's the approach?

- 5E Model for Lessons and Units (Scopes):
 - ➤ Engage
 - > Explore
 - ≻ Explain
 - Extend/Elaborate
 - ➤ Evaluate
- Constructivist Theory (Piaget)
 - Students may direct their own learning, in many forms
- Connections to other content areas (Math and ELA)

How is this different?

- New standards mirror the reality of the science field
 - > Not a fixed body of knowledge
- Shift away from Scientific Method to cyclical process with many entry points
- Students are defining the problem and devising the experiment
- Engineering process is embedded across Scopes
- Vocabulary isn't front-loaded (third "E")
- Encouraging and leaving room from "grappling"
 - Don't steal the struggle!



What's the Plan?

- 3-year process of alignment with the new Frameworks
- Year 1 (2016-2017): Physical Science
 - > E.g. Matter is Everywhere, Gravity, Energy Transfer
- Year 2 (2017-2018): Earth and Space Sciences
 - > E.g. Observing Stars, Earth's Rotation, Water Sources
- Year 3 (2018-2019): Life Sciences
 - > E.g. Matter and Energy in Plants, Food Webs, Ecosystems
- Continue to cover core science concepts during alignment

"We don't want students to learn about Isaac Newton, we want them to <u>be</u> Isaac Newton."

-Kate Doyle, Elementary Science Curriculum Coordinator for WPS