

Cambridge STEM Department Newsletter

The STEM Newsletter is distributed to Cambridge Public School administrators and teachers as a mechanism for sharing departmental information on a quarterly basis. There are many great things happening across this district!

Welcome Back!

Welcome Back! We hope everyone has had a great start to the school year and we are excited to share some great things that have already happened around STEM in the district. Waiting until November has made for a long newsletter ☺

What does STEM means for us?



We continue to vision what STEM will mean for the Cambridge Public Schools. A team of educators from across the district spent two days in August at [WPI's](#)

[STEM Integration for District Leaders Program](#) and crafted a draft vision and golden goals to drive our strategic planning moving forward. We will be providing updates on the work and gathering stakeholder feedback over the next few months. Be on the look out for an update in our next newsletter.

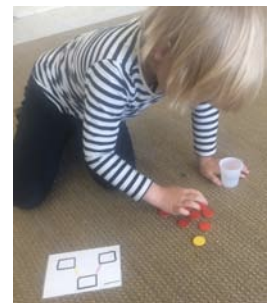


We're Moving...

If it wasn't enough to be rolling out new curriculum, implementing common interim assessments and a corresponding system, and visioning for STEM ... Coming this winter the STEM Department will be relocating. Donna has been busy packing so that we are ready for the move. Our new address will be 159 Thorndike Street but all of the other contact information will remain the same. The department can still be reached at 617-349-3012. We are scheduled to be in our new home on Monday, December 14th so please forward all interoffice mail to our new home as of that date.

Math in Focus Begins in Kindergarten

All of our kindergarten teachers and new teachers to Math in Focus have participated in full-day workshops this Summer and Fall to learn about the best ways to use this resource to teach our students mathematics.



Many teachers are also participating in afterschool workshops throughout the year to share best results and collaborate in lesson planning. We are excited that all students in grades K-8 are now joined together



in learning mathematics through rigorous problem solving.

Strengthening Partnerships

Last year we expanded our successful NetPals program to PAUS ensuring that 7th graders in three of our upper schools have access to mentoring from local STEM businesses. Our goal is to expand this program for all upper school students, but this year we are working closely with CSV to refine the program so that it is perfect before expanding to Amigos and VLUS. Seventh grade teachers that are participating in the NetPals program are taking a “choice course” facilitated by the STEM department with support from CSV to refine the program and expectations.

Last year we launched a new partnership with the Broad Institute of Harvard and MIT. Based on teacher and scientist feedback, we have made changes that we think will better support the partnership so that we can really excite all 8th graders and inspire them to consider a science career path. CPS Staff members [Dan Monahan](#) and [Emily Speck](#) facilitated a training session for Broad Scientists with a focus on supporting their understanding of the developmental stages of adolescents and strategies for interacting positively with them.

Great things in Math at CRLS

Our AP program continues to explode. This year we have 6 sections of AP Statistics, 4 sections of AP Computer Science and 3 sections of Calculus AB. These are all-time highs for CRLS.

We continue to work towards narrowing the opportunity gap. In addition to running our Math Move-Up Program at the mid-year last year in 5 years over 230 students have moved from CP classes to Honors classes after 1st semester), for the first time the CRLS Math Department sponsored a Math Preview Program this summer. 56 students who signed up for Honors or AP math classes this year attended 2 week sessions over the summer, taught by CRLS math teachers, in which they were exposed to material from the classes they

now have. Using a cohort model, during the year these students will be meeting on a quarterly basis to have discussions about their experiences in classes.

School City Stars – Learning Management System

The STEM department is implementing a new Learning Management System called School City Stars. This tool is supporting schools in analyzing data about student achievement. The teachers use the information to make decisions about instruction during the Teaching and Learning Cycle. Grade level teams are developing common assessments using School City’s vast item banks as a resource. Once the tests are administered and data analyzed, teachers then can utilize the instructional resources offered by School City to support, enrich, and extend student learning.



Math Clubs at Most Elementary Schools



Have you hear about the Math Clubs happening in our Elementary Schools? In many of our elementary schools kids are participating in before or after school Math Clubs.

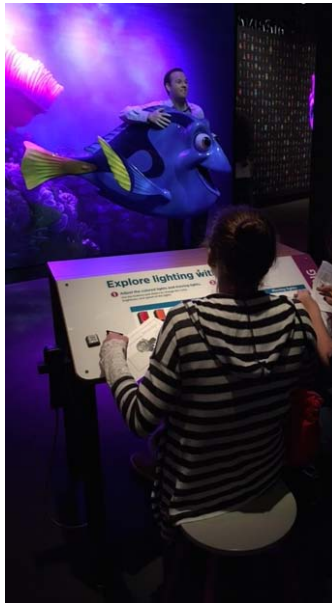
Crazy 8s Club is a NEW recreational math club that helps kids enjoy the math behind their favorite activities. Kids build glow-in-the-dark structures, crack secret spy codes and play games like Toilet Paper Olympics to name a few activities kids are exploring. Check out the website <http://bedtimemath.org> to learn about the resource and other activities for families to engage in mathematics with their children. A new study led by University of Chicago psychologists and published in *Science* shows Bedtime Math significantly boosts kids' math performance. Within just one school year, kids who did Bedtime Math improved their math achievement on average by three months more than those who didn't.

