Africa: The Numbers Don't Lie

Overview: 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 and area class maps that show GDP per capita, literacy rates, life expectancy, % urban, and AIDS rates. They will use these maps, as well as maps they have made in prior lessons (Colonization and Independence maps), to make generalizations and establish correlations.

Minnesota Social Studies Standard:
V. GEOGRAPHY
B. Essential Skills
The students will use maps, globes, geographic systems, and other databases to answer geographic questions at a variety at a variety of scales from local to global.
2. Students will make inferences and draw conclusions about the character of places based on a comparison of maps, aerial photos, and other images.

Objectives:
1. Students will learn how to read and analyze maps.
2. Students will learn how to make generalizations as well as correlations between data sets.
3. Students will learn about modern day problems that have plagued Africa and analyze to what extent colonialism is a factor.

Grade Level: This lesson is designed for a 10th grade World History & Geography class.

Time: This lesson will take two 85 minute class periods. (Maybe three periods depending on how long you discuss each step.

Subject(s)/Topic(s): The lesson really only lends itself to geography, economics, and history.

Required Materials:
1. Goode's World Atlas (or you can find data at the CIA World Fact Book website). It helps to have a class set, but you can also just print the data as handouts.
2. Article: "AIDS in Africa: Dying by the numbers" by John Christensen at: Article from: http://www.cnn.com/fyi/backgrounders/aids.africa/stories/overview/
3. Colored pencils for shading.
4. Handout: Africa: The Numbers Don't Lie Parts I.
5. Handout: Africa: The Numbers Don't Lie Part II
6. Handout: PIGEARS: "Reading Strategy for AIDS Article"
7. Handout: Blank Africa outline map with political boundaries
8. Handout: AIDS Statistics
9. Handout: Literacy Rates
10. Handout: "So What Should We Do?"
11: PPT: Powerpoint "Using Maps to Understand Africa"

Suggested Procedure:
Opening:
The lesson will begin with students journaling on 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 out your thoughts.)"

After students have had time to write, we will Think/Pair/Share about what we wrote. We will categorize information 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, lack technology, etc.

Development:
1. Students will be given a worksheet entitled "Africa: The Numbers Don't Lie Part I." Before going over the directions I talk with them about the idea that there are multiple reasons that many parts of Africa would be considered poor, whether it's poor in terms of technology, money, food, health care, etc. I tell them that their goal is to examine common connections between the issues that plague Africa and to look for what they think is at the root of all these problems. I read the directions to the students aloud and expand about what a choropleth map is and how to create one. My students are familiar with these maps from 9th grade geography and need only a small reminder of how to create one.

2. Students will be divided into groups of six. I pick the groups by numbering them off one through six and placing those students in a group. Then I number off the next group one through six, and so on. Each student will create the map based on the number they were given and the number on the "Africa: The Numbers Don't Lie Part I" sheet. 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 rates. You could use many other statistics as well and come up with other exciting correlations as well. Students are given blank Africa maps to use. They get the raw data from the Goode's World Atlas World Demographic Tables. All maps should include TODALSS. (A handout that describes TODALSS is attached.)

The first step to create their map is to label the countries. Once they have the countries labeled they will began shading based on the four data ranges they've created. The directions are on the "Africa: The Numbers Don't Lie Part I" handout.

3. When students are finished creating maps we reconvene as a class. As a whole class I review the meaning of generalizations and correlations and give examples of each. This information is located on the "Africa: The Numbers Don't Lie Part II." At this point I also go over how to analyze their maps. We discuss looking for patterns of where the light colors and dark colors are and what connections can be made between them.

4. Students will lay out all of the maps they have created on an accessible surface. Each student should have their Africa: The Numbers Don't Lie Part II sheet in front of them. They will fill out the generalizations and correlations worksheet by reading and analyzing their maps. Each student will fill out a sheet with four generalizations as well as four correlations along with evidence

from the map that seems to support the correlation. They will also rank their correlations from what they think are the strongest to the weakest and support why they feel that way.

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

Those are just a few. What they should be able to see is that the problems are interconnected and many of the issues plaguing Africa could be improved with education as literacy rates seem to impact all of the other categories in a negative fashion.

5. When groups are done they should share ideas on the white board by each group putting up what they felt was their strongest correlation and weakest correlation. We will discuss common trends we see with what was on the board and also discuss whether all the correlations are necessarily true. For example, many students notice that areas of high literacy rates also have high AIDS rates. I asked them if that makes sense and no one thought it did so we discussed other reasons this may appear on the maps, such as there may be pockets within each country that aren't literate and the AIDS rate is higher in those areas.

6. Students will be given the reading "AIDS in Africa: Dying by the Numbers." They will read the article and complete the reading strategy that goes with it. I assign this for homework and they complete this on their own.

7. Discuss the reading the following day and highlight that the article backed up 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:
To close the lesson I handed out the "So What Should We Do?" worksheet. I wanted to give this lesson a real-world application so I had them pretend they were the Director of African Affairs and had to decide where U.S. aid to Africa should go and how it could best be used. You could also have them pick an issue and have them write a letter to a Senator, Representative, etc.

Resources:
https://www.cia.gov/library/publications/the-world-factbook/index.html - information on AIDS rates from CIA World Factbook

Assessment: Students will be formatively assessed based on class discussion. They will also be assessed by completion of the generalizations and correlations sheet as well as the PIGEARS reading strategy. In addition, students will be assessed based on where they think economic aid money should go.

Credits: My name is Eric Ripken and I teach primarily 10th World History and Honors World History. I have also taught 9th grade geography and 9th grade government.

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 us to obtain information without reading large amounts of text.

For this assignment you are going to be creating a map along with the rest of your group. Hopefully, when you examine them all together it will give you some insight into issues that are plaguing Africa. During this activity we will be making predictions, correlations, and generalizations that will require that all maps are completed. It is vital that you do your part.

The type of map you will be creating 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 the higher the intensity.

To create a choropleth map you need to break the data into **four categories**. These categories should be based on percentages. The higher the percentage, the darker you would shade that country.

For example, if you were looking at % Urban you might break it down as follows:
10% or less = lightest color
11% - 25% = 2nd lightest color
26% - 45% = 2nd darkest color
46% 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. All maps should be neat and organized.

Where you can find information:

1. Gross Domestic Product (GDP) per capita = page 255 in the 2nd column.
2. Literacy Rate (% of population who can read and write = separate hand out.
3. % Urban (% of population who live in cities) = page 251 in the 3rd column.
4. % AIDS (% of population who have AIDS) = Separate handout.
5. Life Expectancy Male or Female = page 251, either column on the right side.
6. Cropland Area (% of country suitable for growing crops) = page 253, 3rd column.

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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 lay them out where everyone in the group can see them.

During this activity you will be asked to make **generalizations**. A **generalization** is the ability to reason general broad principles from detailed facts or 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 aren't living very long lives and they are having many kids, 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 some generalizations you can move on to the next step--correlations. A **correlation** is the mutual relationship of 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.

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

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

1. (Strongest correlation): Number ____
   Why: _____

   _____
2. Number _____
   Why: _____

   _____
3. Number _____
   Why: _____

   _____
4. (Weakest correlation): Number _____
   Why: _____

   _____

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Reading Strategy for AIDS Article

Before:

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

During:

As you read, code your reading as follows:

? = Ideas in the article that you don't understand.

* = Ideas you think state the main idea of the article.

! = Ideas that you find surprising or interesting.

***Be prepared to share your coding 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 = _____

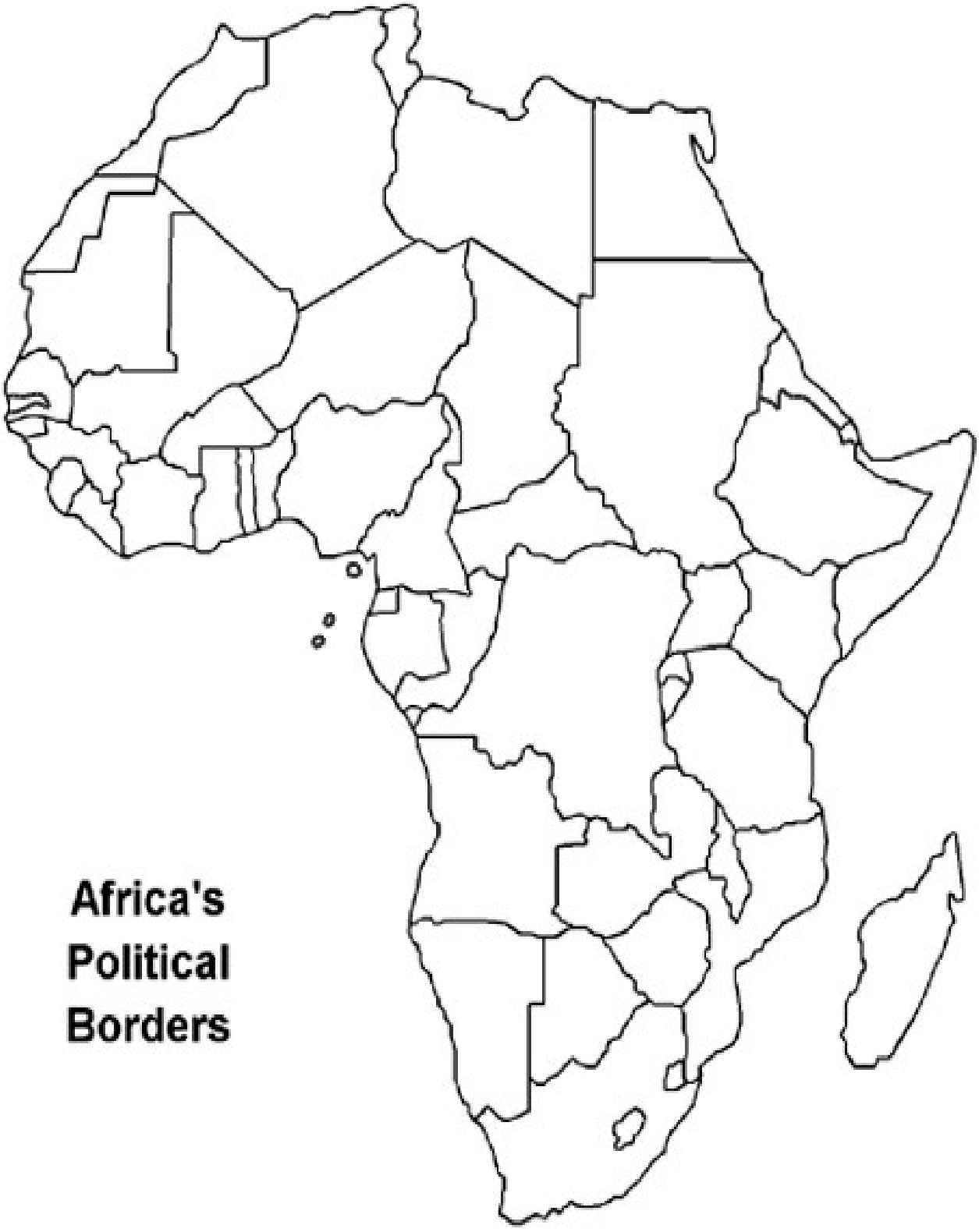
_____

S = _____

_____

After:

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.



Africa's Political Borders

AIDS Statistics (Prevalence among adults)

Country Name	% of AIDS Cases among Adults
Algeria	0.1%
Angola	3.9%
Benin	1.9%
Botswana	37.3%
Burkina Faso	4.2%
Burundi	6%
Cameroon	6.9%
Cape Verde	0.035%
Central African Republic	13.5%
Chad	4.8%
Comoros	0.12%
Democratic Republic of Congo	4.2%
Congo	4.9%
Cote D'Ivoire	7%
Djibouti	2.9%
Egypt	Less than 0.1%
Equatorial Guinea	3.4%
Eritrea	2.7%
Ethiopia	4.4%
Gabon	8.1%
Gambia	1.2%
Ghana	3.1%
Guinea	3.2%
Guinea-Bissau	10%
Kenya	6.7%
Lesotho	28.9%
Liberia	5.9%
Libya	0.3%
Madagascar	1.7%
Malawi	14.2%
Mali	1.9%
Mauritania	0.6%
Mauritius	0.1%
Morocco	0.1%
Mozambique	12.2%
Namibia	21.3%
Niger	1.2%
Nigeria	5.4%
Rwanda	5.1%
Sao Tome and Principe	NA
Senegal	0.8%
Seychelles	NA
Sierra Leone	7%
Somalia	1%
South Africa	21.5%
Sudan	2.3%
Swaziland	38.8%
Tanzania	8.8%
Togo	4.1%
Tunisia	0.1%
Uganda	4.1%
Western Sahara	NA
Zambia	16.5%
Zimbabwe	24.6%

Literacy Rates (% of People who can read and write)

Country Name	% of People who are Literate
Algeria	69.9%
Angola	67.4%
Benin	34.7%
Botswana	81.2%
Burkina Faso	21.8%
Burundi	59.3%
Cameroon	67.9%
Cape Verde	76.6%
Central African Republic	48.6%
Chad	25.7%
Comoros	56.5%
Democratic Republic of Congo	67.2%
Congo	83.8%
Cote D'Ivoire	48.7%
Djibouti	67.9%
Egypt	71.4%
Equatorial Guinea	87%
Eritrea	58.6%
Ethiopia	42.7%
Gabon	63.2%
Gambia	40.1%
Ghana	57.9%
Guinea	29.5%
Guinea-Bissau	42.4%
Kenya	85.1%
Lesotho	84.8%
Liberia	57.5%
Libya	82.6%
Madagascar	68.9%
Malawi	62.7%
Mali	46.4%
Mauritania	51.2%
Mauritius	84.4%
Morocco	52.3%
Mozambique	47.8%
Namibia	85%
Niger	28.7%
Nigeria	68%
Rwanda	70.4%
Sao Tome and Principe	84.9%
Senegal	39.3%
Seychelles	91.8%
Sierra Leone	35.1%
Somalia	37.8%
South Africa	86.4%
Sudan	61.1%
Swaziland	81.6%
Tanzania	69.4%
Togo	60.9%
Tunisia	74.3%
Uganda	66.8%
Western Sahara	NA
Zambia	80.6%
Zimbabwe	90.7%

Name _____ Period _____

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?

As Director of African Affairs, the president has asked for your expertise as to how we should designate how our aid to Africa would best be used. Consider the correlations you have developed in answering these questions: Do you feel one problem is the underlying cause of all others or should they all get equal treatment? Is one region or country in Africa in more need than another area?

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