

Global Economic Challenges

Economics & You



In order to accomplish economic development, the nations of the world have to overcome the problems that hinder their economic growth and they must make use of their resources effectively. To learn more about the challenges and opportunities of a global economy, view the Chapter 27 video lesson:

Global Economic Challenges

ECONOMICS
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Chapter Overview Visit the *Economics: Principles and Practices* Web site at epp.glencoe.com and click on **Chapter 20—Chapter Overviews** to preview chapter information.

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Dish-shaped solar power reflectors at a solar power station

CONTENTS

The Global Demand for Resources

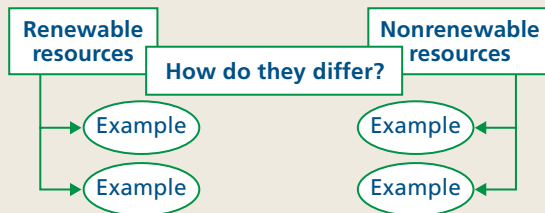
Study Guide

Main Idea

Worldwide economic challenges include overpopulation, food shortages, resource depletion, and environmental pollution.

Reading Strategy

Graphic Organizer As you read the section, complete a graphic organizer similar to the one below by explaining the difference between renewable and nonrenewable energy resources and providing two examples of each.



Key Terms

subsistence, nonrenewable resources, embargo, gasohol, aquifer

Objectives

After studying this section, you will be able to:

1. **Explain** Malthus's views on population growth.
2. **Explain** the importance of conserving nonrenewable resources.
3. **List** ways that people are using renewable energy resources to conserve scarce resources.
4. **Identify** other resources endangered by population growth.

Applying Economic Concepts

Scarcity Have you ever had a water shortage in your area? Read to find out how the price system works to solve this problem.

Cover Story

Six Billion People on Earth

WASHINGTON (AP)—Chances are it will be a boy born in the Third World on Oct. 12 [1999], but no one will know exactly which child pushes the world's population to 6 billion.

It took most of the age of humanity to mark the first billion in 1804 and more than a century to mark the second. But now the world is adding a billion every dozen years or so.

Demographers believe growth will slow down, [but] . . . median U.N. projections say it will take 14 years to add another billion people . . . That's calculated from the yearly rate of population increase of about 1.4 percent . . .




Earth's population surpassed 6 billion in 1999.

—*The Cincinnati Post*, June 19, 1999

Scarcity has been defined as the fundamental economic problem. You experience scarcity at the personal level, and scarcity is also a problem at the national level, even for relatively prosperous nations such as the United States. At the global level, scarcity reveals itself through food, energy, and other resource shortages—all of which are compounded as world population grows.

The world population has now surpassed 6 billion, and, as you read in the cover story, the next billion will be here before long. In many respects, the earth is a very small planet, and it seems to be getting smaller every day.

The Global Population Issue

 Population growth has fascinated the world ever since Thomas Malthus published his *Essay on the Principles of Population* in 1798. His views, published over 200 years ago, are still relevant because of the earth's growing population and its demand for resources.

Malthus: Views on Population

Thomas Malthus argued that population would grow faster than its ability to feed itself. The problem, he stated, was that population tended to grow geometrically, as in the number sequence 1, 2, 4, 8, 16, 32, 64, and so on. The ability of the earth to feed people, however, would grow at a slower and more constant rate, such as 1, 2, 3, 4, 5, and so on. Eventually, according to Malthus, the masses of the world would be reduced to a condition of **subsistence**—the state in which a population produces only enough to support itself.

In many countries—especially in the larger cities of the developing world—poverty is widespread. The Indian city of Calcutta, for example, has about 14 million people. Calcutta is one of the poorest and most crowded cities in the world. Hundreds of thousands of street dwellers beg and search for food in the city dumps and refuse piles. At night they sleep in the streets. Similar conditions exist in other parts of the world. In these places, the Malthusian prediction of a subsistence standard of living is a cruel reality.

Was Malthus Wrong?

In many other parts of the world, conditions are much better. Malthus did not foresee the enormous advances in productivity that have allowed an increasing standard of living to accompany a growing population. He also did not foresee that families might choose to have fewer children. In some countries, such as Japan, for example, the population is actually shrinking.


Malthus's predictions may not have been entirely accurate for the industrialized countries, but they still have long-term consequences for all nations. Today, for example, population pressures in other parts of the world are causing problems for many industrialized countries, including the United States, which is besieged by illegal immigrants from China, Mexico, and Haiti. As a result, many experts argue that it is in everyone's interest to control global population growth.

