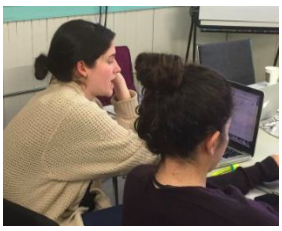
CPS
Cambridge Public Schools

March 2017

Cambridge Science Department Newsletter

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

Do You Teach Grade 2 or 5? This Edition is for You!



The CPS Science Department has been very busy all year long! Our "pioneering" teachers have made great strides to help us refine our curriculum in grades 2 and 5 for district wide roll out next year. **Do you teach grade 2 and 5? Do you want to know more this spring about what the new standards expect of students? Do you want to learn more about the curriculum?**

If the answer to any of these questions is yes, join us for an optional information session on EITHER May 31st from 3:30-5pm or June 6 from 2:30-4pm. Location TBD based on attendees. Please RSVP to Lisa Scolaro at lscolaro@cpsd.us by May 19th so we can plan.

A Royal Visit

On February 15th, the 2013 Nobel Laureate in Chemistry, Dr. A. Martin Karplus, spoke with CRLS students at the Cambridge Public Library.

Dr. Karplus is a proud proud Cambridge resident whose family fled Austria after Nazi troops crossed the border. His education in the United States included Harvard and Cal Tech as well as Oxford in England. For over an hour, Dr. Karplus answered student questions that dipped into science, ethics, immigration and education. CPS is grateful to the Nobel Laureates in Schools Program for generously bringing Dr. Karplus to CRLS. If you want to learn more about Dr. Karplus check out: https://www.nobelprize.org/nobel_prizes/chemistry/laureates/2013/karplus-bio.html

Thank you "Pioneers!"

As the science department prepares for 2nd and 5th Grade curriculum roll out next year, our pioneers are working hard giving the curriculum a test run. Between the Curriculum Review Cycle writing teams and the district-wide roll-out, our Pioneers are a critical Link. Pioneers take the UBD documents created by the Curriculum Writing Teams, and the tool the district has purchased and work collaboratively with each other and the science department to try out the tool, and provide notes and feedback for the upcoming roll-out.

In 5th grade this year this has meant learning a tremendous amount of new content, as well as the customary trial and error. Together, and before trying out new content with students, 5th grade Pioneers have done investigations around the particulate nature of matter, built hydroponic system design challenges, and looked at different models for the water cycle. They have worked together in PD to troubleshoot investigations, build their own content knowledge, and think about how content can be best learned by students.

The teachers have also looked at student work and given feedback on Assessments. They have looked at student work both to reflect on their own teaching and to think about instructional implications for the district roll-out next year. They have looked at student thinking to understand what they were not able to teach yet, and how to improve upon this for next year. They have reflected on what they need to emphasize in their own instruction, and therefore what should be emphasized from the tool for roll-out next year.

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CitySprouts Partnership

On January 6th Science Department staff met with the CitySprouts Director and garden coordinators to share ideas and to develop ways for connecting school gardens with science lessons in support of newly developed science units that are aligned to new state standards and science practices. For example, first grade students who are studying plant and animal structures will be able to observe up close the course protective hairs on corn plants and sunflower stalks, waxy leaves of cabbage and kale as examples of protective structures of plants.

CitySprouts staff are also working with the CPS Science Department to ensure that there are common hardscape features in all CitySprouts gardens to support science curriculum such as sun dials, compost bins, hoop houses. Hardscape features will help to address some engineering standards in new science units as well. For example, 5th grade students will be evaluating various compost designs as they investigate compost, the needs of decomposers and the cycling of matter in the garden.

We continue to look for and find new ways to build on the CitySprout partnership. A recent opportunity for collaboration arose when Monica Leon, JK-5 Math Instructional Coach at the Dr. M.L. King School facilitated an after school teacher training utilizing the CitySprouts garden with teachers to develop an integrated math and science lesson in the garden for each grade level. The math coach, science instructional coach and garden coordinator were on hand to answer teachers' questions and to help them think about how to best support students in the garden. These lessons will be showcased at a parent open house on April 12th.

Next school year, garden coordinators may also attend new science unit roll out professional development workshops to help teachers integrate the garden in lessons as well as point out common features and plants that can be found in the gardens during certain times of the year. This will help students to connect science learning in our wonderful CitySprouts gardens!

