Students researched a variety of animal communities through fieldwork, experts, non-fiction texts and online resources and then applied their knowledge to our own class and school community to create school-wide norms. Our essential questions were: 1) How do animals act in their communities to help and protect each other? 2) How can we use those characteristics to build guidelines for how we should care for each other in our classroom? Students had three final products. First, individually, students wrote informative paragraphs connecting research on animal communities and how it could apply to our classroom culture. Next, in small groups, students established school norms based off of a researched animal behavior and data collection within our school, and then designed a banner to be hung throughout the halls. Finally, the 2nd grade classes collaborated to design and create a kinetic ‘school of fish’ art installation comprised of scientifically-inspired ceramic fish that represented the school community. A student-designed kinetic prototype became the basis for final large-scale kinetic mechanism, produced by Mike Amarillas’ HTHNC Engineering students.

**Teacher Reflection**
This project was exciting because it brought all three 2nd grade classes together. Students built quality relationships across the grade level as they worked together. As teachers, we designed this project as a way to collaborate across the grade level and incorporate engineering, art, and science in meaningful ways. As challenging as it was to collaborate with six separate teachers, we think the final project was well worth the effort.

**Student Reflection**
I like the project because I like to see how animals work together. Also I like to see how animals move, swim and hunt together. My favorite part of the project was when we did our field work. I learned that animals stick together and help each other. —Nethra

Roland Barthes’ Mythologies
Margaret Noble, Digital Art & Technology, 12th Grade
High Tech High Media Arts

In 1957, an extraordinary work of literature was published detailing concepts far ahead of its time. Roland Barthes wrote Mythologies, a game-changing look at the way humans built the lore around them, and turned the world they knew into a place of fictional characters. A look at stereotypes before stereotypes were a widespread notion, 12th graders contemporized Barthes’ ideas into a live multimedia showcase. This one hour, theatrical event was packed with monologues, skits, music and performance art.

Learning goals for this project included researching visual meaning and cultural signs through the semiotic lenses of Roland Barthes. Using this knowledge, students exposed a contemporary problem perpetuated by society and the media that is personally significant. Students then coded a computer program that was visually or sonically experiential and that reinforced their research concept. Finally, students performed a two-minute, rehearsed stage piece that engaged an authentic audience using their research and audio/visual program.

Teacher Reflection
This project was highly experimental and challenging to manage because of the deep interdependence students needed to sustain in order to produce a unified performance in concept and form. In the end, I am proud to say that these 48 students engaged their audience deeply and provoked thinking about what is important to the teen experience and beyond.

Student Reflection
Being introduced to coding was challenging enough but combining it with research, performance and personal perspectives of the real world pushed us to think more creatively. In the end, the exhibition was a lot fun.

—Angela Marie

To view the student work visit: http://margaretnoble.net/educator/mythologies
The Lantern Project
Maggie Miller, Allie Wong, Gary Gould and Mary Williams, 6th Grade
High Tech Middle School

In this project, the entire 6th grade learned about geometry, unit rate, expenses and revenue by designing and creating their own paper lanterns. At the same time, students explored various cultures around the world through the lens of important global issues. Their final product was an original paper lantern that was to be part of an auction to raise awareness and funds for a community improvement project of their choice through the non-profit organization, Lantern Projects. The exhibition took place at Centro Cultural de la Raza in Balboa Park.

Teacher Reflection
It was so exciting to see students motivated to learn math so they could use it to create something beautiful. This project incorporated so many academic and non-academic skills from pre-algebra concepts of profit analysis, to persuasive writing, to craftsmanship, and even empathy building. At exhibition the students were proud of their work and the learning behind it.

Student Reflections
My favorite part about this project was how diverse the lanterns were, whether in size, color, or shape. Individually each one came out creative! —Ajok T

The Lantern Project was based around the organization The Lantern Project, which lists countries, each with their own problem and solution. The problems ranged from human trafficking in Cambodia to starving mothers and children in Kenya. The Lantern Project is original in the sense that each student got to choose their part of the world that they want to help. At the same time, students got to learn about geometry by designing their own paper lantern. The students of the team collectively loved how their eyes were opened to the world around them.

—Olivia H

To learn more about this project and others, visit http://lantern-project.weebly.com/
Students learned about saponification, chemical reactions, pH, strong bases, lab skills, marketing skills and applied what they learned to create high-end, quality soap that was sold competitively in both the online and brick and mortar marketplaces.

