

AMP UP Your 6th Grade Curriculum with Integrated Practices



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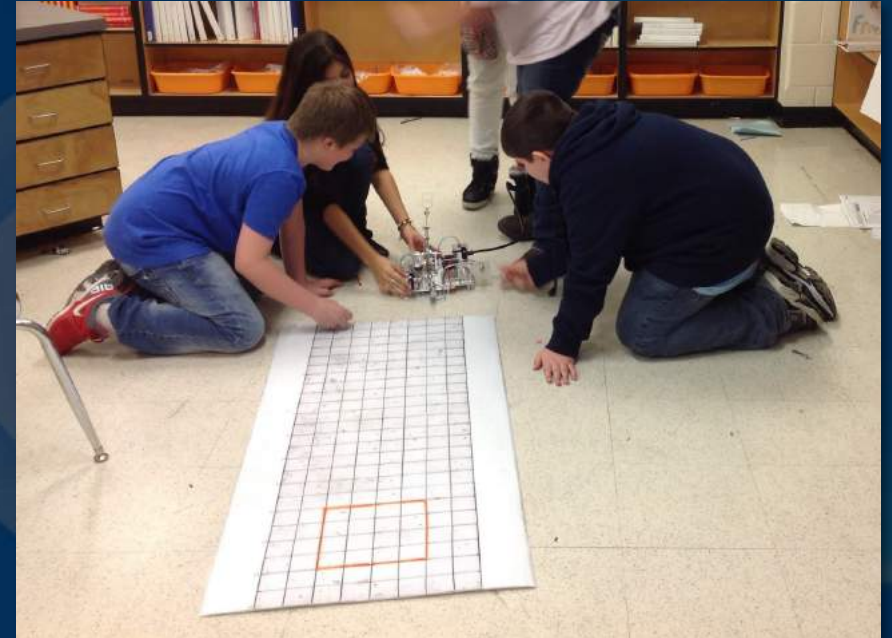


Award # 1238089
Period: 10/1/2012--9/21/2017

Georgia Tech Center for Education
Integrating Science,
Mathematics & Computing

Advanced Manufacturing and Prototyping Integrated to Unlock Potential (AMP-IT-UP)

- A National Science Foundation Math and Science Partnership to promote workforce development and to identify and cultivate the next generation of creative STEM innovators.
 - Partnership with the Griffin Spalding County School System
 - Impact: > 11,000 students over 5 years



Integrates middle school engineering, science and mathematics to promote STEM learning and entrepreneurship.

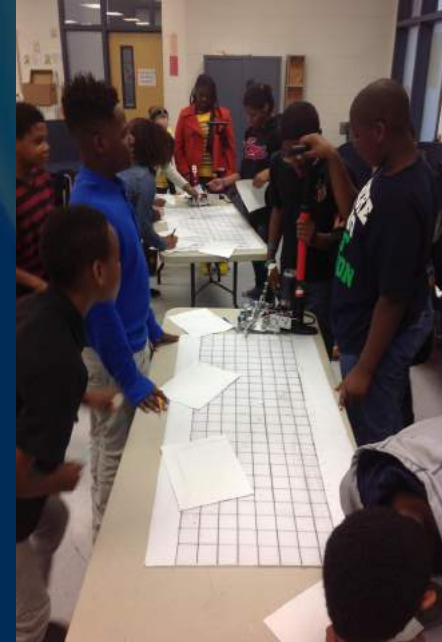
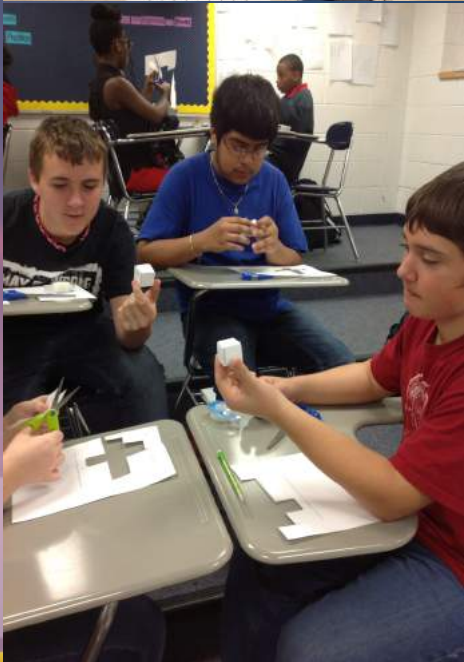


