

Three Teachers...

One Genuine STEM Unit of Study



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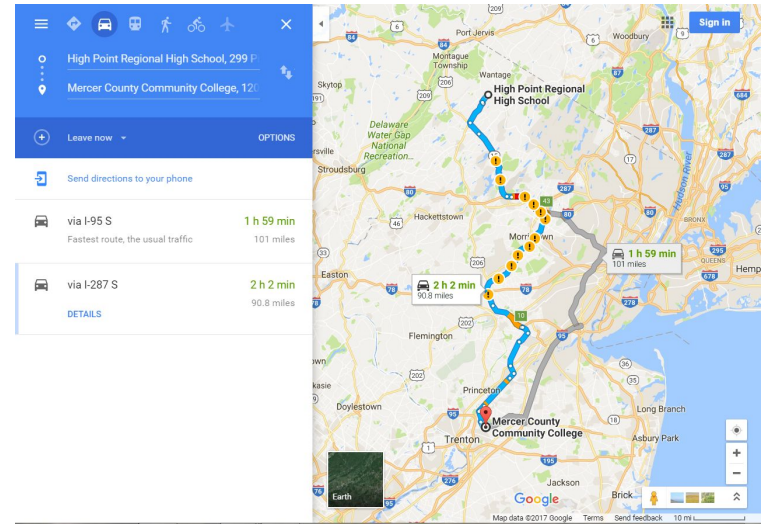
High Point Regional High School

Sussex, New Jersey



Where it began

- Workshop run by the NJ Dept. of Ed.
 - Mercer County Community College
 - 2 Hour commute each way
 - Run By:
 - *STEM Career Cluster, Office of Career Readiness*
- Curriculum Writing for 4 days



Designing STEM Lessons: *Identifying Standards and Phenomena*

GRADES 9-12

Developing Unit

- Designing lessons

- Starting With:
 - Standards
 - Phenomena or Problem

- Implementation

- Collectively Teaching One Unit
 - Other groups teaching one unit for 3-4 Weeks
 - Ours would be a year long unit

STEM education is the use of science, technology, engineering, mathematics, and their associated practices, to create student-centered learning environments in which students investigate, engineer solutions to problems, and construct evidence-based explanations of real-world phenomena. Evidence-based STEM education promotes creativity and innovation, while developing critical thinking, collaboration, and communication skills while students seek explanations about the natural world and improve the built world (NJDOE, 2015. NRC, 2012).

Meeting Times

2016-2017

- Students
 - Common Period
 - Groups working in the same space
 - Groups working within our classrooms
- Teachers
 - Not a common Prep Time
 - After School Meetings (Communication)
 - Texts
 - Google Calendar
 - Google Drive
 - Emails

2017-2018

- Students
 - Common Period
 - Groups working in the same space
- Teachers
 - Common Prep Time
 - 1 or 2 times a week
 - Communication
 - Texts
 - Google Calendar
 - Google Drive
 - Emails

Problem

2016-2017

Students will act as members of the New Jersey Department of Transportation and working within teams, identify and address environmental implications when creating a solution to issues faced by commuters. Explore multiple solutions and determine the best solution based on evidence. Students must consider the environmental and financial impact of the area.

What solution to the commuter problem in Sussex County would be best when considering the environmental and financial impact?

2017-2018

Students will work within teams, identify and address areas for improvement within our school, and create a solution to make a positive impact. Students will explore multiple solutions and determine their best solution based on evidence collected. Students must consider the environmental and financial impact of their solution.

What solutions can be implemented in the community or school to make a positive impact?