World Population Trends

Comparative world population growth rates are shown in **Figure 20.1**. For the world as a whole, the

annual growth is approximately 1.4 percent a year. Although this may not seem very fast, the consequences can be enormous over time. Every year, the population increase is almost the equivalent of adding another Mexico to the world. If the population keeps growing at this rate, it will reach about 8 billion by 2020, and nearly 12 billion by 2050. At this rate, the population of the world will almost double from the time you graduate from high school until you retire at age 65.

Nonrenewable Energy Resources

 Population pressure adds to the depletion of many important resources, and energy is one of these resources. Energy is necessary for production, and energy makes our lives more comfortable. In the form of gasoline, it powers cars. In the form of gas and electricity, it heats and cools homes.

Most of the energy we use comes from **nonrenewable resources**—resources that cannot be replenished once they are used. The major nonrenewable resource category—fossil fuels—is being consumed at an alarming rate and may only last for a few more generations at current consumption levels.

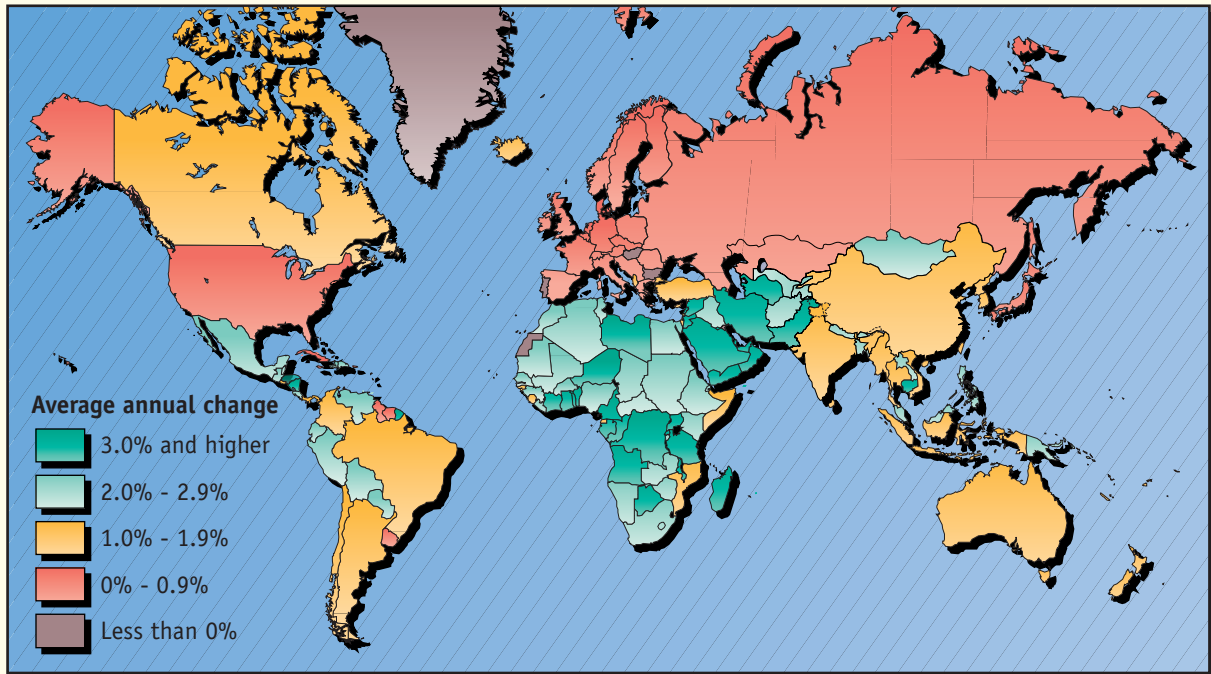
Oil

Oil is the biggest category of nonrenewable energy in use today—primarily because it was so inexpensive during much of the 1900s. Oil was also much more convenient to use than natural gas or coal. Because it could be refined into low-cost gasoline, automobiles were large, heavy, and usually got poor gas mileage.

The low cost of oil even affected living habits. People moved to the suburbs and then spent hours traveling to and from their jobs. Gasoline was so inexpensive that trains and city busses never became as important as the automobile.

In 1973, however, the oil-producing countries of the Middle East placed an **embargo**—a restriction on the export or import of a commodity in trade—on oil sales to the West. The embargo caused energy shortages in many parts of the world, driving the price of oil from \$5 to more than \$35 a barrel. Prices came

World Population Growth Rates



Source: *The World Bank Atlas*, 1999

Reading Maps The map shows the population growth rates of the countries of the world. **How does the annual growth rate in China compare with that of Brazil?**

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down slowly after that, reaching their inflation-adjusted pre-embargo levels in the mid-1990s. In late 1998, the price of oil even dropped below \$9 a barrel, although it has since rebounded.

