# Africa: The Numbers Don’t Lie

## OVERVIEW & OBJECTIVES
In this lesson students will examine some of the problems facing Africa by using a variety of maps to understand correlations between data. Students will work in groups to create several choropleth maps that show GDP per capita, literacy rate, life expectancy, % urban, % agriculture and the AIDS rate. Students will use these maps to make generalizations, establish correlations, and construct inferences.

**Students will be able to...**
- Read and analyze maps.
- Make correlations and generalizations between data sets.
- Make inferences about modern day problems that have plagued Africa.

## GRADE
| 8th Global Studies and 9th Geography |

## TIME
Two 85-minute class periods, plus more depending on discussion

## REQUIRED MATERIALS
- Goode’s World Atlas (or access data at the CIA World FactBook website)
- Article: “AIDS in Africa: Dying by the Numbers” by John Christensen at cnn.com/fyi website
- Power point: “Using Maps to Understand Africa: Terms to Understand”
- Colored pencils
- Handout: Blank Africa outline map with political boundaries

## MINNESOTA SOCIAL STUDIES STANDARD & BENCHMARK(S)

### (8th GRADE)

**Standard 1.** People use geographic representations and geospatial technologies to acquire, process and report information within a spatial context.

**8.3.1.1.2** Create and use various kinds of maps, including overlaying thematic maps, of places in the world; incorporate the “TODALSS” map basics, as well as points, lines and colored areas to display spatial information.

*For example:* “TODALSS” map basics—title, orientation, date, author, legend/ key, source, scale. Spatial information—cities, roads, boundaries, bodies of water, regions.

**Standard 14.** Globalization, the spread of capitalism and the end of the Cold War have shaped a contemporary world still characterized by rapid technological change, dramatic increases in global population and economic growth coupled with persistent economic and social disparities and cultural conflict. (The New Global Era: 1989 to Present)

**8.4.3.14.1** Describe causes of economic imbalances and social inequalities among the world’s peoples in the post-colonial world and efforts made to close those gaps. (The New Global Era: 1989 to Present)

*For example:* Causes of imbalances—political conflicts, natural disasters, the economic legacy of...
colonialism, access to health care, technology, education. Efforts made to close the gaps—human rights organizations, United Nations Millennium goals.

(9th GRADE)
Standard 1. People use geographic representations and geospatial technologies to acquire, process and report information within a spatial context.
9.3.1.1 Create tables, graphs, charts, diagrams and various kinds of maps including symbol, dot and choropleth maps to depict the geographic implications of current world events or to solve geographic problems.

For example: Maps showing changing political boundaries and tables showing the distribution of refugees from areas affected by natural disasters.

SUGGESTED PROCEDURE

Introduction
The lesson will begin with students journaling using the question: “Based on your prior knowledge, would you consider the continent of Africa rich or poor? (Feel free to use PIGEARS to help you sort your thoughts.)”

Ask students to Think-Pair-Share about what they wrote. The teacher will categorize student responses on the white board. Based on prior experience with similar questions, most students will say Africa is poor because people don’t have enough food, clean water, lack technology, etc.

Development
1. The teacher explains that there are multiple reasons that many parts of Africa would be considered poor, whether it is poor in terms of technology, money, food, health care, etc. The teacher may further explain that the goal is to examine common connections among the issues that plague Africa and to make an inference about what they think is at the root of all these problems. Students will be given the handout entitled “Africa: The Numbers Don’t Lie, Part I”. The teacher reads the directions aloud and reviews choropleth mapping by expanding on what a choropleth map is and how to create one. (Students are familiar with choropleth maps and should need only a reminder of how to create one.)

