



Mapping the World

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PURPOSE

To acquaint students with fundamental map skills; to acquaint students with fundamental knowledge of world geography; to enforce geographic themes of location and place.

THEME STATEMENT

People, Places & Environment (PPE): Humans create spatial views and geographic perspectives of the world to make informed and critical decisions about relationships.

SUGGESTED TIME

Five to six weeks.

KEY VOCABULARY & CONCEPTS

Since this unit involves the geography and mapping of the world, the vast vocabulary of the map sciences can be employed. For the sake of brevity, only a few are listed here: longitude, latitude, Prime Meridian, International Date Line, parallel, great circle, compass rose, cardinal directions, and legend.

MATERIALS NEEDED

- one piece of paper per student (38" x 18")
- yardsticks (one per student)
- variety of map projections on display
- soft lead pencils
- large erasers
- poster tube (one per student)
- clear or opaque ruler (one per student)
- world atlas (one per student)
- colored pencils

INITIATION (Inquiry, Preview, Involvement)

Students need to understand the basic concepts of latitude and longitude in order to do this project. Teachers should spend one class period defining the terms, discussing/demonstrating the purposes/characteristics of these lines, and most importantly, pointing out that the latitude and longitude of any one point on a map is fixed, regardless of the map projection. Teaching this early saves trouble later.

SUMMARY

Adaptable Levels
Grades 8-12

Related Themes
USGC

Values
Understanding, appreciation

Skills
Map reading, precision, attention to detail, revision, basic geography skills

Integration
Science (geology, earth science); math (geometry, graphing); English (readings on explorers, exploration, discovery)

DEVELOPMENT (Instruction, Data Collection, Organization)

1. Using tables and floor space, have each student begin by drawing a rectangle (36"x16") on their papers. Have students bisect this rectangle *horizontally* by drawing an *equator* 8" from the top and bottom of their rectangle. Then have students bisect this rectangle *vertically* by drawing a *prime meridian* 18" from the two sides of their rectangle. Make sure that all lines are parallel and perpendicular. This is vital, or the maps will not work well. (SUGGESTION: Tolerate only a maximum of 1/8" variance from the square; allowing more invites trouble.

2. Along the top and bottom of the rectangle, have students make a mark at 1/2" intervals and then connect the marks to form longitude lines spaced 15° apart.

3. Have students follow this same procedure to produce latitude lines, but with the lines of latitude, students should mark off intervals of 1". This will provide a latitude grid ranging from 80°N to 80°S. [NOTE: In steps #2 and #3, it is recommended that the lines be drawn from the outside edge to the middle of one side of the rectangle, repeating the procedure on the other side of the rectangle. This reduces the chances for huge errors stretching across the entire map and minimizes the curvature found on most wooden yardsticks.]

4. The scale of the final grid will be 1/2" = 5° of either latitude or longitude. [NOTE: While students are completing the grid work in the above steps, you must be very vigilant. Measure and check students' work at every step to make sure they are within 1/8" of square so that their lines are straight. Also, advise students to make all marks and lines lightly for easy erasing; when the grid is completed, have students darken the prime meridian and the equator for immediate sight reference, and then have students label all latitude and longitude lines with the proper degree reference.

5. Students can now begin drawing a map of the world. The following steps are involved:

- Have students determine the coordinates of a continental point on their atlas map (e.g., Cape of Good Hope at 34°S, 18°E).
- Have students find that same point on their grid, making a point on their grid at that location. Points should be light but clearly legible.
- Repeat steps #5a and #5b above with several points (e.g., along the African coast) until several points or the entire continent have been made.
- Have the students connect the dots, using an atlas as their guide, in order to complete their depiction of that particular country/continent. Don't be too exact; spark interest in geography rather than kill it with detail. Students' depictions should be realistic, but artistry depends on the particular student's abilities. Expect more precision in plotting points than in connecting them.

[NOTE: The following is the recommended sequence of drawing the world's continents: Africa, Australia, South America, North America, and finally, Eurasia. The first three are fairly easy and straightforward, so that the student is well practiced before taking on the more difficult final two.

6. Throughout this project, have a copy of the Peters Projection in the classroom. It is the one projection that the students' maps will most closely resemble. The projection seems to reassure them that what they are drawing, despite its occasional oddities, is legitimate.