With the exception of the 20 years following the oil embargo, the world was flooded with, and grew up on, cheap oil. The oil was eagerly consumed and, because it is a nonrenewable resource, is gone forever.

Natural Gas

This category constitutes our second most important energy source, accounting for nearly 25 percent of energy consumption in the United States.

Historically, natural gas was more difficult to transport and use than oil, and so it did not become an important energy source until much later. Eventually inexpensive natural gas became popular as an industrial fuel, and so many factories and industrial technologies were built around it.

Coal

Coal is the third-largest nonrenewable resource used in the United States. While it was the first nonrenewable resource to be used on a large scale, oil and natural gas soon displaced it because they are more convenient to use.

Today, nearly two-thirds of the world's known coal reserves are in the United States, Russia, and China. Coal is the most plentiful fossil fuel in the world, but even these supplies will eventually run out. Estimates based on the present rate of consumption indicate that the reserves will last about 200 years.


Nuclear Energy

Nuclear energy is the newest and fourth largest source of nonrenewable energy, accounting for nearly 8 percent of all energy used in the United States. The future of nuclear power is uncertain, however, for a number of reasons.

One of the reasons is cost. Nuclear reactors are expensive to build and maintain. Second, nuclear energy produces highly hazardous byproducts, the safe disposal of which poses a major problem.

Finally, there is always some chance that a nuclear plant will fail, or that another accident would happen like the 1979 near-meltdown at Three Mile Island in Pennsylvania. The 1986 meltdown of the reactor in Chernobyl, Ukraine, served as another reminder of the nuclear power hazards.

Renewable Energy Resources

 Before 1973, the low price of oil gave everyone very little incentive to develop alternative energy sources. Renewable energy resources became more popular after the oil embargo, but today they still account for a small portion of the total energy we consume.

Hydroelectric Power

Historically, hydropower was used to power the mills and factories of the Northeast in the 1800s. The power was reliable, and its source—water—was free at the time. Later, a number of larger generators at the Hoover Dam and the Tennessee Valley Authority were completed to generate power on a much larger scale. Aside from these newer projects, most dams were small and could not distribute power very efficiently to other locations.

When oil was obtained cheaply from the Middle East, hydroelectric power became less important. By the late 1950s, many of the commercial power dams in the United States had been abandoned. When oil became more expensive, however, steps

Natural Resources



Energy Demand for scarce resources is one of the most pressing problems facing all nations. *What are nonrenewable energy resources?*

were taken to bring some of the dams back into use. Today, hydroelectricpower is our most important renewable energy source, accounting for half of all renewable energy consumed in the United States.

Biomass

Energy made from biomass—wood and wood waste, peat, municipal solid waste, straw, corn, tires, landfill gasses, fish oils, and other waste—is the second most important category of renewable energy sources. While relatively new, this category accounts for approximately 40 percent of all renewable energy consumed in the United States today.

Ethanol is grain alcohol made from corn. Ethanol is used to make **gasohol**—a fuel that is a mixture of 90 percent unleaded gasoline and 10 percent ethanol. Although gasohol has not been accepted as quickly as supporters first hoped, it still has a small share of the market in some areas.

Other, lesser-known alternatives are also being used. Major food firms have made progress in converting chicken waste to fuel in the form of methane gas. This gas can then be recycled for industrial and commercial use. Over 100 cities are currently recovering and using methane gas generated in municipal landfills when the landfill waste decomposes.

Solar Energy

Solar power is the third largest source of renewable energy. Solar power has never been effectively harnessed, however, and it did not get much attention at first. After the oil embargo, the federal government began issuing grants to researchers to find ways to reduce the cost of solar energy. While solar power holds much promise, it only accounts for a fraction of the renewable energy used today.

Wind Power

The fourth-largest category of renewable energy sources is wind-generated electricity. In the early 1980s many wind farms were built, each of which produced enough electricity to power a medium-sized city. California is the largest producer of wind-generated energy, but it can also be found in Texas, Minnesota, Vermont, Hawaii, and Iowa.


The Most Dangerous Nuclear Reactors



Reading Maps Nuclear reactors serve three general purposes. Civilian reactors generate energy for electricity and sometimes also steam for heating. Military reactors create materials that can be used in nuclear weapons. Research reactors are used to develop weapons or energy production technology. **How many nuclear power plants are located in the former Soviet Union and Eastern Europe?**

While this is still a small category, wind-generated electricity is an important source of power in areas such as islands or remote peninsulas where it is difficult to obtain other forms of energy.

