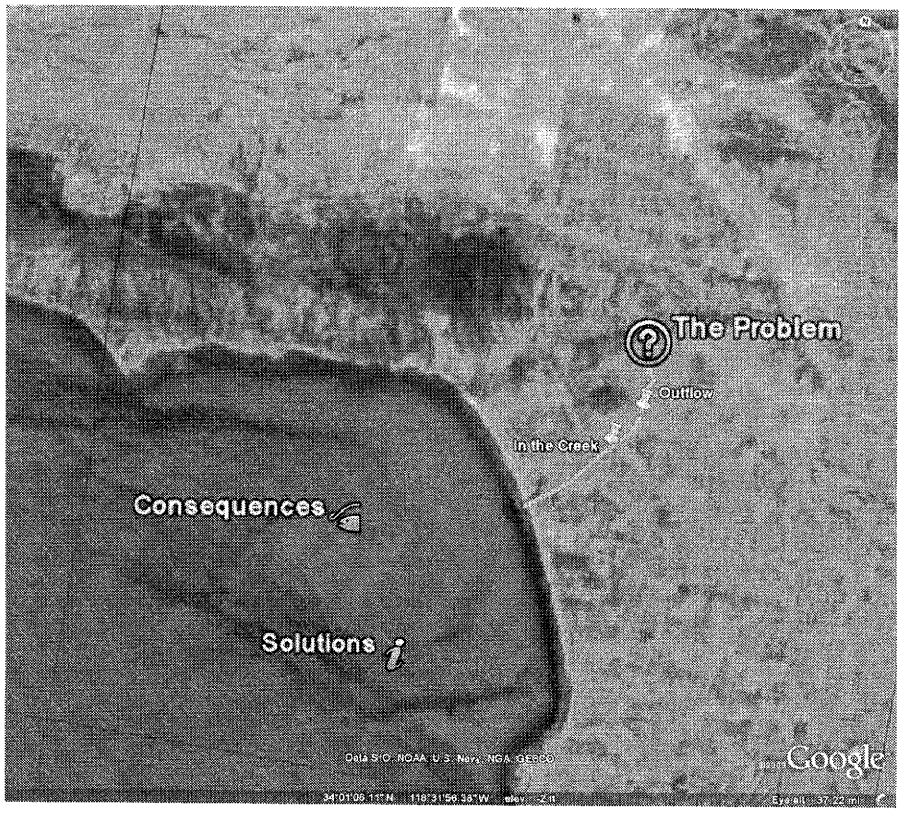
# Mapping the World to Change the World

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# How to Analyze Maps & Atlases

*A Critical Thinking Curriculum Guide*

Includes selected maps from the *Perthes World Atlas*

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# LESSON 8: MAPPING THE WORLD TO CHANGE THE WORLD

## Teacher Pages

Grade levels: 6–12
Estimated time: 3–4 class periods

## INTRODUCTION

In this lesson students use Google™ Earth to create maps of places with local, state, national, or international significance. They pick an issue that is important to them and then annotate the map as a way of communicating the importance of this issue to others. In the fullest development of the lesson, they use the maps as persuasive tools in a campaign to change their world for the better.

Examples of topics that can be mapped include (but are not limited to):

Local issues:

- Air pollution sources
- Water pollution sources
- Waste disposal facilities
- Availability of recreation facilities
- Availability of recycling centers
- Urban sprawl
- Urban blight
- Flood zones
- Real estate values
- Family-owned versus corporate businesses
- Travel time to emergency rooms
- Traffic congestion
- Unsafe road intersections
- Availability of bicycle lanes
- Bus routes versus student residences
- Graffiti
- Crime
- Voting patterns by neighborhood

National or state issues:

- Political affiliation by state or county
- Energy production and use
- Gas prices
- Cost of living
- Graduation rates

- Teen pregnancy
- Water rights
- Resource allocation (mining, logging, etc.)
- Ranges of endangered species