Lessons

2016-2017

- Group Building
- Small Design Challenges
- Hallway Game
- Coding
- Google Drive
 - Groups Researching
 - Group Checklist

2017-2018

- Group Building
- Small Design Challenges
- Google Drive
 - Groups Researching
 - Group Checklist
- Google Classroom
 - Sending out Announcements
 - Submitting work

Student Resources 2016-17

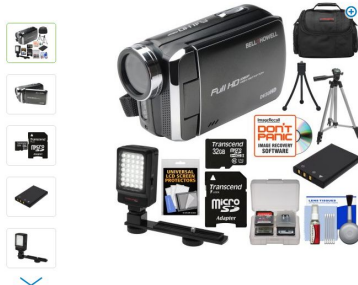
- [Solar Roadways](#)
- [Wevideo](#)
- [Traffic Game](#)
- [Ti Innovator Hubs](#)
- Cameras



SOLAR
FREAKIN'
ROADWAYS

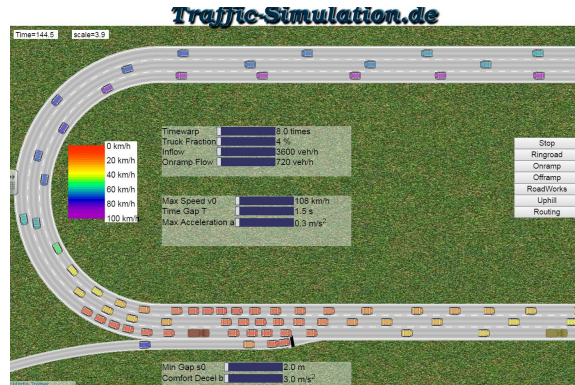
Bell & Howell DV30HD 1080p HD Video Camera Camcorder (Black) with 32GB Card + Battery + Case + Tripods + LED Video Light + Kit

★★★★★ 19 reviews Q&A By Bell + Howell



Highlights

- Includes 11 items with all Manufacturer-supplied Accessories + Full USA Warranty
- Built-in 20.0 megapixel digital camera – 8x digital zoom
- 1920 x 1080 Full HD recording – 3.0-inch wide touch LCD screen



Student Resources 2017-18

- Team Building with Legos
- Toxic Popcorn
- Four 4s
- Newsela Research



FOUR₄'S

RULES:

USE FOUR 4S AND ANY OPERATIONS YOU CAN THINK OF TO GET TO EACH NUMBER FROM 1 TO 100.

AS FOR MATHEMATICAL OPERATIONS,
ANYTHING GOES!

THE BASIC +, -, ×, ÷, ALONG WITH EXPONENTS, ROOTS, DECIMALS (4.4 OR .4), CONCATENATION (44), PERCENTAGES, REPEATING DECIMALS, AND MANY MORE ARE LEGAL.

REMEMBER TO INCLUDE EXACTLY 4 4S (THAT'S FOUR FOURS) IN EACH EQUATION, AND USE PROPER NOTATION.

Funding

2016-2017

- Lessons that were approved by the DOE were granted each \$6000
- Money spent on resources, materials, and software

2017-2018

- Apply for grants
- Kids asking for Donations

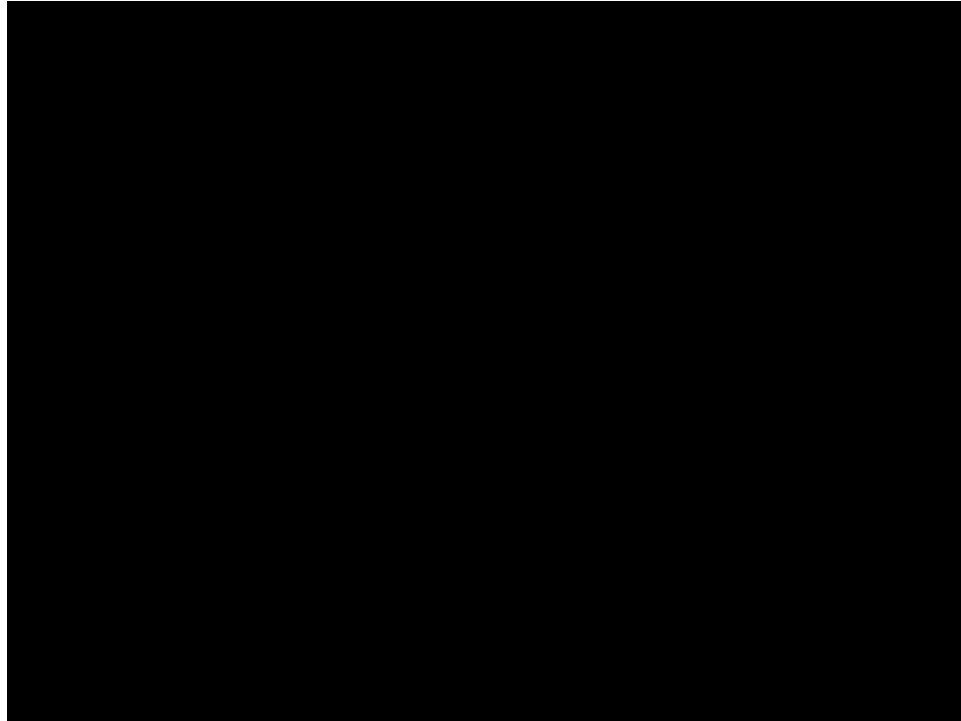
“Roadblocks”

