To: Emily Parks, Superintendent of Schools
From: Allison Borchers, Assistant Superintendent
Date: May 11, 2018
Re: Science-related district goals update

Introduction

This year, the Westwood Public schools has continued to emphasize science, technology and engineering. Our district goals, for example, include the following related action plans:

Innovative Programs and Practices

- Implement Coding/Robotics as a "special" in grade 3.
- Continue to refine the expanded Computer Science and Engineering class for students at the middle school.

Instructional Improvement

- Continue to promote teacher instructional leadership by implementing a teacher-led professional development model, such as the Elementary Science Leadership Team
- Expand instructional coaching model at the middle school to include Science.

Science Curriculum

- Implement new elementary science program (STEMScopes) PreK-5 in Earth and Space Science.
- Continue professional development in science content and pedagogy to elementary teachers.
- Continue the process of aligning the middle school science curriculum to the state's new science standards; use grade 6 & 7 formative assessments to assess impact of instruction
- Continue to infuse project-based, inquiry units into all high school science classes.
- Review district's MCAS performance data to identify areas of strength and areas of need with specific focus on needs of students in high need subgroup.

I am pleased to report that the district has made substantial progress toward achieving goals in all of these areas.

Innovative Programs and Practices

This year, Coding & Robotics was added to the "Specials" options in grade 3, and feedback has been overwhelmingly positive. The Instructional Technology Coaches led the sessions, and they reported that not only did students learn core skills, they also saw evidence that the program helps children work on "soft skills" (e.g., collaborative problem solving, creative thinking). Director of Technology, Learning and Innovation Steve Ouellette has conducted a survey of grade 3 parents and will present his findings at the school committee meeting in June 2018.

At Thurston, the computer science and engineering courses saw some significant changes. The engineering class was refined so that key standards from the Massachusetts Science Technology and Engineering Framework could be addressed at each grade level. The computer science class added programmable robots to the grade 6 & 7 curriculum, and elements of web design to grade 8. Thurston's Science Coordinator has proposed additional program changes in order to give Thurston students opportunities to work with a wider array of materials and tools. We are currently investigating these options and working with the Director of Operations to determine how teaching spaces will need to be modified to allow for these possible additions.

Instructional Improvement

The Elementary Science Leadership Team organized professional development sessions that took place throughout the year in order to help teachers gain insight and familiarity with the Earth and Space Science standards. Learning from last year's experience, the team made a concerted effort to differentiate PD options and to direct more support toward the teachers who needed it. Teachers unpacked the new standards, and dug into those standards by walking through activities in which they also focused on the overarching science practices. They spent time thinking about assessment as well. While the report card for science does not yet include the updated standards, the district will begin including those after next year, and teachers have started working on how to gather data throughout the year so that they can share their insights about students' progress with parents.

In addition to professional development workshop time, science coaching was expanded at the elementary and the middle school levels this year. An elementary specialist joined the coordinator in helping teacher teams plan and implement stronger science lessons. The middle school coordinator focused on providing support as teachers continued to roll out new lessons and units aligned with the revised standards. She also spearheaded the effort to identify updated curriculum resources and supported special educators offering science instruction to students with severe learning disabilities.

Science Curriculum

This year, elementary teachers phased in Earth and Space science units from STEMScopes, the new curriculum program resource that Westwood Public Schools purchased last year. Next year, elementary teachers will focus on the Life Science units in STEMScopes, during the final phase of transition to new curriculum standards.

The middle school invested in new online science resources from McGraw-Hill that teachers started using this spring. These virtual textbooks will provide up-to-date information that students will use, alongside their hands-on investigations, to better understand core science concepts.

At both the elementary and middle school, teachers had the opportunity to preview the types of questions students would encounter for the first time this year on the revised, online MCAS. At the middle school, teachers used MCAS results and released test questions in order to determine to what extent students are retaining key concepts and skills from year to year and to adjust instruction and review accordingly.

At Westwood High School, teachers continued to develop hands-on, inquiry-based units for their classes. In addition, the high school department has engaged in a very thoughtful and thorough examination of the course sequence for science students, and has determined that a change is needed. Next year, Principal Bevan and the new Science Department Head will provide additional details about the new sequence, which is proposed to go into effect in 2019.

Conclusion

The work of implementing recommendations of the recent Science Curriculum Review is well under way. By next spring, the transition to a new science curriculum in Westwood will be complete in grade PreK-8. We are very fortunate in Westwood to have tremendous community support for our science-related initiatives, deeply curious students, and highly-skilled teachers.

At the May SC meeting, district science leaders and I will share this goals update, along with some specific illustrations and examples of the year's work, with members of the School Committee.

Goals Update: Science Curriculum and Instruction

Westwood Public Schools

Westwood School Committee

May 17, 2018

WPS Science Leadership Team

Kate Doyle, *Elementary Science Coordinator*

Katie Clarke, *Middle School Science Coordinator*

Becky Green, *High School Science Department Head*

Goal 1: Innovation

Promote and continue to support innovative programs and practices that accommodate diverse learning styles, needs, and levels of readiness in a changing world.

Goal 2: Leadership

Promote frequent, intentional conversations about teaching and learning in order to improve professional practice and student outcomes.

Goal 3: Curriculum

Align district science curriculum, PreK-12, to the new state learning standards, according to the recommendations of the Science Review Committee

Elementary Science, Technology & Engineering

PreK-5 Action Steps, *continued*

Innovation

Instructional technology coaches introduced Coding/Robotics as a “special” in grade 3.

