



INCREASING RIGOR AND CREATING 21st CENTURY LEARNERS

8th Grade STEAM Presentation
Leatherstocking Conference of Technology
Showcase
October 28, 2014

STEAM Education

An Integrated Approach to Teaching

S- Physical and Social **SCIENCE**

T- Incorporation of **TECHNOLOGY**

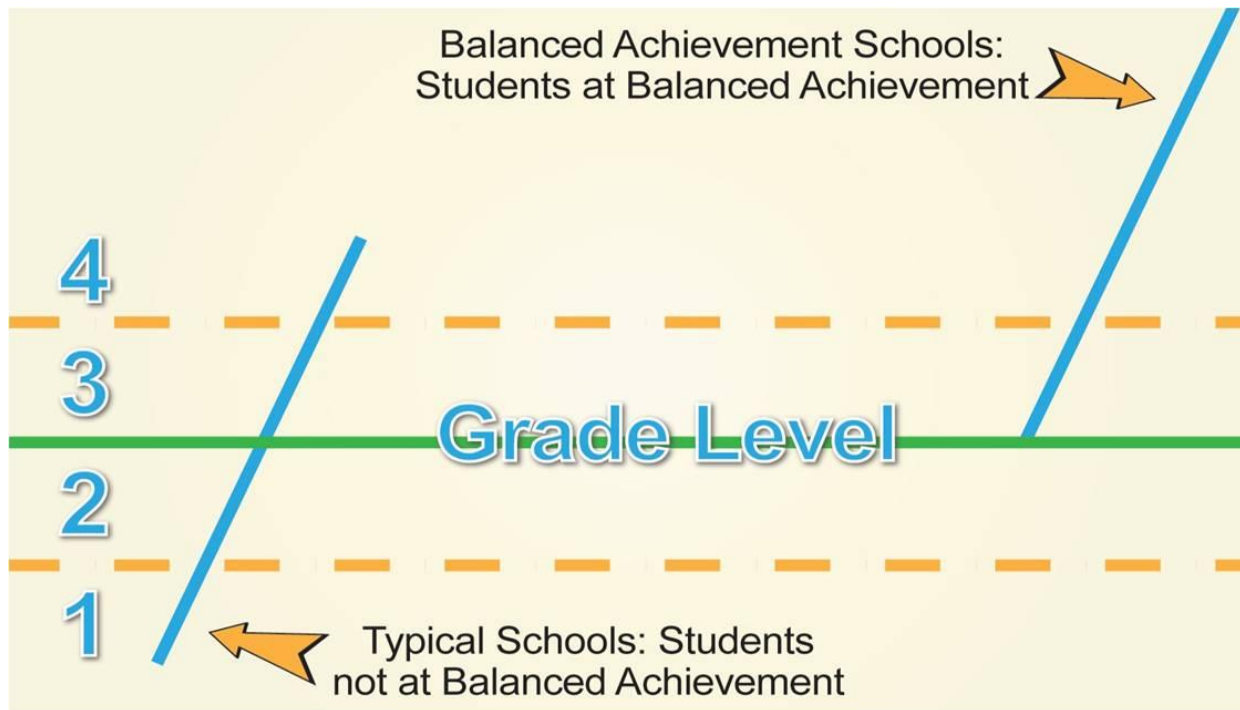
E- Principles of **ENGINEERING** and Design

A- English Language and Fine **ARTS**

M- Application of **MATHEMATICS**

Why STEAM in our School?

- The Common Core State Standards and the Next Generation Science Standards lend themselves to this collaborative, problem-based model of education. Students will become critical thinkers and problem solvers with the strong ability to communicate in a public forum.



Why STEAM in our School?

- Student and teacher accountability will increase as **learning experiences become more rigorous, meaningful, and applicable.**
- This model aids in **character development and leadership** skills; highlighting student strengths not generally acknowledged in a traditional classroom.
- Students will be active and engaged in every lesson, which will increase motivation. They will learn to take **responsibility** and gain the **perseverance** necessary for their learning in high school, college and career.