7. After completing the continents (2-3 weeks), have students begin to fill in their maps with major physical features: rivers, lakes, mountains, islands, etc. The list should be structured to fit your curriculum needs. Avoid political boundaries, as the maps may lack the precision needed. Students should continue to use the above plotting system to locate all features.

8. When all features are on the map, have students color them according to a legend they create. All features should be designated by color rather than symbols (e.g., teepees for mountains); this allows for greater precision in plotting features on the map, and colors are less likely to obscure other features of the map.

EXTENSION/ENRICHMENT (Idea Articulation, Ownership, Experimentation)

- Students should receive an initial list of requirements for the project (Student Handout #1); some students will complete this more quickly than others. Provide a list of additional items (Student Handout #2) that can be added to their maps for extra credit.
- The students' maps can be used throughout the year. For instance, as the class studies regions of the world throughout the year, have students add to their maps when studying each region.
- Students doing projects on individual nations can embellish that nation and its region on the map.
- Students can also use their maps as the basis for a map of current events or world history. Timelines can be applied to the reverse side of the map.
- As students apply various features to their maps (*e.g.*, rivers), have students check thematic maps (*e.g.*, population maps) to reinforce the geographic themes of "Place" and "Human Interaction with the Environment."

ASSESSMENT OF ACHIEVEMENT

- Students' maps are graded periodically throughout the project—usually after each continent and after each kind of physical feature. Students are expected to revise their maps after each of these gradings in order to correct errors and to make improvements.
- A final assessment of the project is based on four criteria: (1) correct placement of all items on the map, (2) spelling of labels, (3) neatness, and (4) completeness (*i.e.*, are all assigned items on the map?).
- Students are also tested for geographic knowledge. Students take periodic quizzes on the physical features (*e.g.*, bodies of water, islands), with a final cumulative test on both map vocabulary and world physical geography (Teacher Background #2).

KEY QUESTIONS

- What are latitude and longitude, and what is their function?
- Why do various map projections exist? How do the various projections differ?

REFERENCES & RECOMMENDED RESOURCES

- *Peters Projection of the World*. New York: Friendship Press.
- *What Do Maps Show?* U.S. Department of Interior, U.S. Geological Survey, 1996.
- *The Nystrom World Atlas*. Chicago: Nystrom (Division of Herff Jones), 1995. ISBN: 0-88463-480-9. Publisher tel.: (800) 621-8086

TEACHER BACKGROUND #1:

World Map Project: Sample Schedule for Procedure

SUGGESTED ORDER:

1. Studying and reviewing the basic concepts of latitude, longitude, and map projections [3-5 days]
2. Creating map grid [1-2 days]
 - a. outer dimensions: 36"x16" (ratio = 2:1)
 - b. inner dimensions: latitude and longitude lines (scale: $\frac{1}{2}$ " = 5°)
 - c. enhancement of equator and prime meridian as well as insertion of degree designations on all latitude and longitude lines along top, bottom, sides, and the prime meridian (for the latter, latitude only)
3. Plotting and drawing of the continents and islands [7-10 days]
4. Placement of required physical features [7-10 days]
5. Final enhancements [1-3 days]

SAMPLE SCHEDULE OF STUDENT DEADLINES:

- Sept. 9: Begin map project; complete grid
- Sept. 13: African continent completed and graded
- Sept. 17: South American and Australian continents completed and graded
- Sept. 23: North American continent completed and graded
- Sept. 30: Eurasian continent completed and graded
- Oct. 4: All continents completed; oceans and seas labeled
- Oct. 7: Quiz on map items
- Oct. 10: All islands completed and graded
- Oct. 14: Quiz on all completed map items
- Oct. 16: All rivers, lakes and mountains completed and graded
- Oct. 18: Maps collected for final grade; test on all map-related items

TEACHER BACKGROUND #2:

World Map Project: Sample Cumulative Test

PART I:

Consult the map and identify the numbered items. [Twenty or so specific items would be numbered on an outline map attached to the test.]

1. _____
 2. _____
 3. _____
- (etc.)

PART II:

Using latitude and longitude, identify the following features by their absolute location.

1. 65°N, 20°W (island): _____
2. 10°S, 77°W (mountains): _____
3. 52°N, 105°E (body of water): _____
4. 66°N, 121°W (body of water): _____
5. 36°N, 6°W (passage): _____
6. 64°N, 59°E (mountains): _____
7. 3°S, 59°W (river): _____
8. 31°N, 33°E (passage): _____
9. 0°N, 113°E (island): _____
10. 55°N, 18°E (body of water): _____

PART III:

1. These mountains are in western North America: _____
2. This sea lies between Vietnam and the Philippines: _____
3. This mountain range separates Spain from France: _____
4. This lake lies due east and quite close to the Congo River: _____
5. This island lies off the southeast coast of India: _____
6. These mountains lie between the Caspian Sea and the Black Sea: _____
7. This island lies across the opening of the Hudson Bay: _____
8. This island lies due west of Great Britain: _____
9. This body of water lies west of Florida: _____
10. This body of water lies southwest of the Black Sea: _____

STUDENT HANDOUT #1:

World Map Project: General Instructions

The map that you draw should contain the items listed below. Use your atlas to find and position them correctly on your map.

1. *continents* (excluding Antarctica)
2. *oceans*
3. *islands*: Greenland, New Guinea, Borneo, Madagascar, Baffin, Sumatra, Great Britain, Victoria, Ireland, Formosa, Sri Lanka, Honshu, Hokkaido, Kyushu, Shikoku, Sicily, Iceland, New Zealand, Hawaii, Tasmania
4. the ten largest *lakes* (see "World Facts" in your atlas)
5. the ten longest *rivers* as well as the Ohio River (see "World Facts")
6. *seas*: South China Sea, Aegean Sea, Persian Gulf, Red Sea, Gulf of Mexico, Bering Sea, Mediterranean Sea, Caribbean Sea
7. *mountains*: Appalachian, Alps, Andes, Apennines, Carpathians, Caucasus, Drakensberge, Himalayas, Pyrenees, Rockies, Scandinavian, Urals
8. *miscellaneous*: Cape of Good Hope, Cape Horn, Strait of Gibraltar, Hudson Bay, Panama Canal, Suez Canal, Tropic of Cancer, Tropic of Capricorn, Arctic Circle, Antarctic Circle, English Channel
9. (Additional items will be distributed as specific regions are studied.)

SPECIAL INSTRUCTIONS:

- *Neatness counts! Spelling counts!*
- *PRINT* all names in small but easily readable letters.
- Use *different colors* to denote deserts, seas, landforms, rivers and lakes, and mountains. Your map must contain a legend or key. Avoid using symbols that obscure significant portions of your map; colors work much better.
- Always remember that your map is unique and will be different from the ones in your atlas. As long as you follow directions and use correct latitude and longitude, you will be okay.

IMPORTANT THINGS TO REMEMBER:

- You need to do some work on this project *every day*. It is a good idea to work ahead of schedule rather than fall behind it.
- Protect and preserve your map. If it is lost or damaged, you will have to start all over again.
- Whenever you have a problem or a question, *ask for help*. Also, resist the urge to use shortcuts; I am familiar with most and can assure you that they do not work.
- Take pride in what you are doing. This is a challenging project, but if you invest time and effort into it, you will be rewarded with a final product of which you can truly be proud.

STUDENT HANDOUT #2:

World Map Project: Extra Credit

The following items may be added to your map for extra credit. For every ten (10) items that you add, you will receive an extra point which will be added to your final grade on the map.

1. *islands*: Philippine Islands, Cyprus, Sakhalin Island, Cuba, Hispaniola, Jamaica, Puerto Rico, Newfoundland, Falkland Islands, Galapagos Islands
2. *rivers*: Mackenzie, Yukon, Niger, Colorado, Missouri, Rhine, Danube, Mekong
3. *passages*: Strait of Hormuz, Strait of Malacca, Bering Strait, Mozambique Channel
4. *seas*: North Sea, Arabian Sea, Yellow Sea, Coral Sea, Sea of Japan, Celebes Sea, East China Sea, Aral Sea
5. *bodies of water*: Great Slave Lake, Bay of Bengal, Gulf of California, Gulf of Alaska, Gulf of Aden, Gulf of Oman, Great Australian Bight, Gulf of Guinea, Chesapeake Bay, Gulf of St. Lawrence