Other Resources

 Resources other than those used to generate energy—water and land in particular—may also be in danger. In the past, American concern with water focused mainly on the pollution of the

CYBERNOMICS SPOTLIGHT

Science

Biotechnology is making an impact in the world economy. Genetic engineering allows researchers to place a gene into a plant in order to create a new plant that can grow twice as fast. Agricultural experts estimate that within the next 40 years the world population will increase by 50 percent, which means farmers will need to produce more crops than ever before. To sustain economic growth in the developing world, experts believe that food productivity improvements must be made using this type of biotechnology.

country's waterways. Today, however, the focus has shifted to the availability of water and the realization that water is in critical supply in many parts of the country.

More than 80 percent of the water consumed in the United States is used in agriculture, and most of this water is used in surface irrigation, which has a high evaporation rate. As a result, much water is lost into the atmosphere.

Farmers have been able to tap large sources of water from rivers, streams, ponds, and **aquifers**—underground, water-bearing rock formations.

Aquifers supply nearly 40 percent of the water that farmers use and are also the source of fresh water for many communities.

One of the largest aquifers in the country is the Ogallala Aquifer, which supplies water to the High Plains states from Texas to Nebraska. So much water has been pumped out, however, that the aquifer's water table has been dropping about three feet a year. Some experts even predict that the Ogallala Aquifer will run out of water in the next 40 or 50 years.

The water shortage is also a problem in southern California. Over the years, plans have been proposed and projects have been undertaken to bring in water from areas hundreds of miles away.

Land is another valuable natural resource subject to the demands of a growing world population. Land, however, is different from other resources because there is only a fixed supply that cannot be moved from one place to another.

A growing population has the effect of reducing the amount of land available for agriculture. As communities grow, factories, roads, and houses are built on the fertile land near the rivers. The development of this land forces the farmers to move to the outskirts. The phenomenon, now known as urban sprawl, has claimed some of our finest farmland—covering fertile fields with expressways, shopping centers, and housing developments.

Section 1 Assessment

Checking for Understanding

- 1. Main Idea** How does population growth affect world resources?
- 2. Key Terms** Define subsistence, nonrenewable resources, embargo, gasohol, aquifer.
- 3. Describe** how Malthus believed population growth would affect the future of the planet.
- 4. Identify** the importance of conserving nonrenewable resources.
- 5. List** the major renewable resources today.
- 6. Describe** the effects that a growing population has on scarce resources such as aquifers.

Applying Economic Concepts

- 7. Scarcity** During the oil embargo, many people openly advocated nonprice gasoline rationing. Some favored allowing each automobile owner to use 10 gallons per week. What are the pros and cons of such a mandatory rationing program?

Critical Thinking

- 8. Making Comparisons** How do renewable resources differ from nonrenewable resources?



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Profiles IN Economics

A Classical Economist:

Thomas Malthus

(1766–1834)

Thomas Malthus was an English economist, sociologist, and member of the clergy who pioneered modern population study. He was a kind, gentle person dedicated to his father and his church. He was also the economist who is credited with giving economics the title of “the dismal science.”

EDUCATION

Malthus was born to wealthy parents and was educated at home by his father and by private tutors. At age 18 he enrolled at Jesus College, Cambridge, to study mathematics and the classics.

While he was away from home, Malthus and his father often exchanged letters debating the popular issues of the day. At one point, the elder Malthus became fascinated with a popular utopian vision that promised eventual peace, prosperity, and equality for all. Malthus attacked the argument in a 50,000-word letter to his father. The elder Malthus was so impressed that he encouraged Thomas to publish the treatise

for others to read. The result was *An Essay on the Principle of Population as It Affects the Future Improvement of Society*, published in 1798.

POPULATION THEORY

The book was an instant success that was to change forever the way people viewed population. In it, Malthus argued that poverty and distress would be the eventual fate of people, not the popular utopian vision. He reasoned that population would increase at a geometric rate (1, 2, 4, 8, 16, . . .), while food supplies would increase at an arithmetic rate (1, 2, 3, 4, 5, . . .).

According to this progression, population growth would eventually outstrip the available food supply, resulting in famine, misery, and a subsistence standard of living for the masses.

At first, Malthus thought only three factors could check the growth of population: war, famine, and disease. Several years later, as

he refined his ideas, he added a fourth check: moral restraint. Separately or together, these factors could raise the death rate, lower the birthrate, or both. In Malthus’s view, however, these restraints on population growth would not be enough to prevent most of the world from forever remaining at the subsistence level. Despite his considerable accomplishments in other aspects of economics, Malthus is best remembered for his pessimistic views on population.

Examining the Profile

- 1. Evaluating Information** Do you agree or disagree with Malthus’s predictions about population? Why or why not?
- 2. For Further Research** Find out what Malthus’s other contributions to economics were.