2. The teacher divides the students into heterogeneous groups of six, so each group makes six different maps. Select the groups by numbering each student 1-6 and placing those students in a group. Each student will create a map based on the number they were given and the number on the “Africa: The Numbers Don’t Lie, Part I” handout. For example, if they are given number one they will create a map that shows GDP per capita. The maps will be based on the following topics: GDP per capita, literacy rate, life expectancy, % urban, % agricultural, and AIDS rate. Additional statistics may be used as well for other correlations. Students are given blank Africa maps and obtain the raw data from the Goode’s World Atlas World Demographic Tables and the attached handout, “Statistics: AIDS Rates, GDP/capita, Literacy Rates”. All maps should include TODALSS.

Students’ first step is to label the countries on the blank Africa map. Once students have the countries labeled they will begin shading based on the four data categories they’ve created. The directions for shading are on the “Africa: The Numbers Don’t Lie, Part I” handout.
3. Reconvene as a class when students finish creating their maps. The teacher will review the meaning of generalizations and correlations and provide examples of each using the handout, “Africa: The Numbers Don’t Lie, Part II”. At this point the teacher will review how to analyze maps by looking for patterns—where the light colors and dark colors are located in particular countries or regions and what connections can be made between them.

4. Students will post or lay the maps they have created on an accessible surface. Each student should have their “Africa: The Numbers Don’t Lie, Part II” handout in front of them. They will complete the generalizations and correlations by reading and analyzing their maps. Each student will complete the handout with four generalizations as well as four correlations along with evidence from the map that supports the correlations. Students will also rank their correlations from strongest to weakest and support why they ranked them that way.

Correlations that will probably be made include:
- Countries that have a higher % urban also have a higher % literacy rate on average.
- Countries that have a higher AIDS rate have a lower life expectancy and less % urban area.
- Countries with a higher life expectancy have a higher literacy rate.

Students should understand that the topics are interconnected. Students should also realize that many of the issues plaguing Africa could be improved with education, as literacy rates seem to impact all of the other topics as shown in the correlations.

5. When groups have completed “Africa: The Numbers Don’t Lie, Part II” handout, each group records on the white board what they felt was their strongest correlation and weakest correlation. The class discusses common trends among the correlations and whether all the correlations are necessarily true. For example, students may notice that areas of high literacy rates also have high AIDS rates. Discuss reasons for such correlations, including that there may be pockets within each country that are not literate and the AIDS rate is higher in those areas.

6. The teacher explains to students that they will make an inference about what is at the root of Africa’s problems. Students will examine common connections among the several issues they mapped as well as examine various Africa maps in Goode’s Atlas, particularly Political Change, which shows both colonial powers and independence dates of African countries. Students will construct inferences on the causes of problems that plague Africa considering colonialism, topography, climate, minerals and economic activities, location (landlocked vs. coastal position; proximity to neighbors).

7. Students will be given the reading, "AIDS in Africa: Dying by the Numbers," as a homework assignment. They will read the article and complete the corresponding reading strategy, "Reading Strategy for AIDS Article.” The handout, “PIGSEARS: A Mnemonic Device for Analyzing Culture Characteristics,” may be reviewed.

8. Discuss the reading as a class the following day and highlight that the article supported many of the correlations they made from their maps. Also discuss what might change if one piece of the puzzle changed. For example, what might happen to life expectancy, AIDS rates, and GDP per capita if the literacy rate improved?
Closing
Students complete the “So What Should We Do?” handout. This will give the lesson a real-world application as they pretend they are the Director of African Affairs and have to decide how U.S. aid to Africa could best be used. The teacher could also have students select an issue and write a letter to a Senator, Representative, etc., proposing a particular action to resolve the issue.

Assessment
- Class Discussion
- Completion of Choropleth Map
- Handout: “Africa: The Numbers Don’t Lie Part II”
- Handout: “Reading Strategy for AIDS Article”
- Handout: “So What Should We Do?”

Website Resources
“The World Factbook” from the Central Intelligence Agency

“AIDS in Africa: Dying by the Number” from CNNfyi.com
Africa: The Numbers Don’t Lie
Part I

Creating, analyzing, and interpreting maps can provide you with a tremendous amount of information. The best part about maps is they allow you to obtain information without reading large amounts of text.