Advanced Manufacturing & Prototyping Integrated to Unlock Potential



Program Components

- Middle school math and science modules that promote inquiry and connect with Georgia Tech
- Middle school STEM Innovation and Design exploratory courses that enable students to explore their creativity using robotics and rapid prototyping
- High school engineering courses that focus on design-build challenges
- Extracurricular enrichment for students and teachers



Integrating Themes Emphasize NGSS Practices

Each module focuses on one of these themes:

- **Experimentation**

- Planning

Students answer

- **Data Visualization**

- Analyzing

Students explain
incorporate
standards

- **Data-Driven**

- Constructing

graphs

- Engaging in Argument from Evidence (Practice 7)

Students analyze data and situations that are intentionally murky, and to make decisions based on data, but where there isn't a simple solution and instead they need to address various trade-offs and then communicate and defend their decisions.

as procedures become standardized.

Lava Flow Challenge

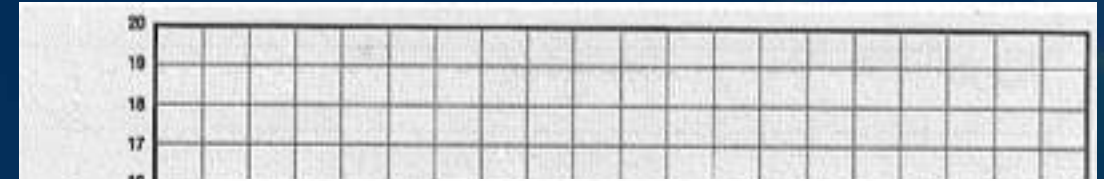
Molten Madness

- Experimental Design Module
- Students investigate and model lava flow to aid a town with their evacuation plans
- 4-5 Class Periods



Lava Flow Challenge

- Students develop procedures to determine how long it takes lava to flow
- Data is presented and analyzed on histograms
- Analysis of data drives the need for a uniform procedure that controls variables, reduces error