Economic Incentives and Resources

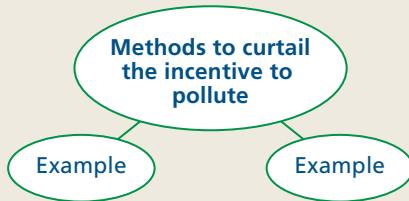
Study Guide

Main Idea

Incentives help preserve scarce resources.

Reading Strategy

Graphic Organizer As you read the section, complete a graphic organizer similar to the one below by providing examples of ways to curtail the incentive to pollute.



Key Terms

glut, pollution, acid rain, pollution permit

Objectives

After studying this section, you will be able to:

1. **Explain** how the price system helps conserve water, natural gas, and oil.
2. **Describe** government efforts to limit pollution.
3. **State** the importance of using resources wisely.

Applying Economic Concepts

Markets and Prices Have you ever traveled to different gasoline stations to get the cheapest price for a gallon of gas? Read to find out how markets and prices operate in the free enterprise system.

Cover Story

Lawmakers Can Recycling in House

WASHINGTON (AP)—The House of Representatives has rejected mandatory recycling for its offices.

The House has had a voluntary recycling program for a decade. But the Associated Press reported last month that most congressional offices were still mixing aluminum cans, bottles and different grades of paper. Many federal agencies and local governments separate their trash and sell recyclable material.




Recycling area

—The Washington Post, June 11, 1999

Economic systems require incentives to make them work smoothly. In a market economy, incentives such as the profit motive and prices can be used to preserve scarce resources.

Economic incentives are important because they tend to encourage more widespread and lasting results than other programs that rely on conscience, patriotism, or other motivations. Those who create them, as you read in the cover story, often abandon voluntary conservation programs.

The Price System

 With resources becoming increasingly scarce, it is important to see how the price system contributes to the conservation—or lack—of scarce resources. The examples that follow illustrate this influence.

The higher price for oil after 1973 dramatically affected the production of oil. When oil was priced below \$5 a barrel, few countries were

willing to devote large resources to retrieve it. When the price increased to \$35 and more, many countries increased their production almost overnight. At the same time, interest in alternative energy sources soared, and countries poured billions into energy-research projects ranging from shale oil to solar power.

By 1981, however, prices began to fall because of a worldwide **glut**—a substantial oversupply—of oil. A decline in demand caused by a recession contributed to the worldwide oversupply. People had also learned to conserve energy, which further reduced the demand for oil.

The collective impact of the increase in world supply and the decline in demand caused OPEC to lose some of its ability to control the supply of oil. This control slipped even further after the Persian Gulf War, when some OPEC members increased oil production to replenish their financial reserves depleted during the war. Finally, oil prices reached their pre-embargo levels in the mid-1990s.

Lower oil prices had several consequences. First, the search for alternative energy sources began to wane. Second, the exploration for new oil slowed dramatically because companies already had enough oil. Third, consumers changed their spending habits again. New houses became large once more, and consumers opted for low-mileage, sport utility vehicles instead of fuel-efficient economy cars.

In the end, the very mechanism that encouraged people to conserve energy when oil prices were high—the price system—did exactly the opposite when oil prices went down again.

When farmers pump water out of the ground to water their crops, they use pumps driven by electricity or natural gas. When water tables fall because of pumping, it costs more to pump the water. The increased cost of pumping encourages everyone to use it more efficiently, thus conserving a scarce resource.

In time, the falling water table makes some of the shallow wells useless, requiring deeper and more costly wells to be drilled. At this point, the price system will affect farming decisions again. Deeper wells will be dug for the most profitable crops, while marginal and unprofitable crops will be abandoned.

Ultimately, the price system works to establish an equilibrium between the rising cost of obtaining water and the profitability of the crops grown with the water. Although some crops and fields will be abandoned, they are likely to be the ones that were the least productive in the first place. As a result, the actual amount of lost agricultural output will not be that large.


When the price of natural gas was low in the 1960s, the quantity demanded was high. Because government regulated the price, however, producers had little incentive to increase its production.

Congress then tried to stimulate gas discovery and production by lifting the price controls on deep gas-pockets of natural gas, 15,000 feet or more below the earth's surface. The price of this gas then rose to three or four times its previous level, causing even more exploration for deep gas. Later, all gas price controls were removed, which encouraged even more production.



The lack of interest in drilling for shallow gas was consistent with the law of supply, which maintains that the lower the price paid to producers, the less will be brought to market. Also consistent with the law of supply was the effort by producers to produce more of the deregulated deep gas when its price went up.

Pollution and Economic Incentives

 **Pollution** is the contamination of air, water, or soil by the discharge of poisonous or noxious substances. Pollution is a problem that most countries face today.