Change Is a Coming: CRLS offers New Elective Offerings

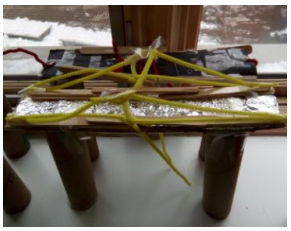
As part of the larger science curriculum review cycle, CRLS science teachers have been engaged in a discussion about our elective pathway and what courses we should continue to offer, which should be retired and what new offerings to add. After reviewing the career paths that CRLS graduates have taken, enrollment figures for our district, as well as the elective offerings of 25 comparable districts, science teachers proposed additional courses to consider adding to our elective offerings: *Brain and Behavior; Food, Farming, and Our Planet; and Project Physics: The Way Things Work.* Here's a brief summary of each:

Food, Farming and Our Planet: Humans have been farming for over 40,000 years! We rely on agriculture for everything from food to animal feed to clothing and fuel. With the looming consequences of overpopulation and global climate change, understanding agriculture is more important than ever. In this course students will learn about agriculture by studying plants, soil, water, microbes, insect pollinators and pests. We will look closely at large agro-business and sustainable organic farming; we will understand environmental degradation and the impact that agriculture has had on our ecosystems; we will learn about solutions and ways that agriculture can sustain our growing human population.

Project Physics: The Way Things Work: Project Physics is an engineering-based physics course that explores both practical and theoretical aspects of physics. The course brings together physics, technology, mathematics and engineering to build and analyze devices and machines. Students will use the Engineering Design Process to complete a series of design challenges, such as mousetrap cars that travel the fastest, catapults that launch projectiles the furthest, handmade musical instruments, and circuits you can draw with a pen.

Brain and Behavior: This course is about the biology of the brain. How are signals transmitted in the brain? How do neurons create memories and how do we learn? How are nervous systems organized? How does the brain control complex animal behaviors such as migration, mating, altruism and echolocation? To answer these questions, students will read varied advanced texts, interpret models and data, participate in class discussions, complete projects and demonstrate understanding on written assessments

Building Bridges



This winter second graders at the Kennedy Longfellow and Martin Luther King Jr. School have been pioneering our new science unit on Materials and their Uses. In this unit students explore the different kinds of materials and objects that make up their world. The learn about the difference between solids and liquids, how materials behave when they are mixed, and how materials change when they are heated or cooled. They investigate the properties of different materials and how these properties affect how the materials can be used.

After testing the properties of a variety of materials, students use the data they have collected to choose the materials to best solve a design challenge. After testing the strength and water resistance of a variety of materials, students were given the problem of designing a bridge prototype that would hold 6 wooden blocks and would be waterproof when sprayed with water to model a rainstorm.

During the Materials and their Uses unit, students will also complete two mini-Curriculum Embedded Performance Assessments (CEPAs) which allow students to show what they know by applying their understanding to new challenges. One CEPA asks students to test and take data on a variety of new materials, and how well they effect the speed and distance a marble will travel along a track. After testing materials in groups, each child gets a specific design problem and they use the data they collected to choose the appropriate material to solve the problem. At the end of the unit teachers will turn the classroom into a mock chocolate factory with different rooms (stations) that the students will use explore how chocolate changes and stays the same. Students will act as "tour guides" for the factory and write a script describing what happens to the chocolate at each station.

(Bridge images courtesy of the King School 2nd grades)

Calling JrK-5 Teachers - Museum of Science Sabbatical

Due to the need to make a scheduling change, we have three spots for interested elementary teachers (that have not participated in a sabbatical before) in this year's MoS Sabbatical. As participants in the sabbatical, teachers explore and use the museum's' resources; observe teaching staff in action; pursue an inquiry project in an interest area of their choice; and make connections between these learning experiences and their curriculum. The collegial atmosphere of the program offers ample time for teachers to engage in productive discussion with fellow participants and Museum staff. These discussions offer an arena for exchanging ideas about content and pedagogy in the teaching of science and engineering practices.

This year's sabbatical is focused on how to use talk and writing to help students make meaning of science while making their thinking visible. Are you interested? The dates are May 22-May 24 and June 1-June 2. The days run approximately 9am - 3pm. If you are interested let Lisa know ASAP - you'd get to join the amazing 3rd grade team from the Morse.

New Materials for Grades 2 and 5 Next Year

Next year the 2nd and 5th grade teachers will be receiving new science materials to support the new curriculum that will roll out in September of 2017. In May you will receive an email from Donna Pereira detailing how we will handle getting old materials out of the classroom (old teacher guides and plastic storage bins) to make room for the new materials. But no matter what, we suggest you keep the following materials safe for next year:

- Grade 2 teachers please keep: Hand lenses, jumbo viewers, flex tanks and funnels.
- Grade 5 teachers please keep: Flashlights, hand lenses, funnels and rock samples.

Please keep an eye out for Donna's email in May and as always feel free to contact her with any questions or concerns!

Thank You to our Pioneering Schools

We want to extend a deep thank you to the schools that have pioneered our new curriculum! This is a messy process that requires support from principals and a willingness on the part of teachers to partner with the district. Thank you to Cambridgeport, Graham and Parks, Haggerty, Kennedy-Longfellow, King, King Open, and Tobin for taking this journey with us. Who is next?