

Exposing Slum Reality Through GIS: Kibera Slum

OVERVIEW & OBJECTIVES	GRADES
<p>The phenomenon of rapid urbanization will be examined through a GIS analysis of the Kianda Village, which lies in the Kibera slum in Nairobi, Kenya. Kibera slum houses one million people within an area the size of New York City’s Central Park. With one-third of urban dwellers living in slums, students will explore what life is like in a slum by analyzing a variety of maps, population pyramids, and Google Earth Layers.</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Describe a slum and how it forms. • Describe how a slum functions and issues slum dwellers face. • Analyze maps and kmz files through multi-media to investigate issues within the slum and answer specific geographic questions. • Construct and analyze a variety of population pyramids. • Synthesize findings and create an action plan to expose issues of slum life. 	8 th
	TIME
	3 – 5 days
	REQUIRED MATERIALS <ul style="list-style-type: none"> ✓ Computer Internet access with projector ✓ Computer Internet access for students ✓ Handouts: “Pre/Post Test”; “Kibera Non-Fiction Reading”; “Stations: Group Work Packet”; “Caption Writing” ✓ Reading: “Being Obama’s Brother” ✓ 2D and 3D maps from the Map Kibera Project ✓ Google Earth kmz files from the Map Kibera Project ✓ Population pyramids for Kenya and the United States from the U.S. Census Bureau

MINNESOTA SOCIAL STUDIES STANDARDS & BENCHMARKS

- Standard 1.** People use geographic representations and geospatial technologies to acquire, process and report information within a spatial context.
- 8.3.1.1.1** - *Obtain and analyze geographic information from a variety of print and electronic sources to investigate places or answer specific geographic questions; provide rationale for its use.*
For example: Sources—Geographic Information Systems (GIS), online atlases and databases, Google Earth or similar programs, maps, aerial photos and other images. Geographic questions—Where are we? What is this location like? What are the characteristics of this location? How has this place been affected by the movement of people, goods and ideas? How do people modify the environment to fit their needs? How do people organize locations into regions? How is this place similar to or different from other places? Questions might also relate to urban development, environmental concerns, transportation issues, flood control.
- Standard 2.** Geographic inquiry is a process in which people ask geographic questions and gather, organize and analyze information to solve problems and plan for the future.
- 8.3.1.2.1** - *Formulate questions about topics in geography; pose possible answers; use geospatial technology to analyze problems and make decisions within a spatial context*
For example: Questions about geographic issues might relate to urban development, environmental concerns, transportation issues, flood control. Geospatial technology—Geographic Information Systems (GIS), online atlases and databases, Google Earth or similar programs.
- Standard 3.** Places have physical characteristics (such as climate, topography and vegetation) and human characteristics (such as culture, population, political and economic systems).
- 8.3.2.3.1** - *Use appropriate geographic tools to analyze and explain the distribution of physical and human*

characteristics of places.

For example: Physical characteristics—landforms (Rocky Mountains, Mount Everest), ecosystems (forest), bodies of water (Hudson Bay, Indian Ocean, Amazon River), soil, vegetation, weather and climate. Human characteristics— structures (Great Wall of China, Eiffel Tower), bridges (Golden Gate Bridge), canals (Erie Canal), cities, political boundaries, population distribution, settlement patterns, language, ethnicity, nationality, religious beliefs.

SUGGESTED PROCEDURE

Day 1

1. Administer the “Pre/Post Test” about Kibera.
2. Present a brief overview of the history of Kenya to students.
3. Present the location and geography of Nairobi, Kenya to students.
4. Present an overview of the background information and statistics of Kibera using the Map Kibera Project at <http://mapkiberaproject.yolasite.com/maps-and-statistics.php>
5. Using the website, “The Places We Live”, at <http://www.theplaceswelive.com/>, take the students to the Kibera slum and give them a virtual tour of any or all of the four families.
6. Assign the article, “Being Obama’s Brother”, from Newsweek along with the reading strategy handout, “Kibera Non-Fiction Reading”.

