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Using GIS/GPS and Stella to Plot Volcanic Locations

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Generic Lesson Plan Template

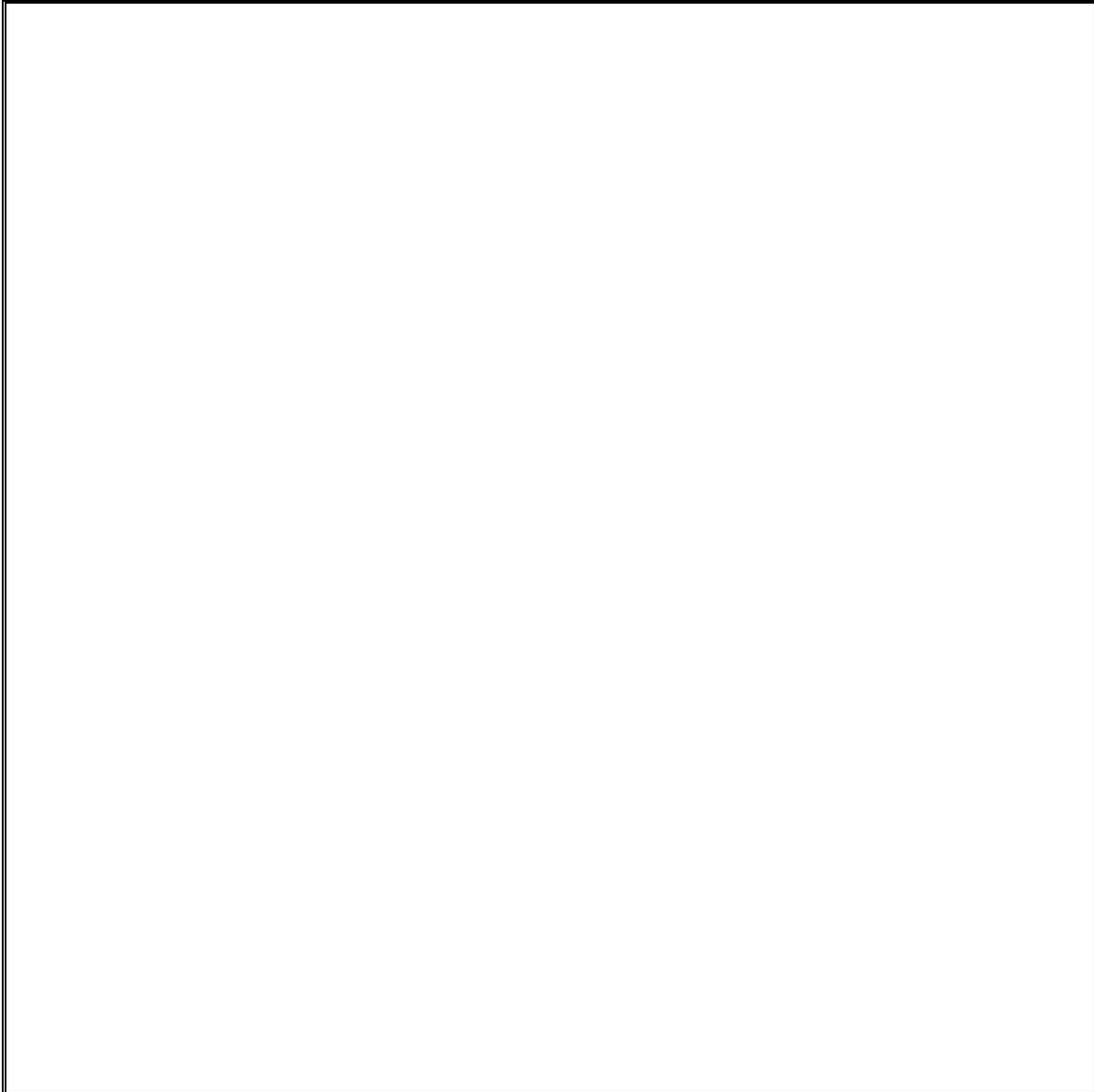
You should submit this form in addition to any computer-generated files/documents/models to your group folder on Angel. Please create a .zip file and upload the group of files as a single archive.