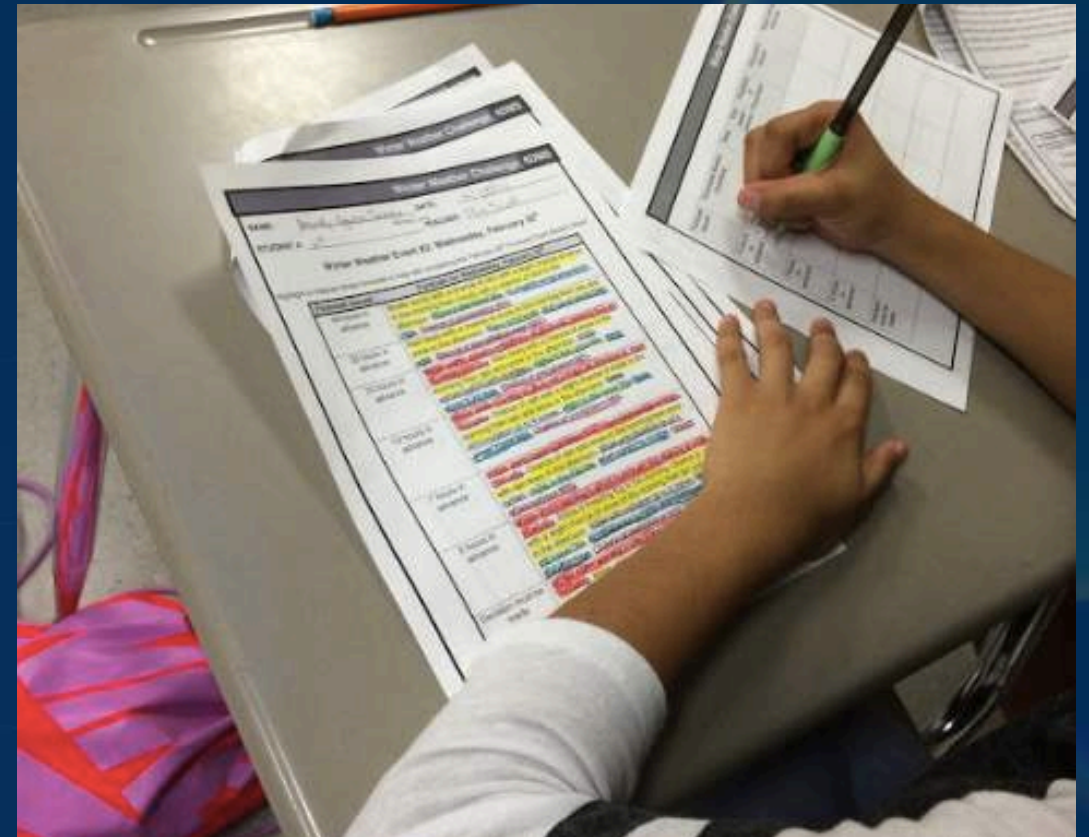
Record the steps in your procedure to test how long it takes the lava to flow across the plate

1.	Put down Newspaper
2.	Set up plate: 7 inch incline use the book plate
3.	Put a starting mark @ the top of the plate & stopping mark @ the bottom
4.	Put 10 drops on the plate, start timer when the first drop hits plate
5.	When the soap hits the bottom line, stop the timer
6.	clean the plate off between trials

Winter Weather Challenge

Snow Day

- Data Driven Decision Making
- Students analyze weather forecasts and make decisions regarding school closures
- 5 Class Periods



Winter Weather Challenge

- Read and analyze National Weather Service Forecasts
- Look for trends and prioritize content to drive decision about closing school
