Satellites, Weather and Climate
Lesson plan summary: Hurricanes
Created by: Carl Hildebrandt
Oxbow High School, Oxbow VT

Grade Level: 9
Curriculum Target Benchmarks:
Subject keywords: Hurricanes, Hurricane Formation

INTRODUCTION: The 9th grade is introduced to this cross curriculum project as a group. For science they are taught about the formation and life cycle of hurricanes prior to starting this research project. They are also familiar with basic topographic map reading.

ESSENTIAL QUESTIONS: How will future changes in climate (specifically rain events) affect lives and property in Vermont.

LEARNING OBJECTIVES:

a. By the end of this activity, the students will know (concepts/ideas)…how to read and create basic topography maps, utilize Google Earth, how local topography and rainfall can cause great destruction, and the future ramifications of rain events for the state VT.

b. By the end of the activity, the students will be able to do (skills)…

c. By the end of the lesson, the students will have developed these habits of mind…

MATERIALS

a. Internet access, graph paper

b. How will materials be organized and sorted for easy access during the activity? Computer carts and graph paper are readily available.

c. Google Earth for topography.

LESSON FORMAT:

a. **Start-Up/Motivator:** We discuss the local effects of Hurricane Irene and how it affected the lives of students. Students also observe pictures of destruction that happened locally in VT.

b. **Mini-lesson:** What initial instructions or information will students need in order to complete the lesson? Describe the "mini-lesson" that you will teach based on the concepts and skills of your activity.

Students practice interpreting topographic maps so they can understand how local features affected places in Vermont. They are taught basic rules for topo lines and how to "see" a three dimensional landscape using a two dimensional map. In addition to topo knowledge, they are also taught how hurricanes form, progress, and basic tracking of hurricanes. They analyze previous tracks and try to predict using real data from old storms.

c. **Independent/ Small Group Work:** What activity will they do? What are the steps or procedures? Will students work alone, in pairs or small groups (3-4)? What will their roles be? How will you differentiate instruction for various groups of students?

   Students look at pictures of Irene damage using the Mansfield heliflight website. They choose 3 pics that pique their interest and use Google Earth to draw a rough topo sketch of the area where the pic was taken. They also look up their home on Google Earth and answer questions for all for sketches.

d. **Wrap-Up/ Closure:** How will you wrap up and provide closure to the learning activity in a way that reinforces the connection to the curricular components and prepares the students for future learning.

   We share pictures and sketches, discuss the stories they have discovered in their research, and talk about the future of VT. This project also leads into how VT handled stream reconstruction and how that could affect future storm events.

e. **Adapt/Modify Instruction:** How will you differentiate and modify aspects of instruction based on individual learner ability, interest and background and IEP and 504 regulations as appropriate.
   This project is very flexible in that students mainly draw pictures and can write about or explain how the area was affected by topography. This project can be answered in pictures, writing, or orally.

ASSESSMENTS (FORMATIVE AND SUMMATIVE):

a. What questions will you ask or activities will you develop during the lesson to determine if they understand the task? How will you wrap it all up?
   What questions will you ask or activities will you develop to determine if they understood the objectives of the activity? The students realize that mountainous terrain leads to intensifying of rain events. Their analysis of the terrain around their home
b. What homework assignment will be assigned? Nothing outside the project itself.
c. What lesson will follow this one? Stream erosion, global climate change, climate change for VT.
d. What summative assessments are aligned to the lesson's learning objectives? Students take a map reading test in which they interpret the terrain of Sunset Ridge Trail on Mt.
   Mansfield.

LESSON REFLECTION:

a. To what extent has your content area skills and actions in the classroom affected the

learning of the students? What is your plan for improving instruction?

This was the first year for this lesson, we as a 9th grade core will add and subtract some sections next year. More work on topo map reading next year, and more follow up with stream subjects such as erosion and erosion control.

b. Reflect upon your strengths and weaknesses of the planning and teaching.
As a 9th core we previously used Hurricane Katrina for a cross curriculum research project, this year we decided to bring it closer to home and use Irene. Next year there will be more sharing of projects (especially with Social Studies) and further use of math to compare Irene to other destructive storms.

RESOURCES/BIBLIOGRAPHY:

Google Earth
http://www.mansfieldheliflight.com/flood/

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