Day 2

1. Prepare materials for the stations activity*. Copy and place maps in page protectors and set up six stations with maps and resources as follows:

Station 1: Terrain and Drainage

- a. Sewage/drainage
- b. Population density
- c. Terrain
- d. Structures

Station 2: Infrastructure

- a. Water points
- b. Toilets and baths/lavatories
- c. Population density
- d. Electricity distribution

Station 3: Structure Building Materials

- a. Iron structures
- b. Mud structures
- c. Concrete structures
- d. Wood structures
- e. Population density

Station 4: Businesses, schools, churches, cost of rent

- a. Business distribution
- b. Population density
- c. Rent/lease cost
- d. Minors/children and schools
- e. Current schilling conversion (research and post for students or have them research it)

Station 5: Population Pyramids

- a. Kenya death rate
- b. Kenya birth rate

- c. U.S. population pyramid 2000
- d. Kenya population pyramids: 1990, 1998, 2008

Station 6: Google Earth Layers (kmz files) (computer with Google Earth necessary)

- a. Terrain
- b. Structures
- c. Sewage system
- d. Water points
- e. Business distribution
- f. Population distribution

2. Hand out “Stations: Group Work Packet” and place students in six groups. Review the directions for the handout and send the groups to an assigned station. Allow 10-15 minutes per station for students to work through the questions pertaining to the given station.

*Note: This may take 2-3 days for all groups to work through each station; students could jigsaw the stations and present the information and results as well

3) Assign the handout, “Caption Writing”, as homework. The teacher will either provide pictures or have students locate pictures on their own. Students write descriptive captions for two pictures.

Day 3

Continuation of station work

Day 4

Continuation of station work

Day 5

1. Begin class by showing students brief videos of Kibera to give them a glimpse of what life is like within the slum. There are many videos on YouTube, but show ones that provide a balanced perspective including proactive behaviors. In addition, address HIV/AIDS and other diseases that are prevalent in Kibera. (The Website Resources provide links to videos.) Discuss Kibera using the following questions:

- How do slums form? (rapid urbanization, high birth rates, etc.)
- What is the attitude of people living in the slum? (Be sure to reinforce that slum dwellers are as happy as students are and, hopefully, transitioning into the city)
- What station uncovered the most issues?
- What can be done to help? (awareness, volunteer)
- What do you have easy access to that people in Kibera do not have? (education, police, fire department, restaurants, shopping, transportation, clean and fresh water, toilets, showers, food, electricity, roads, etc.)
- How does a slum function? How is it governed or policed? (gangs, landlords)
- Do slums exist in the United States? (discuss tent cities, Skid Row, etc.)

2. Administer the “Pre/Post Test” about Kibera.

3. Assign the summative assessment in which students individually write a five paragraphs action plan. Students assume the role of an activist for slum reform to promote awareness and improvements from the Nairobi and Kenyan governments. Students must include and reference at least 3 artifacts that identify the issue they think needs the most attention. Artifacts are what the students studied in their slum analysis (maps or kmz files). Each artifact and issue must be accompanied by a solution or action plan to solve the issue. The action plan must include an introduction with a thesis statement, three paragraphs in the body (one for each artifact/issue/solution), and a conclusion.

Assessment

- “Kibera Non-Fiction Reading” Handout
- “Stations: Group Work Packet” Handout
- “Caption Writing” Handout
- Action Plan
- “Pre/Post Test” Handout

Resources

Kibera background information and statistics at Map Kibera Project

<http://mapkiberaproject.yolasite.com/maps-and-statistics.php>

Kibera slum virtual tour at “The Places We Live” (worksheets and curriculum also available)

<http://www.theplaceswelive.com/>

2D and 3D maps at Map Kibera Project

<http://mapkiberaproject.yolasite.com/maps-and-statistics.php>

Google Earth kmz files at Map Kibera Project

<http://mapkiberaproject.yolasite.com/maps-and-statistics.php>

“Being Obama’s Brother” by George Obama (January 2, 2010) at Newsweek

<http://www.newsweek.com/my-turn-being-obamas-brother-70903>

“Being Obama’s Brother” excerpt with photo at Free Republic

<http://www.freerepublic.com/focus/news/2419631/posts>

Population Pyramids at United States’ Census Bureau

<http://www.census.gov/population/international/data/idb/informationGateway.php>

“The Kibera Slums, Kenya” (2:52) at GoesByQ, YouTube

<http://www.youtube.com/watch?v=8CvXcBi827w>

“Kibera: A Glimpse into Slum Life” (4:46) at unit 45x, Pamoja Youth Foundation, YouTube

