Students collected and dissected vehicle killed wildlife and participated in marine wildlife necropsies to better understand issues surrounding wildlife-human interactions. After receiving a call, small groups (5-12 students) gathered safety equipment and relevant data sheets and drove to meet our collaborators, such as NOAA Biologist Kerri Danil. On site of vehicle-killed wildlife, we documented (e.g. data collection sheets, photos) and collected organisms using the S.D. County Dead Animal Removal protocol. For exhibition, student research groups accompanied their necropsy with original six word stories and photography to engage their audience in conversation surrounding roadkill and marine mammal strandings. Our essential questions included: 1) In San Diego, what are the reasons for vehicle killed wildlife and marine mammal strandings? 2) How do we live consciously and bring awareness to topics that are often ignored or misunderstood? 3) How do the anatomy and physiology of marine/terrestrial mammals compare and contrast to our human body?

Teacher Reflection
Being on call with our collaborators brought a sense of student excitement and anticipation to each day of this project. This excitement combined with the reality of our onsite investigations and necropsies, provided ample opportunities for in-class discussions, weekly student reflections, and empathy for victims of roadkill and deadly strandings.

Student Reflections
Before this project, I would just think if I saw an animal on the street like a skunk or opossum just try to get it away, but after this project it has made me think that they are no different than any other animal because they have a life too. —Christian

I’m going to remember the experience of cutting open and observing the dead body of a coyote because it made me come to terms with the millions of lives that are being lost due to the way our civilization operates. —Nadia

To learn more visit http://neblers.weebly.com
Students learned about the industrial revolution and picked often forgotten negative issues that erupted due to this era, such as labor rights issues, and environmental damage. After picking those issues and researching them, they developed a steampunk character whose mission was to help fix these problems. They had to make something that used a steampunk aesthetic, whether it was an invention that helped the environment, or a soapbox monologue that called for people to give attention to child labor, or a film that showed what happened when there are no labor regulations. The exhibition focused on steampunk ways to change the world and make it better.

Teacher Reflection
I really loved that every student got to make something and that they could decide what they wanted to make out of their research. The diversity in products allowed for equitable access into the classroom. I loved how students took ownership over developing a pitch to display their learning about the industrial revolution and the dark underbelly of it; it was also great to explore change ideas with the students and see how much they began to care about issues like child labor and wealth inequity.

Student Reflections
I learned about the Triangle Shirtwaist Company fire in making my short film. By reading and developing our understanding of the event we were able to imagine the scenes in our heads including the factory, the day the fire was caused, and the real struggles factory workers went through at work with low pay. —Idalia

Our invention uses solar panels to produce electrical currents that get stored in batteries. The batteries get charged and are used as energy to power the sensors. If we use more solar energy, we will be taking people out of the harsh environment of the coal mines and giving them jobs in the solar industry. —Carla

To learn more visit saraislas.weebly.com
Design Challenge: Recycling Center
Sarah Goff, Culinary; Debra Hacker, Physics
St Helena High School

This project was a collaboration between advanced culinary students and physics students. They were asked to look at the recycling system currently in place on our campus and improve both recycling collection and campus recycling awareness. Students were tasked with designing a recycling center that separated trash, bottles and cans, paper, and food waste compost. The design needed to be built using recyclable materials. Students were given a construction budget of $30 per team. After the centers were built and critiqued by community members, students decided where on campus they should be located. The units were monitored and serviced by the students through the rest of the school year.

Teacher Reflection
This design thinking project was launched in the first semester to introduce students to the design process and project management skills while trying to improve the recycling culture of the high school. Students really enjoyed the voice and choice of the project but underestimated the difficulties in changing ingrained habits of dealing with garbage.