Careers



EPA Inspector

The Environmental Protection Agency (EPA) is the federal agency responsible for protecting the environment. It employs thousands of inspectors to supervise enforcement of pollution control laws and regulations.

The Work

EPA inspectors examine air, water, and soil for evidence of pollution. Investigating the cause and scope of pollution requires inspectors to visit sites where pollution might occur and test for pollutants and collect samples for analysis. They monitor the air quality of major cities and of industrial sites. After completing their examination, EPA inspectors put together reports of their findings and initiate action to stop further pollution.

Qualifications

EPA inspectors generally have a college education with a specialization in environmental or biological science, plus several years of experience in the field. As with most government jobs, EPA applicants must pass a civil service examination.

The Incentive to Pollute

Pollution does not occur on its own: it occurs because people and firms have an incentive to pollute. If that incentive can be removed, pollution will be less of a problem.

For years, factories have located along the banks of rivers so they could dump their refuse into the moving waters. Some factories that generated smoke and other air pollutants located farther from the water, but their tall smokestacks still blew the pollutants long distances. Others tried to avoid the problem by digging refuse pits on their property and burying their toxic wastes.

In all three situations, factory owners were trying to lower production costs by using the environment as a giant waste-disposal system. From an economic point of view, the reasoning was sound. Firms get ahead when they lower production costs. Those who produce the most at the least cost make the most profits.

The cost of pollution to society as a whole, however, is huge. For example, **acid rain**—a mixture of water and sulfur dioxide that makes a mild form of sulfuric acid—falls over much of North America, damaging countless rivers and streams. Fertilizer buildup and raw sewage runoff poison ecosystems in other areas. The damage caused by pollution is extensive, but it can be controlled. One way to control pollution is through legislated standards. Another way is through economic incentives.

Controlling Pollution

Legislated standards include laws that specify the minimum standards of purity for air, water, and auto emissions. Congress, for example, has declared that all automobiles sold in the United States must meet certain pollution standards.

Legislated standards can be effective, but they are generally inflexible. Once a standard is set, a firm has to meet it or cease production. Because of this, many firms lobby extensively to exempt their industry from the pollution controls.

Another method of controlling pollution is to have companies pay taxes on the amount of pollutants they release. The size of the tax would depend on the severity of the pollution and the quantity of toxic substances being released.

Fighting Pollution



The Incentive to Pollute Pollution is one of the painful by-products of modern life. Damage caused by pollution is extensive. *What methods are used to hinder the incentive to pollute?*

Suppose a community wants to reduce air pollution caused by four factories, each of which releases large quantities of coal dust. A \$50 tax on every ton of coal dust released into the air would be applied to each factory. Devices attached to the top of the factory's smokestacks would measure the amount of dust released during a given period, and the factory would be billed accordingly.

Each company would then have the choice of paying the tax or removing the pollutants themselves. This tax approach does not try to remove all pollution. It does, however, allow individual companies freedom of choice. It also provides flexibility that legislated standards lack—and may even prevent some plants from closing entirely.

Some firms would rather pay the tax than clean up their own pollution. These firms, however, help fund the pollution clean-up campaign. Consumers will not have to fund these efforts out of their income, sales, or property taxes.

Pollution Permits

The Environmental Protection Agency (EPA) currently uses a similar system to reduce sulfur dioxide emissions at coal-burning electric utilities. Sulfur dioxide emissions from the burning of coal and oil react with water and oxygen to form compounds that fall to the earth as acid rain. The EPA's target is to ultimately reduce sulfur dioxide emissions to a level of nine million tons per year.

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Student Web Activity Visit the *Economics: Principles and Practices* Web site at epp.glencoe.com and click on **Chapter 20—Student Web Activities** for an activity on the Environmental Protection Agency.

Did you know?

Global Warming Most climatologists agree that the earth is likely to warm by as much as 2° to 9° F over the next 50 to 60 years. Human activities have released gasses that trap in the sun's rays and heat the earth. Scientists believe that polar caps will begin to melt, raising sea levels from at least a foot to as much as 6.6 feet in the next century. An estimated one-third of the world's population who live within 40 miles of the sea could be facing severe flooding and depletion of their freshwater sources.

Issuing Permits


The EPA started its program by issuing sulfur dioxide **pollution permits**—federal permits allowing public utilities to release pollutants into the air—in 1993. Utilities are not allowed to operate without them, but if a utility has more permits than it needs, it can sell them in one-ton increments. Thus, utilities that want to spend money on emissions cleanup could sell their permits, and use the cash to clean up their emissions. Those who prefer to purchase and use the permits can do so.