<http://www.youtube.com/watch?v=hbwvtETnzDA>

“Women in Kibera Slums Use Sacks to Grow Vegetables” (4:02) at Kenya Citizen TV, YouTube

<http://www.youtube.com/watch?v=1c3XrHTya6w>

“Kenya: Treating More than just HIV/AIDS in Nairobi’s Kibera Slum” at IRIN (Integrated Regional Information Networks) project of the UN Office for the Coordination of Humanitarian Affairs

<http://www.irinnews.org/report/39434/kenya-treating-more-than-just-hiv-aids-in-nairobi-s-kibera-slum>

“Kibera HIV and Water and Sanitation, Kenya” at AMREF

<http://www.amrefusa.org/what-we-do/kibera-hiv-and-water-and-sanitation-kenya/>

Pre/Post Test

Directions: Label each statement True (A) or False (B) in the blank provided.

- 1) ___ More than half of the world's population lives in rural areas.
- 2) ___ More than 1/3 of the world's population lives in slums.
- 3) ___ The population growth trend of slum dwellers is going down.
- 4) ___ Birth rates and death rates do not impact slum populations.
- 5) ___ There are more than 1 billion slum dwellers worldwide.
- 6) ___ GIS (Geographic Information Systems) lets us visualize, question, analyze, interpret, and understand data to reveal relationships, patterns, and trends through various layers.
- 7) ___ GIS has not had an impact in analyzing and improving slums.
- 8) ___ Access to clean water is not an issue in a slum.
- 9) ___ Slums develop because of rapid urbanization.
- 10) ___ Urban slums are not the fastest growing human habitat.
- 11) ___ HIV/AIDS patients in slums have treatments and vaccinations readily available.
- 12) ___ Slums are recognized and supported by local governments and authorities.
- 13) ___ Slum dwellers are moving from rural areas into the city for better opportunities.
- 14) ___ President Obama has a brother who lives in the Kibera slum.
- 15) ___ Slum dwellers earn \$10 a day in Kibera.
- 16) ___ Rent for slum dwellers is \$7 a month in Kibera.
- 17) ___ Slums function as a city does, with markets, jobs, schools, and places of worship.
- 18) ___ The typical building material for houses in the Kibera Slum is mud.
- 19) ___ Slum dwellers are happy with life and what they have.
- 20) ___ The United States does not have human habitats similar to slums.

Kibera Non-Fiction Reading

Directions: Use the SQ3R reading strategy and highlight or underline as necessary while you read the article, "Being Obama's Brother". Then answer the questions at the bottom.

S: Survey – Review the title, headings, and subheadings; survey introduction and conclusion

Q: Question – Turn heading into question; read questions below after each paragraph; what do you already know about this topic?

R: Read - Reduce your speed for difficult passages; stop and reread parts that are not clear; read only a section at a time and recite after each section; look for answers to the questions you first raised.

R: Recite - Orally ask yourself questions about what you have just read or summarize in your own words what you read; underline or highlight important points you've just read. TRIPLE STRENGTH LEARNING: Seeing, saying, hearing. QUADRUPLE STRENGTH LEARNING: Seeing, saying, hearing, writing!!!

R: Review - If you took notes while reciting, write questions for the notes you have taken in the left hand margins of your notebook; cover the right hand column of your notebook and orally ask yourself the questions in the left hand margins; page through the reading and/or your notebook to re-acquaint yourself with the important points.

When you have completed the article, answer the following questions:

- 1) What magazine was this article from? What is the date?
- 2) What is the overall feeling of George Obama? Give specific examples.
- 3) How has he made positive changes for his life?
- 4) How has he made positive changes for the people of Kibera?
- 5) Did you know President Obama had a brother who lived in a slum in Africa?
- 6) If you chose one of George Obama's quotes as the most important pertaining to Kibera, what would it be?