Teacher Reflection
Never have I seen students more engaged in a project. Students have generally been interested in the soap making process because it is messy, fun, and creates a beautiful, usable product. When we added an entrepreneurial aspect to this project, student excitement and engagement spiked to a level I have not seen before. Creative, social media, logistics, web design, and marketing departments quickly arose out of necessity. There was so much to do and students could pour their energy into an aspect of the project that appealed to them. A beautiful and functional website was created and successfully run by our students. Facebook, Instagram, and Yelp pages helped steer business to our online store and in-person selling events at the Earth Day festival, Von’s shopping center, and various farmers markets. The logistics team accounted for all of our expenditures and sales. Sales topped $5000 in our first semester which allowed us to give a grant to one of our teachers and a scholarship to a graduating senior. Paid internships were also created and filled by our class and we donated thousands of dollars worth of soap to local San Diegans in need.

Student Reflections
This project is not just about making soap, but being able to work with others and appreciate other’s opinions. —Matthew M

Everything in this world, it’s all chemistry. —Lucas S

This project taught me a lot about the real world, especially business. —Solomon S

I learned not only how to make soap but how to run a small business through a real world experience. —Marisol F

To learn more about this project and others, visit http://mmarshall2017.weebly.com/chemistry.html
In this project students worked together to make a documentary about the current California drought. Students learned about water chemistry, the water cycle, the drought’s effect on the environment and economy, and water conservation. Students took extensive notes on current articles related to our drought. They used their new knowledge to write about, plan, film, and edit a documentary to show at our school wide exhibition and at the San Diego Botanical Gardens. Students also created stained glass graphing art pieces to auction off at both exhibitions. The goals of the exhibitions were to bring awareness to the drought and raise money for the San Diego Coastkeeper by auctioning off the student art work, DVDs of the documentary, various water saving items, and donated items.

Teacher Reflection
When we started the project, students already understood California was in a drought and we all need to conserve, but they were inspired by all that they did not know. The information revealed through field trips, expert interviews, current articles, and videos was shocking and motivational. When the time came to create our faux stained glass art for auction, students really owned the importance of creating a quality product that would bring in more money for San Diego Coastkeeper. Screening the film at the San Diego Botanical Garden took the students outside of just our school exhibition. They were proud to know that their movie would reach beyond the walls of our school.

Student Reflections
I realized that once we run out of water we have no backup plan.
—Kat

This project showed me how our lives depend on a delicately balanced system and that changing one thing can have a huge effect on us- the ripple effect.
—Kaitlyn

To learn more about this project and others, visit carterharrison-photography.com/water/
The inspiration for this project came from a student comment, “We learn a lot about the challenges and problems in the world, but what about how people overcome them?” And with that, Portraits of Resilience began. For the first iteration of this project, 50 students conducted 1:1 interviews with 50 veterans to explore these three essential questions: (1) In what ways does war affect human resiliency, (2) How can we resolve conflict aside from war and (3) Why do people fight? During the interview, students photographed their veterans. After the interview, students wrote vignettes to accompany the photographic portraits and capture their veteran’s spirit. The portraits were printed into full sized posters and were also published in a book along with the final written vignette. The final products were exhibited on the USS Midway Museum for a week and all veterans were invited to attend our evening exhibition.

Teacher Reflection
What was particularly powerful about this project was seeing how motivated my students were. I attribute much of this to the authenticity of the audience and the location for exhibition; people totally unaffiliated with our school were really counting on the students to produce excellent work. Throughout the project I consistently heard student remarks such as, “I really want my veteran to be proud,” and “I need to make sure that what I write truly represents who they are.” This combined with the high visibility of having their work on display in a museum pushed students to raise their own standards and exceed the high expectations that were set.

Student Reflections
Everyone has a story to share and their responses may surprise you.
—Sharon O

This project really opened my eyes on the different perspectives of war.
—Joshua E

To learn more about this project, visit portraitsofresilience.com
Using time as a theme, in this project we explored the mathematical concepts of irrational numbers and complex/imaginary numbers. As we followed the process of mathematicians before us by expanding the number system, we decided the best use of our knowledge was to artfully show our learning through clocks. The clocks had to express their values either through all irrational numbers that were rationalized to make the numbers 1-12 or with imaginary numbers that were made real through the use of exponents.

Teacher Reflection
Math is a beautiful art form and in this project students were given the opportunity to see it as such. They took pride in coming up with the most complicated version of the numbers 1-12 that they could and then creating a theme for their clock that went with either their view of irrational or imaginary things. I loved this project because it was beautifully differentiated for the students (as they were in charge of making the numbers as simple or complex as they wanted) and because it valued the beauty of complex numbers just as they are, without the need to always find them “in the real world.” The students were very proud of their clocks at the end and I was proud of them as well!