The first set of pollution permits went on sale in March 1993 at the Chicago Board of Trade. The one-ton permits brought prices ranging from \$122 to \$450 each. The EPA issued additional permits in successive years, but fewer permits will be issued as time goes on, making them scarcer and more expensive. Ultimately, the utilities will either have to pay very high prices for the permits, or they will have to buy additional antipollution devices.

Advantages

The system also has advantages for environmentalists who wanted utilities to reduce pollution at even faster rates. Several environmental groups purchased the pollution permits with their own funds, making them scarcer and therefore more expensive, for the utilities.

Using Resources Wisely

 The resource challenge is vital to a growing global economy. Resources become scarce when the quantity demanded for them is greater than the quantity supplied. In a market economy, the price system plays a major role in the allocation of resources. It tells consumers when resources are scarce. It also helps decision makers allocate resources more wisely.

Economists who understand the workings of a market economy are optimistic about the future, especially if the price system is allowed to function and fulfill its role in the economy. As long as the price “system” is allowed to operate, we will never suddenly run out of an endangered resource.

Section 2 Assessment

Checking for Understanding

- 1. Main Idea** What are two incentives that can be used to preserve scarce resources in a market economy?
- 2. Key Terms** Define glut, pollution, acid rain, pollution permit.
- 3. Describe** how the price system helps conserve water, natural gas, and oil.
- 4. Identify** the ways that the government tries to limit pollution.
- 5. Explain** why resources should be used wisely.

Applying Economic Concepts

- 6. Markets and Prices** Suppose that the demand for natural gas increases sharply because of a series of extremely harsh winters. How would a price increase affect gas usage as well as research efforts by natural gas companies?

Critical Thinking

- 7. Making Comparisons** How do legislated standards and economic incentives differ in regard to pollution control?



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MAY 24, 1999

Newsclip

Foreign plants and animals are invading North America as a result of increased global trade and tourism. It is estimated that invasive species cost the U.S. more than \$122 billion a year in damages.

They're Here, and They're Taking Over

Bioinvasion, the spread of nonnative species, is fast becoming one of our most costly ecological problems as it disrupts food and agriculture, destroys wetlands, interferes with shipping, and drastically alters natural habitats. . . .

. . . The list of troublemakers include noxious weeds (\$35 billion), harmful insects (\$25 billion), and organisms, such as the AIDS virus and cholera, that cause human disease (\$6.5 billion). . . .

There is also a huge untallied cost. Exotic species destroy the ecosystems that support native species, leaving them nowhere to go. . . .

Jack Russell terriers sniffing for snakes in cargo at Guam airport



In Guam, the brown tree snake has eradicated 9 lizard species and 10 types of forest bird. . . .

In many ways, bioinvasion is the dark side of globalization. With more and more goods entering the country, it's easier for pests to stow away. Christopher J. Bright, a researcher at the Worldwatch Institute, says booming tourism also opens the way for invasions. Every day, some 2 million people cross an international border around the world; every week, a million people move between developed and developing nations.

Efforts to control the menace have been far too fragmented. There are 24 federal agencies with some authority to regulate nonnative species, and it has been difficult to coordinate their efforts. . . .

. . . Under the current system, an import is deemed safe unless it's on a list of organisms known to be harmful. Often, by the time federal regulators have the evidence to blacklist a particular species, it's too late. . . .

Ecologists would prefer a "white-list" law, one that bans entry of plants and animals until they're proven innocent. New Zealand and Australia already have such laws, but some U.S. officials worry that such a policy could alienate trading partners. Still, there is a growing sense that it may be worth the risk. . . .

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Examining the Newsclip

- 1. Understanding Cause and Effect** How has globalization contributed to bioinvasion?
- 2. Analyzing Information** Why would a "white-list" law alienate some U.S. trading partners?

Applying the Economic Way of Thinking

Study Guide

Main Idea

Economics provides a foundation for analyzing choices and making decisions.

Reading Strategy

Graphic Organizer As you read the section, complete a graphic organizer similar to the one below by describing how American capitalism has changed.



Key Terms

cost-benefit analysis, modified free enterprise economy

Objectives

After studying this section, you will be able to:

1. **Describe** the reasoned approach to economic decision making.
2. **Understand** how our market economy will be able to cope with the future.

Applying Economic Concepts

Cost-Benefit Analysis Have you ever decided not to do something because the cost of doing it was greater than the benefits that would be received? Economists call this cost-benefit analysis—and they use this analysis often. If you think the same way, perhaps you are starting to think like an economist.

Cover Story

The Outlook—Pushing Adam Smith Past the Millennium

WASHINGTON—If Adam Smith were to visit the U.S. at the millennium's end, he would like what he saw. . . . Today, the invisible hand is more limber and supple than ever.

