

Shrinking Spaces: Population Growth and the Environment



Grades 9–12

Using AIT Products

- *Road Trip to Kenya*, program 2, “Ecological Issues”
- *The Voyageur Experience in Global Geography*, program 3, “Greece: Urbanization and the Environment”
- *Global Geography*, program 1, “South Asia: Why Are Forests Disappearing?”

Overview

In the year 2000, some crowded cities had over 10 million inhabitants and our planet had approximately 6 billion people living on it. Many people predict that by the year 2050, the world population will reach 9 billion. The number of people on Earth, where they live and how they live, will have a tremendous impact on the environment. In this lesson students will investigate the problems that are associated with high population growth rates. Students will also explore what people are doing to cope with overpopulation.

Objectives

- Describe the impact of population growth on the environment.
- Describe how cities affect their surrounding environment.
- Explain how cities are handling growth and its resulting effect on the quality of life.

- Develop possible solutions for problems created by population growth.

Vocabulary

natural resources
pollution
population
population growth
urbanization

Preparation

Materials Needed

- Internet connection
- World map
- From U.S. Census Bureau: [U.S. and World Population Clocks —POPClocks](#)
- From the Earthday Network: Ecological Footprint Quiz

- From the U.S. Central Intelligence Agency: The World Factbook
- AIT Video: *Road Trip to Kenya*, program 2, “Ecological Issues”
- AIT Video: *The Voyageur Experience in Global Geography*, program 3, “Greece: Urbanization and the Environment”
- AIT Video: *Global Geography*, program 1, “South Asia: Why Are Forests Disappearing?”
- Presentation software such as Microsoft PowerPoint®

Optional

- Spreadsheet software

Planning Notes

Arrange students in work groups to complete the activity on Days One and Two. Groups of four to six are best.

Time

This project will take about two or three 60-minute class periods, in addition to homework and extension activity time.

Procedure—Day 1

Introduce Topic: World Population

Explain to students that during the next few days they will be exploring population growth issues. Use a projection device to show students the World Population and the U.S. Population clocks that are available from the U.S. Census Bureau. Facilitate a discussion around the following questions.

- What impact do you think human population has on the environment and the availability of natural resources?

- How do you think population growth impacts the quality of life?
- What are the advantages and disadvantages of increasing urban growth?

Have students complete the Ecological Footprint Quiz at www.earthday.net/footprint/index.asp. Then discuss students' results. Ask the following questions.

- How do humans impact the environment?
- Do you think the United States impacts the environment more or less than other countries?
- What would happen if everyone in the world had a lifestyle similar to that of the students in the class?

Pre-Viewing Activity

Show students Kenya on a world map and explain that Kenya has a very large population, which is growing rapidly, even by standards for developing nations.

Have students visit the CIA World Factbook Web site at www.cia.gov/cia/publications/factbook/geos/ke.html and read the information posted about Kenya. Ask students to record the following information on a chart.

- Climate
- Terrain
- Natural Resources
- Land Use
- Irrigated Land
- Environment: Current Issues
- Population

- Population Growth
- Major Infectious Diseases

As a class, carefully examine this data and speculate how an increasing population is impacting Kenya.

Video

Cue program 2 from the series *Road Trip to Kenya* to approximate time code 01:44, after the introduction. PLAY through time code 03:66, after the farmer stops talking. Ask the following questions after viewing the video.

- Why is there a battle for land use in Kenya?
- How is human population growth affecting Kenya's environment?

Tell students that many groups and organizations in Kenya are working to address the ecological issues that have arisen due to population growth. Cue program 2 from the series *Road Trip to Kenya* to approximate time code 06:24, after the students arrive at the Taita Discovery Centre. PLAY through time code 07:37, after the employee from the Taita Discovery Centre stops talking. Ask the following question after the video.

- What is the Taita Discovery Centre doing to help communities grow and prosper without destroying the habitat?

Activity: Cause and Effect

Have students re-examine the table they created with the information from the CIA World Factbook and consider what they learned while watching the “Ecological Issues” video. Ask students to create a cause-and-effect chart that shows the effect of population growth on Kenya.



“We must alert and organize the world’s people to pressure world leaders to take specific steps to solve the two root causes of our environmental crises—exploding population growth and wasteful consumption of irreplaceable resources. Over-consumption and overpopulation underlie every environmental problem we face today.”

—Jacques-Yves Cousteau

Procedure—Day 2

Introduce New Topic: Greece

Show students Greece on a world map and have each student state one fact s/he knows about that country.

Have students visit the CIA World Factbook Web site at www.cia.gov/cia/publications/factbook/geos/gr.html and read the information posted about Greece. Ask students to record the following information on a chart.

- Climate
- Terrain
- Natural Resources
- Land Use
- Irrigated Land
- Environment: Current Issues
- Population
- Population Growth
- Major Infectious Diseases

Explain to students that the ongoing settlement of land in Greece has had many negative environmental impacts. As a class, carefully examine this data and speculate how urbanization is affecting Greece.

Video

Cue program 3 from the series *The Voyageur Experience in Global Geography* to approximate time code 14:15, after the students eat. PLAY through time code 15:54, before the students get on the subway. Use the following questions to spur discussion after the video.