For this assignment you are going to create a map along with each member of your group. Hopefully, when you examine the maps all together they will give you some insight into issues that are plaguing Africa. During this activity we will make generalizations, correlations, and inferences that will require that all maps be completed. It is vital that you do your part.

The type of map you will create is called a choropleth map. A choropleth map is a map that uses shading or colors to show intensity on a map. The darker the color is the greater the intensity.

To create the choropleth map for this activity you need to break the data into four categories based on percentages. The higher the percentage, the darker you would shade that country.

For example, if you were looking at % Urban, you would realize that the percentage ranges from less than 10% to almost 90%. Thus, you might break the data into four categories as follows:

- 0% - 25% = lightest color
- 26% - 50% = 2nd lightest color
- 51% - 75% = 2nd darkest color
- 76% or greater = darkest color

It is vital to include all of the elements of TODALSS on your map so that when it comes time to do the analysis you can understand what the map is telling you. In addition, all maps should be neat and organized.

You will find the data for the six categories in the back of Goode’s Atlas (before the Glossary and Index) or on the separate handout:

1. Gross Domestic Product (GDP) per capita = separate handout
2. Literacy Rate (% of population who can read and write) = separate handout
3. % Urban (% of population who live in cities) = Goode’s Atlas World Demographic Table
4. % AIDS (% of population who have AIDS) = separate handout
5. Life Expectancy Male or Female = Goode’s Atlas World Demographic Table
6. Area in Agriculture (% of country used to grow crops or raise livestock) Goode’s Atlas World Agriculture Table
Africa: The Numbers Don’t Lie Part II
What do the maps tell us?

Now that your maps have been completed you need to find some space and post them or lay them out where everyone in the group can see them.

During this activity you will be asked to write generalizations. A generalization is making a broad statement that applies to a group based on only a few facts or pieces of information.

Example: Based on the median age map I created, I can see that the median age is very young. This tells me that adults are not living very long lives and they are having many children, which drives the median age lower.

STEP 1: GENERALIZATIONS
State four broad generalizations below that you can infer from analyzing the maps your group has created.

Generalization One __________________________________________________________

Generalization Two __________________________________________________________

Generalization Three _________________________________________________________

Generalization Four _________________________________________________________


**STEP 2: CORRELATIONS**

Now that you have made generalizations you can move on to the next step—**correlations**. A correlation is a mutual relationship or connection between two or more things. To make a correlation you will need to examine multiple maps and look for relationships. There are positive correlations and negative correlations.

A *positive correlation* is when a map shows an increase and the other map shows an increase in the same region.  
A *negative correlation* is when a map shows a decrease while the other map shows an increase in the same region.

*For example, if you looked at a map of the average temperature and another map that showed the number of retired people who move during the winter months you would find that there is a positive correlation between higher temperatures and the number of retired people living in those states during the winter.*

1. ________________________________  
Correlates with . . .  
______________________________

Evidence to support the correlation: _____________________________________________
_________________________________________________________
_________________________________________________________

2. ________________________________  
Correlates with . . .  
______________________________

Evidence to support the correlation: _____________________________________________
_________________________________________________________
_________________________________________________________

3. ________________________________  
Correlates with . . .  
______________________________

Evidence to support the correlation: _____________________________________________
_________________________________________________________
_________________________________________________________

4. ________________________________  
Correlates with . . .  
______________________________

Evidence to support the correlation: _____________________________________________
_________________________________________________________
_________________________________________________________
**STEP 3: RANKING YOUR CORRELATIONS**

From the four correlations you have stated based on analyzing and interpreting your maps, rank the correlations from strongest relationship (1) to weakest relationship (4). Provide a rationale that explains why you ranked them the way you did.