Student Reflections
Green, blue, black, and red. While very simple in its design, this project required hard work from all members of team Eco Machine. Although we were relative strangers when first introduced, this project bonded us together and gave us the opportunity to get to know people that we might not have otherwise. It was extremely easy to designate tasks, as we were all eager to get started and we all had different strengths and interests. —Julia

This project was a great companion to the Culinary Art program’s goal of creating great food, through green and sustainable practices. This composting project was a good way of combining these two different classes. Given the materials, I believe we achieved our goal of producing receptacles that both are green and benefit various school programs. —Alex

To learn more about this project visit www.napaccr.org
Bonapartism
Peter Jana and Eric Hoobs, 10th Grade Humanities
Gary and Jerri-Ann Jacobs High Tech High

When Karl Marx wrote that history occurs, “the first time as tragedy, the second time as farce” he was referring to how revolutions start by imitating past revolutions and end by undermining their own ideals. Napoleon Bonaparte and his nephew Louis Napoleon were the examples foremost on his mind. Later, the term Bonapartism came to refer to the historical tendency of a dictator to emerge at the end of a democratic revolution and use the ideals of the revolution as a way of masking his own power. During the Bonapartism project students conducted comparative historical analysis to determine whether the Egyptian Revolution of 2011 followed the same patterns as the French Revolution of 1789. Students were asked to consider the following questions: Do revolutionary processes follow similar patterns or does each revolution follow its own dynamic? Did a Bonaparte figure emerge in Egypt? Students presented their research in the form of creative monologues that were written from the perspective of historical actors. The monologues were videotaped and used in a student made documentary that can be found on YouTube. For exhibition they were performed live in a local public venue.

Teacher Reflection
I appreciate how students deeply explored a historical concept and used a variety of creative ways to communicate their conclusions. The French Revolution and the dictatorship of Napoleon can easily be seen as dusty things without much contemporary relevance, but this project shows how a key concept from the period can be an organizing principle that helps us understand the world today.

Student Reflection
The most meaningful part of the project was how it helped me connect with the emotions of individuals who participated in historical revolutions. I could relate their experiences to my own as well as to current civil rights issues. I walked away from this project with an enhanced sense of empathy that has carried over into my life outside of school. —Ilona

To learn more visit http://peterjana1.weebly.com/bonapartism.html
This is a beginning of the year project that focuses on bacteria, cells, and microscope usage for Biology, and kitchen sanitation and health in Culinary. During the project, Biology students swab the kitchen for bacteria before cleaning, then clean that surface, and swab again. They then culture the swabs and grow the cultures on Petri dishes, analyze the bacterial cultures, and share their findings with the Culinary students. Biology students also study cells, organelles, and microscopy. Culinary students learn the techniques of sanitizing a kitchen for food preparation. The project culminates in a handbook collaboratively created by Biology and Culinary students focusing on kitchen sanitation and the bacteria that can affect our health that might be found in the kitchen. As part of the process, Culinary students give how-to instructions on cleaning and sanitizing in the kitchen, and the Biology students each do a study of a different pathogenic bacteria that might be found on food or contaminated surfaces.

Teacher Reflection
After reflecting on the project and accomplishments, my overall impression is that it was a good learning experience for the students, and a nice way to touch base with a different subject area and other students. The students learned bacterial swabbing, culturing, and slide preparation before learning about microscopy. It was good to culture and see bacteria that was in their own environment and in a kitchen environment.

Student Reflection
I liked doing the project because it helped me understand what bacteria is. At first I didn’t know what effects bacteria could have on us. After doing the project I learned a lot, like we should be washing our hands and cleaning our kitchens more effectively, especially with bleach. I think more students are engaged with the growing of the bacteria and understand what it is. I think other students learned a lot also.

—Monica

To learn more about this project visit www.napaccr.org
**Liberty Station: Then and Now**  
*Ruby Rodrigues, Jami Saville, Janna Steffan and Georgia Figueroa, 2nd Grade*  
*High Tech Elementary*

The community our school lies in has so much rich history. We knew that our 2nd grade students would be fascinated to know that our very own building used to house a pool for Navy Seal Team 6 to train in. There are so many interesting stories to gather from the people who knew this community as the Naval Training Center. We thought this project would be a great entry point for students to delve into learning about the past and how one community can change over time. Through this project, students also became experts on Liberty Station, as we know it today and how it serves our community in the present. They then created a mobile website about Liberty Station.

