

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!

It's Winter Ahead?!

Wow. When did it become winter? After some beautiful days the snow sure came heavy. There are a lot of great things that have happened in the department since our Fall Newsletter and we are excited to share them with you.

We have moved!

If you haven't yet heard, it's official – we have moved to 159 Thorndike Street. You can find Donna and the Science Material Resource Center on the first floor and most of the staff on the sixth floor. We are still working to get phone lines up and running so in the short term all calls to the STEM department should go to x6683. We'll let you know when the Science Material Resource Center's extension (x3012) is fully functional.



Thank you to all of the teachers who patiently waited for science materials during December while Donna was packing up the center to move. Currently under construction is our new database that will allow teachers to go online and request their science materials. We will keep you posted when we are up and running with the new system. Until then you can still access material request sheets on First Class in the Science Folder. Material sheets are listed in the grade level folders.

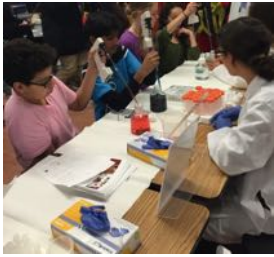
A Broad Partnership

The Broad Institute of MIT and Harvard and CPS are excited to be kicking off the second year of a partnership to bring Broad scientists into every 8th grade classroom throughout the district during the genetics and evolution unit. The role of these scientists will be to develop interactive presentations that make connections between what scholars are learning in class and the work happening in real research labs. Through this program, we hope that scholars will meet a diverse team of scientists, get excited about science, learn how to think like a scientist, and discover career opportunities in STEM. The Broad Institute is the world's leading biomedical research institute dedicated to transforming the understanding and treatment of disease. The Broad is also deeply committed to education and increasing the number of scholars entering and succeeding in STEM careers and this is just one way they are showing that commitment.



The first "career day" happened at VLUS on January 22nd. Pictured is 8th grade science teacher Iona Brightman and Broad Institute volunteers with their "show and tell" props.

Cambridge Street Upper School STEM Night



On January 12th, Cambridge Street Upper School held its second annual STEM Night, kicking off with a performance by the CSUS Chorus. Over 100 students and families

participated and there were over 20 different activity tables hosted by teachers, corporate partners and organizations that provide out of school STEM activities for middle school students. Students engaged with enthusiasm at all the event activities, including the Marshmallow Tower Design Challenge, making gravity-powered cars, exploring robotics, simulating chromatography, taking apart a microwave, and much more. The Hour of Code table with Scratch was hosted by 7th grade students and the Math Contest table was hosted by members of the CSUS Math Team.



A special thanks to Cambridge community organizations who participated and made STEM Night 2016 a success: Cambridge Creativity Commons,

Computer Clubhouse, MIT SHINE, More Active Girls In Computing, Science Club for Girls, Novartis, Future Engineers, Broad Institute, IBM, Draper, Cambridge School Volunteers, Shire, NuVu School, and Girls Who Code.

According to student surveys, 91% of students who attended are more excited about STEM than they were before the event, 95% learned more about STEM, and 84% want to do more STEM in school.



Math Buddies at the King School

Some lucky Junior Kindergarteners at the King School now have Math Buddies. Much like a Reading Buddy, a Math Buddy is an older student who helps a younger student practice and become more fluent. The older student acts as expert in counting, cardinality and beginning addition and subtraction.



Armed with a bag of cubes, clipboard and a check list the third grade students asked their JK Math Buddy to 1) count 10 cubes, 2)

count to 10 on their fingers and 3) draw 10 circles, providing help as needed. When they were successful with all of these tasks the 3rd grade Math Buddy made up a subtraction story for the JK student to solve.

This new program is the result of collaboration between two teachers who enrich and extend mathematics in various ways, Summer Thompson (Gr. 3) and Tori Corpas (JK). Tori proposed Math Buddies because while many teachers partner for Reading Buddies she wants her students to have role models for learning mathematics. Summer was eager to give her students this experience because, she said, "Being a Math Buddy gives my students a chance to be leaders and subject experts."

As part of the closing activities one third-grader shared that "It was a little hard to get her to subtract, like ten take away three, but when I explained it in a different way she understood." We are all truly teachers and learners.

The Gingerbread Man Problem

During the month of December, Kindergarten room 106 at the Kennedy Longfellow School enjoyed reading many versions of the Gingerbread Man story.

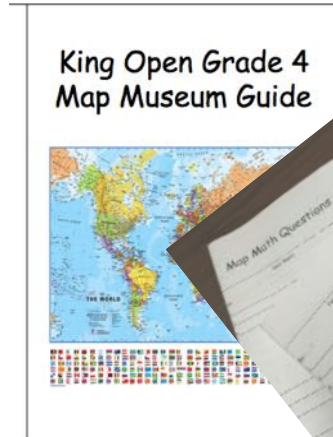


After reading many versions of the story, we realized the Gingerbread Man had a problem. The problem was that after being chased by many people, he needed to cross the river. He could not get wet because he would crumble and he could not go on the fox's back or he would get eaten. We used the engineering process: ask, imagine, plan, create and improve, to design a vessel that would safely help the gingerbread man cross the river. We used paper cups, paper bowls, tinfoil, and straws to build our vessels. After planning, creating and improving, we were able to create a number of vessels that successfully helped the gingerbread man cross the river!