International issues:

- Boundary disputes
- Resource allocation
- Political hot spots
- War/genocide
- Human rights violations
- Health issues
- Ranges of endangered species

## OBJECTIVES

Students will:

- Learn to use Google™ Earth
- Select a local, state, national, or international issue to investigate
- Define the scope of the selected problem
- Research the selected issue
- Annotate Google™ Earth maps to organize their research findings
- Analyze their findings
- Propose solutions to the selected problem
- Present their findings and recommendations to the class, the public, and/or relevant organizations

## NATIONAL GEOGRAPHY STANDARDS

Standard 1. How to use maps and other geographic tools to acquire, process, and report information from a spatial perspective

Standard 3. How to analyze the spatial organization of people, places, and environments on Earth's surface

Standard 18: How to apply geography to interpret the present and plan for the future

## MATERIALS

- A computer with a projector or (ideally) several computers that students can gather around
- An Internet connection so students can do research
- A library for research
- The "Drains to Ocean.kmz" file (included on the curriculum disc)

## PROCEDURE

**First class session:**

1. Challenge students to use maps to change the world. Challenge them to think of a problem—local, national, or international (you may prefer to narrow the parameters)—suitable for exploration as a geographic question. Tell your students that, by now, they should be both expert map readers able to extract information from maps and skillful mapmakers able to express their ideas in maps. Tell them that, in the project they are about to begin, you expect them to demonstrate their mastery of "thinking like a geographer"—to ask geographic questions; to acquire, organize, and analyze geographic information; and to answer geographic questions.

2. Introduce the type of map they will be working with.

   If you have Internet access, this activity can be based on the use of Google™ Earth (or another map program of your choice). If you do not have Internet access, this exercise can be done through mapping by hand.

   Assuming you have Internet access, if the Google™ Earth browser is not already on your students' computers, download a free copy from http://earth.google.com. If possible, complete this download before beginning the lesson.

3. Once installed, tell students they will be looking at a map made by students who researched the effects of storm-drain runoff in their local ecosystem. Let them know that the students made this map for a presentation to be made first to their classmates and then to local citizen groups as part of a campaign to build support for remedying some of the problems in the storm-drain system.

   Have students open the "Drains to Ocean.kmz" file (included on the curriculum disc). This sample file includes photos and annotations to a map of Los Angeles in which students examine the effects of storm-drain runoff on the local ecosystem. The sample presentation will give the students a good idea of what it might look like to annotate Google™ Earth with photos in order to illustrate an issue. It is a model that they will emulate when they create and annotate their own maps.

   Fully discuss this map with students. Determine its purpose, note its strengths (ask what features of the map help it accomplish its purpose) and critique its weaknesses (ask: from your knowledge of map conventions, how could this map be improved?).

4. To sample the mapping of an international issue, have them go to the Google™ Earth sidebar and either "Fly to" "Crisis in Darfur" or, looking under "Layers," check "Global Awareness" and then the subtopic "Crisis in Darfur." This will take them to a set of annotated maps created by the United States Holocaust Memorial Museum. Clicking on the map's icons opens windows with information about the villages and people involved in this conflict. Students can scroll around the map by clicking and dragging with the hand pointer.

Note: Some of this content may be disturbing to students. Please preview the site yourself and prepare students for what they are going to see by discussing the Darfur situation before visiting the site. Before working in Google™ Earth you may want to have students review the brief video presentation created by Physicians for Human Rights (URL: http://physiciansforhumanrights.org/sudan/darfur.html).

5. In the remaining class time, distribute **Student Handout 1** and ask students to (1) broaden their familiarity with similar maps and (2) acquaint themselves with the features of Google™ Earth. Students may continue the activity as homework if most students have Internet access at home, or in a second class session if they do not.

   To familiarize themselves with other examples of annotated Google™ Earth maps, students may examine the following Web sites (or teachers may prefer to make their own suggestions). To open these files in Google™ Earth, students should first save them to their computers. In Google™ Earth's menu bar, they'll select File, then Open. Then they'll choose the file they would like to open.

   - World Population: http://services.google.com/earth/kmz/world_population_animation_n.kmz
   - World Energy Consumption: http://services.google.com/earth/kmz/energy_consumption_n.kmz
   - World Oil Consumption: http://services.google.com/earth/kmz/world_oil_consumption_n.kmz
   - World Population Density: http://services.google.com/earth/kmz/population_density_n.kmz
   - Neighbors Against Irresponsible Logging: http://services.google.com/earth/kmz/nail_logging_n.kmz
   - Global Historical Temperatures (note: long download): http://services.google.com/earth/kmz/global_temperatures_n.kmz

**Second class session:**

1. Review the homework outlined in **Student Handout 1.** Your purpose is to have students explain to each other what the features of Google™ Earth are and how to use them.

   Ask students which features they explored. Employing a blackboard or whiteboard, list all the features and functions of Google™ Earth that students have gotten acquainted with (each student should have explored ten Google™ Earth features). Taking the features one by one, for each feature they mention, ask:

   - How many other students explored this feature?
   - What does the feature do?
   - Was this feature used in any of the annotated maps that you explored?

- What are the advantages and disadvantages of using this feature?
- What technical problems did you run into when exploring this feature?
- Did anyone find solutions to these technical problems?

2. For homework, students with Internet access will work with **Student Handout 2** to select a local, national, or international issue and **Student Handout 3** to draft a relevant Google™ Earth map (or draft a hand-drawn map for students without home computers). In the final minutes of the class session, prepare students for this homework by explaining your expectations and challenging them to think up projects that can make a difference. Among your expectations:
    - Students will choose an issue that can be addressed geographically
    - Students will make the size of the project realistically doable
    - Students will plan projects that have two stages:
        - Gathering information and mapping it
        - Communicating the information to make a difference
    - Students will return to class with:
        - A draft of a map that demonstrates a geographical approach to the problem
        - A written plan explaining how they intend to:
            - Gather and map relevant information
            - Communicate the information to make a difference

    To accomplish the second goal of the homework assignment (designing a project that is realistically doable), students will need to know the size of the team that will be working on the project. For the purposes of the homework, tell students to assume that they will be working in small groups and—depending on the individual teacher's preference—tell them what team size to expect.

    It may be helpful to assign this homework over a weekend so motivated students have ample time to do thoughtful work.

**Third class session:**

1. Ascertain which students are most excited about the topic they have chosen and ask those students to summarize their findings for the class. Also ask two or three students who fear that they may have chosen impractical topics to describe what problems they ran into, and ask the class to brainstorm what changes might rescue those topics to make them valid subjects for geographical investigation.
2. Either select a single topic for the whole class to investigate, or choose a number of topics and divide students into teams to pursue each of the selected topics. The goal of today's class session is for the teams to (1) develop a practical plan for

conducting the necessary research, (2) plan the design of their map and its features, and (3) predict how they could use their results to campaign for change.

If you choose to have the entire class work on a single mapping project, divide the class into groups and assign each group different tasks. One group might do Internet research. Another group might take pictures of local sites. Another group might work on the html to create annotations for the map. Students should consider what types of information they will need to find in order to create an interesting and compelling map. Guide the class as it decides as a group how to define its topic and how to proceed with the project.

Help students plan how to conduct research on the topic they've decided to map. This might involve searching for information on the Internet, in the library, and in their community. Their research should include the following aspects of the issue:

- Specific locations relevant to this issue
- Details about what's happening in these locations
- Photos, if possible (students should be sure to cite their sources)
- Potential solutions to problems related to this issue
- Identifying the best audience to present their findings to

## ASSESSMENT

To assess these student projects, consult the rubric labeled **Teacher Handout 1**.

## EXTENSION IDEAS

Implement the plan. Use geographical thinking to study the world and change it.

# LESSON 8: MAPPING THE WORLD TO CHANGE THE WORLD—GETTING ACQUAINTED WITH GOOGLE EARTH

## Student Handout 1

### OBJECTIVE

Familiarize yourself with the program Google™ Earth. Learn how to read these maps and use their features.

### PROCEDURE

1. If the Google™ Earth browser is not already on your computer, download a free copy from http://earth.google.com.
2. Familiarize yourself with a variety of Google™ Earth maps. Your teacher may have suggested which maps you should explore, or you may begin with the maps in the following list. To open these files in Google™ Earth, first save them to your computer. Then, in Google™ Earth, select File, then Open from the menu bar and choose the file you would like to open.
    - World Population: http://services.google.com/earth/kmz/world_population_animation_n.kmz
    - World Energy Consumption: http://services.google.com/earth/kmz/energy_consumption_n.kmz
    - World Oil Consumption: http://services.google.com/earth/kmz/world_oil_consumption_n.kmz
    - World Population Density: http://services.google.com/earth/kmz/population_density_n.kmz
    - Neighbors Against Irresponsible Logging: http://services.google.com/earth/kmz/nail_logging_n.kmz
    - Global Historical Temperatures (note: long download): http://services.google.com/earth/kmz/global_temperatures_n.kmz
3. Now get acquainted in a more general way with the features of Google™ Earth. In the toolbar at the top, use the View menu to turn some of the features on and off. In the same toolbar, select Help and check out the User Guide and Tutorials. As you try out the features of Google™ Earth, use this handout's graphic organizer to keep a journal of what you discover. Familiarize yourself with at least five Google™ Earth features, using the table to make notes about how they work. Be ready to explain the features to your classmates.

| | | | | | |
|---|---|---|---|---|---|
| HOW IT WORKS | | | | | |
| NAME OF FEATURE | | | | | |

# LESSON 8: MAPPING THE WORLD TO CHANGE THE WORLD

## Student Handout 2

Important: Before you begin this assignment, find out from the teacher the size of the team that will be working on your project.

## OBJECTIVES

Select a local, national, or international issue that is important to you and that can be studied as a geographical problem—a problem in a place.

- Choose an issue that can be addressed geographically
- Make the size of the project realistically doable
- Plan a project that has two stages:
    - Gathering information and mapping it
    - Communicating the information to make a difference
- Return to your next class with:
    - A draft of a map that demonstrates a geographical approach to the problem
    - A written plan explaining how you intend to:
        - Gather and map relevant information
        - Communicate the information to make a difference

The goal of this assignment is not to actually complete your project—that may come later—but to show that you can make a realistic plan for accomplishing your project.

## CREATING YOUR MAP

If you have Internet access at home, use Google™ Earth (if you have not already done so, download a free copy from http://earth.google.com) to create your map. If you do not have Internet access, you can make a hand-drawn map.

## WRITING YOUR PROJECT PLAN

See "Sample Map Project Plan" for an example of an acceptable project plan.

# SAMPLE MAP PROJECT PLAN

**Choosing an issue that can be addressed geographically**

We will study traffic and pedestrian safety near our school. We will try to make travel near our school safer.

**Making the size of the project realistically doable**

We will research accidents that happened within a three-block radius of our school over one school year.

**Gathering information and mapping it**

To find out how many traffic accidents happened close to our school, my first guess is that we will need to study police reports.

We'll study two types of accidents: car versus car and car versus pedestrian.

We'll find all the accidents that happened in our study area from September to June of the last school year. For each accident, we'll find out where it happened and when. On our map, we'll show where the accidents happened, using a car symbol for car-versus-car accidents and a pedestrian symbol for car-versus-pedestrian accidents. To show when the accidents happened, we'll make three maps: during travel time to school, during school hours, and during travel time home from school. Nighttime accidents seem irrelevant, so we'll leave them out of our maps. If we have time, we could also use a series of maps to track the accidents month by month. Then our series of maps would tell us where the most dangerous places are, what time of day is most dangerous, and what time of year is most dangerous.

**Communicating the information to make a difference**

After we study the dangers, we'll make a presentation to our school's Parent-Teacher Association. If we find out that a certain intersection is most dangerous, we could ask for a stop sign or a crosswalk. If we find out that a certain time of day or time of year is most dangerous, we could ask for more crossing guards.

# LESSON 8: MAPPING THE WORLD TO CHANGE THE WORLD—A FEW QUICK TIPS FOR USING GOOGLE EARTH

## Student Handout 3

Use Google™ Earth to create your own customized map. If the Google™ Earth browser is not already on your computer, you can download a free copy from http://earth.google.com.

Decide what issue you want to map and conduct preliminary research on the topic. After conducting research and gathering information, you can create a map.

If you have access to YouTube (http://www.youtube.com) there are several helpful tutorials that can be viewed. For example:

- "Marking Locations in Google™ Earth" (http://youtube.com/watch?v=FB1EseH7jzs)
- "Navigating in Google™ Earth" (http://youtube.com/watch?v=vp9hX6OQ8z4)
- "Searching in Google™ Earth" (http://youtube.com/watch?v=Ca5hj7LG6Zs )

To create your map:

a) Zoom in on the location where you will place the annotation.

b) Choose Placemark from the Add menu. A dialog box opens which allows you to name the placemark, select an icon (by clicking on the yellow pushpin), and create a short description.

c) While the dialog box is open, select the exact location for the placemark by dragging the icon across the map. Once you close the dialog box, the annotation is fixed.

d) If you need to move the annotation after it is "fixed," you can right-click (or control-click on a Mac) on the annotation and choose Properties to open the dialog box again. Then you can move the placemark or modify the annotation.

e) You can include links to Web sites in your annotations by using simple html. For example, here is simple html for creating a link to more information on a Web site:

See <a href="http://www.google.com">www.google.com</a> for a link to Google.

You can use this as a template. Just copy and paste your text into your placemark, and then change the URL and the message to create your own link.

f) To add a photo, select Add Photo from the Add menu. Name the annotation, and use the Browse dialog to select an image file from your local computer, network, or by creating a link to the Web.

For more information on using Google™ Earth, creating annotations, and then sharing your annotations with the world, visit http://earth.google.com/outreach/tutorials.html.

# LESSON 8: MAPPING THE WORLD TO CHANGE THE WORLD—ASSESSMENT RUBRIC

## Teacher Handout 1

| Criteria | Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|---|
| Defines the problem | Problem is not clearly defined | Problem apparent but unclear at times | Clear expression of problem | Problem is expressed using rich or persuasive detail |
| Evidence of research | Little evidence of research | Annotations show some evidence of research | Annotations show clear evidence of research | Annotations show evidence of considerable research |
| Effective use of Google™ Earth | Color and/or symbols and graphics unclear | Colors and/or symbols and graphics not clearly supportive of theme | Colors and/or symbols and graphics support theme | The message or purpose is obvious to the audience through the use of color and symbols |
| Effective use of text and/or captions | Text minimally displayed and purpose unclear | Text clearly displayed but does not support theme or message | Text supports the purpose of the map | Text or caption delivers the message with impact |
| Clear expression of ideas when presenting findings/solutions | Communicates information as isolated pieces in a random fashion | Communicates important information but not a clear theme or overall structure | Clearly communicates main idea, theme, or point of view | Powerfully communicates main idea, theme, or viewpoint to audience. |
| Overall impact and creativity | Limited effort in presentation is shown; visuals and texts do not match each other in quality; design flaws in the presentation | Visuals and text are clear, though their connection may not be obvious to the audience; design is efficient but not innovative | Effort and thoughtful preparation clearly shown; elements of innovation in the presentation's design | The combination of visuals and text make for an eye-catching design with powerful impact |