Some schools are even running STEM clubs:



A True STEAM Field Trip: PIXAR

Google and the Boston Museum of Science partnered together to provide all CPS 7th grade students a free science, technology, engineering, arts, math (STEAM) field trip to *The Science Behind PIXAR* exhibition at the museum, October 26th-29th. Students had a chance to see how STEAM applies to the creation of the animations behind PIXAR favorites such as *Toy Story*,

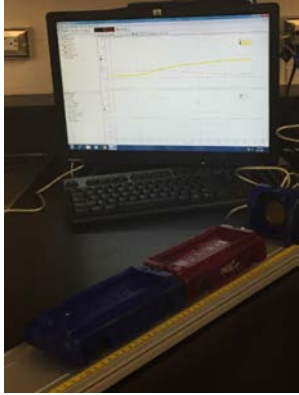


Brave and *Cars* to name a few.

Students were also treated to an IMAX show, planetarium show or live presentation about Animation in Action as well as lunch at the museum and bus transportation thanks to the generous support of Google!

New Science Curriculum at CRLS:

The Physics Teachers at CRLS have been enthusiastically implementing the new ninth grade physics curriculum, which includes an emphasis on the engineering design process as well as 21st century skills. The students are finishing up an energy research project in which they are researching a method of generating energy for an off the grid house. In the upcoming term students will design and build a toy or game that uses electricity and magnetism concepts. The physics team appreciates the new Pasco probeware that allows for more accurate and user-friendly data collection. New classroom iPads also



provide greater opportunity for student multi-media projects such as creating, editing and analyzing videos.

New motion detectors allow students to quickly see both qualitatively and quantitatively what is going on.

Interactive Ecosystems

Our grade 6 students are creating interactive art in their science classes! In this collaborative project they use observational drawing and watercolors to paint a forest ecosystem and draw organisms within that ecosystem with Kyle Browne, an artist, and director of Cambridge Creativity Commons at Lesley University. They then create a computer simulation using Scratch to demonstrate their understanding of how the organisms in the ecosystem interact with one another. Finally, they connect the computer to their painting with a Makey Makey board that allows a user to touch the artwork to animate the computer simulation, showing relationships between several flora and fauna.

This is all thanks to the DESE Creativity and Innovation grant awarded to CPS last year, and renewed this year.



Pioneering new Science Curriculum in Elementary School

What do a skunk, zip line, and the Grand Canyon all of have in common? They're all part of the new Fourth grade science curriculum!

Last year the Science Curriculum Review team analyzed the MA Draft Science, Technology, and Engineering standards, and created Understanding by Design documents for four new First and Fourth Grade Science Units. Then the department chose a new curriculum tool, *Bring Science Alive! Exploring Science Practices*, to help teachers meet the desired results and assessments described in these curriculum documents.

First grade teachers from the Dr. M.L King School and the Kennedy Longfellow School are pioneering 1st grade science curriculum this year, beginning with a life science unit. Pioneering teachers will meet throughout the year to collaborate and to look at student work. In the beginning of October students from the Kennedy-Longfellow School learned about similarities and differences between plants of the same type and of different types in their CitySprouts garden with the garden coordinator Shay.



This year Fourth grade teams in 4 different schools, Cambridgeport, Graham and Parks, King, and King Open, are Pioneering the new curriculum and putting the new standards into practice.

Bring Science Alive gets students thinking, acting, and reading like scientists. It has students designing plants for arid environments, creating lunchbox alarms,

modeling changing landscapes, and digitizing pictures. It incorporates complex, grade-level texts that support and extend students' experiences and investigations. It uses a digital teacher's platform that includes a variety of high quality media resources to stimulate student's thinking around scientific concepts. Pioneering teachers are helping the department to test drive these resources in the classroom, learn what works and what needs revision, and assisting as we prepare to roll out these new units to all the Fourth grade teachers for the 2016-2017 school year.

New Curriculum in Science in our Upper Schools

Teachers and students are loving our new grade 6 curriculum tool, IQWST. This tool will help us shift our instruction to align with the demands of Common Core and new state science standards as well as help our students prepare for high school and beyond. At NSTA last spring, we found this new, NGSS aligned, cohesive science curriculum tool published by Activate Learning. This is the only middle grades curriculum tool we have found that spirals content thoughtfully, integrates literacy skills and embeds the new science practices. A few teachers piloted units last spring, and we were able to purchase this tool for all of our grade 6 students this year!

Next Steps in Curriculum

The Science Curriculum Review Team (CRIP) continues to work on the science curriculum review process for the third year as the STEM Department welcomes back K-12 teachers/team members as well as welcoming new teachers and support staff to the team. Last year CRIP members completed science curriculum grades 1, 4, 6, 9. This year teachers are working on grades 2, 5, 7, 10. A large part of the work consists of reviewing new state science standards and practices to design how science content understanding builds in complexity throughout the grades JrK-12.

CRIP team work is based on the backward design process of *Understanding by Design*.

The Start of School... from the MEC



Another autumn at Fresh Pond and the Maynard Ecology Center is bustling with classes!

Field trips are booked up to the December vacation with 3rd grade *Habitats* field trips, 5th grade *Weather and Water* field trips, where students learn about the movement of water on earth and how weather relates to the water cycle. Fourth grade students come to Fresh Pond to observe evidence of *Weathering and Erosion* as well as to model erosion and deposition using stream table models.