- Learn forecasting basics, trends and about probability

Forecast Issued	Forecasted Weather Conditions Green—Dry Yellow—Rain	Temperature Green—40° or higher Yellow—Mid-to-upper 30's (33-39°)	Probability of Precipitation Green- Less than 40% Yellow- 40%	Frozen Precipitation Amount Green—None, or no accumulation	Watch/warning/advisories Green—none Yellow—
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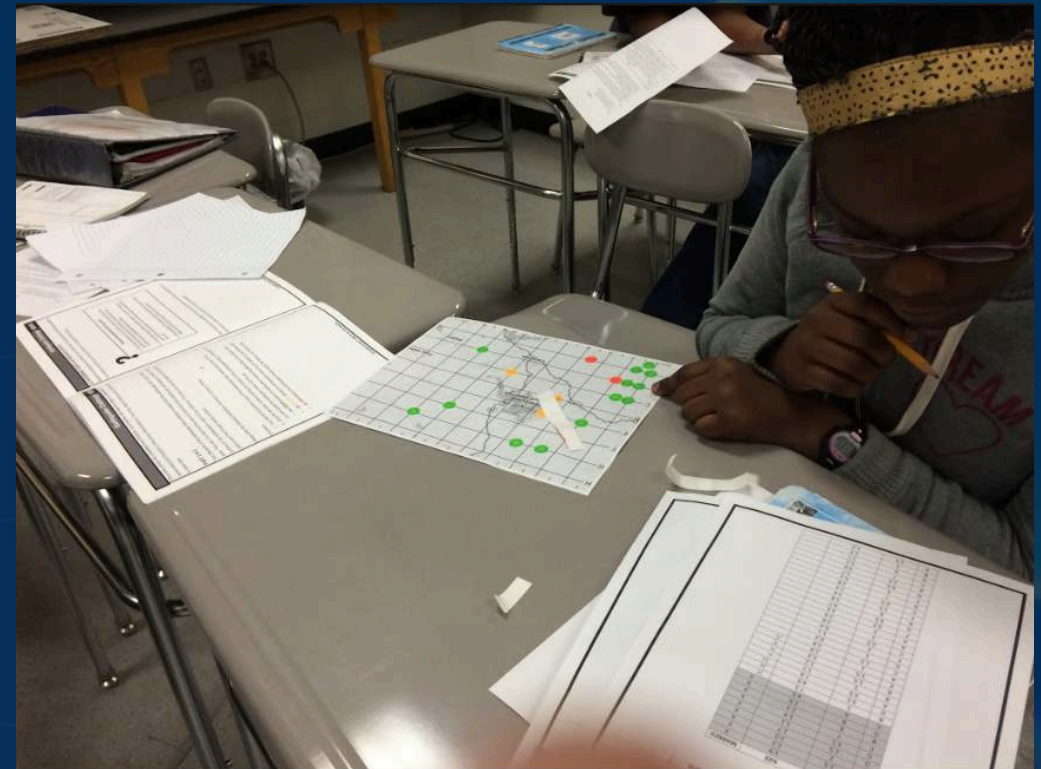
Wednesday 4 a.m.					
	# Hey, guys watch for the snow today. If you have plans I suggest you cancel them.				
1. Did you decide that school should remain open or be closed? Why? We decided that school should be closed because the snow accumulation gets up to 2-3 inches, which is quite a bit.					