**Teacher Reflection**

This was the founding year of our elementary school. Our students came from diverse neighborhoods within San Diego county. As we began learning and sharing about our unique neighborhoods in the first months of school, students began sharing their interests and curiosities about our school’s surroundings, Liberty Station. We took many walking trips from school to local businesses and met with Naval Training Center experts to learn about the history of our school’s building and community. It was rewarding to see students connect and apply learned information towards the creation of a kid-friendly, mobile website to then educate our greater community.

**Student reflection**

I really liked walking around Liberty Station because we got to witness and learn about the past and the present. I also really liked how we made a website about it. It wasn’t just for us to access, but for other people to use and learn!  
— Lillian

To learn more visit [http://hteplroom208.wixsite.com/libertystation/about](http://hteplroom208.wixsite.com/libertystation/about)
The Dream Project
Allison Kucia, 3rd Grade
High Tech Elementary

Why are we here if not to dream? In this project, students engaged in conversations with different members of our San Diego community to investigate the wide scope of dreams that an individual may have in his or her lifetime. In honor of April being National Poetry Month, students sought inspiration from various poets, and deeply examined their own lives and dreams for the future to create a piece of writing accompanied by a mixed media illustration. These poems were compiled into an anthology and published by a company selected by the students based on cost and time efficiency. Their co-created anthology acts as a “dreamcatcher,” or legacy project, of the students’ aspirations at that point in time.

Teacher Reflection
What I love about this project is that it provides students the opportunity to be creative through both artistic and written expression. It was powerful to see how beautifully students worked independently, as a classroom unit, and with project collaborators to critique and improve their work, and to ensure that their art and poetry captured their hopes and dreams correctly. I attribute much of this to the high involvement of students in all realms of the project. Having students learn and engage in the process of writing, illustrating, and publishing a book from start to finish (students ended their project by watching their book get printed and compiled at the publisher) gave them a heightened sense of pride and ownership over their work.

Student Reflection
The best part of the project was making our final drafts. It was pretty cool to go to the publishing company and see how they turn our work into a real book. Our book was made by a powerful machine with smart technology. It was neat to see how it worked and how the people at the company used it. —Luca

To learn more visit www.hightechhigh.org/hte/projects
In this project, students explored all about healthy living. First graders became exercise experts, learning different ways to move their bodies and why exercise is important to staying healthy. Students also learned about nutrition and applied these ideas to their own lives. They discovered the five food groups and why each is important in a balanced plate. At the end of the project, students completed two final products. Through multiple drafts and critique, students created a ‘healthy plate’ that included the food groups with labels and realistic drawings. Students also used group work to choreograph an exercise routine. They filmed each section to compile into a class instructional workout DVD. First graders brought the plate and DVD home to help their families stay healthy.

Teacher Reflection
We designed this project with active first graders in mind! Our hope was to harness their natural energy and need for movement while serving the purpose of promoting healthier living. We felt that they would be very engaged in the different forms of exercise and would enjoy choreographing and videotaping their own workout routines. What we didn’t expect was how enthusiastic they would be about nutrition as well! They really enjoyed learning about the food groups and how each one helps our bodies. They also loved creating actual plates with their careful artwork showing examples for a balanced meal. They worked diligently to use critique and improve each draft to make their food look realistic. Students took what they learned about food and carried that into their real life. Parents have told us that when they go grocery shopping now, their child will often suggest healthier options!

Student Reflection
It was special making the first grade workout video because I got to make it with other people. We used a green screen. At first I was like, ‘Wait a minute! It’s just going to be green behind us!’ But then it changed to have different scenes like New York or a picture frame! —Sydney

To learn more visit www.hightechhigh.org/hte/projects
The Force of Friction: What Moves Objects? What Moves People?
Michelle Sadrena Clark, Humanities; Cate Challen, Maths/Physics
High Tech High North County

In humanities students researched undocumented minors and the reasons they immigrate to the United States. After examining multiple perspectives through texts, documentaries, guest speakers, and border field trips, students wrote an original, bilingual, one-act play, based on the life of an unaccompanied minor, and then decided which plays would be produced and performed at the all-school exhibition. During each play performance, at the moment of climax, the audience had an opportunity to determine the protagonist’s course of action, and the play was acted out accordingly. Our hope was to enlighten the public and inspire civil discourse.