Shifts in the ELA Standards

Shifts in ELA/Literacy		
Shift 1	Balancing Informational & Literary Text	Students read a true balance of informational and literary texts.
Shift 2	Knowledge in the Disciplines	Students build knowledge about the world (domains/ content areas) through TEXT rather than the teacher or activities
Shift 3	Staircase of Complexity	Students read the central, grade appropriate text around which instruction is centered. Teachers are patient, create more time and space and support in the curriculum for close reading.
Shift 4	Text-based Answers	Students engage in rich and rigorous evidence based conversations about text.
Shift 5	Writing from Sources	Writing emphasizes use of evidence from sources to inform or make an argument.
Shift 6	Academic Vocabulary	Students constantly build the transferable vocabulary they need to access grade level complex texts. This can be done effectively by spiraling like content in increasingly complex texts.

Shifts in the Math Standards

Shifts in Mathematics

Shift 1	Focus	Teachers significantly narrow and deepen the scope of how time and energy is spent in the math classroom. They do so in order to focus deeply on only the concepts that are prioritized in the standards.
Shift 2	Coherence	Principals and teachers carefully connect the learning within and across grades so that students can build new understanding onto foundations built in previous years.
Shift 3	Fluency	Students are expected to have speed and accuracy with simple calculations; teachers structure class time and/or homework time for students to memorize, through repetition, core functions.
Shift 4	Deep Understanding	Students deeply understand and can operate easily within a math concept before moving on. They learn more than the trick to get the answer right. They learn the math.
Shift 5	Application	Students are expected to use math and choose the appropriate concept for application even when they are not prompted to do so.
Shift 6	Dual Intensity	Students are practicing and understanding. There is more than a balance between these two things in the classroom – both are occurring with intensity.

Why STEAM for College and Career Readiness?

- A disconnect exists between the knowledge and skills students need for success in an increasingly global workplace and what most students experience in school.
- 90% of high school teachers believe their students are prepared for college; 26% of college professors agree students are ready. (engageNY).
- Siemens has 3,000 unfilled jobs in the US because people are not qualified.

STEM SKILLS ARE IN DEMAND

In New York, STEM skills have stayed in demand even through the economic downturn.

STEM:
1.7 jobs for every
1 unemployed person



Non-STEM:
3.4 unemployed
people for every **1 job**



Impact to Current Program

- **What IS NOT Changing**

- District Vision, Goals and Initiatives
- Implementation of Curriculum and State Standards
- Common Core Standards
- APPR
- Benchmarks and Common Core Assessments

- **Impact**

- Increased Efficiency
- Inquiry Driven, Student Led Lessons
- Project Based Learning
- Content and Skills Carried by Students Between Disciplines
- Increased Self-Motivation
- Development of Life Long Learning Skills
- Development of soft skills
- Additional Support Throughout the Curriculum by Co-teaching and Collaboration

What will STEAM look like?

- Flexible scheduling
 - Traditional, Block, Large Group
- Flexible use of space
 - Morning Meeting
- Flexible grouping
 - Enrichment and Support: Options based on activity, ability, and student objectives
- Common expectations
 - Behavior, homework policy, writing

Traditional Scheduling

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1	Band	P.E.	Band	P.E.	Band
2	Algebra/SH	Algebra/SH	Algebra/SH	Algebra/SH	Algebra/SH
3	Language	Language	Language	Language	Language
4	ELA	ELA	ELA	ELA	ELA
5	S.S.	S.S.	S.S.	S.S.	S.S.
6	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
7	Sci.	Sci.	Sci.	Sci.	Sci.
8	Math	Math	Math	Math	Math
9	Technology	Technology	Technology	Technology	Technology