Monday, 12 pm.					
Monday, 8 p.m.					
Tuesday 4 a.m.					

Earthquake Challenge

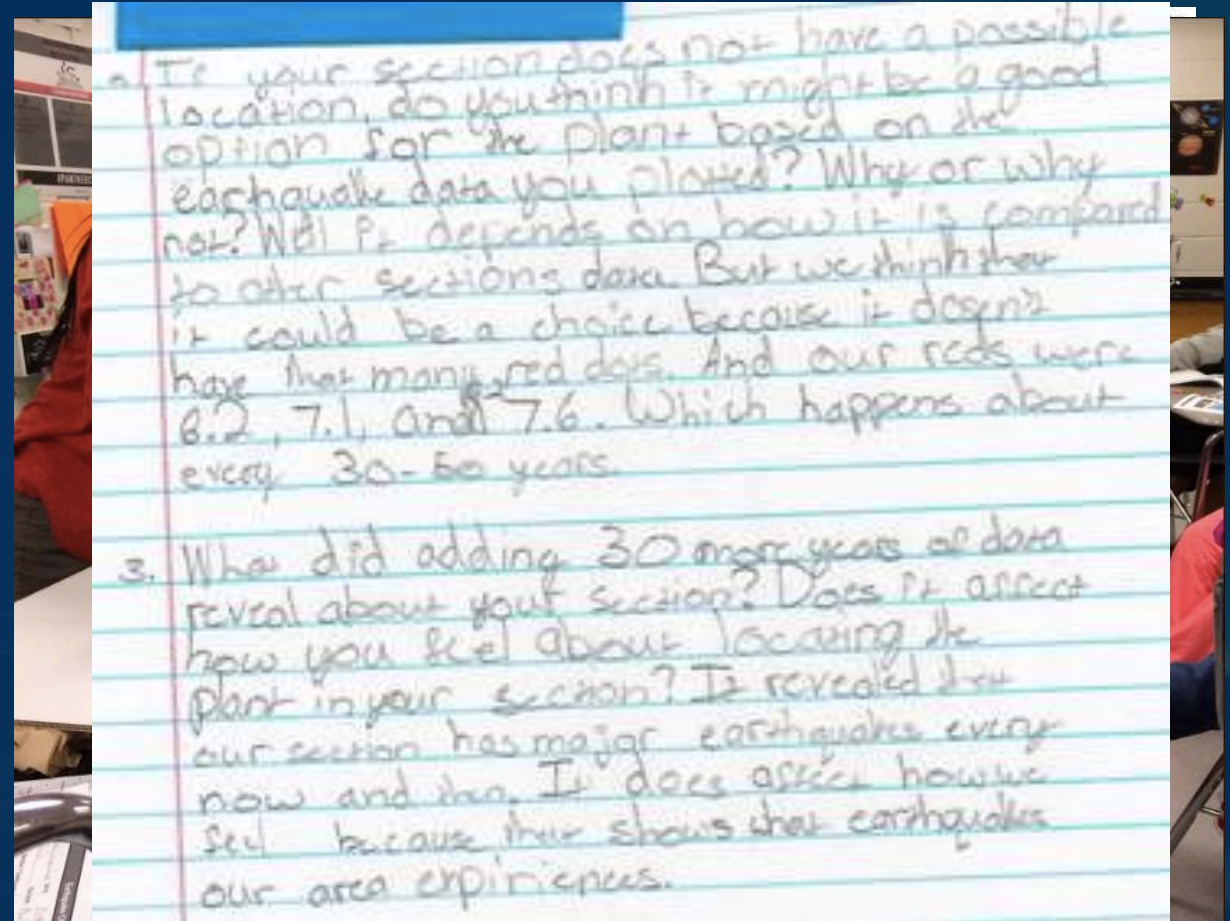
Shake and Break

- **Data Visualization Module**
- **Students analyze spatial and temporal earthquake data to determine where to build a manufacturing plant**
- **3-4 Class Periods**