Student Reflections
One thing that stood out to me was that this project made math fun! It made me push myself to make intricate equations and I exceeded my own expectations. —Michelle

I liked this project because it gave me the opportunity to use my creativity in math class! I had to make the equations as complicated as I could and then just make them equal to one. —Taylor

To learn more about this project and others, visit http://sarahgracestrong.weebly.com/best-project-of-all-time.html
Ninth grade students in the MPX Program at Mid-Pacific Institute created a timeline of World War II using 3D printers. Each student chose a WWII event to research. In addition to creating a short documentary about their event, each student wrote an essay about the event through the perspective of a historical figure associated with event, which the student also chose. Hoping to draw in audience members and teach them about WWII, the students designed an artifact using 3D modeling software that would represent a WWII event they chose to research. The printed artifacts were arranged chronologically with QR codes that allowed visitors to pull up the student-created videos about the WWII event corresponding to each 3D-printed artifact, as well as an essay about the event written by the students in the perspective of a historical figure.

**Teacher Reflection**
It was great to use the 3D printers on campus in an interdisciplinary way. The project incorporated elements of design, history, language arts, and technology, which engaged the students throughout the process. The students were so excited to create a WWII artifact from scratch and see it come to life in the 3D printer.

**Student Reflections**
The process of learning, step by step, the programs and then seeing your creation come out of the 3D printer was cool! I also really liked how we got to dive deep into a WWII event that particularly interested us. —Dan

It was a great learning experience to imagine that you were in the historical figure’s shoes and also to create something in your mind that was then printed so you could hold it in your hand. —Isabel

I liked how this project made me think about how I could best represent my event through a 3D design. —Michael

To learn more about this project and others, visit https://sites.google.com/a/midpac.edu/midpacific3d/
In this action-packed eight-week project, students used primary and secondary resources to research the beginnings of our nation. As historical fiction authors, they wrote first person narratives from the perspective of one of the colonists at Roanoke. After comparing the politics, religions, and immigration trends of the settlers in the New England, Middle, and Southern Colonies, students began to examine what contributed to the desire for independence. As artists and mathematicians, they created shadowboxes inspired by Joseph Cornell that express their interpretations of the big ideas of revolution.

Teacher Reflection
We loved this project for so many reasons and our end of the year student reflections showed that this was a favorite for the majority of scholars in our class as well. The collaboration and compromise required helped our students become better communicators and closer friends. This project also involved so many disciplines as students were asked to work as authors, artists, mathematicians, historians and makers.

Student Reflections
In this box project we learned how to build, use math in real-life situations and lots about the artist Joseph Cornell, but most importantly, we have learned about ourselves. We faced many challenges in this project but we found out that we could overcome all of them. We also learned that in the 1700s nothing was really fair, and freedom was a privilege. As we go into middle school we will always remember our skills we have learned. We loved this project. —Delanie & Audrey

One thing we definitely learned was that to create a masterpiece, you need patience and collaboration. We experienced a time when we couldn’t rely on our teachers for every little thing or critique. We had to ask others in the class for critique and help when something went wrong. —Nora & Alanna

To learn more about this project and others, visit http://www.hightechhigh.org/schools/HTEX/?show=projects
Superheroes Unite!
Diane Hawke, Linda Salamanca and Jen Schultz, First Grade
High Tech Elementary Explorer

The Superhero project explored what superhero qualities each student possessed and how these unique “superpowers” contribute to our classroom and school community. The students investigated fictional superheroes and found a common theme in their powers. The students examined everyday superheroes in their community, learning about their different jobs and responsibilities. Each first grader considered the questions: What superhero qualities can you bring to better our community? How do superheroes work together? Students designed and made a costume to represent their superpower. The children also created social stories featuring their superpower in a comic book format. The stories were then made into short films with the students role playing in their superhero costume. These films and the students’ experiences were then shared at a school gathering.

Teacher Reflection
There were several things we loved about this project. An absolute highlight was the excitement in the children’s faces when they realized that everyone possesses a superpower and no matter how old you are, you can make a difference. We often found them using their superpowers like Grit Girl, Thinking Man and Happiness Gal on the playground or during class time when no one was watching. At a table you would hear “Don’t give up, use grit!” when participating in a difficult math activity or “I’ll get a band-aid!” as Helpful Boy ran off to help a friend who had fallen down on the blacktop. It empowered the children to take ownership in making a positive change in their classroom and school.