STEAM Schedule
Monday, October 20

Period	Morgan	Hast	Smith	Kupiec	Misner
4	Group D	Group B	Co-Teach	Group C	Group A
5	Co-teach	Group C	Group A	Group D	Group B
6	LUNCH				
12:06 – 12:42	Group A	Group D	Group B	Co-Teach	Group C
12:45– 1:21	Group B	Co-Teach	Group C	Group A	Group D
1:24 – 2:00	Group C	Group A	Group D	Group B	Co-Teach
2:03 - Dismissal	AFTERNOON MEETING – LIBRARY ALL GROUPS				

STEAM Schedule

Tuesday, October 21

Period	Morgan	Hast	Smith	Kupiec	Misner
4	Group C	Co-Teach	Group A	Group B	Group D
5	Group D	Group A	Group B	Group C	Co-Teach
6	LUNCH				
7	Co-Teach	Group B	Group C	Group D	Group A
8	Group A	Group C	Group D	Co-Teach	Group B
9	Group B	Group D	Co-Teach	Group A	Group C

STEAM Schedule

Wednesday, October 22

Period	Morgan	Hast	Smith	Kupiec	Misner
4	LARGE GROUP ACTIVITY – LIBRARY ALL GROUPS				
5	LUNCH				
6	FINNDALE FARMS FIELD TRIP – When you are dismissed from lunch, get your coat, a notebook and a pencil from your locker. Report to: Group A – Morgan Group B – Smith Group C – Hast Group D - Misner				
7					
8					
9					

STEAM Schedule
Thursday, October 23

Period	Morgan	Hast	Smith	Kupiec	Misner
4	Group B	Co-Teach	Group C	Group D	Group A
5		Group C	Group D	Co-Teach	
6	LUNCH				
7	Group C	Group D	Group B	Group A	Co-Teach
8		Group A	Co-Teach	Group B	Group D
9	Co-Teach	Group B	Group A	Group C	

STEAM Schedule
Friday, October 24

Period	Morgan	Hast	Smith	Kupiec	Misner
4	Group D	Co-Teach	Group A	Group B	Group C
5		Group A	Group B	Co-Teach	
6	LUNCH				
7	Group A	Group B	Group C	Group D	Co-Teach
8		Group D	Co-Teach	Group C	Group B
9	Co-Teach	Group C	Group D	Group A	

Project Based Learning and Problem Solving

- Inquiry and Project Based Learning
- Partnerships with Area Businesses and Higher Education Institutions
 - Siemens, Inc.
 - Mr. Steve Heaslip and Mr. Charles Cohen
 - King + King Architects
 - Mr. Jim King
 - SUNY Institute of Technology
 - Ms. Elizabeth Rossi
 - Griffiss Institute
 - Ms. Regan Johnson
 - Other Local Businesses - Challenges
 - Restaurants, logo design

Cross Curriculum Activities

- Science / Math / Technology
 - Sledding Lab
 - Newton's Laws of Motion
 - Metric Measurement
 - Rate of change; graphing speed and acceleration
 - Sled Design
- Social Studies / ELA
 - Reconstruction
 - Harlem Renaissance
 - WWII (*The Diary of Anne Frank*)
 - Take a Stand Research Paper
- Science / ELA
 - Technical Lab writing
 - Expository Writing

Multiple Curriculum Projects

What's on Your Lunch Tray?

- Science
 - Review of Life Science
 - Experimental Design
 - Matter/Chemistry
- Social Studies
 - Westward Expansion
 - Economics and Government
- ELA
 - *The Omnivore's Dilemma*
 - Reading/Writing
 - Research
- Math
 - Rates, ratios, graphing, and proportions
 - Scientific Notation
- Technology
 - Design Process
 - Principles of Engineering
 - Hydroponics Project
- LOTE
 - Foods
 - Customs