In physics and math, students studied forces, energy, motion and geometric transformations. Students applied their understanding of these transformations to illustrate the migration of an unaccompanied minor through a unique kinetic art (moving art) piece.

Teacher Reflection
Students developed their problem-solving, critical thinking, and collaboration skills to design and engineer unique designs with an emotive story behind them. We were impressed by the critical thinking, courageous conversations, and creativity the students exhibited throughout this project.

Student Reflection
The Force of Friction immigration project made me more aware of the social and economic factors affecting immigration in the United States and taught me a very important aspect of critical thinking; know the facts before forming an opinion. In Maths/Physics I utilized my understanding of mechanics and my creativity to apply our lessons on transformations into kinetic art pieces.

—Rachel

To learn more visit http://thedifferencemakercoachclark.weebly.com/the-force-of-friction.html or http://catechallen.weebly.com/
First grade scientists in Room 2 have been interested in garden creatures for a long time...since kindergarten! They have spent a lot of time outdoors looking for, observing, and wondering about these animals. These are questions they had about the animals: Who lives in the garden, and how do they live? Is our garden a good home for these animals? When they became experts on these little creatures, they taught the school community about them. Other children learned about the animals and learned to take care of them while visiting the garden. They also figured out which animals are helpful or harmful to the garden. This can help other classes find solutions to gardening problems caused by animals. Signs and books remain in the garden so students can continue to learn about the animals.

Teacher Reflection
Students were truly connected with this project. They knew that the idea came from them and their passion for animals and the garden (which they designed and built in a previous project). They now understand that they are real scientists, artists, writers, and teachers. At our exhibition, guests learned from the 1st graders and noticed their expertise on the subject of animal adaptations and gardening, and sensed how proud students were of their work.

Student Reflection
Our project was about what small animals can do. I learned about what snails can do. The hardest part for me was writing a lot. My favorite part was making the experiment. This helps others because I can tell others all I learned. —Stella

I felt like a real artist and that’s what I really want to be. —Blanca

To learn more visit https://www.hightechhigh.org/schools/HTEX/
The graduating seniors of HTHMA presented a compelling and provocative interactive art exhibition on the current state of social, cultural, technological and ideological constructs emerging in today’s modern teenagers. Fifty students presented short talks and interactive art experiences on topics ranging from bullying, depression, education, media addiction, feminism, sports injuries, the judicial system and many more contemporary issues. All of these projects were uniquely authentic as the sources of inspiration came directly from the teenagers living these realities every day. Through their rigorous research, personal experiences, artistic renderings and computer programming design, these 50 teenagers provoked their peers and adults to reconsider their notions of the challenges, habits, practices, and rich cultural experiences that impact the leaders of tomorrow today.

**Teacher Reflections**

We felt it essential to design and facilitate educational opportunities where students can try, take risks, make changes to their work, and adapt as they go forward. This process is critical to their growth as students and as people. The outcome of this work was extraordinary. Working in this type of interdisciplinary, collaborative environment with the students leading their research interests and directing their projects’ development really demonstrated to us the importance and educational merits of honoring student voice and choice.

**Student Reflections**

I learned how to synthesize ideas, think logically and analyze research. I wasn’t quite sure what to expect when I started learning programming or had to figure out a way for mature audiences to understand what I was trying to convey through both my research paper and interactive program. But, I found my way through these challenges and to see myself overcome and flourish was pretty amazing.

—Angie

In this semester-long project, 10th grade students dissected, analyzed, predicted and suggested specific ways to improve the lives and livelihood of six South County communities, based on their ethnography and current needs. Each group studied the complex intersection of culture, politics, economics and technology to create real world change for those around us. Students assumed a variety of roles (from anthropologist to politician) and generated projects that utilized professional consultants along with their own ethnographic research. The wide-range of final products included building a local park for families in Logan Heights, and implementing enrichment and wellness programs at a retirement home in Bonita. Our essential questions were: How do individuals’ wants vs. needs affect the direction of a community? What actions are necessary for a community to continue to thrive in the long term?