**Strongest correlation**

1. Map Topic ________________  Map Topic ________________
   Why: ________________________________
   ________________________________

2. Map Topic ________________  Map Topic ________________
   Why: ________________________________
   ________________________________

3. Map Topic ________________  Map Topic ________________
   Why: ________________________________
   ________________________________

**Weakest correlation**

4. Map Topic ________________  Map Topic ________________
   Why: ________________________________
   ________________________________
### Reading Strategy for AIDS Article

**Before Reading:**
Before reading the article make a prediction as to why AIDS is so much more prevalent in Africa than in any other continent.

<table>
<thead>
<tr>
<th>Name _____________________________</th>
<th>Period ______</th>
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</thead>
</table>

**During Reading:**
As you read, code your reading as follows:

- * = Ideas you think state the main idea of the article.
- ? = Ideas in the article that you don't understand.
- ! = Ideas in the article that you find surprising or interesting.

Be prepared to share your coding results with the class.

As you read the article categorize the information according to PIGEARS. For example, if the article discusses specific ideas about how AIDS impacts the African economy place it in the (E)conomics blank. If the article offers an example of how AIDS impacts society you would place it in the (S)ocial blank.

- P = __________________________________________________________
- I = __________________________________________________________
- G = __________________________________________________________
- E = __________________________________________________________

A = Artistic Activity will not be used.

- R = __________________________________________________________
- S = __________________________________________________________
After Reading:
After you have read the article and processed the information, create a title for the article that you feel captures the main idea of what the author is trying to convey.

Title: ____________________________________________________________

______________________________________________________________
**PIGSEARS: A Mnemonic Device for Analyzing Culture Characteristics**

