

INNOVATION IN LEARNING

Report To School Committee

October 2016

Shrewsbury Public Schools Innovation In Learning Study Group

Why an Innovation in Learning Study Group?

MLTS Prompts

THE PROMPTS THE FILM



DOWNLOAD FROM VIMEO

Essential Skills

THE ESSENTIAL QUESTION

- What skills and character traits are essential for students in the 21st Century? For career, citizenship, and life?

OTHER DISCUSSION QUESTIONS

- What do you find noteworthy about this scene?
- Our current education model was defined over a century ago. What skills and character traits did the Committee of Ten want young adults to have for 20th Century assembly line jobs??
- On balance, are our students being prepared more for the 20th or the 21st Century?
- How might we critique assignments on the basis of how they help our students develop essential skills? Do we already? Should we?
- How might we assess student progress on essential skills?
- What micro-innovations could we try to accelerate student development of essential skills?

BONUS ARTICLES

- Ken Kay on 21st Century Skills
- Tony Wagner WSJ article

<http://sparks.mltsfilm.org/essential-skills>

What skills and character traits are essential for students in the 21st Century? For career, citizenship, and life?

Problem of Practice

**“SUCCESS IN THE SLOWLY
CHANGING WORLDS OF PAST
CENTURIES CAME FROM BEING
ABLE TO DO WELL WHAT YOU
WERE TAUGHT TO DO. SUCCESS IN
THE RAPIDLY CHANGING WORLD
OF THE FUTURE DEPENDS ON
BEING ABLE TO DO WELL WHAT
YOU WERE NOT TAUGHT TO DO.”**

~Seymour Papert

In the fall of 2015, the Shrewsbury Public School District convened an Innovation in Learning Study Group in response to the significant changes that have occurred around access to information, interconnectedness, and the new skill sets being sought after in the knowledge economy.

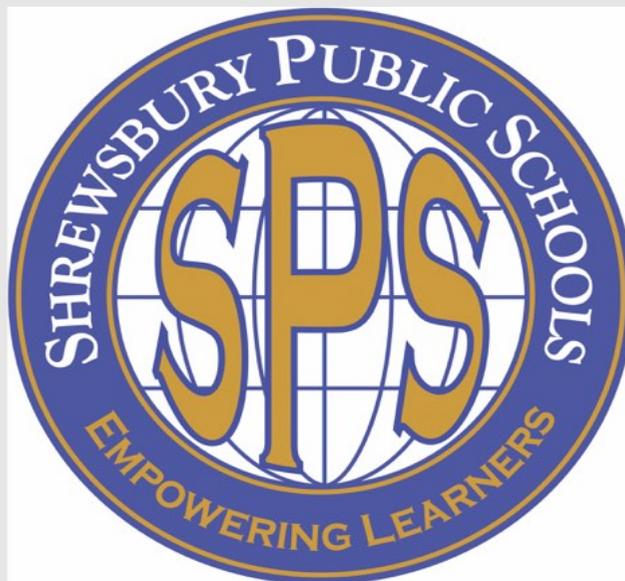
This group was tasked with visiting a variety of different learning environments that have been recognized for their innovative practices and for effectively preparing their students for the demands of the 21st century. In conjunction with the visits, the group also read the book, Most Likely to Succeed, written by Tony Wagner. This book explores the belief that the basic structures of our education system, which were developed in the late 1800s, are no longer appropriate for contemporary learners.

Using federal professional development grant funding, the team visited five schools during the 2016 winter-spring time frame and met on June 7, 2016, at an off-site retreat, to reflect upon, summarize, and synthesize what had been learned.

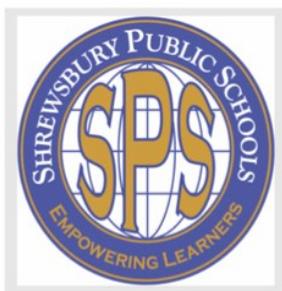
Study Group Membership

INNOVATION IN LEARNING STUDY GROUP SHREWSBURY PUBLIC SCHOOLS

Tiffany Ostrander (Elementary Administration)
Erin Kendrick (Elementary)
Heather Gablaski (Middle Administration)
Moira Cristy (Middle ELA 6)
Megan Graham (Middle Math/Science 5)
Melissa McCann (Middle Curriculum Coordinator/Math)
Ann Jones (Middle Administration)
Jeremy Mularella (Middle Science 8)
Maura Egan (Middle ELA 8)
Jose Schroen (SHS Science/Math)
Jill Carter (SHS Science)
Sarah Powers (Special Education)
Shawna Powers (K-12 Department - Instructional Tech and Media)
Mary Beth Banios (District - Curriculum and Instruction)
Erin Canzano (School Committee)
B. Dale Magee (School Committee)



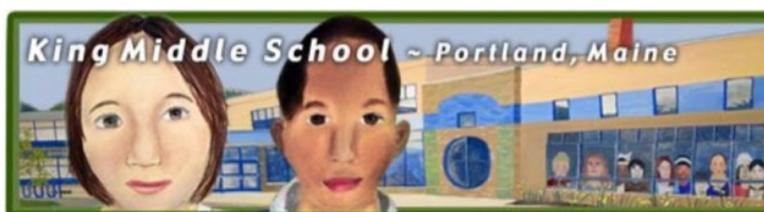
Site Visits



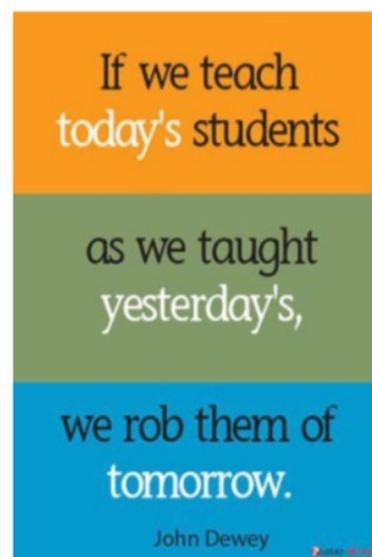
PORTRAITS OF INNOVATION: EXPLORING INNOVATIVE MODELS FOR TEACHING TODAY'S STUDENTS

Innovation Portrait: King Middle School

Posted on May 27, 2016 by [spsinnovationinlearning](#)



The King Middle School Mission: "It is not enough to get yourself to the top of the mountain; it is everyone's responsibility to get everyone to the top."



Click here to view the study group's blog:
spsinnovationinlearning.wordpress.com

The 16 member Innovation in Learning Study Group visited the following schools during the 2016 winter-spring time frame and met on June 7, 2016, at an off-site retreat, to reflect upon, summarize, and synthesize what

had been learned. Information around the innovative aspects of each school can be found by clicking on the link associated with each site.

