

Title : Around The World With Capt'n Eli

Grades: 4-8

Subject: Geography

Overview of Lesson:

After reading [The Undersea Adventures of Capt'n Eli Volume 1](#) students find that Capt'n Eli and his family inhabit an island off the coast of Maine. In this lesson, students learn about map symbols and cardinal directions by designing and mapping out their own imaginary "Eagle Rock Island." Upon completion of the map, students will use longitude and latitude skills as they locate the key places in the world highlighted throughout Capt'n Eli's adventures.

(For an advanced extension, students create and develop a scaled, three-dimensional model of the island using clay or wood thus incorporating vertical as well as horizontal measurements and calculations.)

Middle level students use Google Sketch-Up to create the island in 3D. The map key with all relevant symbols and compass rose will be included.

Time for completion:

One class period for review of mapping criteria and 1-2 sessions for Island Mapping Lesson

Materials:

For elementary grades with limited number of computers, have one station set up so that students can explore Google Earth or if possible, have a sketch program so that students can design Eagle Island by creating a digital map.

Graphing paper if integrating with a math lesson on scale drawings. For younger students provide drawing paper the size of a standard desk. Markers, crayons, rulers, and colored pencils should be available. If creating textured maps with 3D features, provide clay, cardboard, or materials to construct objects for the map.

Compass

Each student should have a reflective learning journal. At the middle level, a digital journal would be fine. Noteshare Notebooks are perfect for this.

Maine Learning Results:

In order to understand and analyze the relationships among people and environments, students will learn how to construct and interpret maps and how to use globes and other geographic tools to locate and derive information about people, places, regions, and environments. In an integrated way, students will study people and the physical characteristics and processes of the earth's surface to understand causes and effects, ecosystems, human behavior, patterns of population, interdependence, resources, cooperation and conflict, and how these are shaped by economic, political, and cultural systems.

National Geography Standards:

Students will learn:

- how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective
- how to analyze the spatial organization of people, places, and environments on earth's surface

Objectives:

Students will:

- understand compass rose, cardinal and intermediate directions on a map
- determine what information is displayed on both physical and political maps
- construct original map integrating knowledge of mapping features
- understand how to use lines of longitude and latitude

Skills

A. SKILLS AND TOOLS

Students will know how to construct and interpret maps and use globes and other geographic tools to locate and derive information about people, places, regions, and environments.

B. HUMAN INTERACTION WITH ENVIRONMENTS

Students will understand and analyze the relationships among people and their physical environments.

Technology integration:

Technology will be integrated throughout this lesson for a variety of purposes. If the teacher has online access and a projector, the physical and political map of Maine (and a map of your state if other than Maine), can be visible to the whole class and for both warm up activities the elements of mapping can be displayed from the teacher's computer. If a classroom is set up with a small number of computers, students can rotate for the activity and have the computers be specific stations where students use the computer for accessing maps, designing their island etc.

Teachers should make use of online map sites such as the map machine located at [National Geographic](#) and [Maine GIS](#). Become familiar with mapping and orienteering when preparing this series of lessons. These sites are perfect for students to zoom in on physical and political maps as they examine Maine's features. With a 1:1 laptop program, these sites will provide hands on examination for detailed information.

Teachers should keep in mind that all of the mapping concepts covered in the lesson can be applied and adapted to one's own state map and students will be motivated if their own physical environment is included in the lesson.

Warm up Exercise 1 (one class period)

This activity will provide a refresher to the terms **compass rose** and **cardinal** (N, E, S, W) and **intermediate directions** (NE, NW, SE, SW) With a compass indicate the location of N, E, S, and W. Divide the classroom into groups and have one member from each group post the directional sign in large letters on the corresponding wall (N, E, S, W). Have a map of the classroom (link to suggested diagram that can be edited) on an overhead so that students can see where objects in the room are located. Draw a large compass rose on the board and make sure to include a compass rose on the classroom map. Have students answer directional questions such as: If one walks due east of the teacher's desk, what would he find? What direction is the door in relation to the windows? (This can be modified to include a mapping activity of the school or the neighborhood)

Have students reflect in an individual learning journal. You can either have a writing prompt for them or ask them to reflect on the activity in general.

Warm up Exercise 2

To **introduce common symbols** used on **topographical** maps, the teacher selects specific **symbols** to be learned and locate a map that includes these symbols. Make an outline of the symbols numbering each one.

Divide the class into heterogeneous groups and assign cooperative roles such as time-keeper, recorder, observer, and summarizer. Each group will have a large map on the wall with the outlined symbols (numbered). The first student in each group will go up to the large map and try to determine what the symbol number 1 is and return to the group to have the recorder write down the name of the symbol. Each student takes turns going up to the large map and finding the numbered symbols until all are identified. The time keeper makes sure that the students are on task and records the amount of time it takes the team to complete the task. The recorder writes each symbol down at the home group. The observer focuses on the interactions between group members and gives positive feedback to them. After all groups have finished, it is important to process the activity not only the academic outcome, but also the social outcome. The summarizer shares with the whole class how they decided upon the roles and how well they worked together as a team. This activity will give the students an introduction to map symbols so that they can incorporate into their original map design.

