Lake Champlain by the Numbers

Grade Cluster - 3-5

NETS-S-3 - Research and Information Fluency

Quick Look:

As part of an interdisciplinary project, students research and collect a list of interesting numerical facts and graphs that describe Lake Champlain. Student groups then select one topic to identify trends and make a prediction about the lake from the data they have collected.

Scenario:

The students have just returned to the classroom from a ferryboat trip across Lake Champlain, which began an interdisciplinary project of Lake Champlain. "How are we going to use math to study the lake?" the students asked. They start to discuss how numbers could describe Lake Champlain and soon students are working together using their *netbooks* to search the *Internet* for numerical information about Lake Champlain. Very soon, questions like "Did you know there are over 300 historic shipwrecks on the bottom of Lake Champlain?" and "Can you believe the lake has over 80 species of fish?" are heard in the classroom. (3a, b)

The students are familiar with project-based learning and create groups, quickly assigning tasks to each person (scribe, editor/leader, graphic artist, media manager). The class takes a field trip to the ECHO Lake Aquarium and Science Center and works in the Resource Room to gather information and get ideas for their projects with a math focus. Students work with ECHO center staff to select a topic for their final project and identify organizations that might be interested in their projects. Additionally, students decide to create short, (30-60 second), public information videos and numerical trivia questions for the ECHO web site based on their research of Lake Champlain by the Numbers. (3a, b, c, d)

With teacher support, each student group contacts an organization and identifies an expert to mentor their project. Students spend several sessions in small groups planning, locating and recording their data using *Google Docs* that is shared with their mentor. The teacher is working with each group to help them develop their topics, insuring they have a project where they can make a prediction and making sure, they cite their sources. Students continue to develop their project, work with their "expert", and select appropriate software to create their public information video. (3a, b, c) (6b)

As each group finishes, they create an entry in the class *blog* describing their project, listing their Lake Champlain facts, embedding their project video, and sharing their prediction. All the student work is presented to the ECHO center for possible inclusion in the ECHO Center exhibits and the ECHO Center web site. It is also available for others under the *Creative Commons license*. (3d) (6a, b, c, d)

A sample student project might look like this:

Using a *spreadsheet*, graph the dates when Lake Champlain froze over for the past 180 years.

Prediction:

In the first 100 years of the graph, the lake did not freeze-over 3 times. In the past 30 years, the lake did not freeze-over 16 times. If the trend continues, the lake will reach a point where the lake will not freeze-over again.

Actual Fact:

Students' research is factually based from several reliable sources.

Video Clip:

Students have created a short video clip that is highly entertaining about the truth of this data.

(3a, b, c, d) (6a, b, d)

Resources:

ECHO Lake Aquarium and Science Center
http://www.echovermont.org/

Student Standards – The following NETS-S are noted in the Scenario.
   3. Research and Information Fluency – A. B, C, D
   6. Technology Operations and Concepts – A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T.
   1. Facilitate and Inspire Student Learning and Creativity - A,B,C
   2. Design and Develop Digital-Age Learning Experiences and Assessments – A,B,C,D
   3. Model Digital-Age Work and Learning – A,B
   4. Promote and Model Digital Citizenship and Responsibility – A,B,C
   5. Engage in Professional Growth and Leadership – A,B,D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Standard 7.9: Data, Statistics, and Probability Concepts

M4: 23 Interprets a given representation (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.

M4: 24 Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using measures of central tendency (median or mode), or range.

M4: 25 Organizes and displays data using line plots, bar graphs, tally charts and frequency charts, or tables to answer questions related to the data, to analyze the data to formulate or justify conclusions, or to make predictions.

H&SS3-4:7 History and Social Sciences Inquiry
Student communicate their findings by giving an oral, written, or visual presentation that summarizes their findings

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…
- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

H&SS3-4:12 - Students show understanding of human interaction with the environment over time by…
- Describing a community or state environmental issue (e.g., creating a slide show describing the environmental issues surrounding Lake Champlain).