Worcester Technical High School, Worcester, MA

Visit Date: January 27, 2016

<http://wbur.fm/2e2nDUZ>

Olin College of Engineering, Needham, MA

Visit Date: February 9, 2016

<http://www.olin.edu/about/rankings-awards>

High Tech Elementary, Middle, and High Schools

Visit Dates: March 10 -11, 2016

<http://sparks.mltsfilm.org/#/hth-wheel-project/>

Rivers and Revolutions Program, Concord-Carlisle
High School

Visit Date: March 3, 2016

<http://bit.ly/2e6KtPB>

Beaver Country Day School, Chestnut Hill, MA

Visit Date: April 12, 2016

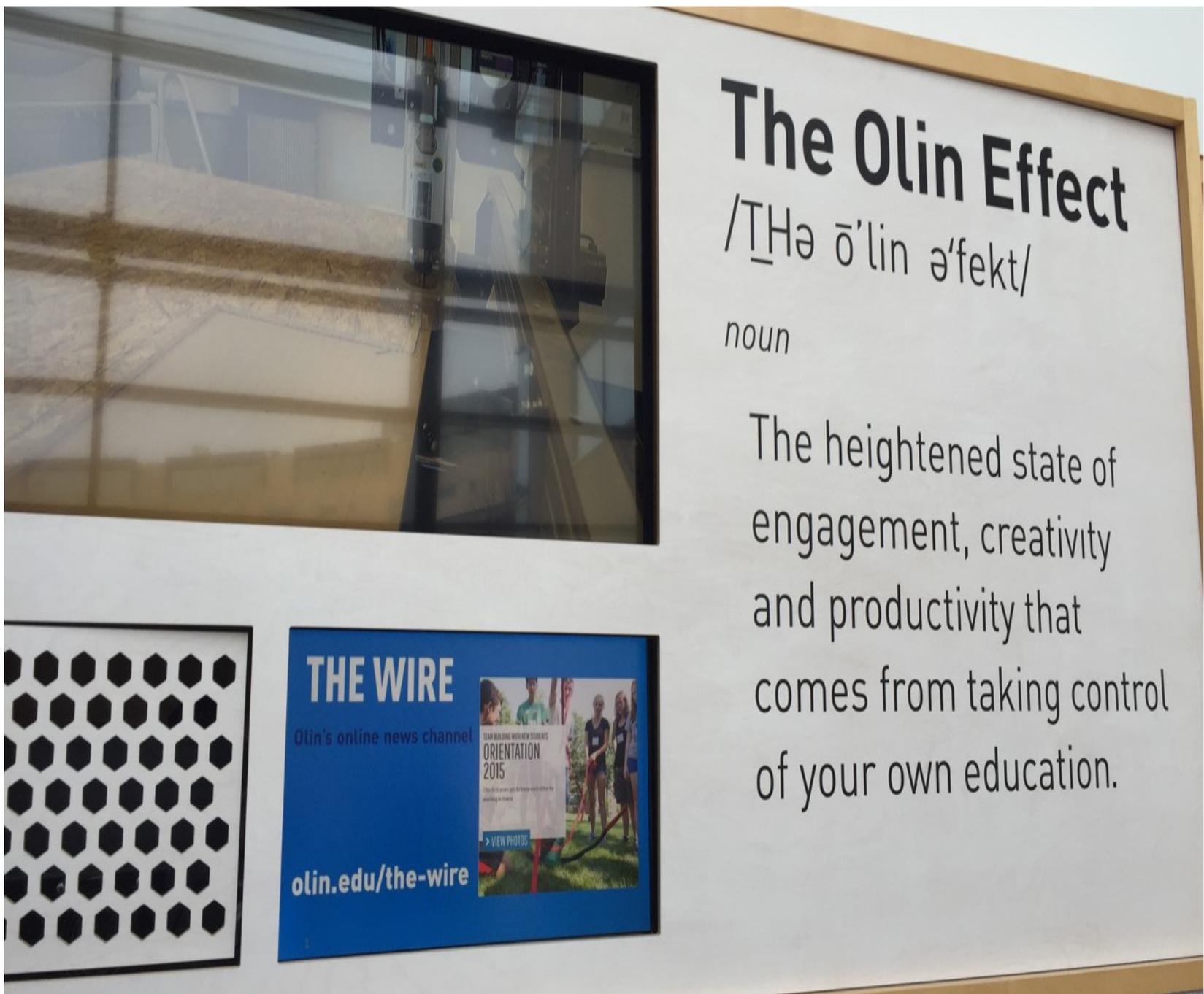
<http://bit.ly/1GtdCJP>

King Middle School, Portland, ME

Visit Dates: May 12 -13, 2016

<https://www.teachingchannel.org/videos/expeditionary-learning>

Common Vision



Whenever change is made, and especially when it impacts long and widely-held beliefs, it is imperative to garner support of all stakeholders. Part of the development of a common vision needs to be based on an honest assessment around how our traditional educational system

and success markers may be out of alignment with the realities of our digital, interconnected economy. An understanding of the alignment issue helps to avoid the perspective that innovation efforts in high performing schools are trying to fix something that isn't broken.

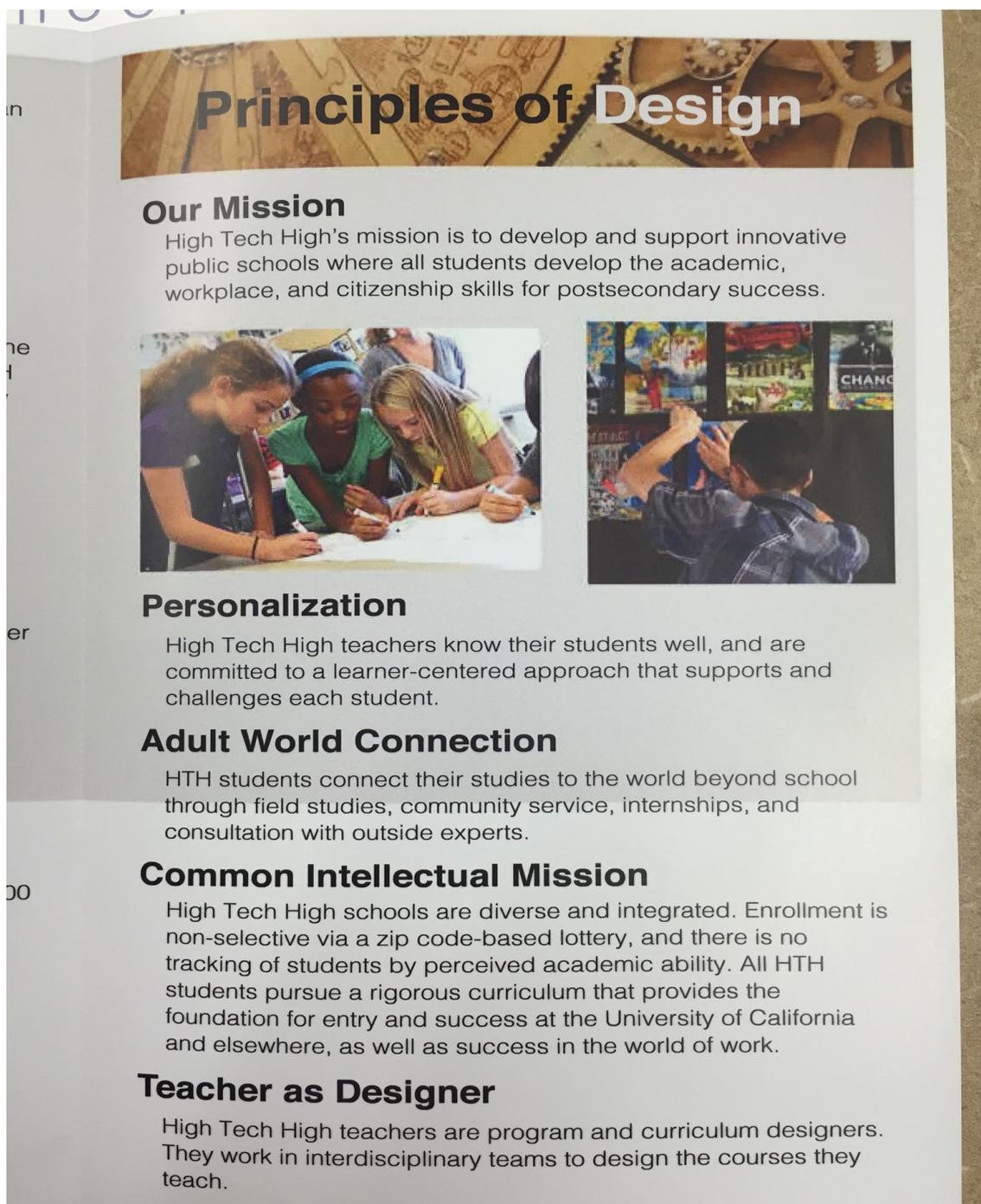
The schools we visited:

- Started with a clear vision and the instruction and culture in the schools reflected the mission that had been articulated
- Had empowered faculty who shared a common mindset - in some schools this was attained through hiring, in others it needed to be cultivated with existing staff
- Communicated consistently with all stakeholders regarding the mission of the schools and the vision for effective instruction.



NEW BASICS

- Creative Problem-Solving
- Collaboration
- Tech & Media Literacy
- Iteration
- Visual Communication
- Empathy
- Presentation Skills



Principles of Design

Our Mission
High Tech High's mission is to develop and support innovative public schools where all students develop the academic, workplace, and citizenship skills for postsecondary success.



Personalization
High Tech High teachers know their students well, and are committed to a learner-centered approach that supports and challenges each student.

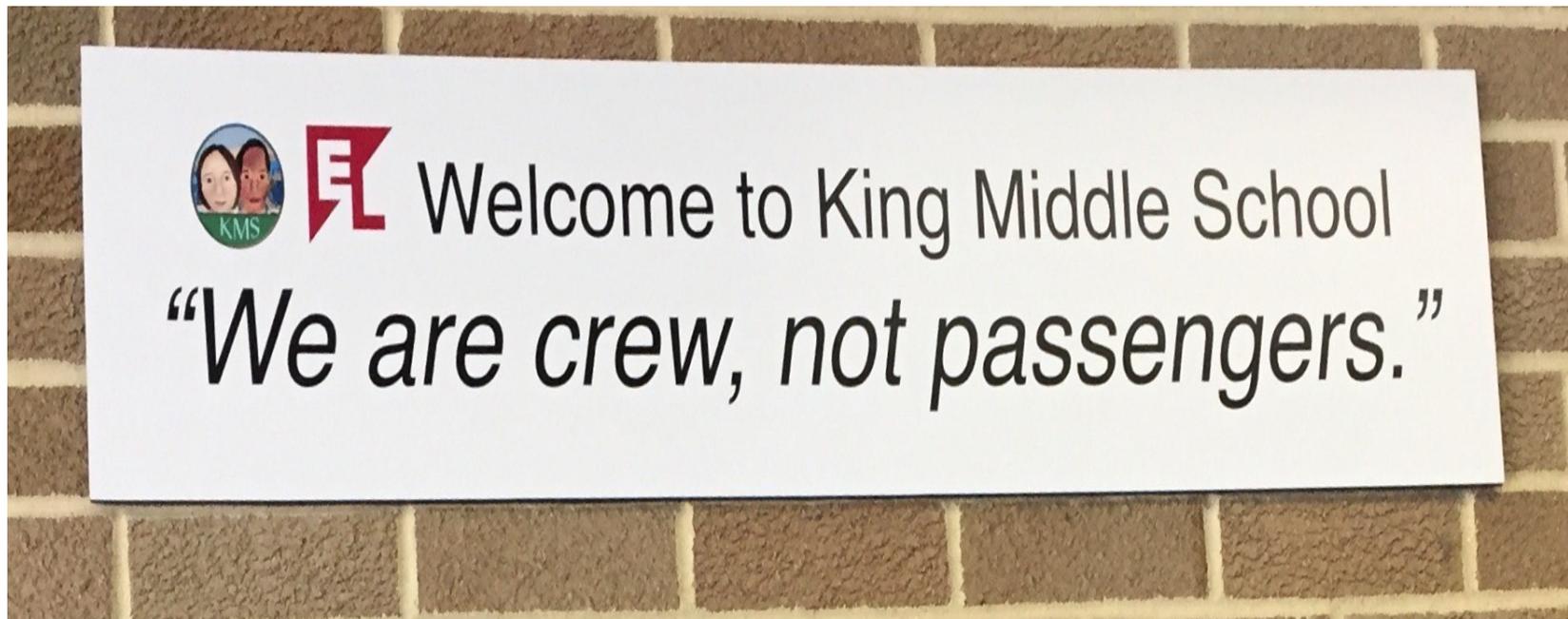
Adult World Connection
HTH students connect their studies to the world beyond school through field studies, community service, internships, and consultation with outside experts.

Common Intellectual Mission
High Tech High schools are diverse and integrated. Enrollment is non-selective via a zip code-based lottery, and there is no tracking of students by perceived academic ability. All HTH students pursue a rigorous curriculum that provides the foundation for entry and success at the University of California and elsewhere, as well as success in the world of work.

Teacher as Designer
High Tech High teachers are program and curriculum designers. They work in interdisciplinary teams to design the courses they teach.

High Tech High

Sense of Community



Incorporated into the vision of each of these schools was the sense that everyone was a part of the team. The members simultaneously appreciated both individuality and community. They made it clear that every individual had something of value to offer to the group. Teachers modeled this by genuinely sharing of themselves in a way that removed barriers which, at times, can exist between students and teachers.

Relationships mattered. Relationships among faculty, students, families and the community as a whole. No captain or passengers, everyone had a sense of agency and a sense of responsibility. Advisory time was key. It enforced the importance of connection between adults and

students. Multiple settings used advisory time, which allowed for small groups of students to meet with a designated teacher to engage in dialogue and instruction around the students' sense of self.

Families were strongly connected to the classroom and had multiple opportunities to view student exhibitions of work. Community partnerships were fostered, cultivated, actively pursued and supported in order to provide real-world experience and off-site learning opportunities for students. We saw schools that aggressively pursued community partnerships and also witnessed environments where community partnerships were more in the developmental stages. The efforts to make these connections allowed students to feel a part of the community while simultaneously providing the community with the opportunity to feel connected to the students and the school.



TINY HOMES PROJECT

What We Want To Do:

Our goal for this project is to be able to keep artists in San Diego. Oftentimes, artists can't afford to live and produce work in bigger cities because the cost of living is too high. We have been working with local San Diego artists to create affordable housing to help keep the art community and culture alive.

Keep Up With Us On:

 @HTHCVTinyHomes  Sempiternal Tiny Homes  Sempiternal Tiny Homes
 @HTHCVTinyHomes  @Sempiternal_TinyHomes  hthcvtinyhomes@gmail.com

Please support building tiny homes by checking out the rewards and donating as much as you can on our **KICKSTARTER**
SempiternalTinyHomes

Investigating Normal: Adaptive + Assistive Technologies

ENGR 3299 | Spring 2015

Assistant Professor Sara Hendren

What counts as "normal"? Whose bodies are broken, and whose need fixing? This design depth course invited students to rethink disability and the technologies designed for atypical bodies and minds. In these images are tiny glimpses into the design-build processes of six teams and their external partners, resulting in high-tech and low-tech tools for daily life.

