THE I^3 INITIATIVE

PHENIX CITY PUBLIC SCHOOLS

MAY 6, 2015

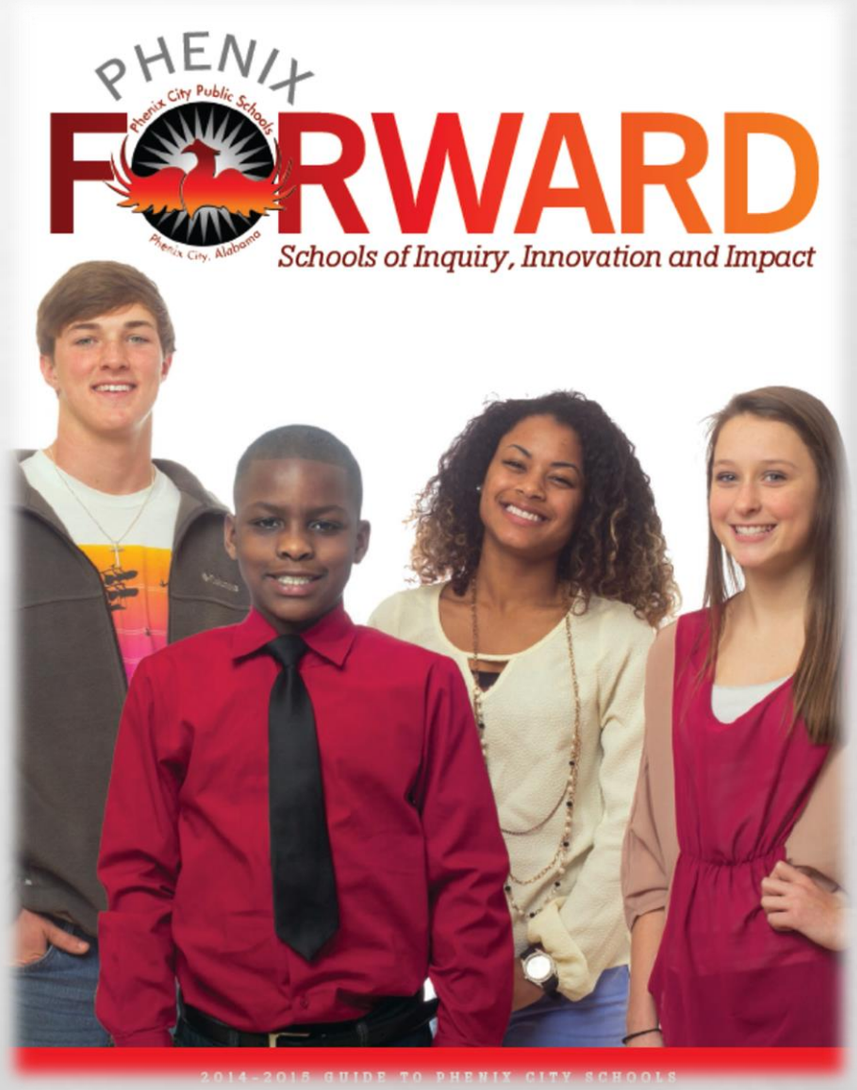
STEMing our way into a brighter future.

SCIENCE, TECHNOLOGY ENGINEERING & MATH

NEED, BENEFITS, PREPARATION, COURSE OF ACTION

- Gage Dollar- Class of 2017
- Matthew Dixon- Class of 2022
- Josylnn Dill- Class of 2018
- Caroline Williams- Class of 2019

ARE THEY READY?
ARE WE READY?



This year's Kindergarten Class will enter the workforce in the year 2027 and will graduate from college in 2031.

WHY STEM?

THE DIVIDED STATES OF STEM EDUCATION

Technology touches nearly every aspect of our lives, but STEM education in America is all over the map. Learn which states are leading the charge to give our future innovators the tools they need to succeed, and which states need to invest the most in their STEM students.

IT'S TIME TO INVEST IN STEM EDUCATION

93% of parents of K-12 students believe STEM education should be a priority

Yet less than **½ (49%)** believe the U.S. actually prioritizes STEM education

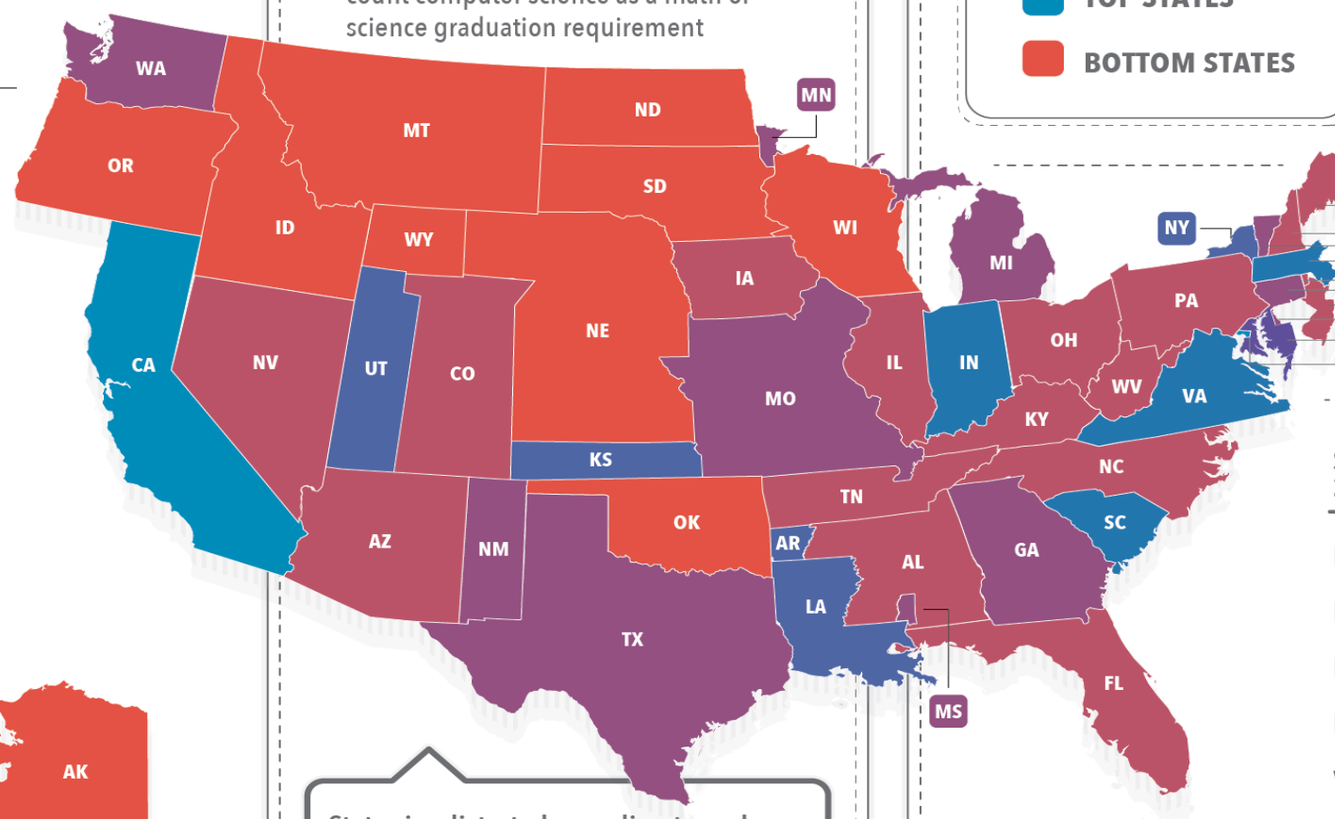
Only **1** in **5** STEM college students believe K-12 education prepared them extremely well for relevant college coursework

10%

STEM students are **10%** more likely to have "A" GPAs than non-STEM students

WE CAN DO BETTER

Just **23** states and the District of Columbia count computer science as a math or science graduation requirement



State size distorted according to each state's CSTA Computer Science Standards school adoption rate for K-8 (3 – 100%)

STATE SCIENCE STANDARDS GRADES, 2012

A	A-	B+	B	C	D	F

K-8 COMPUTER SCIENCE REQUIREMENT SCHOOL ADOPTION RATES

The U.S. has a **69%** school adoption rate for K-8 Computer Science Teachers Association (CSTA) standards

TOP STATES

BOTTOM STATES

K-8 ADOPTION RATE

FL	100%	DC	3%
LA	100%	MS	3%
MA	100%	MN	6%
ID	100%	CO	11%
VA	100%	HI	11%

SPEND PER STUDENT INCREASE 2006 -2011

FL	18.20%	DC	54%
LA	28.10%	MS	7.53%
MA	15.61%	MN	19.95%
ID	4.46%	CO	10.21%
VA	8.58%	HI	18.44%

We have a responsibility to teach and inspire tomorrow's inventors and innovators – today.