All teachers are now implementing an inquiry-based approach to instruction.

PreK-5, *continued*

Curriculum

Teachers aligned Earth and Space science units to new standards.

Continued refining lessons based on STEMscopes, a new elementary science program ("backbone" of curriculum) and supplementing with lessons from Mystery Science program.

Leadership

Elementary Science Leadership Team members planned and led professional development for their colleagues.

Science specialists provided coaching for elementary teachers.

Middle School Science, Technology & Engineering

Middle School Action Steps

Innovation

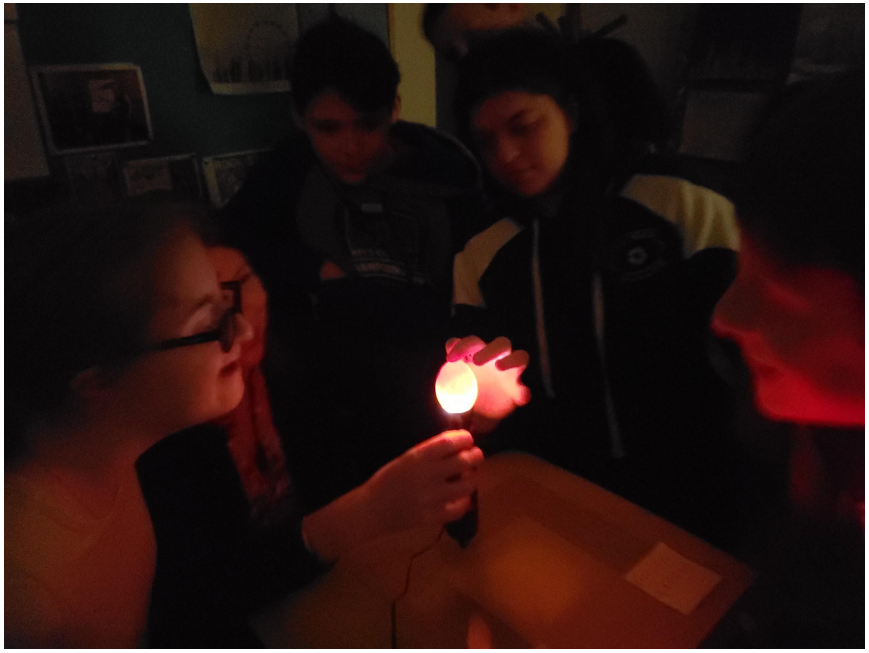
Computer Science added robotics units to grade 6 & 7 and a web design unit to grade 8. Engineering classes in all grade levels incorporated more explicit instruction of Engineering Design Standards from the MA frameworks.

Curriculum

New online curriculum resources from McGraw-Hill were introduced this winter.

Teachers used interim assessments to gauge students' retention of core concepts from Grade 6 & 7.

Middle School Action Steps, cont.



Leadership

The curriculum coordinator position was expanded to include instructional coaching.

High School Science, Technology & Engineering

High School Action Steps

Curriculum

All teachers developed and implement more inquiry-based units, continuing the transition towards student-centered science education.

A co-taught biology class helped students meet the MCAS science competency determination.

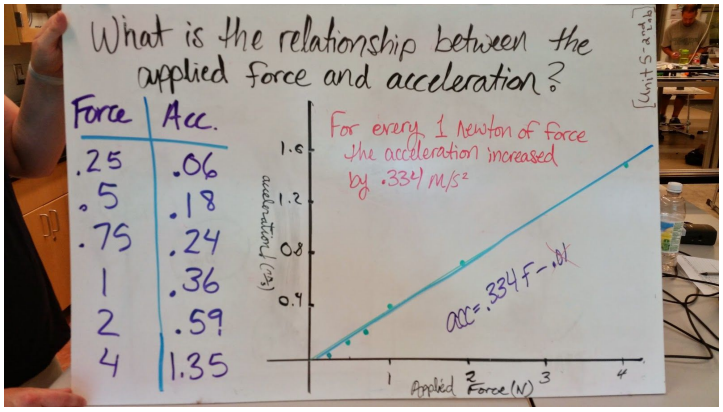
Leadership

Led by the science chair and principal, a committee conducted a thorough examination of the WHS course sequence for science.

High School Action Steps, *continued*

Innovation

Chemistry and Physics teachers trained in the modeling approach to science education, and implemented new lessons and units.



Next steps PreK - 12

Elementary

- Complete curriculum alignment by adding Life Science standards
- Continuing to build science content understanding for all teachers
- Integrate science learning with other content (literacy, math, social studies and the arts)

Middle School

- Investigate options for expanding the scope of Engineering projects
- Complete the curriculum alignment process
- Pilot a co-taught special education science course in grade 6

High School

- Complete transition to inquiry-based unit design
- Finalize course sequence recommendation and create an implementation plan

In large measure the success of our nation depends on the extent to which it harnesses ***the power and promise of science and engineering*** *in pursuit of a better life for all of its citizens. Students' experience in school can either advance or hinder advancement depending on whether or not the full diversity of learners' interest, passion and creativity are engaged.*

-**Arthur Camins** (Director of the Center for Innovation in Engineering and Science Education at the Stevens Institute of Technology).

Thank you!

Any questions?