Thanks to our co-design collaborators:

Children's Hospital Boston
Walker School
Adaptive Design Association
Amanda Cachia
Chris Hinojosa

Course Students:

Grace Ahn, Jennifer Anderson, Morgan Bassford, Kari Bender, Ari Chae, Brandon Chiou, Victoria Coleman, Myles Cooper, Adit Dhanushkodi, Elizabeth Doyle, Naomi Dudley, Lauren Froschauer, Ad Garties, Becca Getto, Ingrid Hagen-Keith, Julianne Jorgensen, Emily Mamula, Kate Maschan, Mary Morse, Cullen Ross, Michael Searing, Jess Sutantio, Brooks Willis, Mei Lang Xiong

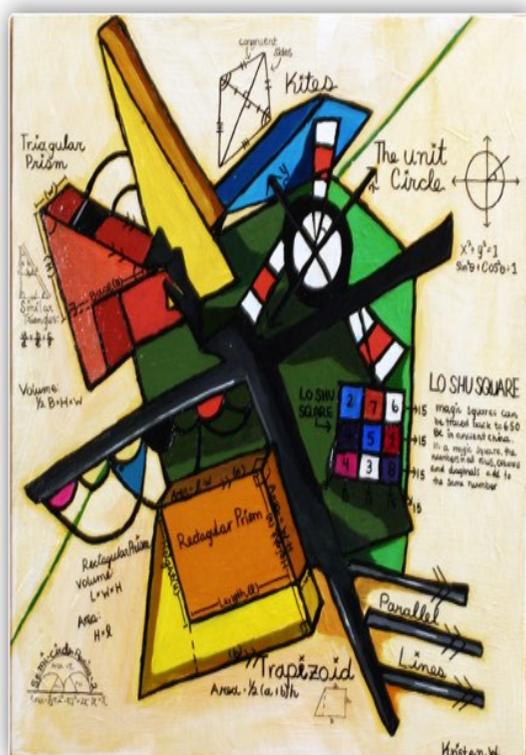
**Ms. Hanley's Rule to Live
By:**



**Try to Do Something Kind
Every Day-**

Inclusion and Equity

Center for Research on Equity and Innovation



The Center for Research on Equity and Innovation engages practitioners, scholars and youth in critical dialogue and networked improvement efforts addressing complex problems of practice in K-12 education. Our work is guided by the following principles:

Excavate: We critically examine our own beliefs, practices, and the systems in which our students live and work.

Disrupt: We use disciplined inquiry to disrupt predictable patterns of success and failure, and the inequitable practices that perpetuate them.

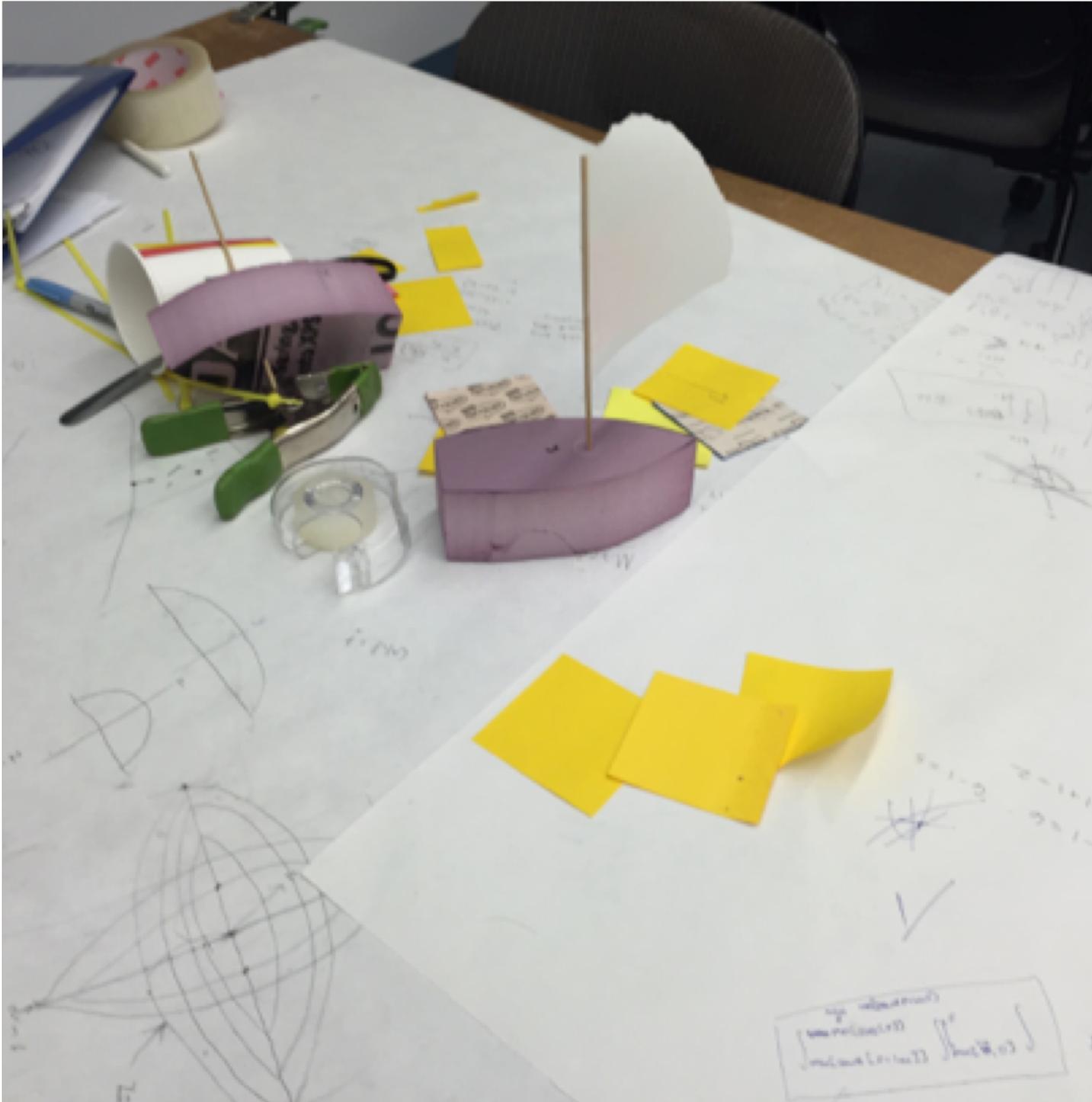
Design: We design practices and transform systems to create more equitable, engaging learning environments for young people and adults.

Grounded in participatory research, the Center merges professional practice and scholarship to actively improve teaching, learning and leadership in schools. Some of the tools we are developing for engaging in improvement science in schools are available [here](#).

Overall there was a clear trend across these schools to fade out tracking structures, such as Advanced Placement (AP) courses and honors courses, in favor of more heterogeneous groups. One model gave all students the ability to “opt in” to the honors pathway within a specific course/class.

The semester based Rivers and Revolution Program had a class comprised of high level honors students to intensive special needs students. Students across the special education spectrum were incorporated into the learning environments at High Tech High, King Middle School, Rivers and Revolutions, Worcester Technical High School Programs. The level to which special needs students were integrated into project based learning experiences did vary between schools.

