AMP UP Your 8th Grade Curriculum with Integrated Practices

Kassidy A. Bynoe
Shannon Thompson
Griffin-Spalding Schools

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

• **Experimental Design**
  - Planning and Carrying Out Investigations (Practice 3)

• **Data Visualization**
  - Analyzing and Interpreting Data (Practice 4)

• **Data-Driven Decision Making**
  - Constructing Explanations and Designing Solutions (Practice 6)

• **Engaging in Argument from Evidence** (Practice 7)

Students plan and carry out investigations to answer questions or test solutions to problems. Students are challenged to set up and run an experiment, identify variables that cause inconsistent results across groups, agree on a standard protocol, re-run the experiment and graph data to demonstrate that data converges as procedures become standardized.

Students represent data in multiple ways and realize that different types of visualizations allow people to extract different meaning from the evidence.

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.
Grade Level Modules

**Experimental Design: Ocean Blizzard**
- Students have to write procedures to determine how to predict where oil from the Deepwater Horizon spill landed at the bottom of the ocean

**Data Visualization: Helmet Challenge**
- We will complete this today

**Decision Making: Skate Park Challenge**
- Students use the data gathered from multiple variables to determine which helmet is best for each skater
Exploring Helmet Challenge

**Intentions**

- One-to-One technology (one device per student)
- Student booklets: Pre-printed one per student
- Student handouts: one per person

**Reality**

- Small groups (2-3) mainly dependent on teaching style
- Student pages copied, teacher created presentation for material
Use your phone/computer/ipad and go to the following site:

www.tinyurl.com/ampitup8
Engage

Watch Skateboard videos
Talk with students about skating experiences
Explore

- Guide students through text and check for understanding
- Students complete simulations
- Class discussions
Explain

- Class discussion
- Data trends
- Simulations
- Ethics
- Trade Off
Elaborate

- Different ways to present data results
  - Targeting audience
  - Visual appeal
  - Persuasive writing
  - Matrix to determine weather
  - Which college to apply to
Evaluate

- Student question sheets
- Completed data tables
- Possible presentation over each helmet and protection and why a person should wear a helmet (PSA)
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.

<table>
<thead>
<tr>
<th>Grade Level: 6</th>
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<tbody>
<tr>
<td><strong>Module / Curricula</strong></td>
</tr>
<tr>
<td>6th Grade - Science - Data Visualization: &quot;Molten Madness&quot; - Lava Challenge</td>
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<tr>
<td>6th Grade - Science - Experimental Design: &quot;Shake and Break&quot; - Earthquake Challenge</td>
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</tbody>
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Contact Information

General AMP-IT-UP Inquiries: ampitup@gatech.edu

Curriculum Developers:
jayma.koval@ceismc.gatech.edu
sabrina.grossman@ceismc.gatech.edu