Math at the Map Museum

The King Open School strives to bring together Standards, Community and Celebrations. Their mission statement guides them to “include in-depth themes and projects that integrate subject areas and culminate in community events.” This year, the Grade 4 team did just that at a Map Breakfast attended by families.



Student, staff and families joyfully

interacted while trying to solve the math questions written by students about their maps. The planning for this project started in the summer and included collaborative work to integrate the Grade 4 Math Standards. We are all proud of the excitement and learning associated with this Math/Map project.

Rethinking Assumptions



Tobin School teacher, **Brittany MacDonald**, is excited to share that her students ages 6-9, are engaging in cooperative math challenges. Brittany is participating in a year-long professional development course within the district, where she collaborates with other teachers to rethink assumptions about how children and adults learn math. Shown in this picture are children taking on the “Spaghetti Marshmallow Challenge” and engaging in the design cycle together.

NetPals in Grade 7 Science

The NetPals program in Grade 7 at CSUS, RAUC, and PAUS are off to a great start! The NetPals program is coordinated by Cambridge School Volunteers in collaboration with the CPS Science Department and grade 7 science teachers **Kaitlin Gass, Jay Mahoney, and TJ Manning**. 239 scholars are matched with mentors from 11 STEM companies including IBM, Draper, Broad Institute, Cambridge Systematics, Grace Construction Products, MIT Department of Chemical Engineering, Novartis, Oracle, Pegasystems, Vecna Technologies, and Volpe Transportations Systems Center. During the course of the program, scholars practice writing about science and explore career options through bi-weekly email correspondence with their mentors and three face-to-face class visits at the workplace and the school. It is a great opportunity for the scholars to explore STEM and STEM related careers and have an authentic audience for connecting their learning in science to life beyond the classroom.

Collaborating toward Perseverance, Reasoning, and Rigor

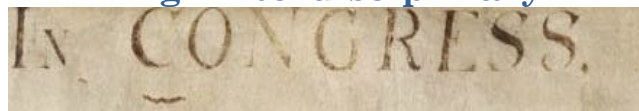
Throughout 2015-16, math teachers at Vassal Lane Upper School are collaborating school-wide around the Common Core Standards of Mathematical Practice. These Math Practice Standards highlight the skills and habits that students practice K-12 as they develop their capacities to “think like mathematicians.”

VLUUS saw student growth in 2014-15 when teachers developed individual Action Plans to teach the Math Practice Standards in their own classrooms. Building upon this work, teachers decided this year to collaborate toward a coherent and vertically-aligned approach to teaching the Math Practice Standards school-wide.



Since September, teachers have been meeting after school and voluntarily during lunch periods to pursue this collaboration. Our goal is to “build a culture of student engagement and achievement through teachers’ analysis and instruction of a common Standard of Mathematical Practice.” They selected a Math Practice Standard to focus on (MP1: “Make sense of problems and persevere in solving them”) and identified a “problem of practice” to guide the work (“How do we help students restate/reframe problems to increase their understanding of what they are being asked to do?”).

Thinking “Interdisciplinary”



This year educators from across the district will take part in two Sabbaticals at the Museum of Science. From Monday, February 8th through Thursday, February 11th, coaches and coordinators from the Science, Social Studies and ELA departments will be working together to align curriculum in all three departments to maximize opportunities for interdisciplinary units. We will be working with the Museum staff to think about how the curriculum in these departments can support and connect with each other to create rich learning experience for children across the district. Once we have aligned and sequenced units in the three departments, we will identify essential questions that can be used to engage students in investigations that incorporate all three academic fields. We will be starting with a focus on 4th grade curriculum connections, since we will be rolling out new science curriculum for 4th grade next

year, making this the ideal time to rethink sequencing and order of curriculum units.

The second Museum of Science Sabbatical will take place in March. During this week, teachers from the Cambridgeport and Graham and Parks schools will be continuing the work started during the coach sabbatical. Using the connections and essential questions identified during the February Sabbatical, the teachers will work on writing interdisciplinary, project-based units for fourth grade students.

These units will be rolled out in classrooms at both schools next year, and will also be made available to teachers in other schools who are interested in incorporating interdisciplinary work into their own classrooms. The hope is that the 4th grade curriculum will provide a model of interdisciplinary work for other grade levels moving forward.

Caticle! Integrating Scratch into Science Performance Assessments

In this new performance assessment, students take on the role of a computer animator and produce a Scratch animation of a cat smelling an object from across a room. The scenario: *Pixar is creating a new animated movie called Caticle, about a mutant cat that can see sub-microscopic particles. They have put out a request for an animator to create a scene of what the character sees when it smells some delicious food across the room. Pixar wants this scene to be realistic, so your animations must use scientific principles.*

Sixth grade science teachers and LTS in all four Upper Schools and Amigos worked together to support students in developing animations that modeled scientific principles. Students then analyzed the models for how well the model did (or did not) clearly communicate the scientific principles. Students are building their skills in Scratch

for the next unit where they will incorporate Makey Makey kits and Scratch into an Interactive Ecosystem Project supported by a DESE grant.