Project Based Learning



At King Middle School, we don't just learn about things; we do things. Gus Goodwin, KMS Teacher

All students in the schools we visited participated in authentic, interdisciplinary units of study that incorporated a variety of targeted content, but also allowed for a great deal of student voice and choice. Students we met demonstrated a high level of investment and engagement in their work. They could easily articulate the real world relevance of their work. There was more of an emphasis on the process over the product. Students were given time to receive feedback and make revisions in their work. This led to much higher quality products.

Careful curriculum planning and lesson design, that in some settings including student participation, was evident across all sites. Teachers embraced their role as co-learner and coach. They shared their enthusiasm for trying new things and demonstrated that failure is a natural part of the learning process. These schools made strategic decisions about curriculum content; there was an acceptance that curriculum standards needed to be streamlined in order to accommodate deeper learning activities. It should be noted that none of the schools used a project-based learning approach 100% of the time. In all locations, lectures, quizzes, labs, discrete assignments were utilized in classroom settings.

Across all sites, students' work was ultimately assessed by authentic audiences and some sort of public performance task.

Essential Questions:

How has popular music in the United State developed over the last century?
How does music influence culture and how does culture influence music?

Project Objectives:

Students will learn about waves (sound and light)
Students will study basic musical rhythms and theory
Students will learn and build basic circuits
Students will investigate the cultural impact of music including the subcultures of age, fashion, & politics.
Students will identify a defining moment within a musical genre as well as an icon of the genre.
Students will look at the social and cultural milieu surrounding a genre

Exhibition and Timeline:

Students will create an interactive infographic complete with their genre research, a pictorial representaion of the icon and a wired soundboard that will play sounds from the genre
Project will run for 10 weeks with an exhibition the week of March 23, 2015

Challenge Option:

Students may extend their research to create a video to show the evolution of an instrument across genres or an aspect of the instrument. Examples may include the evolution of piano playing across genres, the evolution of the distortion pedal or evolution of the trumpet in east coast music.





THE SWARM

A Kinetic Linear
Sculpture Project

How can kinetic sculptures be used to involve the public audience in an art experience?

How do artists use LINE as a way to represent a 3-Dimensional form?

**8th Grade Artists
&
Ms. Charlie Linnik (Art)**



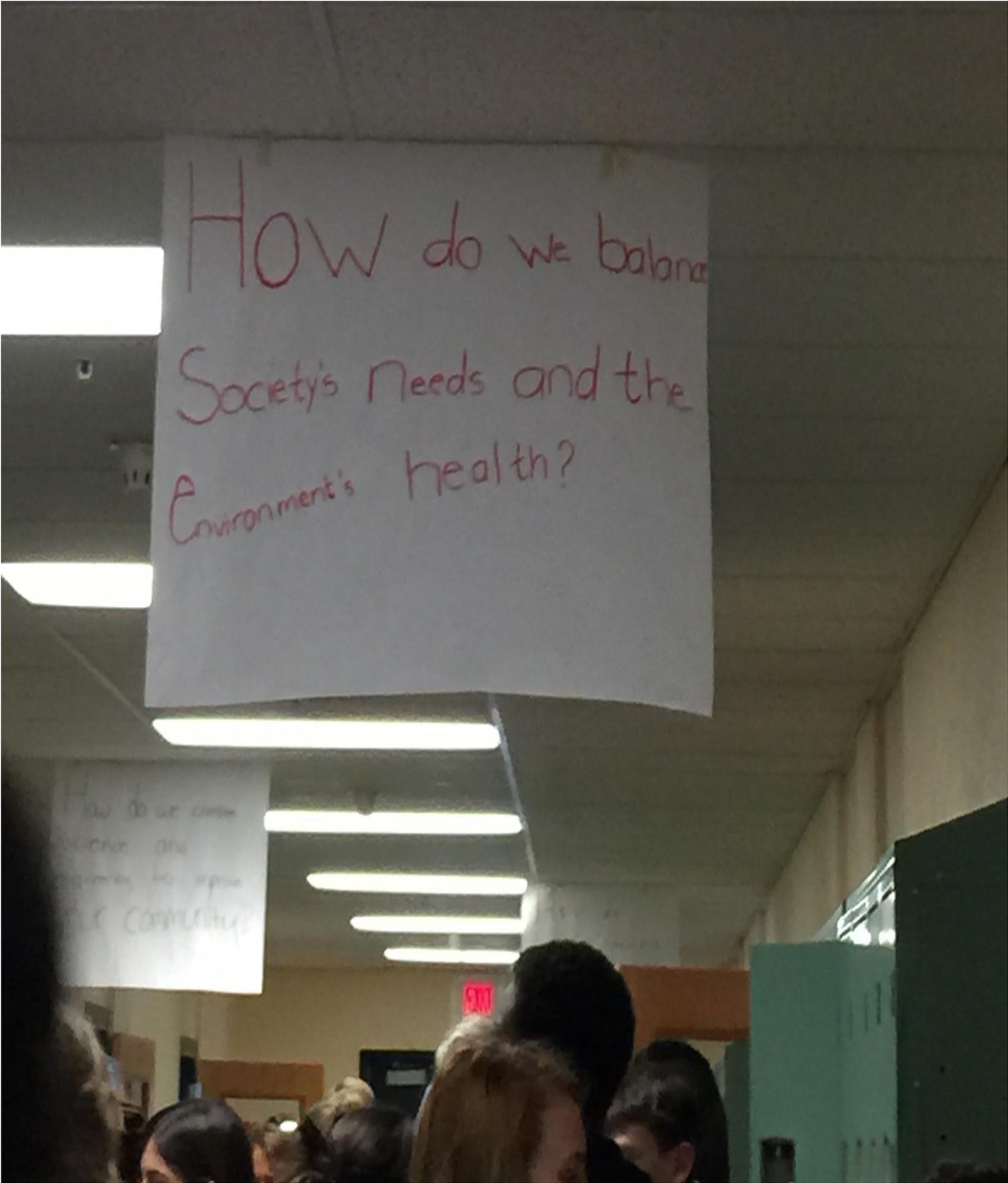
For information about this project,
Scan the QR code