- Meeting Times
 - Finding Prep Time
 - Differences in Schedules
 - Not enough consecutive days together
- Too Large of Group (55 Students)
 - Meet in media center all together
 - Meet in Individual classrooms
- Not enough resources for large groups
 - Cameras
 - TI kits
 - Water Kits
 - MONEY

Changing Sussex County

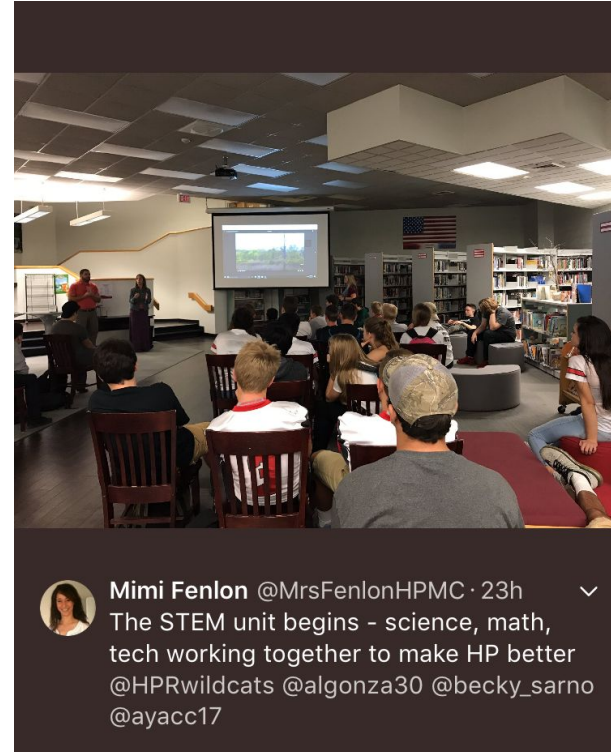


Changing Sussex County



This Year

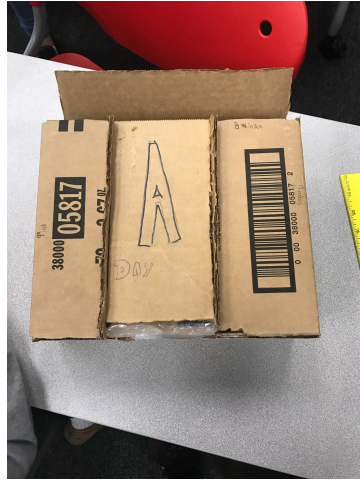
- Chosen Topics
 - Bird Houses
 - Gardens
 - Bee Boxes
 - Insect Hotels
 - Schedule Boxes
 - Gecko In the Library



Students In Action



Modeling



2018-2019 Wish List

- Smaller Classes
- Enough Resources
- Budget
- Different Problem chosen by Students
- More Consecutive days Meeting
- Even More Prep Time

FAQ's

- How could I start this in my school?
- How does this benefit students?
- How is this a genuine STEM Unit?

Questions



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- Resources
 - Presentation & Information