Name: Team D (Erin Gwara, Liz Watkins and Lisa Englert)

Grade Level/Subject Taught:

Objective: Students will:

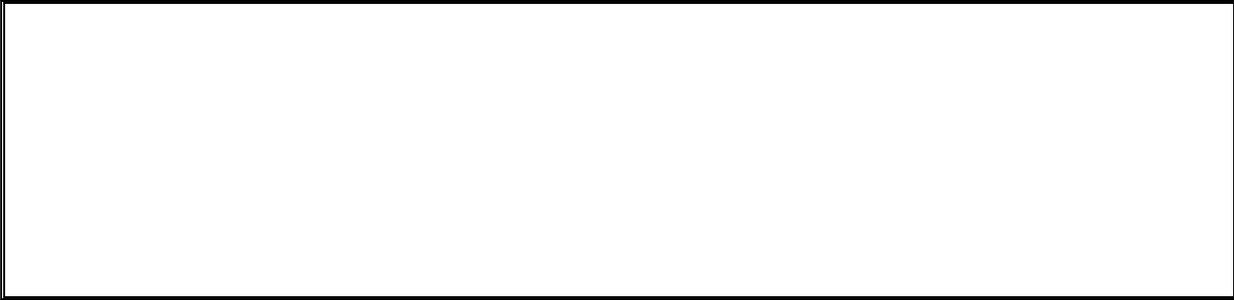
1. be introduced to volcanoes and by using GIS and STELLA software
 2. will be asked to devise Emergency Preparedness Plans
- will be asked to involve themselves in conversations
- will be asked to perform word and percentage problems as they correspond to the NYS Math Curriculum



Please provide a rich **one-page, single-spaced**, description or a *vision* of your best thinking on a way or ways you might teach the planned lesson. (approximately $\frac{1}{2}$ page for the teacher role, $\frac{1}{2}$ page for the student role). Also, construct a tentative rubric that you might use with your students (see example)

Items to include in your lesson plan: (Choose your discipline/concepts from your own area).

1. *Write the Mathematical Concept or “key idea” that modeling will be used to teach: (e.g. Students use mathematical modeling/ multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships)*



and/or...

1b. *Write* the Science Concept or “key idea” that modeling will be used to teach: (e.g. Organisms maintain a dynamic equilibrium that sustains life).

- *Physical Setting #4: Many of phenomena that we observe on Earth involve interactions among components of air, water, and land.
- *Physical Setting #5: Energy and matter interact through forces that result in changes in motion
- *Mathematics #1: Students use mathematical reasoning to analyze mathematical situations, make conjectures, gather evidence, and construct an argument
- *Mathematics #4: Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships.

Materials:

Laptop (for instructor)

14 computers for students (minimum)

GIS/GPS Software (ArcMap)

STELLA Software

Internet Access

“...a rich **one-page, single-spaced**, description or a *vision* of your best thinking...”

Prompts:

1. How will you assess the prior knowledge of the student?
2. How will you begin the lesson?
3. What are the teacher and students doing every 5-10 minutes? (Teacher Actions and Student Actions)
4. How will you assess the learning for the lesson?

Using GIS/GPS & STELLA_ I plan on having my students

1. Warm-up Activity:
2. Essential Question(s): How can the GIS/GPS and STELLA software be used to determine the volcanic eruption and (2) thus devise an Emergency Evacuation Plan?
3. Instructor will introduce use of GIS/GPS to plot volcanic locations in the US with use of an overlay of the United States map. Demonstration will include how to extract information for each volcano
4. Class will pick a volcano at random (we will demonstrate using MT ST HELENS)
5. Using the data (exit velocity, elevation, and exit angle) of a specific volcano, students will be exposed to the projectile motion of the volcano (lava)
6. Discussion will involve parabolic properties. Teacher will demonstrate conversions and other mathematical applications.
7. Students will visit a specific Website and work on math related problems using the volcano information available. Work is to be completed in their Science Journal.
8. Focus will then shift to real-life application regarding Emergency Evacuation Plans.

Q. Example questions may include: how far away from the base of the volcano would a community build residential or industrial facilities?

9. Homework Assignment: Students will be responsible for:
 - *researching a volcano of their choice with data to include: elevation, eruption, velocity, etc
 - *two mathematical applications that can be completed by the rest of the class
 - *apply real-life situation to the volcano as was done in class

Scoring Rubric for Team D Presentation Model Using GIS/GPS & STELLA Software

	3	2	1	0
Assignment was completed as directed	Students have completed the mathematical applications and the Science Emergency Evacuation Plan	Students completed both applications, but not in their entirety	Students have not completed the assignment Both applications are incomplete	Student was absent from class
Work was done neatly and legibly	All work was completed as directed and is legible	All work that was completed Was hard for the instructor to read and make sense of	Work that was completed was illegible; instructor could not read	Student was absent from class
Homework assignment was completed as directed	Students completed both the mathematical and science applications on the homework assignment	Students attempted to do both of the mathematical and science applications but was not able to complete	Student did not attempt to do the homework assignment as directed	Student was absent from class