CONSTRUCTION CLUSTER LAB







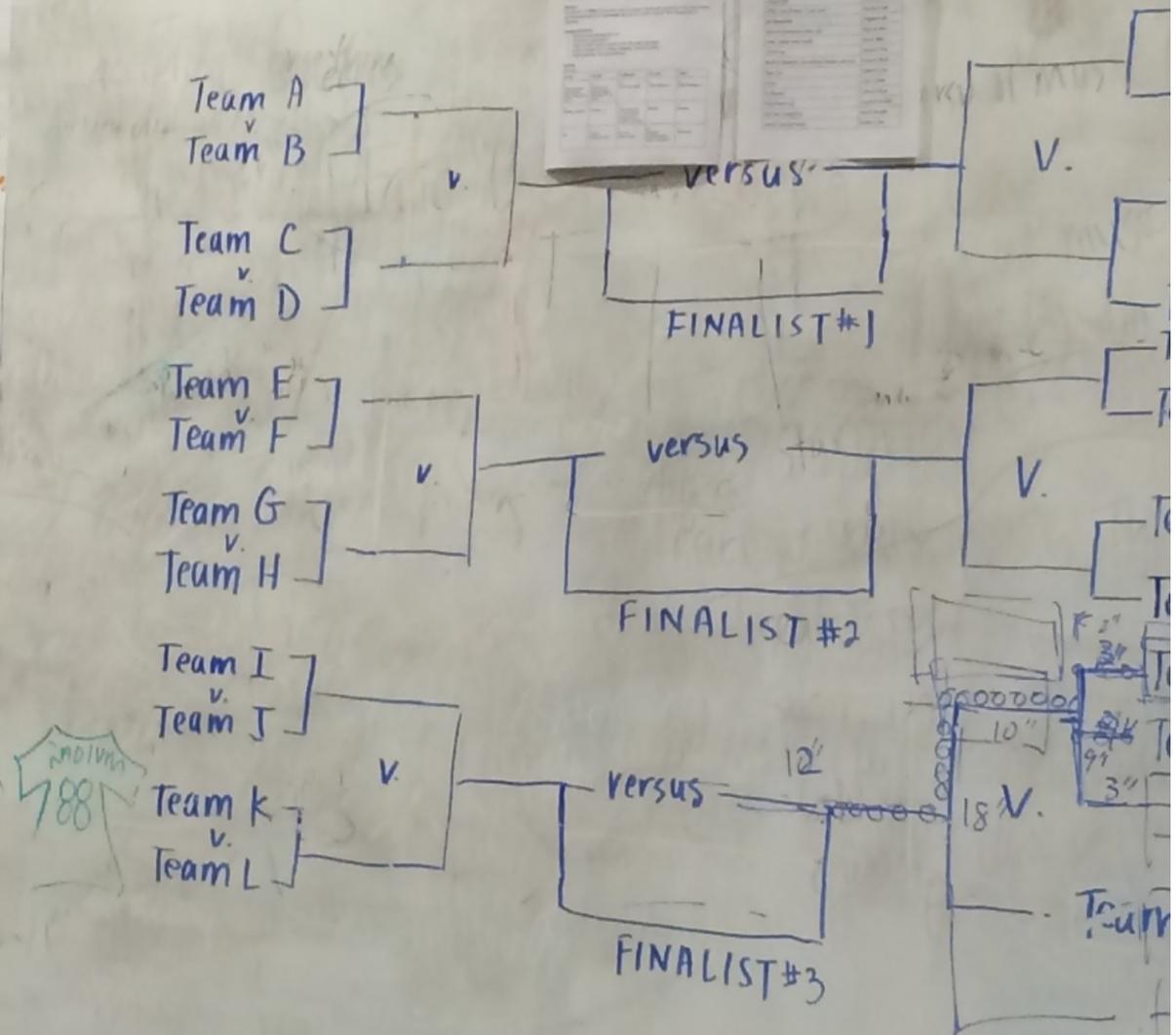
How can the humanities illuminate the sciences? How can we convey the awesomeness

Qualities of a Strong Speech

- 5-7 minutes
- notes only
- The audience must be able to identify:
 - how the product evolved from idea to thing
 - how the product works (not just how to use it)
 - why the product is significant
- compares your product to existing solutions
 - (The status quo is ____, Our product does ____)
- addresses counterarguments to product's significance
- ends with the "new bliss" (potential of product)
- uses elements of the story structure to make it understandable.
- You are the Yoda to your audience. Make them believe that choosing your product is the heroic thing to do.
- Model how to marvel at your product.
- Use analogies/comparisons
- Demonstrate your passion/unique perspective on the product.

Slide Deck:

- bullet points
- consistent font & background
- Helvetica or other non-serif fonts are best
- no fancy transitions or effects
- a large font to display few words / #s
- eyes can fill the page
- images that invoke empathy
- images to illustrate comparisons
- masking to guide audience eyes to one part of image
- should be short (30 sec max)
- no diagrams/charts



Another clear trend across all sites was the significant integration of visual arts into the project based learning experiences.

Every day 4,000 teens try their first cigarette...

Smoking isn't child's play.

Amount of smokers in different age groups

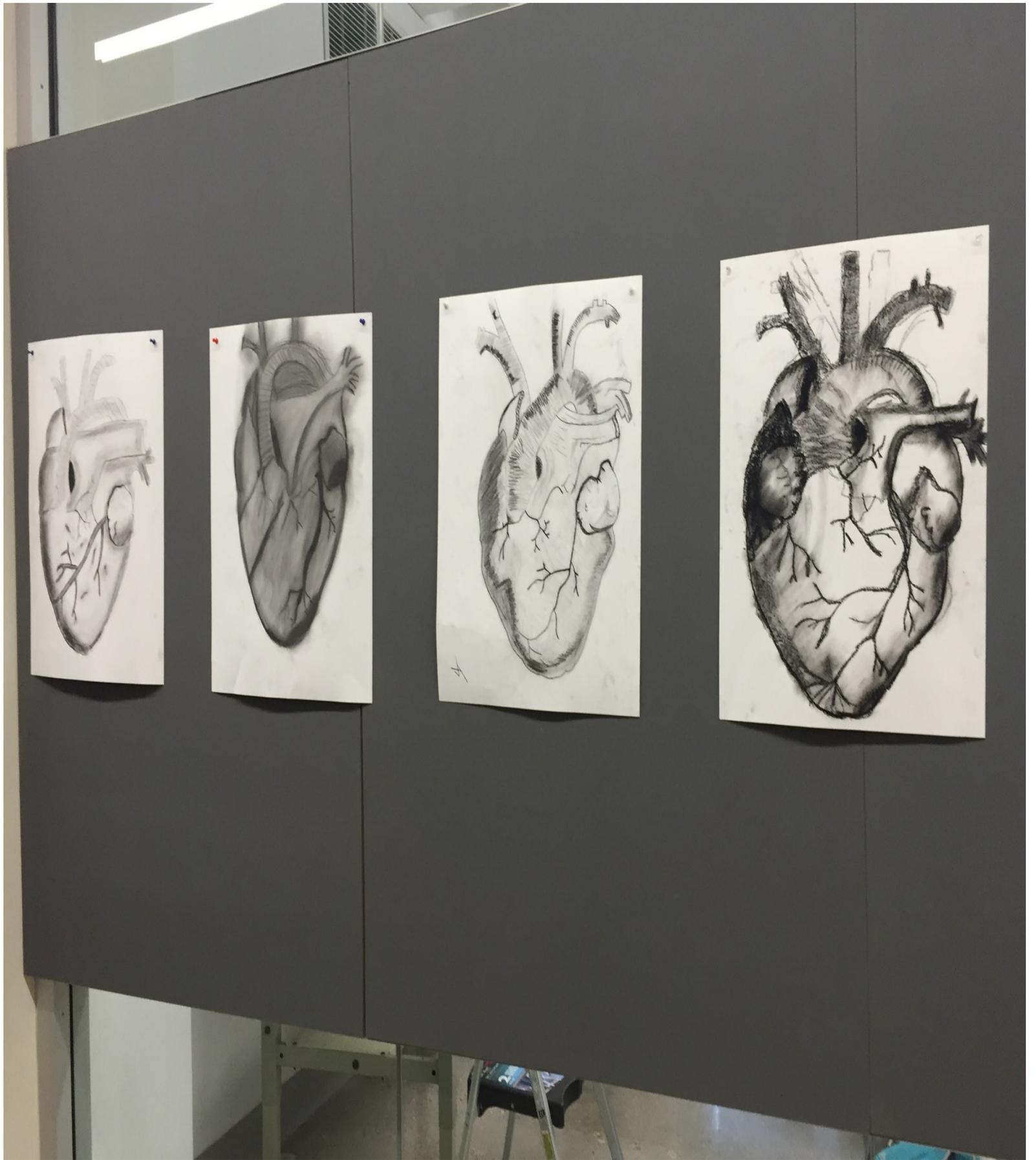
Ages	Percent of smokers
0-24	21
25-34	28
35-44	21
45-54	18
55-64	14
65-74	10
75+	5

My graph displays the number of smokers in different age groups. I opted for a bar graph because it is great at showing a big number compared to a little number, and getting your message across. On the y axis It shows the percentage of smokers opposing to the x axis which shows the age groups of smokers. This graph supports my issue because in the younger age categories the bar is much higher than the older age categories meaning there are many more young and underage smokers than any other age.