Student Reflections
The Superhero project taught me that I should help people and I should take big risks for the people I care for. —Nia

I learned that superheroes are real and help us everyday like police officers and firefighters. Everyone is a superhero! —Giovanni

To learn more about this project and others, visit http://www.hightechhigh.org/schools/HTEX/?show=projects
Staircases to Nowhere
Jeff Robin and Andrew Gloag, Art and Physics
Gary and Jerri-Ann Jacobs High Tech High

Seniors used physics, art, and carpentry to plan and build model and life-sized staircases of their own designs. First students designed 1:10 scale model staircases alone or with a partner. They had to find some mathematical equation or pattern that modeled something about their staircase and show it in a poster. In the next phase of the project, students designed 1:5 model staircases, which they had to carefully plan and execute. The larger size required them to be more detail-oriented in their designs. In the final stage of the project, students worked in groups to build 1:1 life scale staircases around the school. The four full stairway installations will be permanent and must hold up to significant human teenage wear and tear. The 1:1 staircases required teamwork as well as design, engineering, physics, and carpentry skills.

Teacher Reflection
The scale models, the one-to-ten, were basically whimsy and play. In the one-to-five, students were thinking about structure and how to build these things. The full sized ones were practical and buildable. They all lent different things to the creative process of the students. In the first staircase they learned that play is important to design. In the second, they learned that planning is important to creating something. In the third one, they learned that collaboration is critical to doing something bigger than yourself.

Student Reflections
I learned that it takes an immense amount of planning to produce things in the real world. You can’t just B.S. something that you want to look nice.
—Sophie

It requires stepping out of your comfort zone and realizing that you have to put forth a team effort, that everyone does work. Sometimes it’s work you don’t really want to do, but you do it anyway.
—Czarina

To learn more about this project and others, visit http://dp.hightechhigh.org/~jrobin/Projects.html
Who Walks Here: The Journey of Our People and Our Land

Shayna Cribbs, Brooke Newman, Misa Adams, Christine Kuhl and Julie Hutchins, Third Grade High Tech Elementary Explorer

The Who Walks Here project came from the teachers’ passion for nature and wanting our students to explore the outside world. The project began with an overnight camping trip. Students visited places in San Diego County, and worked with local experts, to experience what life was like for the Kumeyaay (first people who lived in San Diego) and to see first-hand our local birds and native plants. Each student researched a local bird and a native plant, and their final pictures and research were put together into a published field guide that was donated to the experts they worked with. Students worked to make scientific drawings of their birds by participating in the critique process, making multiple drafts of their birds, and working with high school buddies. Students researched more about the Kumeyaay and wrote historical fiction stories or legends. After learning about the footprint the Kumeyaay left on the land, the students thought about the footprint they want to leave on the land.

Teacher Reflection
My hope with this project was for my students to gain an appreciation for nature and want to protect it. I did not anticipate that through this project a group of “birders” would be born. A handful of my third graders became passionate about birds. They would want to take walks on the weekends to look for birds, and they would bring bird books to school to read and to share with one another. Many also worked on drawing drafts of other birds in their free time.

Student Reflections
We should all love nature and enjoy it and be thankful for its beauty and what it provides for us. —Camille

The Kumeyaay barely changed the land. They treated it with respect and they weren’t doing any harm and they never ever wasted food, drinks, or any other kind of resources. —Alex

To learn more about this project and others, visit http://www.hightechhigh.org/schools/HTEX/?show=projects
Why do we need honey bees and how do they affect our world? In order to answer these questions, second graders investigated the role of bees in our ecosystem, and the various ways bees are being threatened. Once their research was complete, students became advocates for the bees. Working collaboratively in groups, students wrote and performed bee plays to educate the school community about the threats to bees. They also wrote letters to the city and large corporations, planted over 200 bee-friendly plants, and built beehives to donate to a community organization in Mexicali.

Teacher Reflection
This has been one of my favorite projects because it gave students the opportunity to advocate for what they feel is important and to make a change in our community. I knew this project was meaningful when students insisted we write letters to our local government asking if they could plant more pesticide-free flowers for bees. Our students were so proud as they stood by the plants that they put into the ground with their own hands. I think that what impacted me most as a teacher was to see my students take ownership of their learning. When they began to understand the problems that honeybees were facing, they also realized that there were ways for them to advocate for change. Students began to ask questions about why people, namely adults and big corporations, are not doing more to help the honeybees. After building beehives to send to Mexicali to help a community of women and children there, students felt a sense of accomplishment and contribution to solving a problem that they realized is affecting us all.

Student Reflections
I learned that if we didn’t have bees we wouldn’t have most of our favorite food. —Silas

Working in a group helped me because I got more ideas. None of us is as smart as all of us. —Aiden

To learn more about this project and others, visit http://www.hightechhigh.org/schools/HTEX/?show=projects