Multiple Curriculum Projects

Alternate Energy Source Project

- Research paper on alternative energy sources (ELA / Science)
- Complete green energy stock project and consider the role of energy in US economy and policies (Social Studies / Math / Science/ ELA)
- Analyze data on availability / cost return of the alternative energy resources in comparison to fossil fuel costs (Math / Science)
- Deliver a presentation to the HP Board of Education suggesting possible alternative energy investment projects (ELA / Science)
- Construct a model of the alternative energy proposal using an engineering design process (Engineering / Technology / Math / Science)

Differentiated Alternate Energy Source Project

Subject	INTERVENTION	ON LEVEL	ENRICHMENT
ELA	Research Alternative Energy Sources given credible sources to use and format for writing (modified rubric)	Research Alternative Energy Sources- write research report	Research Alternative Energy Sources- write a research report Research specific companies and create comparisons between companies- present to classmates
Social Studies	Essential Information on the influence of energy sources on US history and foreign policy. Study contemporary movements for alternate energy sources.	Examine new energy sources throughout US history and the influence of oil dependence on foreign policy. Study contemporary movements for alternate energy sources.	Explore energy use throughout US history and the influence of oil dependence on foreign policy. Study contemporary movements for alternate energy sources and analyze how current federal, NY state and local policies may impact community and alternate energy project recommendations.
Math	Track stock market for a given green company- monitor fluctuation using basic inequalities	Choose a green company and track stock market for selected company- monitor fluctuation through graphing	Choose green company and track stock market for selected company- monitor fluctuation and analyze information to determine effectiveness and cost return

Special Ed. Students

Special Ed. Teacher follows the supervision group for the core subjects

Time in AM for Resource Room

Co-teach time – plan time

Data Collection

- Action Grant Research
- Surveyed students beginning and end of year
- Surveyed parents

Results - Sustainable Energy Challenge

Student Comments/Evaluations

What specifically did you enjoy about this challenge? (86 total comments)

- Very interested in the topic studied 17
- Choosing groups/partners 15
- Making the presentation 14
- Having many choices for the presentation (other than PowerPoint) 12
- Building the visual aid (demo or model) 11
- Having time limits 5
- Choosing my own topic 5
- Viewing the other students' presentations 5
- Using out-of-class time to visit places about my topic 2

Results - Sustainable Energy Challenge

**What suggestions you have to improve this challenge?
(45 total comments)**

- More time 30
- Do not let students pick their own partners 7
- Add a community service aspect 4
- Make the research groups larger 1
- Eliminate specific jobs because everyone worked equally 1
- Allow students to fire group members who do not participate 1
- Take a field trip 1

Results - Lunch Menu Challenge

What did you enjoy the most about the challenge? Response Total 84

- Experiencing the job 17
- Finding/Creating meals 15
- Working as a group 15
- Presenting the meals 9
- Making the presentation 6
- Working with new people 5
- Researching 4
- Creativity of the project 4
- Creating a Bill 2
- Hearing the presentations 6
- Guest speakers 1

What suggestions do you have to improve the challenge? Response Total 73

- Time management
- (giving more time, giving deadlines) 31
- Needed more direction in instruction 14
- Ability to choose groups 8
- Needed accountability for jobs 8
- More websites to help 4
- Legislators work more with groups 3
- More guests (Sugg. Legislator) 1
- Less time between the work times 1
- More time with group 1
- Teachers choose group 1
- Laws not able to be voted on to pass 1

Important To Us

- Common plan time
- Flexible Scheduling
- Flexible Grouping
- Co-teaching

Getting Started

- Visited other STEAM programs
- Discuss curriculum – find common ground
- Where are you teaching the same skills/concepts?
- Determine when and how these will be taught
- Training TIES and Solution Tree
- Keep good records – blog

MAKE IT YOUR
OWN

Website/Email

- <http://hpschools.schoolwires.net/Page/756>
- shast@hpschools.org



“Strategies That Engage All Minds”

-Jim King of King + King Architects

Questions and Comments

Thank you for attending today!

Potential Constraints and Solutions

- Accelerated Courses

- Integrated Algebra
- Living Environment