Teacher Reflection
I was struck by how much our students grew in areas that were not specific to any of our disciplines, but nonetheless integral pieces of their learning repertoire. Students rose to the occasion and delved into our communities, learning to empathize with perspectives other than their own. As they grappled with the intricacies of collaborative problem-solving, they developed both their abilities to voice their opinions and compromise, working through their disagreements and owning their decisions.

Student Reflection
When we first visited Imperial Beach we were overwhelmed by the beautiful surroundings of the community. While there, we interviewed several locals in order to better understand the community. We noticed right away that there was half of IB that welcomed new changes and another half of the community that wanted things to stay the same. As a cohort we needed to figure out something that addressed the needs of both parts of the community. —Mariano

To learn more visit www.hightechhigh.org/htcv/projects
Inspired by the way that World’s Fairs bring visitors into a vision for the future, Fourth Grade students recreated a World’s Fair, complete with their own working inventions and a large-scale model of a city of the future. This exhibition at the San Diego History Center in Balboa Park also helped to celebrate the centennial of Balboa Park. For this project, students researched current problems of today and designed innovations to make our future better. Among the innovations was a city plan that included alternative energy, smart growth, and innovative infrastructure. As part of the project, students presented project proposals to experts such as city planners, transportation planners, and environmental advocates. In addition, students created working prototypes of inventions to help with mobility, environmental issues, hunger, poverty, and water issues, and informational posters and flyers for their inventions.

**Teacher Reflection**
This ambitious project shows how we should never underestimate children’s potential. The quality of student work, and their level of professionalism in presenting to experts, families, and the general public was amazing. The depth of learning was evident in the way students transformed knowledge about our world today to create something new.

**Student Reflections**
It felt good to present my work to family and strangers to get feedback and to put it out there. —Asher

The most challenging thing was making everything work as expected. I can do that by taking more time and testing more often. —Ally

About the Invention Cycle: I learned that it is very challenging, and you fail a lot. The most exciting part for me was seeing it finally work. —Heather

To learn more visit http://room14explorer.weebly.com/
Our questions: Can we create math problems in the form of 60 second films that draw people into solving them? How can a math problem give access to every student in the class while still challenging the most persistent of students? We broke the project into three phases: the first, where students experienced doing many 3-Act problems in collaborative groups in math class while learning animation techniques and telling stories in art class. We also analyzed the 3-act problems we did, working at creating criteria for 3-act problems that effectively pull people into the problem while giving them access. In phase two, art and math merged and students drew storyboards in art class to represent a math problem they developed in math. In phase three, students perfected their 3-act problems through critique and feedback cycles.

Teacher Reflection
3-Acts is, in essence, a project in math education that pulls as much rigorous math discussion into the project as possible. There is craftsmanship in the refinement of the film; there is authenticity in the search for scenarios that draw people into a math problem; there is intellectual complexity in the dozens of problems that students solve throughout the project and in the tension between the need for great story and the need for access and challenge in a math question.

Student Reflection
I learned that failure leads to success. Doing the animation and storytelling was a challenge for me, but throughout the project I learned that perseverance and effort will leave me with the satisfaction of a great final product. A math classroom should be a safe space where students can show their ideas and work together to come up with a solution, can share their creativity and never be scared to be wrong. They should accomplish each task and challenge feeling proud of themselves and never giving up.

—Marysol

To learn more visit www.hightechhigh.org/htbcv/projects
On my first day of teaching engineering, our room was empty. It was by design that I moved out the chairs and tables and put some carpet squares out to sit on and left the walls blank.

I envisioned this project would be my first community building project for all K-5 students and we would design our room together.

I remember my students’ faces, tiny, a little confused, wondrously looking around the empty room. Then I asked them to share their hopes and dreams for our classroom and I realized quickly that robots, flying couches, dog houses and playgrounds although varied and wonderful, were not all going to be possible. However, we celebrated them by hanging their drawings up on our blank walls to share, and thus began the dream classroom project.

I’m not an engineer, nor do I have a degree in engineering or engineering education. My background is in visual arts so I literally started teaching engineering from scratch. After nine years as a middle school multimedia teacher, I yearned to explore a different path. I