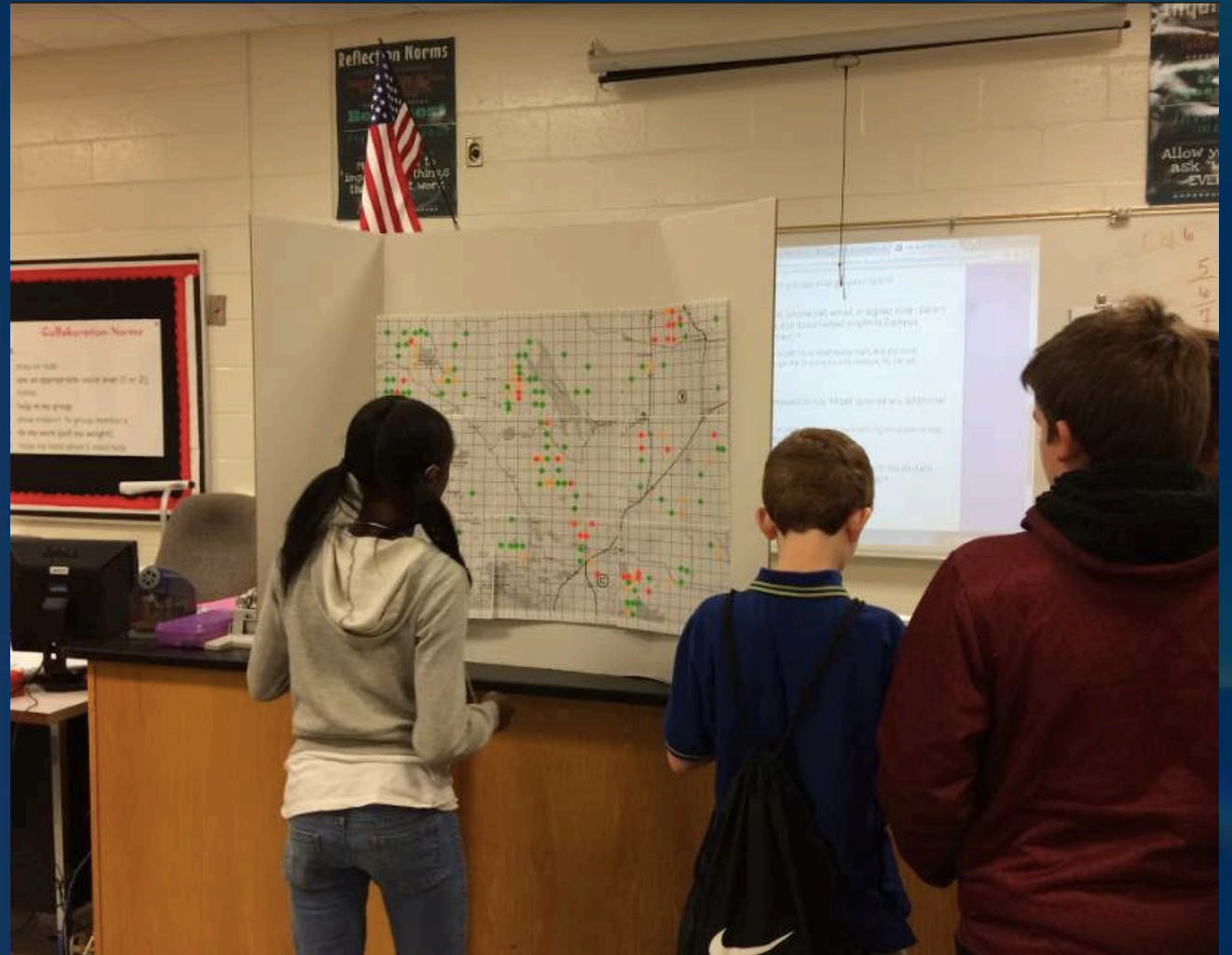
Earthquake Challenge

- Students map 10 and 40 year earthquake data showing location and intensity of each event
- Students combine their map sections together to see “the big picture”
- Analysis of temporal and spatial data leads to a recommendation of where to build the plant



Experience the Earthquake Challenge

Analyzing the complete set of earthquake data



Want to learn more? Visit ampitup.gatech.edu

New Math & Science Curriculum is Now Available for Download

LEARN MORE AND DOWNLOAD HERE >



Middle School Science Curricula

Math and science curriculum materials are currently still being developed. Requests for curriculum materials will be held and fulfilled when applicable curriculum materials are finalized.

Grade Level: 6

Module / Curricula▲	Description	Supported Georgia Standards	Last Updated	
6th Grade - Science - Data Visualization: "Molten Madness" - Lava Challenge	During this 5 day module, students engage as earth scientists to help a small town that is adjacent to a volcano develop evacuation plans in the event of an eruption. Students develop a procedure to determine how long it takes lava to flow across the landscape, modeling with dish soap. The students use a scale model to investigate lava flow rate. They iteratively use histograms and work together to develop a procedure that controls variables and reduces error. The module covers some basic concepts regarding volcanoes, lava, and igneous rock formation, seeding further exploration of GPS standards later in the semester or year. Module features the work of Georgia Institute of Technology Earth & Atmospheric Sciences faculty working with volcanoes.	<ul style="list-style-type: none">• S6CS5.• S6CS6.• S6CS8.• S6CS9.• S6E5.	Monday, January 30, 2017	Request this Module
6th Grade - Science - Experimental Design: "Shake and Break" - Earthquake Challenge	During this 5 day module, students engage as earth scientists to help a company decide where to build it's new cell phone and tablet manufacturing plant in northern California. Students map 10-year earthquake data to see if the sites have significant activity. Then, they map 40-year data to see a surprising change in the data set within their assigned region and across the larger region their classmates are mapping. Students learn the importance of looking at data over a long time and across a wide geographic area. They create visualizations of these data to make a recommendation to the company about the plant's would be site. The module covers some basic concepts of seismology, plate tectonics, earth's structure, seeding further exploration of GPS standards later in the semester or year. Module features Dr. Andrew Newman's work in GT's Earth & Atmospheric Sciences on earthquake forecasting through land deformation mapping.	<ul style="list-style-type: none">• S6CS7.• S6CS9b.• S6CS9c.• S6E5.• S7CS6.	Monday, January 30, 2017	Request this Module

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