- How is rapid urbanization affecting Greece?
- What are the primary sources of air pollution in Athens?
- How does air pollution affect the ancient ruins?
- What are people in Greece doing to decrease air pollution?



“... [D]emocracy cannot survive overpopulation. Human dignity cannot survive it. Convenience and decency cannot survive it. As you put more and more people into the world, the value of life not only declines, it disappears. It doesn't matter if someone dies. The more people there are, the less one individual matters.”

—Isaac Asimov

Activity: Cause and Effect

Have students re-examine the table they created with the information from the CIA World Factbook and consider what they learned while watching the video “Greece: Urbanization and the Environment” Ask students to create a cause-and-effect chart that shows the effect of population growth on Greece.

Pre-Viewing Activity

Show students Nepal on a world map and have each student state one fact s/he knows about that country.

Have students visit the CIA World Factbook Web site at www.cia.gov/cia/publications/factbook/geos/np.html and read the information posted about Nepal. Ask students to record the following information on a chart.

- Climate
- Terrain
- Natural Resources
- Land Use
- Irrigated Land
- Environment: Current Issues
- Population
- Population Growth
- Major Infectious Diseases

Tell students that the people in Nepal depend on wood for a variety of needs. As a class, carefully examine this data and speculate how an increasing population is impacting the availability of natural resources such as wood.

Video

Cue program 1 from the series *Global Geography* to approximate time code 02:32, when the image of the forest appears. PLAY through time code

10:03, before the video fades out. Discuss answers to the following questions after the video.

- For what purposes do people in Nepal use forest resources?
- What role does population growth in Nepal play in the disappearance of forests there?
- Why did the father and son need to spend so much time gathering wood?
- What are some of the other consequences of deforestation in Nepal?
- What are people in Nepal doing to slow down deforestation?

Activity: Cause and Effect

Have students re-examine the table they created with the information from the CIA World Factbook and consider what they learned while watching “South Asia: Why Are Forests Disappearing?” Ask students to create a cause-and-effect chart that shows the effect of population growth on Nepal.

Project

Tell students to select one country, other than Kenya, Greece, and Nepal, and research how population change in that country is affecting its environment. Ask students to use the information they collected while conducting research, as well as information they collected during class, to create a multimedia presentation that describes the impact of population growth on the environment. If students have access to spreadsheet software, have them create tables and charts that show data about the population in the four countries. This presentation should also include possible solutions to environmental problems that have been caused by population growth. Give students the opportunity to share their presentations with the class and discuss their proposals to alleviate environmental problems created by overpopulation.

Assessment

1. Project Assessment

Use the following form to evaluate the student multimedia presentations created during this lesson.

Student Expectation	Criteria for Meeting Expectation	Developing Student exhibits none of the criteria.	Approaching Student shows evidence of understanding most of the criteria.	Meets Student shows evidence of meeting all of the criteria.
Describe how the population is changing in Kenya, Greece, Nepal, and one other country.	Students identify the population growth rate in Kenya, Greece, Nepal, and one other country. Students describe patterns of migration in the countries and the growth of urban areas.	Circle One: Developing Approaching Meets		
		Comments:		
Explain how human population is affecting the environment.	Students describe how humans are altering the landscape, causing pollution, and depleting resources.	Circle One: Developing Approaching Meets		
		Comments:		
Explain how countries are handling growth and its resulting effect on the quality of life.	Students explain how governments and civic organizations are helping their nation grow and prosper without destroying the habitat.	Circle One: Developing Approaching Meets		
		Comments:		
Develop possible solutions for problems created by population growth.	Students describe methods of reducing pollution and resource depletion caused by overpopulation.	Circle One: Developing Approaching Meets		
		Comments:		

2. Individual Assessment

Check for deep understanding of the concepts by assigning students to write an essay on the following topic.

Explain the relationships between Earth's natural resources, its systems, and its human population. What are some demographic trends that are likely to have an impact on the environment?

Extension Activity: Future Land Use

Ask students to interview someone from the local Extension Service office and find out the average amount of land it takes for various species to survive (e.g., human beings, cattle, horses, goats). Ask students to use the data to make comparisons and projections about land use in the future.

Resources

Population Reference Bureau

<http://www.prb.org>

The Population Reference Bureau Web site includes databases and reference publications with information about the world population, health, and the environment. The Educators section of the Web site contains lesson plans and classroom resources.

U.S. Census Bureau: World Population Information

www.census.gov/ipc/www/world.html

The U.S. Census Bureau Web site has population clocks that are continually updated, as well as statistical tables of demographic data for all countries of the world.

United Nations Population Information Network

www.un.org/popin

This Web site contains official UN estimates (1950-2004) and projections (2004-2050) for every country in the world, including estimates and projections of 28 demographic indicators, including birth rates, death rates, infant mortality rates, and life expectancy.

Population Connection

www.populationconnection.org

This Web site includes a collection of activities, facts, and background materials about population growth. In addition, this site provides teachers with information about workshops and professional development opportunities that provide practical, hands-on tools and strategies for teaching about population growth.