Have students reflect in an individual learning journal. You can either have a writing prompt for them or ask them to reflect on the activity in general.

Procedure: Day 3 Island Mapping Lesson

Guiding Question: When analyzing physical and political maps of a region, how can we design an original map incorporating features of both in order to learn more about characteristics of place?

Explain to the class that they will be reading from the graphic novel and examining both a physical and political map of Maine. They will be applying the information that they already have learned about map symbols and compass orientation to a map of their own creation. This map will be used in other lessons, so they should take care to do a good job.

Physical and political maps from any state can be used for this activity as long as students do examine a Maine map to know where Eagle Island is located.

Write “Map” on the board or overhead. Have students brainstorm all the things that they already know about maps. This will give you a wide range of prior knowledge. They will easily come up with the symbols and elements covered in the warm up activities, but they most likely will include other categories such as uses for maps, purposes, different types of maps etc. After brainstorming and recording all the responses, come up with category headings such as Political Maps, Physical Maps, Purposes of Maps, features of maps etc. thus organizing the student responses. If there is online access and an overhead projector, this is a perfect time to show the class examples of satellite images of the US and examples of physical and political maps. A good resource is the [National Geographic Map Machine](#).

- Guide the students by asking such questions as;
- Describe major differences between physical and political maps
- When do you think these maps were developed?
- Can you find your state’s borders? Is there any connection between the boundaries and the physical features of the land?
- Can you locate the cities?

If you can overlay the physical and political maps, students will be able to draw conclusions about the two. If you have the population maps available or the information, have students make connections between the physical features, political information and population growth.

Use the Maine Map on an overhead or projector to show where the islands are located and conduct a discussion on features of Maine islands. A physical map of one of the islands will help students understand the landforms and give them information as they connect physical and political information.

Explain to the students that they will remain in the same groups to read together the beginning section of [The Undersea Adventures of Capt'n Eli Volume 1](#). Have a political and a physical map of Maine (or maps of your own state) available for each group. Students locate their own town in relation to the Maine coastline. The task for each group is to design their own interpretation of Eagle Rock Island. First they will decide how to

orient their island and determine which map symbols will be included. Students should also have the freedom to design their own additional symbols. From the graphic novel, the teams will choose specific characteristics such as the lighthouse, the home, the dock etc. to create symbols on the map. This map will be a starting point for students as they use their navigational skills of longitude and latitude to locate the key places Eli must travel on his adventures. (As per my overarching question in my email—perhaps more of an emphasis on things found within the graphic novel to be used within the lesson.

Pass out Handout #1 to each group establishing the scenario and criteria for the map activity.

For middle level have students collaborate on the hand drawn design and when completed, each can use Google Sketch Up to create the digital version. After completion, they can decide which map will be used for future lessons. There are other design programs that could also be considered. This map of the island will be created in 3D. Link to tutorial for basic use of Google Sketch Up

Students will connect their island design to Google Earth. Features for the design can be imported directly into Sketch Up.

Note to teacher: You may want to allow a portion of a class period, or assign as homework time to experiment with Sketch-Up. It is very user friendly and students have no problem with the grasping of the features. Having them map out their home, or their bedroom space serves as a good practice activity.

Have students reflect in an individual learning journal. You can either have a writing prompt for them or ask them to reflect on the activity in general.

Assessment and Self Reflection:

A useful ongoing and informal assessment might include recording on regular basis anecdotal information on how the students are participating in their work groups and inspecting their individual learning journal entries. For a more formal assessment of the final map product, a RUBRIC such as this one, would provide information as to specifically what features the students have mastered and indicates where they need improvement.

Advanced:

Teaching students how to create scale drawings using proportion and measurement skills would be a perfect fit with this lesson. Math concepts and skills would be applied for this visual representation. This is a scale drawing lesson created with NCTM standards by *Creative Publications* and available to all teachers.