You may be interested in reading the entire memoir, Homeland: An Extraordinary Story of Hope and Survival, by George Obama with Damien Lewis (2010).

Stations: Group Work Packet

Station 1: Terrain/Drainage

Maps to analyze: 1) sewage/drainage; 2) population density; 3) terrain; 4) structures

- 1) Why are these maps grouped together?
- 2) What problems in Kibera do you see exist by analyzing these maps?
- 3) How does terrain affect life?
- 4) How does the drainage affect life and what are the 2 types of drainage/sewage?
- 5) How is daily life in Kibera affected by what these maps show you?
- 6) How is health in Kibera affected by the features shown in this map?
- 7) What problems do you foresee when these features of Kibera are updated?
- 8) Make 2 generalizations comparing the population density map and the other maps at this station.
 - 1.
 - 2.
- 9) What are the 2 biggest problems in Kibera that these maps show you?
 - 1.
 - 2.
- 10) List 2 ideas that would solve a problem in Kibera that relate directly to the maps at this station.
 - 1.
 - 2.

Station 2: Infrastructure

Maps to analyze: 1) water points; 2) toilets and baths/lavatories; 3) population density; 4) electricity distribution

- 1) Why are these maps grouped together?
- 2) What problems in Kibera do you see exist by analyzing these maps?
- 3) How is daily life in Kibera affected by what these maps show you?
- 4) How is health in Kibera affected by the features shown in this map?
- 5) What problems do you foresee when these features of Kibera are updated?
- 6) Make 2 generalizations comparing the population density map and the other maps at this station.
 - 1.
 - 2.
- 7) What are the 2 biggest problems in Kibera that these maps show you?
 - 1.
 - 2.
- 8) List 3 ideas that would solve a problem in Kibera that relate directly to the maps at this station.
 - 1.
 - 2.
 - 3.

Station 3: Structure Building Materials

Maps to analyze: 1) iron structures; 2) mud structures; 3) concrete structures; 4) wood structures; 5) population density

- 1) Why does it matter what type of material buildings are made of?
- 2) What type of material costs the most?
- 3) Are the various building materials clumped together in areas? Where is each building material centered?
- 4) What problems in Kibera do you see exist by analyzing these maps?
- 5) How is daily life in Kibera affected by what these maps show you?
- 6) How is health in Kibera affected by the features shown in this map?
- 7) What problems do you foresee when these features of Kibera are updated?
- 8) Make 2 generalizations comparing the population density map and the other maps at this station.
 - 1.
 - 2.
- 9) What are the 2 biggest problems in Kibera that these maps show you?
 - 1.
 - 2.
- 10) List 2 ideas that would solve a problem in Kibera that relate directly to the maps at this station.
 - 1.
 - 2.

Station 4: Businesses, Schools, Churches, Rent

Maps to analyze: 1) business distribution; 2) population density; 3) rent/lease cost; 4) schools and minors/children; 5) schilling conversion

- 1) Why are these maps grouped together?
- 2) What problems in Kibera do you see exist by analyzing these maps?
- 3) Where is the most expensive place to live in Kibera and **why**?
- 4) Where is the least expensive place to live in Kibera and **why**?
- 5) What buildings does Kibera not have that you have in your community?
- 6) What is Kibera missing that are important to your daily life?
- 7) How is daily life in Kibera affected by what these maps show you?
- 8) How is health in Kibera affected by the features shown in this map?
- 9) What problems do you foresee when these features of Kibera are updated?
- 10) Make 2 generalizations comparing the population density map and the other maps at this station.
 - 1.
 - 2.
- 11) What are the 2 biggest problems in Kibera that these maps show you?
 - 1.
 - 2.
- 12) List 2 ideas that would solve a problem in Kibera that relate directly to the maps at this station.
 - 1.
 - 2.

Station 5: Population Pyramids

Resources at this station (none online): 1) Kenya death rate; 2) Kenya birth rate; 3) U.S. population pyramid 2000; 4) Kenya population pyramids: 1990, 1998, 2008

1) Is it possible for a population pyramid to be lopsided with significant differences in population between men and women? If so, what would cause that to happen?

