

Can You Hear Me Now? How a Country's Wealth Influences Communication

Data on various countries will help students explore the relationships between income and the ownership of televisions and cell phones and access to the Internet.

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Grade Level	8
Duration	2 class periods

National Geography Standards

ELEMENT ONE: The World in Spatial Terms

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

ELEMENT FOUR: HUMAN SYSTEMS

11. The patterns and networks of economic interdependence.

Arizona Geography Strand

Concept 1: The World in Spatial Terms

PO 1. Construct maps, charts, and graphs to display geographic information.

CONCEPT 4 Human Systems GRADE 8

PO 7 Describe how changes in technology, transportation, communication and resources affect economic development.

Other Arizona Standards

Mathematics Common Core Standards Statistics and Probability

8.SP.A.1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

Standards for Mathematical Practice 8.MP.4. Model with mathematics.

6-8 Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects

Text Types and Purposes

6-8.WHST.1 Write arguments focused on *discipline-specific content*.

- Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
- Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
- Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from and supports the argument presented.

Production and Distribution of Writing

6-8.WHST.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Research to Build and Present Knowledge

6-8.WHST.9 Draw evidence from informational texts to support analysis reflection, and research.

Strand 2 World History**Concept 9: Contemporary World**

PO 3. Analyze how world events of the late 20th century and early 21st century affected, and continue to affect, the social, political, geographic, and economic climate of the world (e.g., terrorism, globalization, conflicts, interdependence, natural disasters, advancements in science and technology and environmental issues).

Overview

Changes in technology help people gain better access to information now more than ever before. In 2004, about three-quarters of humanity had access to at least one television set. Using scatter plots, students will investigate how the wealth of a country influences the ability of people to obtain access to communication from electronic sources (TV, cell phones, internet).

Purpose

In this lesson, students to use scatter plots to discover relationships between the wealth of a country and the access of its citizens to modern methods of communication.

Materials

- Teacher Information
- Internet access
- Student worksheets
- World Map (no countries)
- Overhead of world map
- Pencils
- Rulers
- Raw Spaghetti
- Countries of the World Wall Map or atlas

Objectives

The student will be able to:

1. Locate on a world map: Argentina, Australia, Bolivia, Botswana, Canada, China, Cote d'Ivoire, Fiji, Germany, Guatemala, Hong Kong, India, Indonesia, Italy, Kuwait, Mexico, Saudi

Arabia, Singapore, South Africa, United States, and Uzbekistan.

2. Construct scatter plots to show the relationship between the wealth in a country and the access to communication and information technologies.

3. Interpret information from scatter plots.

Procedures

1. Using an overhead of the world map, tell students they will be looking at data from 21 countries from around the world. Distribute the Prior Knowledge Chart.
2. Have students locate and label the 21 countries on a world map. Students can volunteer to identify countries on the world map overhead or they can work individually, using copies of the world map.
3. Use an overhead of the Prior Knowledge Chart and have the class list information they may know about each country. This can include relative economic wealth, physical characteristics (including mineral resources), and cultural characteristics.
4. Talk with students about the Rise and Spread of Electronic Information, and how access to communication is a two-way street with economic activity. Explain that in a global world, countries need modern communication to compete.

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5. Distribute the data table: Does wealth of a country affect the ability of its citizens to get information? Explain to students how the data was generated. **Gross National Income (GNI)** is the total domestic and foreign output claimed by residents of a country, consisting of gross domestic product (GDP) plus factor incomes earned by foreign residents, minus income earned in the domestic economy by nonresidents (income) from abroad. The GNI per Person was calculated by dividing the US GNI by its population. Persons per TV, Persons per Cell Phone and Person per Internet Connection were all calculated by dividing the population by the total number of each of these items in the country.

6. Tell students they will be making scatter plots of this data. They will be comparing Gross National Income per Person and Number of Persons per TV, Number of Persons per Cell Phone, and Number of Persons per Internet Access. Tell students to round the GNI per Person data to the nearest \$500.

7. Students should use the graphs provided on the student worksheets. As students graph the data, have them label each point with the name of the country (abbreviations or numbers are fine).

8. Students will draw a best fit or trend line for each graph. Students can use a piece of raw spaghetti or a clear ruler to estimate the position of the trend line. The class may want to check their trend line against the answer key. Remember, trend lines are estimations, so lines may vary. Accept a wide range of possible lines. The important thing is that students see a negative trend (that less money means that more people have trouble getting access to a TV, a cell phone (using 2004 data), or an Internet connection). Ask students why they were not asked to graph the 2014 data for cell phones.

9. Students should answer questions about trends shown by the scatter plots.

10. Whole group discussion may help students find and explore unusual country outliers and clusters on each scatter plot. Be sure to discuss how the 2004 figures for cell phones per person is very different today. Why would this be true? (status symbols, essential for home and work, no need for infrastructure like cables and networking that take financial capital, cell towers can be put everywhere so remote areas can have phone access, much cheaper than landlines per minute of usage in many cases, portability, etc.,).

Assessment

Math Assessment: Student scatter plots can be graded for graphing all 21 points in the "approximately" correct position. The important thing is that students create a negative trending scatter of points.

In grading, remember that trend lines are estimations, so lines will probably vary. Accept a wide range of possible lines (and some students may even draw a curve). The important thing is that students draw a negative trend. Student answers to multiple choice questions can be graded as well. Mastery for both is 80% or higher.

Geography Assessment: Students can be tested on correctly identifying the location of the 21 countries used in this lesson. Students can be given the multiple-choice quiz. Both these can be graded for Mastery at 80% or higher.

Writing Assessment: Students can be asked to write a short essay explaining the connection between country wealth and access to modern communication. This essay can be graded for ideas and organization. Use the 6 Traits rubric. A score of 4 or higher will be considered mastery.

Extensions

Students can compare the scatter plots using both 2004 and 2014 data to see changes.

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Students could investigate other aspects of popular culture (persons per automobile, persons per radio, persons per video game system) and graph them in a similar manner.

Use photographs of each country from such sources as *National Geographic* or Peter Menzel's *Material World: A Global Family Portrait*. Could you use images to see the same trends?

Sources

<https://www.cia.gov/library/publications/the-world-factbook>

<http://www.worldwatch.org>

http://en.wikipedia.org/wiki/Gross_national_income