Staggering amount of under age smokers

Ages	Percent of smokers
0-24	25
25-34	25
35-44	20
45-54	18
55-64	14.95
65-74	9.4
75+	4.9

This is my manipulated graph. It is scientifically true although it has been manipulated. The non manipulated parts of the graph are the accurate data, and data points. I manipulated the graph by changing the y axis data points in my favor. By putting the lowest data point next to the lowest interval and the highest piece of data next text to the highest interval, the lowest being 9.4 and the highest being 25, I created the illusion that the graph is much taller and stunning then it really is. The reason I manipulated the graph is because I wanted to support the claim that there are many more under age and young smokers than any other age category.



King Middle School and Invasive Species Project

<http://www.theforecaster.net/portland-students-rise-to-the-occasion-against-invasive-species/>

High Tech High School Teacher Project Page

<http://www.jeffrobin.com/projects.html>

Growth Mindset, Empathy, and Risk Taking



If parents want to give their children a gift, the best thing they can do is to teach their children to love challenges, be intrigued by mistakes, enjoy effort, and keep on learning. That way, their children don't have to be slaves of praise. They will have a lifelong way to build and repair their own confidence. - Carol S. Dweck

Across these innovative schools, classrooms were observed that balanced a focus on rigorous academics, social-emotional well-being, and mindset work.

Cultivating growth mindset (the belief that one can get better through effective effort) was taught both explicitly and consistently across the school settings. This mindset was fundamental to student success and school culture.

An emphasis on developing a sense of empathy was another mindset that was integrated into a number of sites as well. The idea of “kind, helpful, and specific” critique, which requires a sense of empathy towards the person receiving feedback, was promoted at King Middle School and High Tech High. Olin Engineering College focused on empathizing with the user prior to beginning the design and construction process.

Finally, positive messaging around risk taking and learning from mistakes was a predominant theme in the classrooms that were visited. Failure was expected, and viewed as an integral part of the learning process.



DOWNLOAD FROM VIMEO

Failure and a Growth Mindset

THE ESSENTIAL QUESTION

- How do we foster a growth mindset?

OTHER DISCUSSION QUESTIONS

- What strikes you as noteworthy about this video?
- How is failure viewed in our school culture? For students? Teachers?
- What is our student mindset around failure?
- When a student is struggling, how do we handle the trade-off between giving them the answer, or letting them continue to struggle?
- What are examples of assignments where students are encouraged to take risks, fail, and iterate until they produce something they're proud of?
- What incentives within our school motivate students to embrace opportunities for failure?
- What micro-innovations could we try that would give students more experience with recovering from failure?

BONUS VIDEO

- Carol Dweck TED Talk

<http://sparks.mltsfilm.org/#/failure-and-growth-mindset/>

EVER TRIED
EVER FAILED
No MATTER
TRY AGAIN
FAIL AGAIN
FAIL **BETTER**

11 Sept 62

Samuel Beckett

What Can I Say To Myself

Instead of...

- I'm not good at this.

- I'm awesome at this.

- I give up.

- This is too hard.

- I can't make this any better.

- I just can't do math.

- I made a mistake.

- She's so smart. I will never be that smart.

- It's good enough.

- Plan A didn't work.

Try thinking...

- What am I missing?

- I'm on the right track.

- I'll use some of the strategies we've learned.

- This may take some time and effort.

- I can always improve, so I'll keep trying.

- I'm going to train my brain in Math.

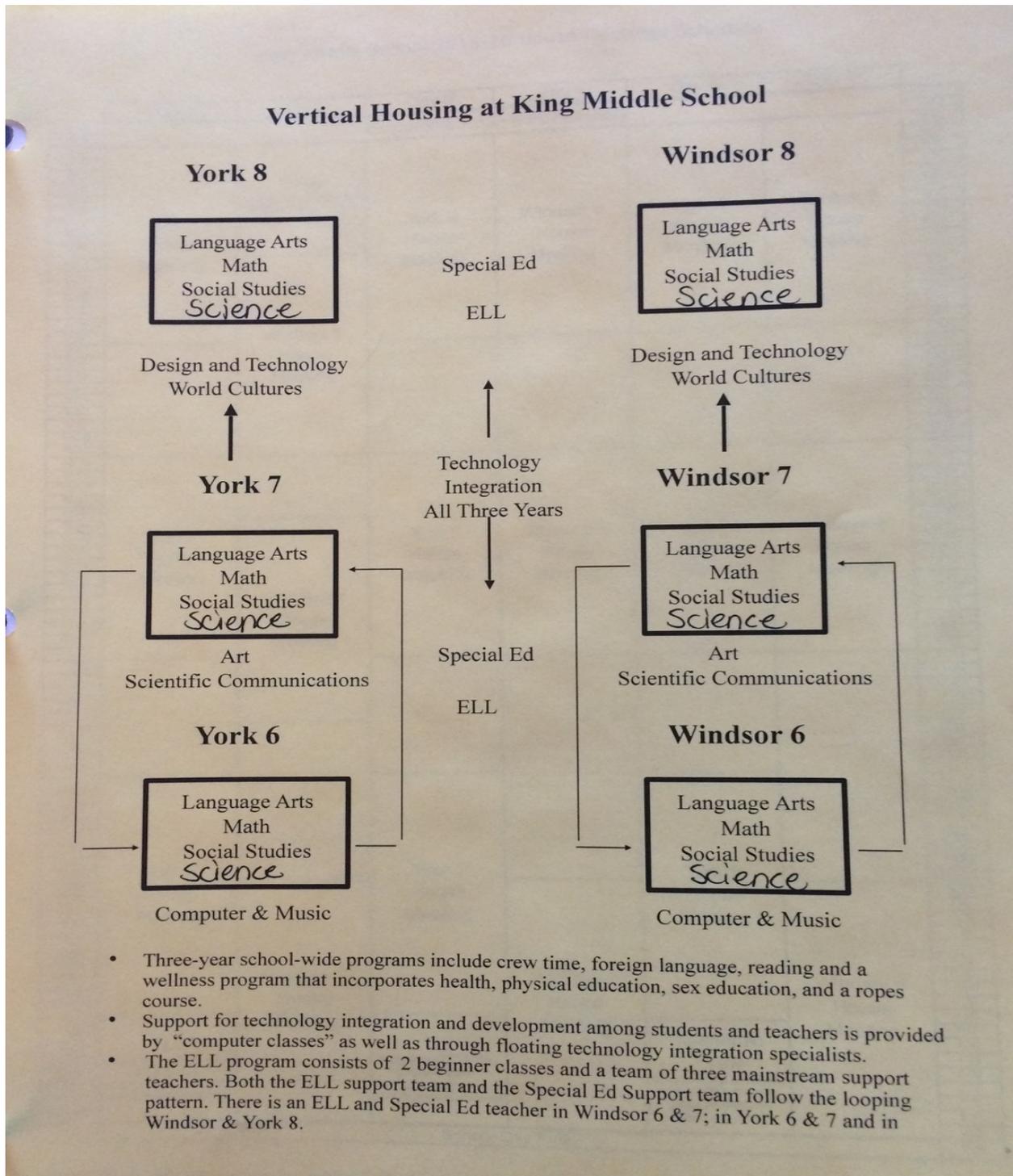
- Mistakes help me to learn better.

- I'm going to figure out how she does it so I can try it!

- Is it really my best work?

- Good thing the alphabet has 25 more letters!

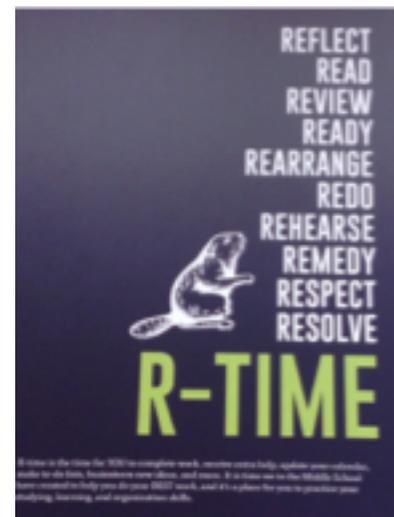
Rethinking School Structures and Making Time for Collaboration



There are very few schools that purposefully try to create lines and connections between different fields. The way most high schools are set up, you're in history class, and then the bell rings; then you go to science class, and then the bell rings.

- Michael Goodwin, Founder of Rivers and Revolution Program

Schools can be constrained by overly complex scheduling that can inadvertently impact the quality of the student experience. At the sites we visited, schedules were designed to support the mission and vision of the school; this meant breaking from traditional educational schedules. A representative from High Tech High shared that the organization operates from a “simple structures lead to complex learning” belief system. Please find below some of the structures that were observed at the different sites that moved away from what is typically seen in most school environments:



- School Within a School Model
- 1 Week Hands On/Project Based, 1 Week Academics
- Experimental classes co-designed by instructors and students in the summer
- Students attending an exploratory class at the end of the day instead of having a different “special” each day
- Physical Education classes held after school with students having the ability to chose from a variety of options - creating additional room in the school day schedule for project based work

- Teachers beginning the school year a week to two weeks prior to students and using this time to collaborate.

Reflections



This section of the report offers the collective wisdom of the group around considerations for the practices and programs of the Shrewsbury Public School district. These insights are provided in service of supporting our district in its on-going efforts to provide all of its students a world class education.

Common Vision

- There is a need to broaden the conversation with Shrewsbury educators beyond the Innovation in Learning Study Group.
- The Innovation in Learning Study Group would also be strengthened by inviting parents and community members into the conversation. This group could be involved in the formation of a cohesive vision for the community.
- Shrewsbury is a district that consistently performs above state averages for standardized testing scores, graduation rates, college attendance rates, and AP test scores and prides itself on these accomplishments. Being mindful of this, raising the question of change can be challenging, with the understandable perspective of many being, "If it isn't broken, don't fix it". Revisiting the question of what a successful graduate knows and is able to do, along with exploring our how our current graduates are faring in the college environment, may be helpful starting points for this discussion.

Sense of Community

- Explore providing dedicated resources, primarily in the form of personnel, that would facilitate connections to the community. The individual/s in this role could work to create authentic partnerships that would facilitate bringing community expertise and real world problems to be solved into our classrooms. Partnerships could also be used to assist in providing our high school students opportunities for internships and on-site work experiences. Finally, these connections could provide a professional level audience for student public exhibition of work.
- Study the issue of transportation and its connection to students' involvement in community based projects. Paying for buses on an ad hoc basis to bring students out in the field is not a financially viable model. Is there a systemic approach to lessening the transportation obstacles to getting students involved in real world/ authentic projects?
- Explore the implementation of an advisory model at the middle level and high school in order to build a personal connection between a staff member and a small group of students.

Section 3

Inclusion and Equity

- Explore areas in the district where students are tracked into different levels, for example 8th grade honors math, to assess if these structures continue to be in the best interest of our collective student body.
- Consider the impact that leveled classes have at SHS. One issue connected to this is that high performing students are often unwilling to take any class that is not available for Honors credit. This creates a situation in which these students may choose not to try an elective out of concern that a non-Honors class will negatively impact their GPA.
- Creating project based learning experiences for students who are in substantially separate classrooms has its unique challenges. Consider forming a team that is dedicated to exploring how to provide these students real world, authentic learning experiences.
- There is increasing evidence that colleges are looking for unique applicants rather than the applicant that can take as many APs as possible, but this shift in mindset will require a great deal of processing and change management at the high school level.

- Teachers are used to focusing on a guaranteed curriculum across classrooms/teams. What parts of the curriculum does every classroom need to cover? How will parents feel if there is one team that does one project and another team that does something completely different? Studying these questions through an equity lens should be considered.

- Understanding that family knowledge and experience with higher education can impact student success in college, how might the district support first generation college students?

Project Based Learning

- Project Based Learning was the central instructional strategy used at each site visited. The student work and mindsets that resulted from engaging in this type of learning mirrored what is required of knowledge economy workers. The district should strongly consider integrating the adoption of the project based learning approach into the next strategic planning process. Questions of structures and resources should be explored and problem solved as part of cohesive plan.
- A key take away was the importance of emphasizing depth of the content over breadth. By adjusting this, educators are able to free students to develop research, problem solving, project management, and communication skills that are more generalizable. In order to achieve this, “power standards” need be identified to articulate the most important content students must know across all curriculum areas.
- Explore a partnership with EL (Expeditionary Learning) to provide professional development and guidance in transitioning to a more project based learning approach across the district.

Growth Mindset, Empathy, and Risk Taking

- Across all sites visited growth mindset, empathy, and risk taking were elevated to the same level of importance as academics. Where these competencies fall in terms of the Shrewsbury Public Schools may be worthy of exploration.
- Consider on-going dialogue with Shrewsbury parents and the community that strong test scores do not necessarily relate to college readiness. Is there a shift needed from seeing college as the “end game” to being more focused on career and citizenship?

Rethinking School Structures and Making Time for Collaboration

There are many various ways that the district may want to consider the efficacy of existing learning structures and collaboration time. The following thoughts are offered as starting points for these conversations.

- Consider multi-age classes or multi-age peer support at the elementary/middle grade.
- Consider simplifying the program of studies at SHS and narrow the options of allied arts (exploratory) classes at the middle level to only two or three offerings a year.
- Is there a way to have Allied Arts more integrated into academic teams? Could Allied Arts be the thread that ties together the work that students do in their core classes at the middle level?
- Revisit school-wide schedules to identify opportunities for increasing teacher collaboration, extending learning blocks, and providing for the integration of allied arts into the general education classroom the general setting.
- Explore developing an internship program that is integrated into the overall student program and not an optional extra.

- Explore ways that students at SHS can take courses at local community colleges as part of their school day. This model at HTH allowed students to challenge themselves, be better prepared for college, and to accumulate college credit.
- Explore reorganizing the SHS schedule to include more teacher collaboration time into the regular school day.