| CATEGORY | WEIGHT | 4 | 3 | 2 | 1 |
|----------|--------------------------------|---|---|--|---|
| CATEGORY | X1 (up to 4 points available) | All assigned details have been added. The details are clear and easy to identify. Cardinal directions intermediate directions, compass rose, individual symbols | Almost all assigned details (at least 85%) have been added. The details are clear and easy to identify. Cardinal directions intermediate directions, compass rose, individual symbols | Almost all assigned details (at least 85%) have been added. A few details are difficult to identify. Cardinal directions intermediate directions, compass rose, individual symbols | Fewer than 85% if the assigned details are present OR most details are difficult to identify. Cardinal directions intermediate directions, compass rose, individual symbols |
| CATEGORY | X3 (up to 12 points available) | 95% or more of the assigned structures are drawn accurately and are recognizable. All assigned structures are labeled accurately. | 94-85 % of the assigned structures are drawn accurately and are recognizable. All assigned structures are labeled accurately. | 94-85 % of the assigned structures are drawn accurately and are recognizable.94-85% of the assigned structures are labeled accurately. | Less than 85% of the structures are drawn AND/OR labeled accurately. |
| CATEGORY | X3 (up to 12 points available) | When asked about 10 items in an unlabeled map, the student can identify all of them accurately. | When asked about 10 items in an unlabeled map, the student can identify 8-9 of them accurately. | When asked about 10 items in an unlabeled map, the student can identify 6-7 of them accurately. | When asked about 10 items in an unlabeled map, the student can identify 5 or less of them accurately. |

Using the Map of Eagle Island as a starting point for practicing skills of Longitude and Latitude:

Have students look at a world map and find the lines running north and south. Showing these lines on a classroom globe is also a good idea. Point out to them that the lines running north and south are lines of longitude and those running east and west are lines of latitude. (I have them visualize a LONG flagpole and say LONG as in Longitude. I also have them think of a FLAT surface and it rhymes with LATitude. This does help them to remember by association.)

Explain that they are not real lines, but imaginary and brainstorm with them what they might think the purpose of the lines would be.

They should know that the lines were devised to assist people to more easily locate places on the earth. Write these terms on the board as you explain each.

Key vocabulary to add to their learning journals:

Lines of Longitude

Lines of Latitude

Equator (0 degrees latitude)

Prime meridian (0 degrees longitude)

Tropic of Cancer

Tropic of Capricorn

North Pole

South Pole

Arctic Circle

Antarctic Circle

Using a globe, hold it so that the students can see the North Pole and point out that lines of longitude are placed every 15 degrees and they radiate from the poles. As you show them the prime meridian, point out that it represents 0 degrees longitude and runs through Greenwich, England. Have them follow you as you point out that the lines of longitude are placed east and west of the prime meridian.

Point out the equator and that it is 0 degrees latitude and the lines emanating from the equator are also every 15 degrees, but instead of east and west, latitude lines are measured north and south of the equator. Explain that they will be following the adventures of Capt'n Eli by using longitude and latitude skills.

Discuss the word "hemisphere" and ask students on what hemisphere we reside. Relate this to the locations found. (This can also inspire a conversation about weather and relative location to the equator.)

Each student should have a map with lines of longitude and latitude and preferably blank so that they can label all the locations and later list the coordinates.

Have students first list all the geographic locations in the graphic novel and note the significance of the place. Their list should include:

Eagle Island-Label on the blank map

Volcano Island- Ask if there are any clues in the text or graphics, as to where this might be located. Locate and place a dot on the map. Have a discussion of what “volcanic island” could mean and what island could match this description.

The Navy Research Lab-Ask if there are any clues in the text as to where this might be located. Locate and place a dot on the map

Garoo's Island- Ask if there are any clues in the text as to where this might be located. Locate and place a dot on the map

Antarctica- Is this mentioned in the text? Locate and place a dot on the map.

The Sargasso Sea- Have students locate the text where the exact coordinates are stated. Locate and place a dot on the map

Bermuda Triangle-Research this area and have students draw it on their map

Aquaria- Ask if there are any clues in the text as to where this might be located. Locate and place a dot on the map **Lemuria**- Ask if there are any clues in the text as to where this might be located. Locate and label map

Atlantis- Ask if there are any clues in the text as to where this might be located. Locate and place a dot on the map

The Arctic Circle- Ask if there are any clues in the text as to where this might be located. Locate and place a dot on the map

The first location to find using longitude and latitude would be Eagle Island. Work as a whole class to find this. Have a large map projected with lines of longitude and latitude, the equator, prime meridian and tropics all highlighted with dark marker. Since this is an imaginary island, each student will not have the exact coordinates, however, it should be within the area off the coast of Maine.

Have them first locate 0 degrees latitude and ask:

Is this North or South of the Equator? (North)

Count the imaginary lines as we go north and mark it on your map (i.e. Latitude: 44 N)

Locate the Prime Meridian; is this island east or west of this imaginary line? (West)

Count the imaginary lines as we go west and find the number that is closest to your island. Write down this degree of longitude. (i.e. Longitude: 68W)

You may want to give them practice by giving them the coordinates of various cities in the US and having them find the longitude and latitude coordinates. Here is a [chart](#) for recording coordinates and can be used as an assessment tool.

Once you have modeled this for the class, have them try to find reasonable coordinates for the places in the story that they listed and added dots to their map.

This mapping of coordinates will help the students with their general sense of geography as they continue to read the novels and understand the historical and mythical references.