2) Research online and make a rough sketch of the following population pyramids: (be sure to have separation between M/F)

Developing

Developed

Decreasing

War

Natural Disaster

Population Control

3) What causes a period on the population pyramid to shrink from the previous years? What issues will Kenya face in the future?

4) How does Kenya's population pyramid compare to the U.S. population pyramid?

5) Draw a population pyramid for Kenya in 2010.

Station 6: Google Earth Layers

Use the Map Kibera Project website at <http://mapkiberaproject.yolasite.com/maps-and-statistics.php>. Click on the link Map Kibera and open the following layers in Google Earth. Remember to cycle through the layers by turning them on and off to see how the data overlaps. This is GIS, or geographic information system. Layers to open: 1) terrain; 2) structures; 3) sewage system; 4) water points; 5) business distribution; 6) population distribution.

You will take the role of an activist to eliminate slums and improve living conditions for those living in slums. You will present GIS information to support your action plan to the local governmental authorities and expose the authorities to what life is like in Kibera.

- 1) Choose 3 layers on which to focus and provide a reason for that choice:

Layer: _____

Reasoning: _____

Layer: _____

Reasoning: _____

Layer: _____

Reasoning: _____

- 2) Circle the approach you would use? *Economic Health Care Standard of Living Education*

- 3) List 5 issues you would explain to the government authorities as you present your action plan:

1)

2)

3)

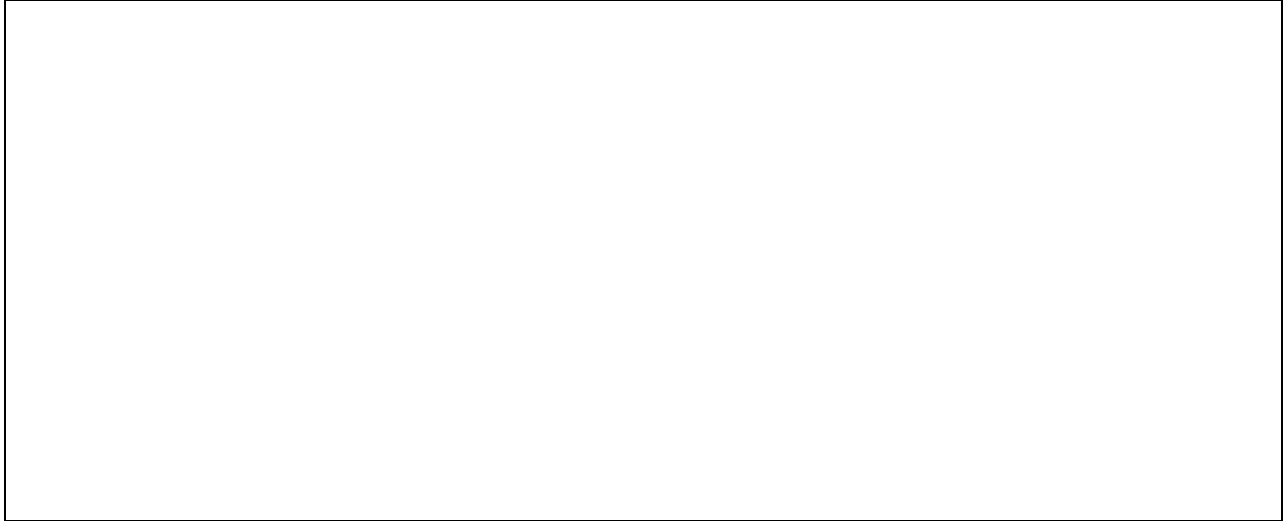
4)

5)

Caption Writing

Directions: Taking the role of a news reporter, you have just snapped some emotional pictures. Locate two pictures online that you feel should be published for the world to see and gain awareness of life in a slum. Print the picture and paste it in the space below. Then, creatively write a caption for the picture that will be published in a news article. Captions must be at least 2 sentences and no more than 4 sentences. Be creative and use descriptive and attention grabbing word choices.

Picture 1:



Picture 2:

