WORLD GEOGRAPHY—USING STATISTICS

NAME _____SCHOOL _____

DATE STARTED_____DATE COMPLETED_____

PREREQUISITES: Some knowledge of the physical geography and major nations of Earth. Ability to research using the Internet.

HOW TO DO THIS COURSE: Do the steps one at a time, in order. When you finish a step, put your initials and the date on the sign-off line on the right. A split line means to get a pass (and an initial) from another student (or your Academic Supervisor if it says that). Essays are turned in to the Academic Supervisor. A number of technical terms are defined in the glossary for the course. Refer to it as a first action when you encounter unfamiliar technical terms.

PURPOSE: Gain the ability to analyze and interpret geographic data in order to better evaluate current world events and predict future world events.

ESTIMATED TIME: 10–20 hours.

MATERIALS NEEDED FOR THIS COURSE
Study booklet, *World Geography—Using Statistics*, with these data sheets (DS):
 7521   8629   8630   8631 (glossary)
Exams: 4937, 8632 (answers)

Other texts/references:
Access to data resources such as *World Almanac, World Atlas*, world atlases (printed or online).

Other materials:
Computer with Internet access or downloaded copy for viewing the Gapminder presentations.

A. INTRODUCTION: GEOGRAPHY AND STATISTICS

1. READ: Data Sheet (DS) #7521 The Main Divisions of Geography.   _____

2. READ: DS #8629 Geography and Statistics.   _____

3. DEMONSTRATE: Show an example of how a planner might make use of statistical data to predict the future needs of a country.   _____

B. RESEARCHING STATISTICS

1. RESEARCH: Countries with largest populations and largest land mass. You can do this research using reference books such as the *World Almanac* if you wish, but it is recommended that you do the research on the Internet. The website http://www.nationmaster.com/statistics is a

good place to start. Another is https://www.cia.gov/library/publications/the-world-factbook/index.html. Also http://data.un.org/.

a) Find out the 10 largest countries by land mass and list them in order (along with their areas). Compare two or more sources to see if the data is consistent. (On NationMaster, open the Statistics tab and select category Geography, then select geography stat Area > Land. Compare this to other possible choices like Area > Total, or Land Area or Surface Area. On the CIA World Factbook, click the button Guide to Country Comparisons, then Geography and Area. On UN Data, search for and select Land Area, then select the most recent year and the individual countries you want to compare. You may also google *land mass countries.*) ___

b) Determine the top 10 countries by population and list them in order (along with the numbers). (On NationMaster, open the Statistics tab and select category People, then Total Population. On the CIA World Factbook, click the button Guide to Country Comparisons, then People and Population. On UN Data, search for and select Population, then select the most recent year and the individual countries you want to compare. You may also google *population countries.*) ___

c) If the sources aren't consistent for a) and b), choose the one(s) you think are best and explain why. Note: on NationMaster you will find pop-ups for Definition and Source at the top of the chart. Comparing how a statistic is defined may help explain inconsistencies in the data. Going to the Source site may provide more background on the data. (Keep a record of the data and your sources, as you will use the data again in later steps.) ___

d) Compare a) and b) to see if countries with the largest land mass have the largest populations. Explain what you found. ___   _____

2. RESEARCH:

a) Research the age distribution breakdown of the ten largest populations. (On NationMaster, open the Statistics tab and select category People, then Age Structure > 0–14 years, then > 15–64 years, then > 65 years and older. You may also google *age distribution country.*) ___

b) Draw graphs or histograms to show the age distributions of the different countries. ___

c) Choose a country other than India, the U.S. or Japan, and write an essay on what the age distribution might mean to the future of the country. ___   _____

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C. DISPLAYING STATISTICS

This section makes use of an Internet site called Gapminder that features interactive statistical graphs which the student can explore. The page called Gapminder World offers an introductory example and other useful features.

1. DEFINE: Gapminder (using the glossary in the back of the study booklet). _____

2. DEMONSTRATE: Gapminder World.

   a) Go to Gapminder at http://www.gapminder.org/ and select Gapminder World (use either the tab at the top or the Load Gapminder World button). ___

   b) At Gapminder World, play the Wealth & Health of Nations graph. On the screen it will say, "This graph shows how long people live and how much money they earn." This is an example of an interactive graph. (You can expand it to full screen if you wish, using the button at the top of the graph.) Watch how it shows the data changing over the years. You can also move the cursor around on the screen to see what happens. If you hover the cursor over the bottom (horizontal axis) label or the side (vertical axis) label, you will see a pop-up box that explains the label. Note that "PPP" stands for "product per person." You needn't try too hard to figure out what it all means just yet. You will learn more about it in the following steps. ___   _____

3. READ AND DEMONSTRATE:

   a) If you are still on the full screen graph, click the button at the top that says "How to use." (Alternately, at Gapminder World, in the Wealth & Health of Nations box on the left, under "Explore more of Gapminder World," click on "learn to select indicators and more.")

   b) Click to watch the animated tutorial. It will say "A two-and-a-half minute demo." Pause it as often as you like to study the display.

   - The first part demonstrates that "Every bubble is a country." ___

   - Next it demonstrates that "The color defines the region," according to the world map on the right. ___

   - Next it demonstrates that you can "Click play for development over time," and shows how the graph changes as the years go by (notice the year in big gray numerals on the graph). ___

   - Next it demonstrates that you can "Select one or more countries," and the selected countries will be labeled and will make "trails" on the screen when you play the graph. It also shows how you can "Deselect" countries, and "Click to Zoom" on a part of the graph, and control other features. Notice that when a country is

selected it gets check-marked in the list on the right. You can also select countries by clicking on the check boxes. ___

- Next it shows how to "Click to show data" to bring up a table of the data being shown on the graph. Notice that here you can find definitions and explanations about the data. ___

- Then it shows how to "Select indicators" to change what the graph displays. If you don't understand an indicator, you can select it, click to show the data, then click on "about" and read the definition and explanation. ___

- Then it shows that you can "Choose linear or logarithmic scale" to change the way the graph is scaled. (Note: the meaning of a "logarithmic" scale is explained in the data sheet "Using Gapminder." For now, just see what happens to the graph when you change it.) ___

c) Repeat the tutorial as often as you need, until you are ready to play the Wealth & Health of Nations graph again. (There is a chart you can refer to in Data Sheet #8630 Using Gapminder that summarizes the features covered in the tutorial. You may refer to it as needed.) _____

4. READ AND DEMONSTRATE: DS #8630 Using Gapminder. Use the default graph on Gapminder World, titled "Wealth & Health of Nations" to demonstrate the features as you read about them. _____

5. DRILL: Go back to Gapminder World and play the Wealth & Health of Nations graph again. Then do the following steps. (There is a glossary in the back of the study booklet that may help you with some of the terms.)

a) Notice that if you hover the cursor over an axis label the label will turn white and a yellow balloon will pop up that explains the label. Do this on both axis labels. ___

b) Select several countries by checking the boxes in the list on the right. Notice the labels that appear on them and their region colors. ___

c) Click *play* and notice how the selected countries are tracked. ___

d) Zoom in on a part of the graph, then restore it to normal. ___

e) On the graph, you will see several icons that look like tiny data tables (for example, below the left end of the axis label boxes). These will say "View data" when you hold the cursor over them. Click on the "View data" boxes and look at the tables of the data being shown on the graph. ___

f) Switch the scales back and forth between linear and logarithmic to see how this affects the display. ___

g) Select different indicators to change what the graph displays. ___

h) Select the Map tab at the top of the chart. (You may have to wait for the Indicators to load so you can see the bubbles move to the countries they represent.) ___   _____

6. READ AND DEMONSTRATE: From Gapminder World, select Downloads (tab at the top) and then select Human Development Trends. (This presentation can be downloaded and installed locally. If that has been done, run the Human Development Trends program. This will give you a full screen display.)

a) When you are ready to start, click on the Start button, then click again to continue. Read and watch the display and click to continue on through the presentation on "World Income Distribution." Note that you can use the slider bar at the bottom to go back and review any of the 15 steps, and on step 15 you can use the controls at the top (under the year) to replay the final graph. ___

b) Continue on with presentation 2, "Regional Income Distribution." Hover the cursor over OECD on item 4 on the slider bar to see what it stands for. Note that at the end you can again replay the graph, and can make it advance to the (predicted) 2015 values. ___

c) Read and watch presentation 3, "The distribution of poverty." ___

d) Read and watch presentation 4, "Regional differences in health and income." After step 11 you can use the cursor to select and identify the different bubbles. After step 12 putting the cursor on a box on the right will identify the region. See the glossary in the study booklet for definitions of regions. ___

e) Read and watch presentation 5, "Income and health of countries." Here you can use the cursor to identify individual country bubbles in the "exploded views" where a region is broken out into different countries. Different bubbles of the same color make up a region. You can use a World Atlas or the Maps feature of the CIA World Factbook to find the locations of countries within regions. It is not required that you do this for all countries, but you should do it for any "featured" ones (those whose names are displayed in one of the presentation steps) that you are not already sure about. The glossary in the study booklet has a listing of all these regions and countries. At step 10, putting the cursor on a box on the right will highlight all the bubbles in the region. ___

f) Read and watch presentation 6, "Same income, different health." ___

g) Read and watch presentation 7, "Development directions." When you get to step 18, you can replay the graph with various countries selected. The "Select countries" box allows you to select countries by name from a pop-up list. Notice that you can also vary the play speed and turn the "trails" feature off and on. ___

h) Read and watch presentation 8, "Differences within countries." At step 20, select several different countries from the list in the box to split up into the five "20%" bubbles. Consider what these splits tell you about drawing conclusions from the broader one-bubble statistics. ___

i) Read and watch presentation 9, "Child deaths—the cumulative human cost of missed targets." ___   _____

7. ESSAY: Using examples from Human Development Trends, tell in what ways you think presenting statistics graphically can be useful, and some possible misconceptions they can lead to if taken too broadly.   _____

8. RESEARCH: Play the "Wealth & Health of Nations" graph. Compare the development trails of the top 10 countries by population that you found in step B.1.b above. Click on "View Data" to open each of the data bases used to generate the graph indicator points (per DS #8630 Using Gapminder) and examine them to gain more understanding of the data (use the "About" tabs).   _____

9. ESSAY: Select two of the top 10 countries you researched above. Pick two that have significantly different histories as shown by their graphs. From your research (study the two countries more if you wish), tell what you think makes these countries different and how the graph could be used to help convey this to others.   _____

10. DRILL: Click on "Data" at the top of the Gapminder webpage. This page shows all the indicators available on Gapminder. Do the following:

a) Look over the list of indicators. Choose one and click on "View" to see the raw data used to compile the graphs. On the data table, click the "About" tab and read the explanation of the data. ___

b) Choose another indicator from the Data page and click on "Visualize" to load a graph of the topic. Play the graph to see what it shows. ___

c) Repeat this step until you understand well how you can access the data and learn what it means. ___   _____

11. RESEARCH: Make a different graph. Again bring the Gapminder default "Wealth & Health of Nations" graph up on your computer screen and then do the following.

a) Open each of the lists of indicators by clicking on the title bars (per Using Gapminder) and look them over. ___

b) Choose one or two different indicators and change the graph. Run the graph. ___

c) Repeat b) if needed until you have a graph that interests you. ___

d) Open the data bases used to generate the graph and examine them. ___

e) Write an essay discussing the results and how you think they might be useful. ___   _____

D. VIDEO—ASIA'S RISE

1. PRACTICAL APPLICATION: At the Gapminder home page select Videos and then select "Hans Rosling: Asia's rise—how and when (TEDIndia)." The link is http://www.gapminder.org/videos/hans-rosling-asias-rise-ted-india. It can also be found on TED at http://www.ted.com/talks/lang/eng/hans_rosling_asia_s_rise_how_and_when.html.

    Watch the video (more than once if you need to). Refer to DS #8631 World Geography Glossary, section "Asia's Rise" Video as needed. This section has definitions and explanations of terms used that you may not be familiar with and they are listed in the order in which they appear in the presentation.   _____

2. PRACTICAL APPLICATION: Conduct further research on the information presented in the video, and discuss whether, in your opinion, India and China will actually achieve a higher standard of living than the U.S. by mid-century. Back up this argument with other references and citations from other geography sources as well. **Supervisor pass.**   ____ ____

E. FINAL APPLICATION

1. RESEARCH: Use statistics and other research tools to examine some aspect of physical or human geography, in order to evaluate a situation or make a prediction in an essay. You may use graphs or videos from the Gapminder website, or choose another primary source. (At Gapminder World, click on "Open Graph Menu" for a list of possible topics.) Back up this discussion with other references and citations from other geography sources as well. **Supervisor pass.** (Save this for the Examiner.)   ____ ____

I have completed the steps of this course. I understand what I studied and can use it.

Student _____   Date _____

The student has completed the steps of this course and knows and can apply what was studied.

Academic Supervisor _____   Date _____

This student has passed the exam for this course.

Examiner_____   Date _____

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