<table>
<thead>
<tr>
<th>Description and Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong> Political</td>
</tr>
</tbody>
</table>
| Describes who has power and control in a culture. This occurs at many scales: family, community, city and state.  
*U.S. Example: Representative Democracy; many levels of government*  |
| **I** Intellectual       |
| Identifies the tools, technologies, and flow of information in a culture.  
*U.S. Example: Mandatory education for all; colleges, smart phones, tablets, many forms of media*  |
| **G** Geographic         |
| Describes the physical landscape of the culture region and how it influences people’s way of life.  
*Minnesota Example: Humid Continental climate; plains in the south, forests and glaciated lakes in the center and north. These impact jobs, clothing, activities, etc.*  |
| **E** Economic           |
| Explains how a culture meets the basic requirements for life and distributes its resources  
*U.S. Example: Many levels of economic classes; majority of jobs in the tertiary sector; capitalist economic system*  |
| **A** Artistic           |
| Illustrates how a culture expresses itself through traditional artistic forms. Artistic may also include what people do with their leisure time.  
*U.S. Example: Painting/dance/music. Leisure activities such as fishing, sports, video games*  |
| **R** Religious          |
| Describes how the culture explains the creation of the earth and people, along with the role of faith in daily activities.  
*U.S. Example: Religious diversity, freedom of religion*  |
| **S** Social             |
| Explains the role of language and other forms of communication in a society and how people relate and interact with one another.  
*U.S. Example: Rising use of social media, legal equality for all, etc.*  |
## Statistics: AIDS Rates, GDP/capita, Literacy Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>AIDS*</th>
<th>GDP/capita+</th>
<th>Literacy Rate^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>0.1%</td>
<td>$7,600</td>
<td>72.6%</td>
</tr>
<tr>
<td>Angola</td>
<td>2.0%</td>
<td>$6,500</td>
<td>70.4%</td>
</tr>
<tr>
<td>Benin</td>
<td>1.2%</td>
<td>$1,700</td>
<td>42.4%</td>
</tr>
<tr>
<td>Botswana</td>
<td>24.8%</td>
<td>$17,100</td>
<td>85.1%</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>1.2%</td>
<td>$1,400</td>
<td>28.7%</td>
</tr>
<tr>
<td>Burundi</td>
<td>3.3%</td>
<td>$600</td>
<td>67.2%</td>
</tr>
<tr>
<td>Cameroon</td>
<td>5.3%</td>
<td>$2,400</td>
<td>71.3%</td>
</tr>
<tr>
<td>Cape Verde</td>
<td>0.04%</td>
<td>$4,200</td>
<td>84.9%</td>
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<tr>
<td>Central African Republic</td>
<td>4.7%</td>
<td>$800</td>
<td>56.6%</td>
</tr>
<tr>
<td>Chad</td>
<td>3.4%</td>
<td>$2,000</td>
<td>35.4%</td>
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<tr>
<td>Comoros</td>
<td>0.1%</td>
<td>$1,300</td>
<td>75.5%</td>
</tr>
<tr>
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<td>$4,700</td>
<td>83.8%</td>
</tr>
<tr>
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<td>$400</td>
<td>66.8%</td>
</tr>
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<td>3.4%</td>
<td>$1,800</td>
<td>56.9%</td>
</tr>
<tr>
<td>Djibouti</td>
<td>2.5%</td>
<td>$2,700</td>
<td>67.9%</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.1%</td>
<td>$6,700</td>
<td>73.9%</td>
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<tr>
<td>Equatorial Guinea</td>
<td>5.0%</td>
<td>$26,400</td>
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<td>$1,200</td>
<td>39.0%</td>
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<tr>
<td>Gabon</td>
<td>5.2%</td>
<td>$16,800</td>
<td>89.0%</td>
</tr>
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<td>2.0%</td>
<td>$1,900</td>
<td>51.1%</td>
</tr>
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<td>Ghana</td>
<td>1.8%</td>
<td>$3,400</td>
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<td>89.6%</td>
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<td>1.5%</td>
<td>$700</td>
<td>60.8%</td>
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<td>Libya</td>
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<td>$1,000</td>
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<td>Mali</td>
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<td>$1,200</td>
<td>56.1%</td>
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<td>28.7%</td>
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<td>Nigeria</td>
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<td>$2,800</td>
<td>61.3%</td>
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<tr>
<td>Country</td>
<td>AIDS*</td>
<td>GDP/capita+</td>
<td>Literacy Rate^</td>
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<tr>
<td>Rwanda</td>
<td>2.9%</td>
<td>$1,500</td>
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<tr>
<td>Sao Tome and Principe</td>
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<td>$2,400</td>
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<td>$25,600</td>
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<td>Uganda</td>
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<tr>
<td>Zimbabwe</td>
<td>14.3%</td>
<td>$600</td>
<td>83.6%</td>
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</table>

Data from CIA World Factbook; 2014
* AIDS Adult Prevalence Rate: Percentage of AIDS cases among adults
+ Gross Domestic Product per Person: Amount of money made by a country divided by its population
^ Literacy for Total Population: Percentage of people who can read and write
So What Should We Do?

The United States offers more economic aid to the continent of Africa than to any other continent in the world. However, is the money going to the right place?

You are the Director of African Affairs and provide advice regarding social and economic concerns. The President has asked for your expertise to determine how aid money to Africa should be spent. Determine the percentage of money that should be spent on each item. Consider the correlations you have developed to answer these questions:

1. Do you feel one topic or problem is the underlying cause of all other topics or problems?
2. Should all topics or problems receive equal treatment?
3. Is one African region or country in greater need than another region or country?

Using your maps, class discussions, and AIDS article as a guide, decide how you would spend the money and where in Africa it is needed most. Support your answer with specific details.

<table>
<thead>
<tr>
<th>Item</th>
<th>%</th>
<th>Justification</th>
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</tr>
</tbody>
</table>
Next, answer the following questions:

1. Is one topic or problem the underlying cause of all others? ____________________________________________________________

2. Should they receive equal treatment? ____________________________________________________________

3. Is one African region or country in greater need than another region or country? __________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________