SOURCES:
http://edex.s3-us-west-2.amazonaws.com/publication/pdfs/2012-State-of-State-Science-Standards-FINAL_2.pdf
https://www.stemconnector.org/sites/default/files/store/STEM-Students-STEM-Jobs-Executive-Summary.pdf
http://www.bloomberg.com/visual-data/best-and-worst/biggest-increases-in-school-spending-states
http://www.microsoft.com/en-us/news/press/2011/sep11/09-07msstemsurveypr.aspx
http://runningonempty.acm.org/roemap.html
http://www.ncwit.org/share/3435

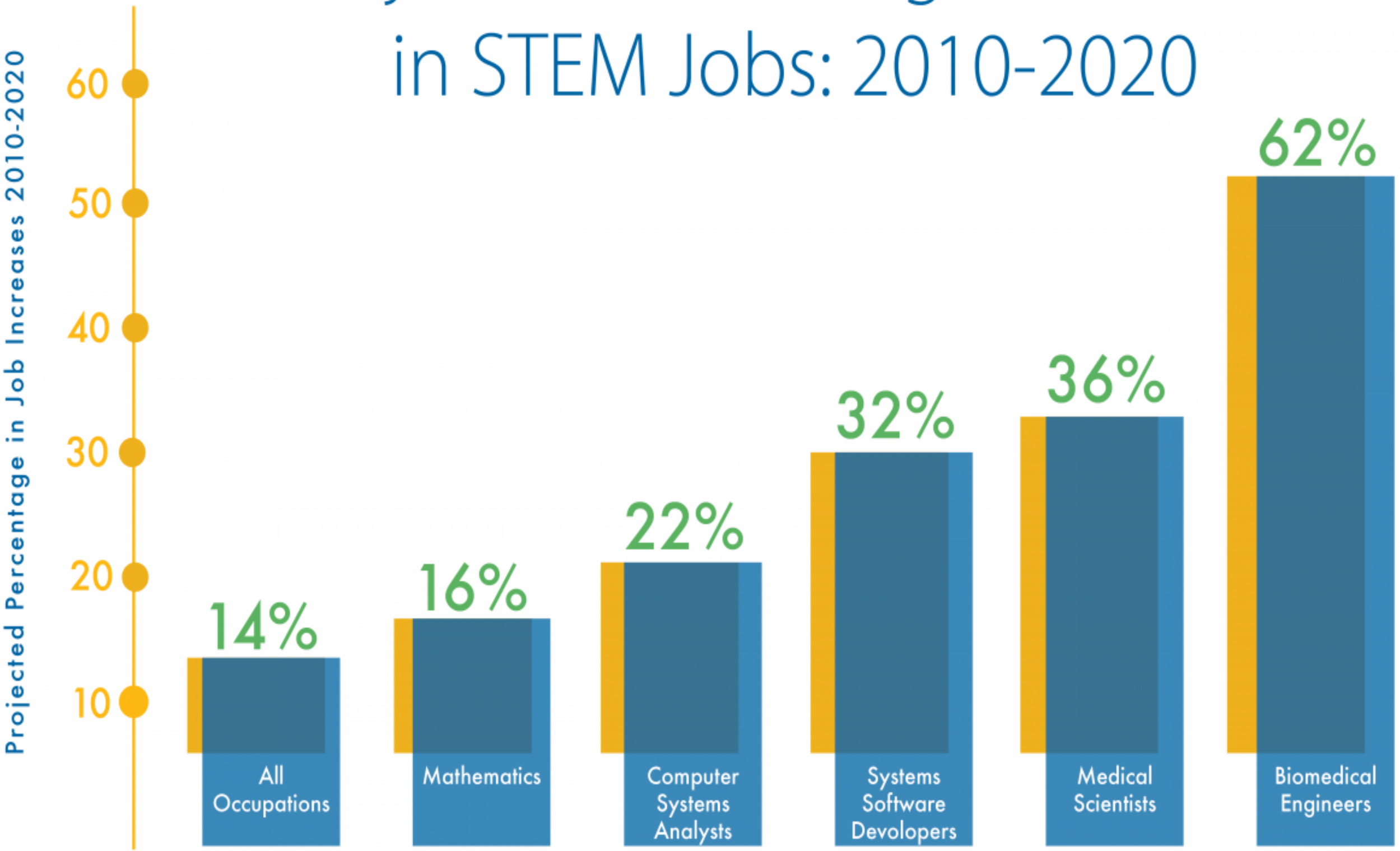
SPRK
schools parents robots kids
Learn more at sphe.ro/sprk

WHY STEM?

- STEM education creates critical thinkers, increases science literacy, and enables the next generation of innovators. Innovation leads to new products and processes that sustain our economy. This innovation and science literacy depends on a solid knowledge base in the STEM areas.
  - To expand the hands-on, minds-on, instructional practices to grades K-12.
  - To foster greater student engagement via a take-home electronic device in grade 6-12.
  - To create an elementary school environment that affords 1:1 ratio of students to electronic device.
  - To create curricula pathways from elementary school, to middle school, to high school, to careers and/or college.
  - To increase student achievement
  - To improve graduation rate, decrease dropout rate
  - To decrease the percent of remedial college entrance courses
  - To increase scholarship opportunities

Job competition is global.

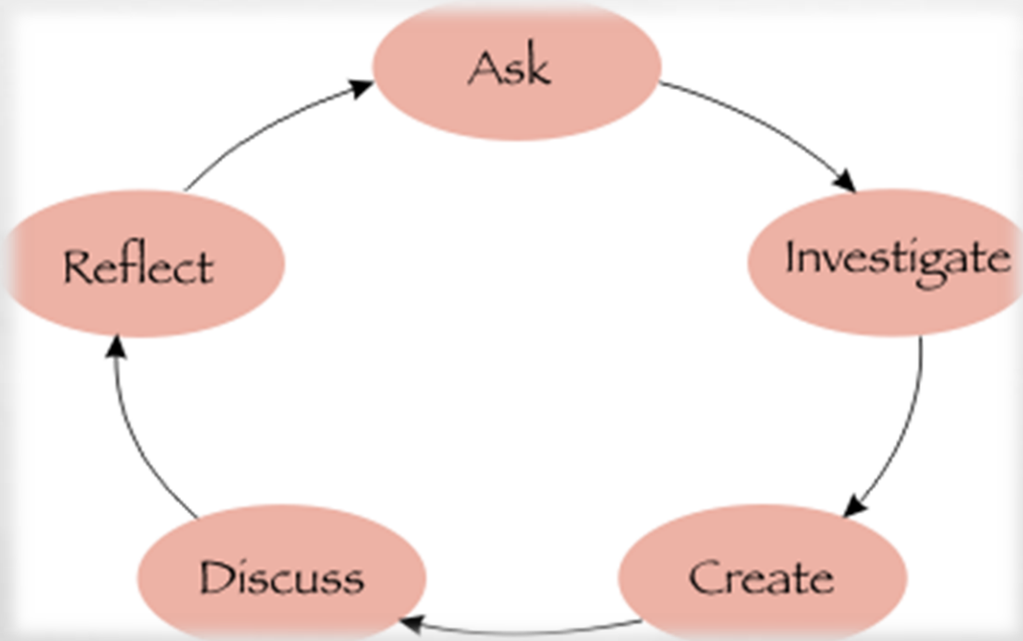
Projected Percentage Increases in STEM Jobs: 2010-2020



http://www.ed.gov/stem

PCS'S RESPONSE-
i^3 LEARNING PROJECT

- (Inquiry)(Innovation)(Impact) $= i^3$
  - Inquiry: based pedagogy
  - Innovation: technology
  - Impact: school work that matters



Schools of Inquiry, Innovation and Impact

ADDING THE "A" TO STE "A" M

- **forScore**–Digital Sheet Music Interface/Reader---Apple Store
  - App: $9.99 (per student/iPad cost)
  - Would replace/eliminate any and all need daily need for on paper printed music, binders, textbook and even writing utensils. Also contains a tuner, metronome and music editing software to meet or exceed any needs of a musician on any level.
  - YouTube video demonstration/review of forScore: https://www.youtube.com/watch?v=ZQTSsQIkNvs
- **Smartmusic**– app/subscription service designed as a digital practice tool --- $32.00
  - Subscription Fee (per student/iPad cost) Actual App is downloaded for free from iTunes.
  - Smartmusic is software used by music educators around the world to enhance their programs and provides a way to dramatically improve their students' skills. Student practice is focused because they receive immediate feedback while listening to their performance and seeing the correct and incorrect rhythms and pitches onscreen. It also allows the teacher to provide students with the individual instruction and customized feedback needed to get better faster.
  - Demonstration Videos and information can be found at: http://www.smartmusic.com/products/

Engaging students' strengths using art activities increases motivation and the probability of STEM success.

STEM PROJECT

PHASE I - FALL 2015

- iPads for every student, grades 6-8
- *MasteryConnect* for all students grades K-8
- *Investigations* math program, grades K-5
- *Carnegie Learning* math program, grades 6-8
- 6th Grade *STEM Academy*
- Engineering Lab piloted at SGS

PHASE II - FALL 2016

- 6th - 7th Grade STEM Labs
  - PCIS STEM Building
    - Coding Lab
    - Engineering Lab
    - Virtual Learning Lab
    - Digital Media Lab
  - SGS STEM Rooms/Labs
    - Coding & Digital Media Lab
    - Robotics Lab
    - Engineering Lab
- 6th And 7th Grade *STEM Academy*
- Wireless Access In every classroom
- 1:1 iPads for all students grades 6-12
- 1:1 ratio of electronic devices in grades K-5

UNPARALLED EDUCATIONAL OPPORTUNITY

Combination of : (1.) state-of-the art facility, (2.) Challenging curriculum, and (3.) Student management system, (4.) Innovative Technologies (i.e. 1:1)

MIDDLE SCHOOL STEM CURRICULUM

6th Grade	7th Grade	8th Grade
Digital Media I	Digital Media II	Advanced Coding & Digital Design
Engineering & Design I (White Box)	Engineering & Design II	Engineering & Design III
Coding 101	Coding 102	Robotics
3D Virtual Learning A	3D Virtual Learning B	

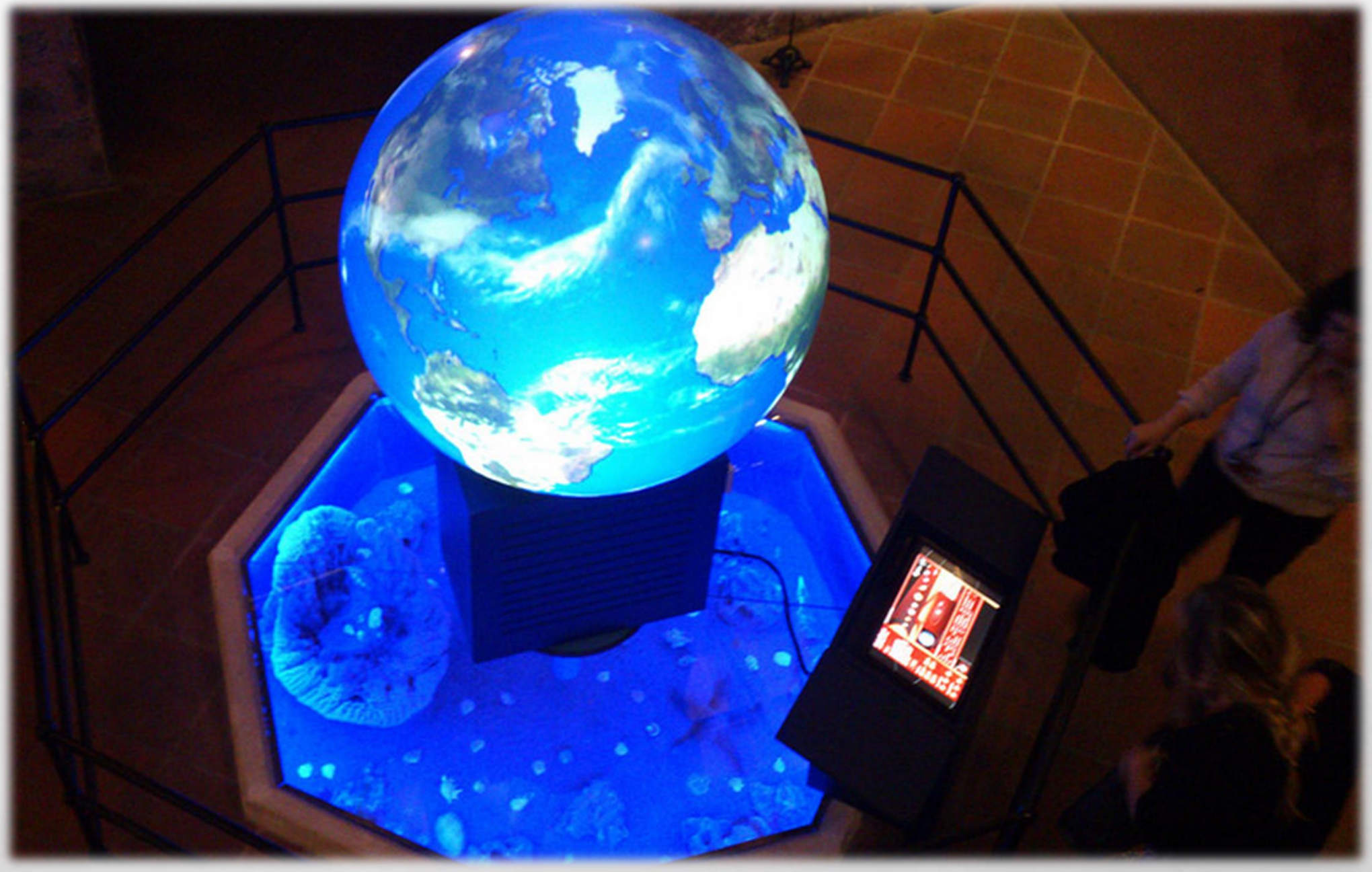
Each 6th and 7th grade course is 9 weeks in length. Every student will participate. Each 8th grade course is 12 weeks in length.

STEM

Science • Technology • Engineering • Math

Thank you STEM Committee for your guidance.

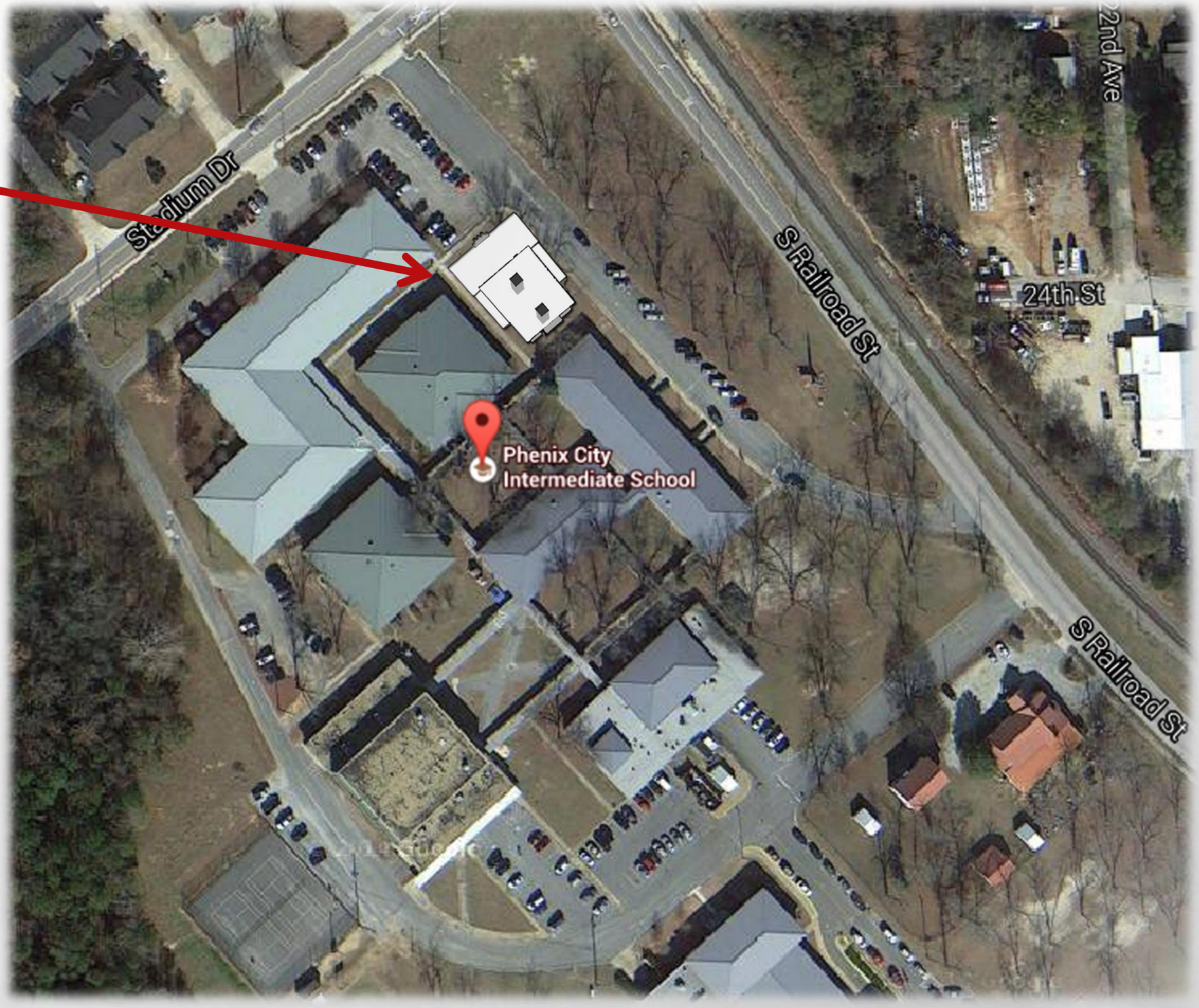
PHENIX CITY SCHOOLS - STEM LABS



Phenix City Intermediate School (grades 6-7)

LOCATION

- On the Quad adjacent to the office building (100 building) and at the corner of the 400 Building

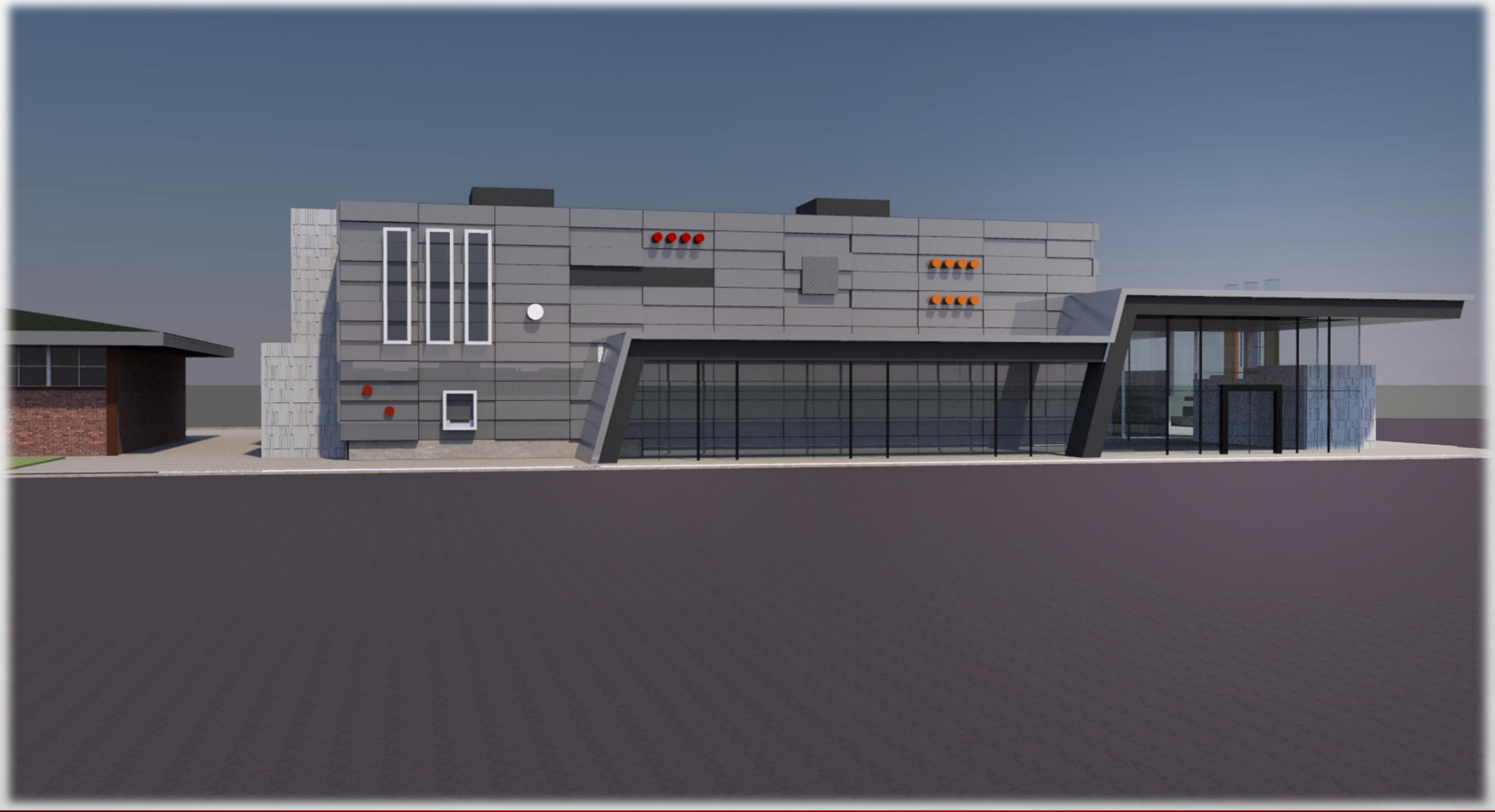


Location! Location! Location!....
At the Corner of Stadium and South Railroad

FRONT VIEW

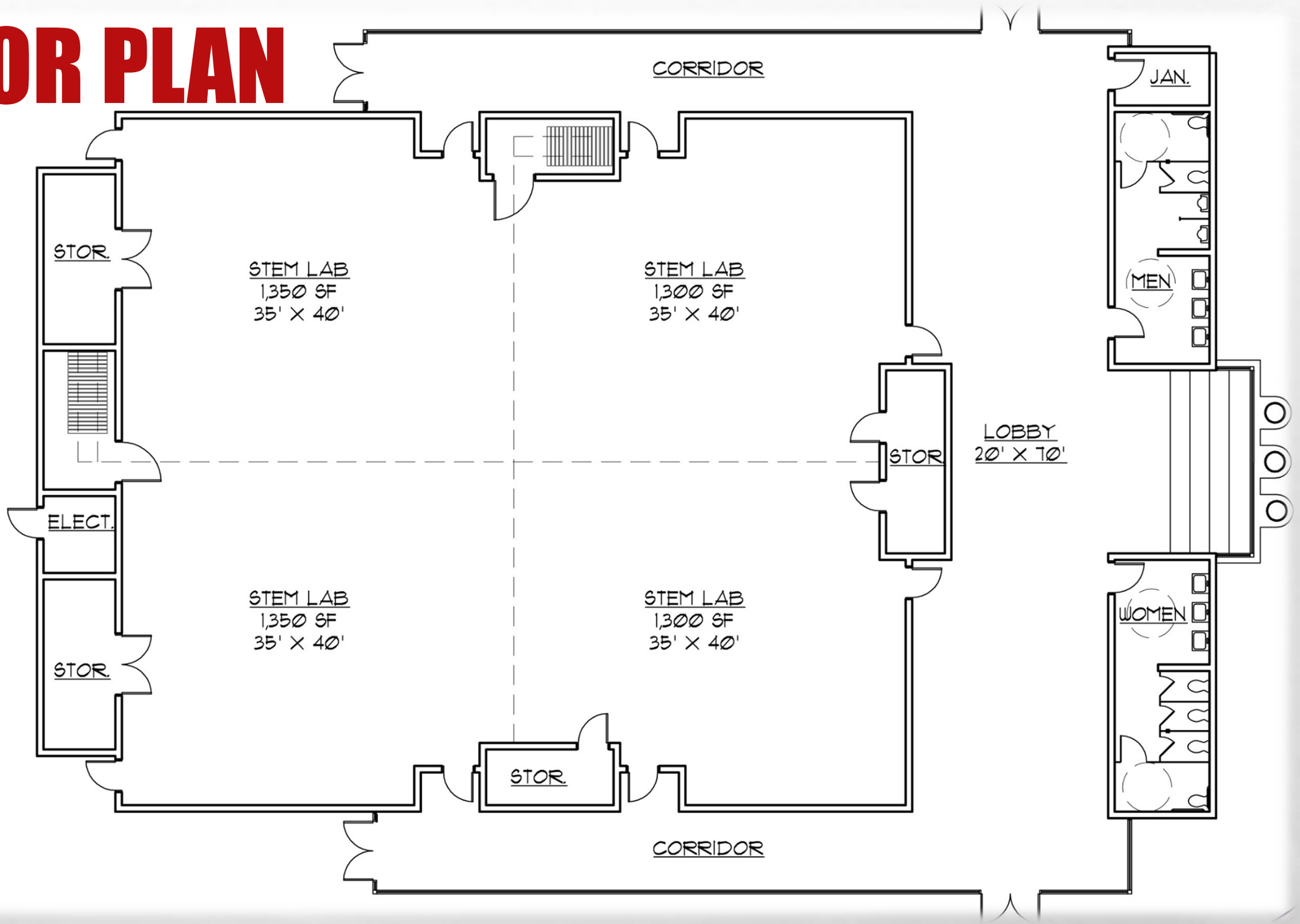
Beakers to “light” the way to a brighter future

SIDE VIEW



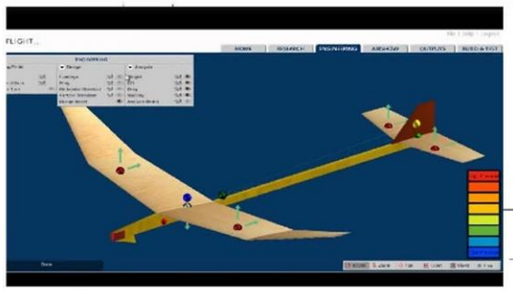
Under Consideration: A mechanical wheel turned by water flow, solar panels, and a wind turbine

FLOOR PLAN



10,000 Square Feet

Portable ActivPanels in each Room

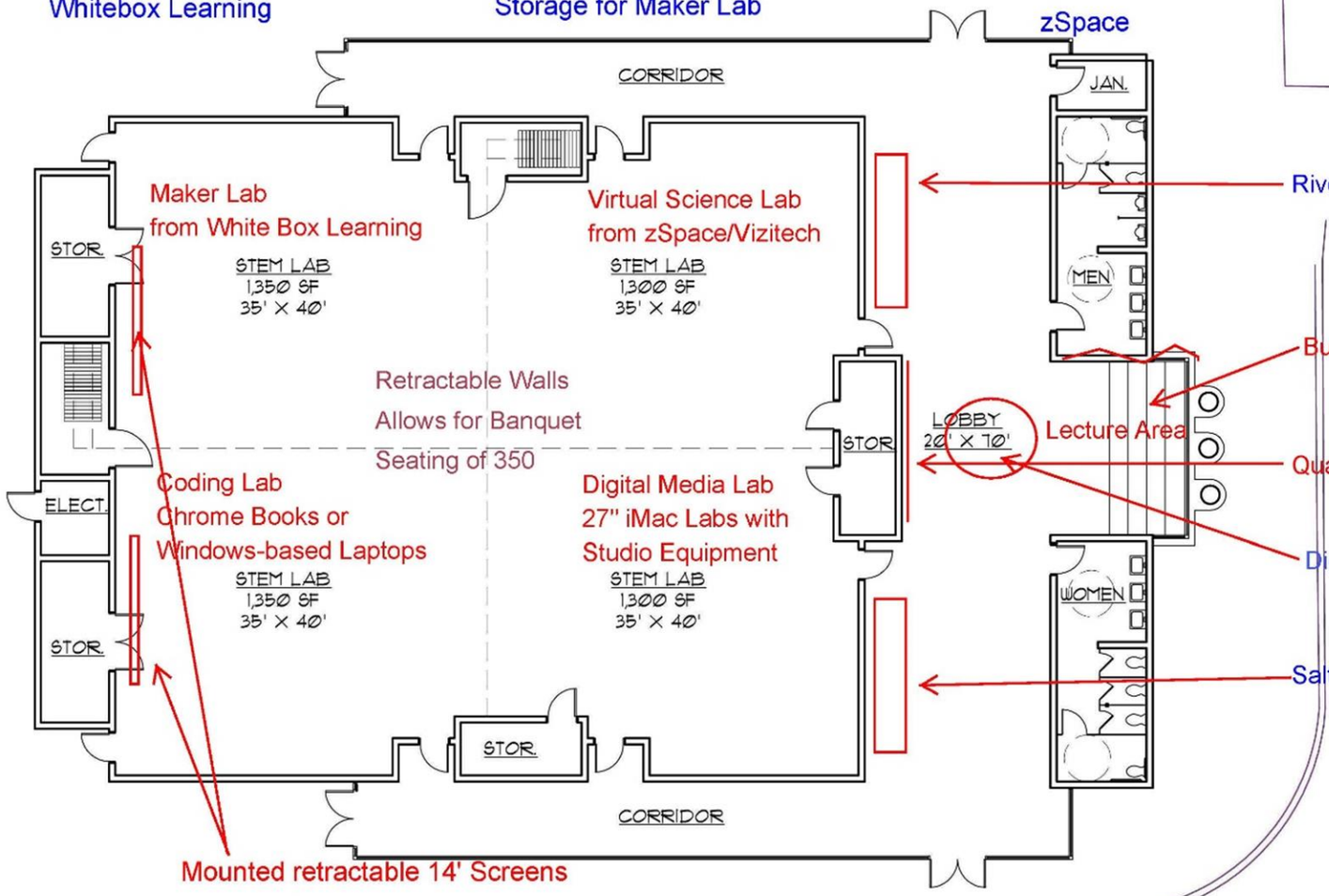


Whitebox Learning

Storage for Maker Lab

ChromeBooks

iMacs and Digital Studio



zSpace

River Tank System

Built-in Risers to seat 50-70 s.

Quad Plasma Screens

Digital Earth

Saltwater Tank System

Covered Walk-Ways To Connect the Buildings

Stay at Home Field Trips

PCIS ZSPACE-
VIRTUAL LEARNING LAB

- The zSpace system allows for the visualization of data in three dimensions. It consists of three user-responsive components: a stereoscopic display, stylus, and glasses. Working together, these components create an “augmented reality” or “immersive realistic interaction” in which data that appears as a “real object” can be viewed, manipulated, analyzed, and shared. The technology can also be used for virtual hands-on training and gaming.

zSpace content contains over 270 virtual dissections

The health care industry is truly the place to be with a need for roughly 3.2 million health care professionals by 2018, and many occupations are predicted to grow by at least 28% over the coming years.

PCIS CODING LAB

- In this course, students will learn how to create animations, computer games, and interactive projects. Using a graphical programming language, students will learn fundamental programming concepts such as variables, loops, conditional statements, and event handling. The course will show students how to make and import objects, create audio recordings, and use them to develop interactive projects. At the end of the course, students create their own informative product to be shared with others.

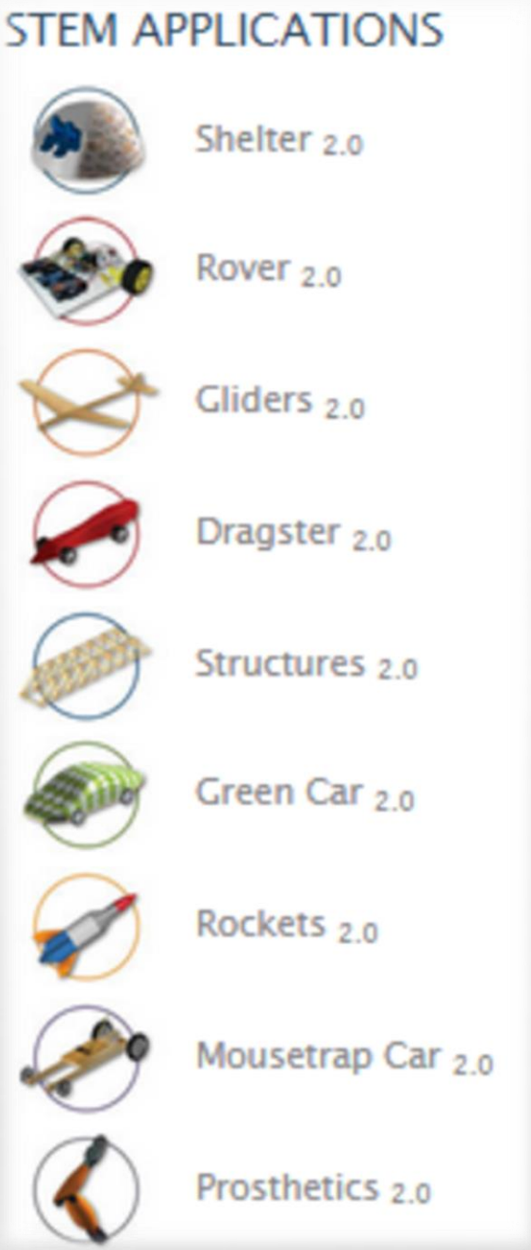
Chromebooks

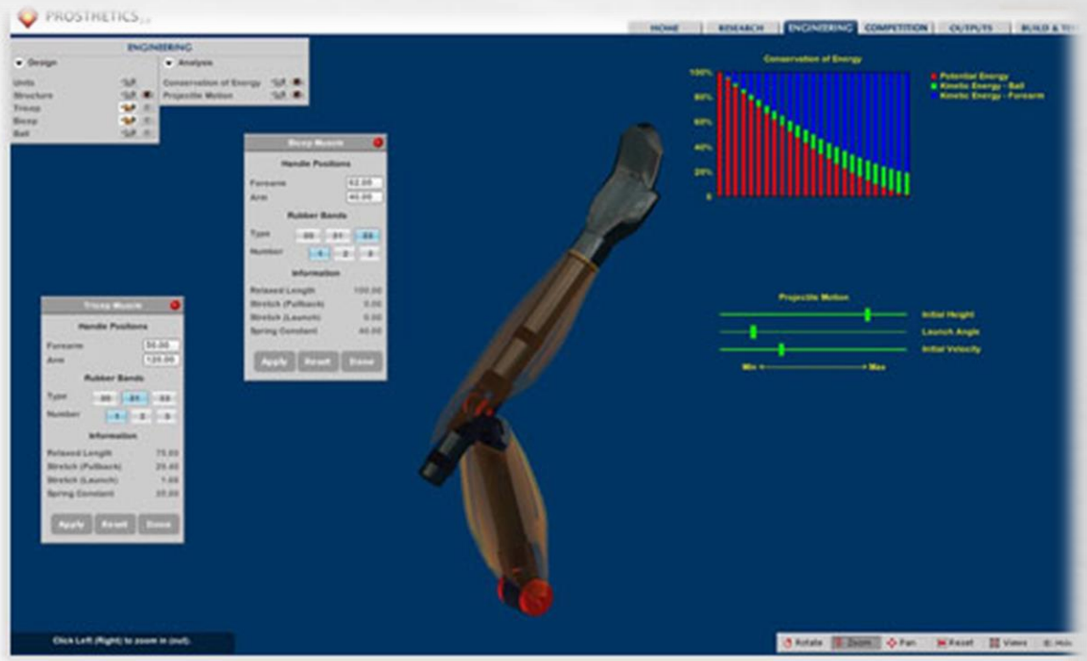
We are teaching them to code, however, not so much as an end in itself but because our world has changed. So many of the things we once did with elements such as fire and iron, or tools such as pencil and paper, are now wrought in code. We are teaching coding to help our kids craft their future.

Learning to write programs stretches your mind, and helps you think better, creates a way of thinking about things that I think is helpful in all domains.- Bill Gates -Chairman, Microsoft

SGS ENGINEERING LAB

- Completely web-based, students can design, analyze, and simulate their designs, hundreds of times, from a web browser, and compete with other students throughout the school.
- Science, Technology, Engineering, and Mathematics standards all fused together in one easy-to-use web-based interface.
- Turn-key solution encapsulates a comprehensive virtual and physical modeling activity





*A complete **standards-based STEM learning system** for engineering, science, and technology education classrooms.*

PCIS DIGITAL MEDIA LAB

- This course combines visual design, computer applications, and business techniques. Students create, manipulate, and use print media, audio recordings, video recordings, and websites to communicate information and ideas effectively to multiple audiences.
- Possible projects include: photo manipulation, digital animations, sound bites, movie productions, and digital portfolios.

"I hear and I forget. I see and I remember. I do and I understand."

PCIS- RIVER TANK (EXTERNAL) LAB

- The River Tank combines elements of an aquarium, a terrarium, and an animal exhibit to produce a dynamic habitat where plants, animals, and microorganisms interact in ecological balance. Functionally, what distinguishes the River Tank from a traditional aquarium is the flowing water. A pump raises the water to an upper pool whose surface is 20 centimeters above the surface of the bottom pool. The water flows downstream through a series of pools, waterfalls, and rapids before being recirculated. The result is a model of a stream with shallow and deep pools, slow and swift currents, rapids, eddies, and waterfalls. Fish swim freely from pool to pool, and students can observe how fish use the currents to help propel themselves up the rapids and waterfalls.

- The River Tank also serves as a terrarium with cavities and ledges providing places to grow a variety of plants, which utilize fish waste and help keep the tank in balance by removing nutrients from the water. In a classroom version of the water cycle, the plants on the upper ledges are watered by drops of condensed vapor. Reflecting the diversity of life in and around a stream, lizards, frogs, turtles, and insects also use the banks and ledges as living areas.

The Chattahoochee River is a vital part of the past, present and future of the Bi-City.

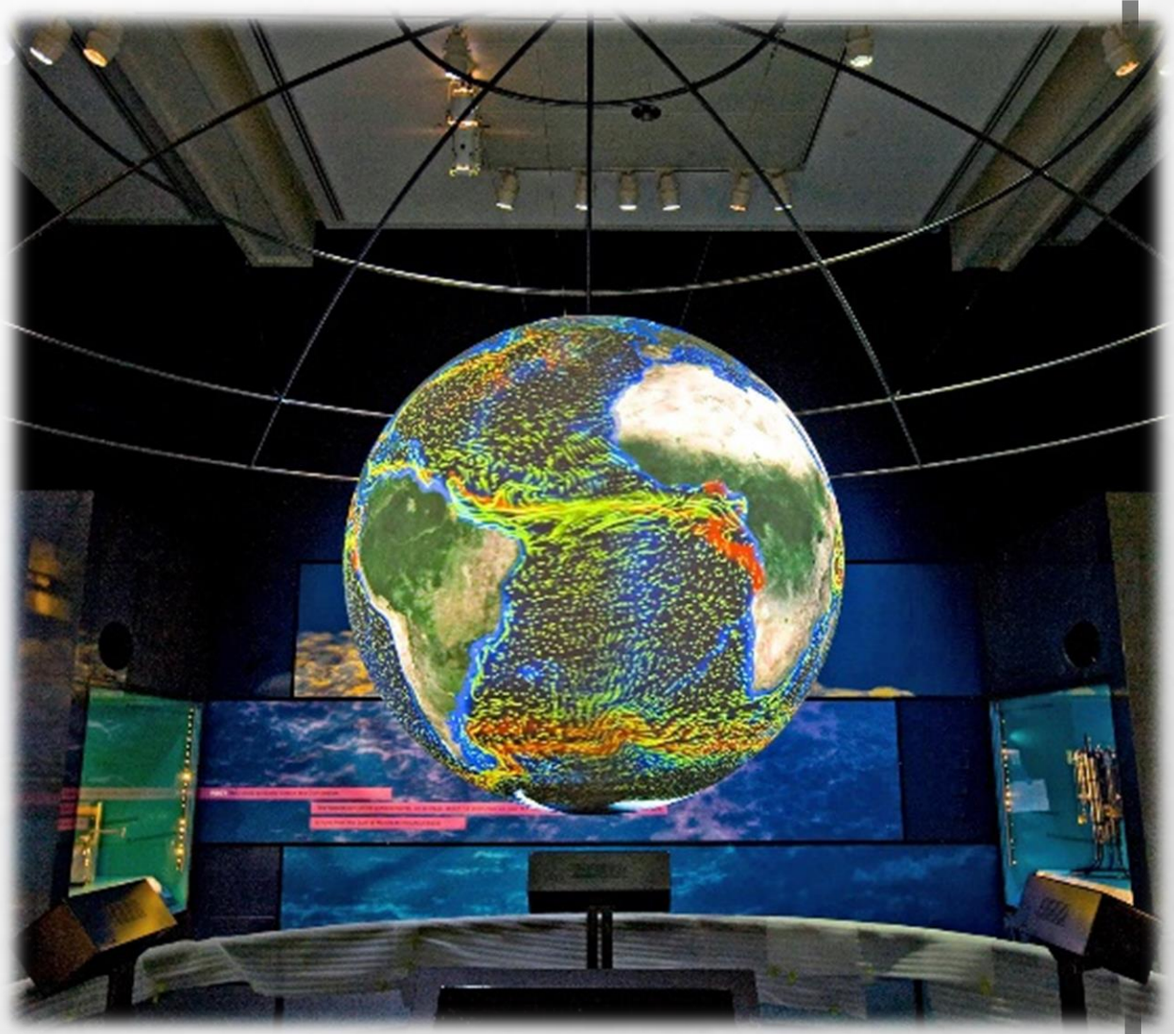
PCIS- SALTWATER AQUARIUM (EXTERNAL) LAB

- Biology, chemistry, ecology, and physics are just a few of the sciences involved in aquarium keeping.
- An aquarium can be used to teach students about specific topics, such as fish anatomy or more complex topics, such as the food chain, water cycle, or the nitrogen cycle.

More than just aesthetically-pleasing…

PCIS- DIGITAL GLOBE (EXTERNAL) LAB

- There are numerous museum exhibits available for – and unique to – the Magic Planet.
- Magic Planets are designed to be used with a touch screen kiosk to create a compelling, self-guided visitor experience. These ready-made exhibits allows visitors or students explore topics affecting our planet or how a global phenomenon is impacting a local or regional area and sometimes these exhibits will take you to worlds millions and millions of miles away.
- The Magic Planet is versatile and will allow one to use touchscreen templates and exhibit developer tools to tell your story in the most intuitive and visually engaging way.

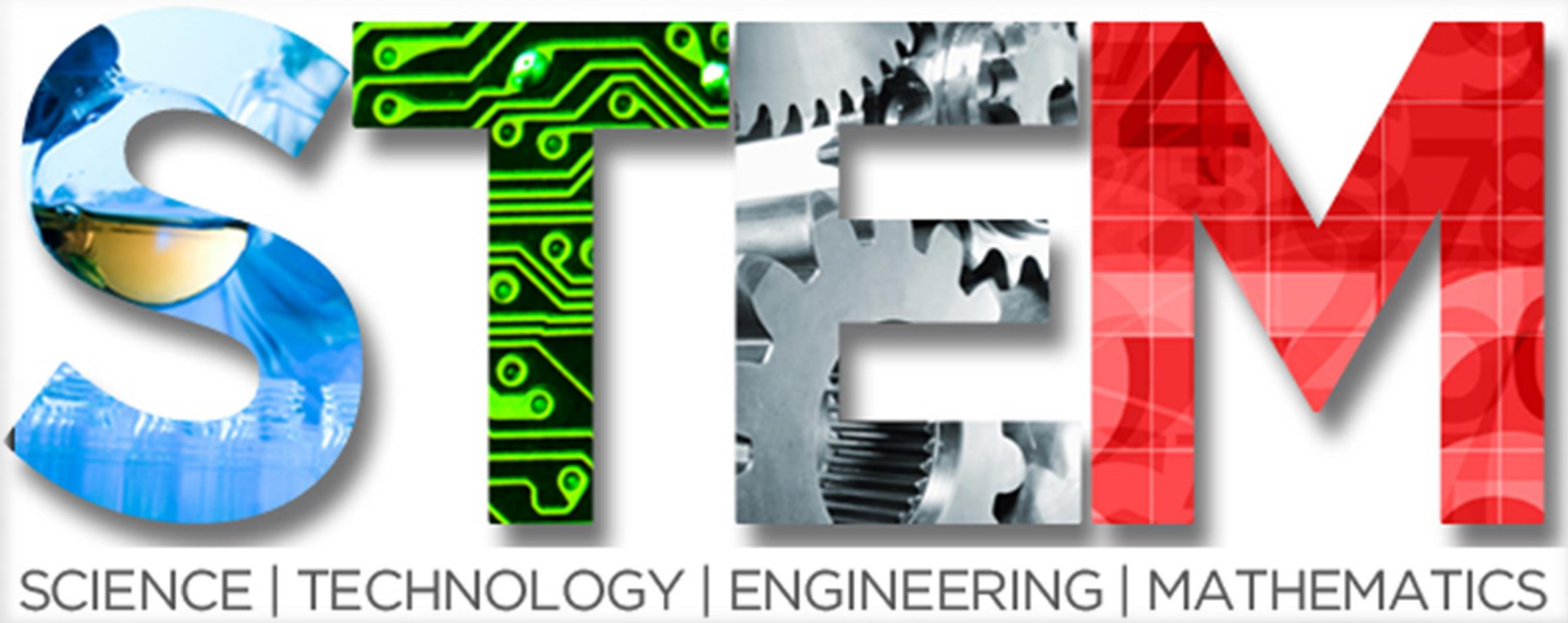


The digital globe's content includes:

- *20 Museum exhibits from the Smithsonian, NASA, NOAA….*
- *1,000 animations*
- *60 IMAX Quality Movies (4-7 min. each)*

Research shows that hands-on learning significantly increases student efficacy.

SGS STEM LABS



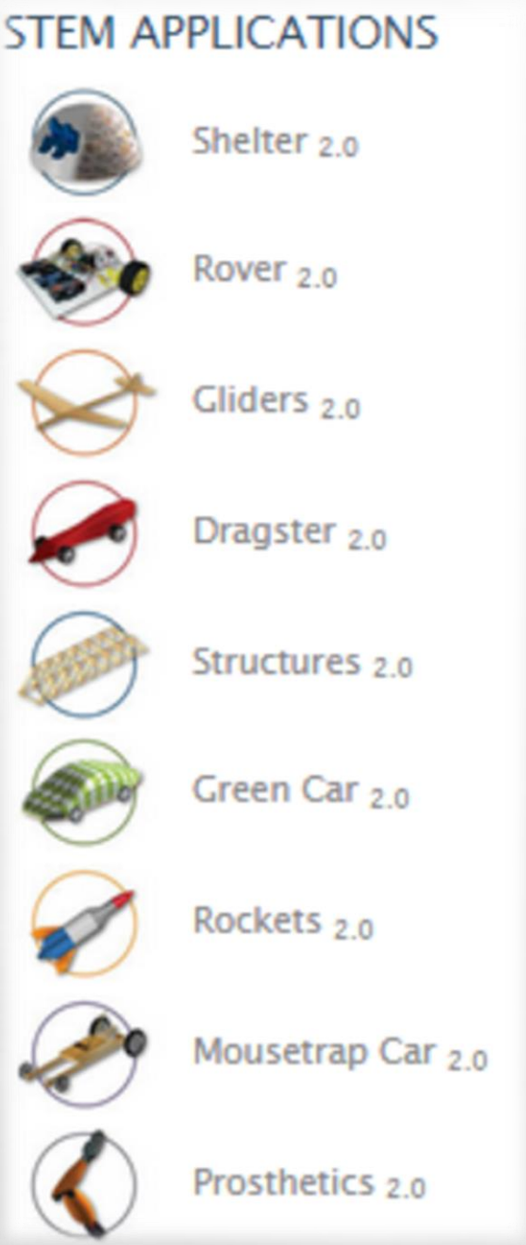
South Girard School (Grade 8)

SGS ROBOTICS LAB

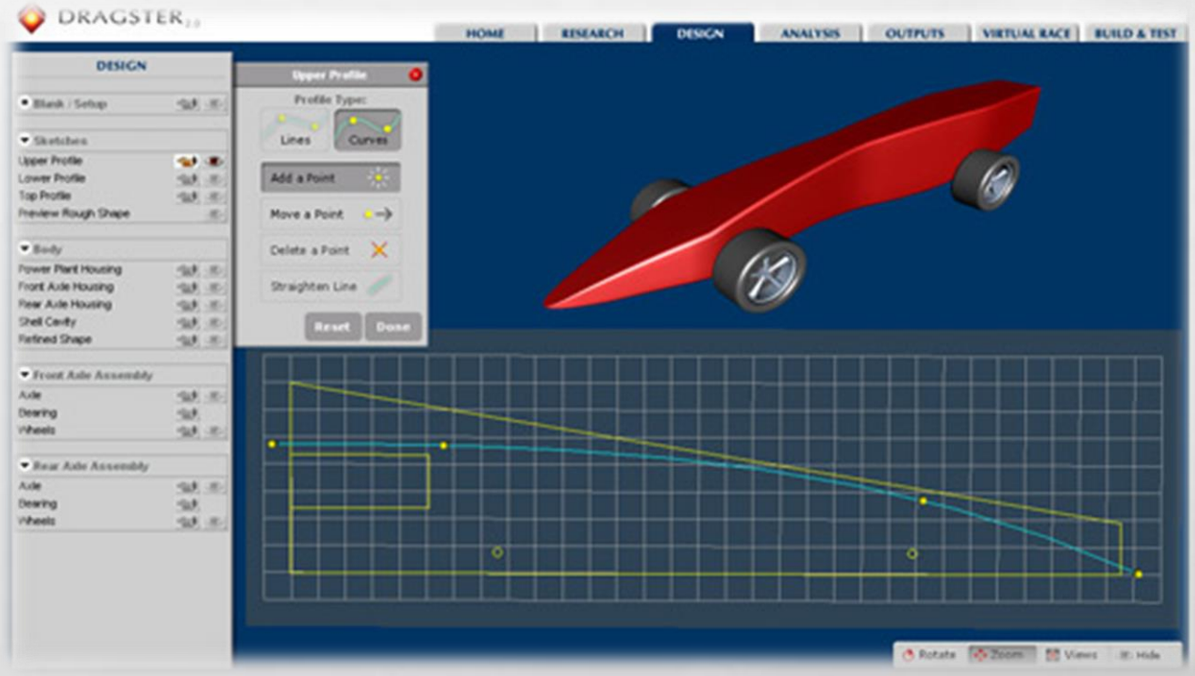
- LEGO
  - Robotics is a great way to get kids excited about science, technology, engineering, and math (STEM) topics. Studies show that it is highly effective in developing team-work and self-confidence.
  - Mindstorm-Create and command robots that walk, talk, think and do anything you can imagine. Follow the step-by-step 3D building instructions to create TRACK3R, R3PTAR, SPIK3R, EV3RSTORM and GRIPP3R and bring them to life with an easy, intuitive and icon-based programming interface. Grab the enclosed remote control and take on challenging ready-made missions or download the free app and command your robot using your smart device. Share your creations with others per a designated on-line community.

Create and command robots that walk, talk, think and do anything you can imagine

SGS ENGINEERING LAB-WHITEBOX LEARNING



- Completely web-based, students can design, analyze, and simulate their designs, hundreds of times, from a web browser, and compete with other students throughout the school.
- Science, Technology, Engineering, and Mathematics standards all fused together in one easy-to-use web-based interface.
- Turn-key solution encapsulates a comprehensive virtual and physical modeling activity.



Beginning Fall 2015, Grade 8

SGS DIGITAL MEDIA AND CODING

- iMac
  - iMac comes loaded with Photos, iMovie, GarageBand, Pages, Numbers, and Keynote. So you can do more with your photos, videos, music, documents, spreadsheets, and presentations right from the start.

(21” or 27” Display)

A big, bold display. Fourth-generation Intel Core processors and powerful graphics. An advanced Fusion Drive option. And much more. It’s the desktop our students deserve.