In the past two decades, globalization has forced American companies to compete on a worldwide scale, and the collapse of communism has extended capitalistic principles to every corner of the globe. Deregulation has injected market forces into areas long insulated from them . . . [and] the Internet has helped better-informed buyers find legions of new sellers, and sellers find far-flung buyers. . . .

—*The Wall Street Journal*, June 6, 1999




Free market idea grows

As a science, economics is concerned with the way in which people cope with scarcity. Because scarcity is a universal problem, the study of economics is important to everyone.

The economic system based on capitalism and free enterprise has, as you just read in the cover story, done quite well. There is also every likelihood that it will continue to do well in the future—although we also expect some evolution and modifications as we deal with new challenges and opportunities.

A Framework for Decision Making

 Through the study of economics, you learn that choices must be made. You begin to discover different ways to analyze a problem, and that alternatives must be considered. The late economist Kenneth Boulding observed that economics has evolved to the point that it has now become a generalized theory of choice.



THE INFORMATION REVOLUTION

In this era, not only is capitalism global but so is the Information Revolution. As powerful data networks spread, the developing nations are being drawn into the borderless information economy.

Inside a gleaming computer center in Taipei, a young engineer labors late into the night. Connected by the Internet to some of the best software writers in the U.S., he is helping design a digital phone system that will match anything the U.S. or Europe can muster.

In China's northern boomtown of Tianjin, an auto worker pores over documents on how to arrange a low-interest mortgage on a modern condominium. In Mexico City, a working couple plows savings into a mutual fund, all to put two children through private school.

Ingenuity, new prosperity, middle-class striving—familiar Western values are appearing on the frontiers of capitalism. Multiply these scenes by the millions, and you see the shape of a revolution that

will transform the global economy well into the next century. Already, capitalism is flourishing in regions as diverse as communist Asia and the former dictatorships of Latin America. Affluence is lifting millions out of poverty, giving many the chance to purchase their first Fiats and Toyotas as well as their first Apple computers and Panasonic VCRs. And inflation is brought to heel in even the most wayward economies.

The implications are huge for rich and poor alike. Hundreds of millions of peasants are leaving ancient ways of life for the factory. Cities such as Guangzhou and Bangalore teem with new inhabitants. Many are living poorly, of course, but just as many are thriving.

—*Business Week*, December 14, 1998

Critical Thinking

- 1. Summarizing Information** What is the main point of the article? Write a thesis sentence in your own words explaining the main point.
- 2. Drawing Conclusions** "The Information Revolution will draw economies from different parts of the world closer." Do you agree or disagree with this statement? Explain your answer.

Economics provides a framework for decision making that helps people to become better decision makers. The future will be different than the past, or even the present for that matter, but some things in economics—the way we think about problems—are likely to remain the same.

A Reasoned Approach

Economic decision making requires a careful, reasoned approach to problem solving. The National Council on Economic Education, an organization dedicated to the improvement of economic literacy in the United States, recommends five steps. These steps provide useful guidelines to decision making.

1. State the problem or issue.
2. Determine the personal or broad social goals to be attained.
3. Consider the principal alternative means of achieving the goals.
4. Select the economic concepts needed to understand the problem and use them to appraise the merits of each alternative.
5. Decide which alternative best leads to the attainment of the most goals or the most important goals.

—*A Framework for Teaching the Basic Concepts*, 1996

Life is full of trade-offs, but you will be better equipped to deal with the future if you know how to analyze the problems you will encounter.

Decision Making at the Margin

Economists use a number of tools to help them analyze and make decisions. Some of these tools include production possibilities curves, supply and demand curves, production functions, and even the National Income and Product Accounts.

One of the most important decision-making tools is the concept of marginal analysis. For example, when a firm makes a decision to produce additional output, it compares the extra cost of production with the extra benefits to be gained. If the benefits outweigh the costs, the firm decides to continue with the additional production. If the costs outweigh the benefits, the firm decides not to produce the additional output.

This process—**cost-benefit analysis**—involves comparing the costs of an action to its benefits. Firms use cost-benefit analysis when they make decisions to produce or purchase additional capital equipment. Many government agencies use it when they evaluate programs. Individuals also use it when they make decisions. Cost-benefit analysis is even used to make choices among economic goals. Some choices will work against one goal while favoring

another, but evaluating the costs and benefits of each choice helps in making decisions.

Finally, we must remember that the economist uses a very broad definition of costs—that of opportunity costs. This ensures that we account for all of the costs of a decision, not just the monetary ones.

Coping With the Future



Everyone wants to know what will happen to the economy in the future. How will it adjust and what course will it take? Part of the answer can be found by examining the way markets work.

Markets and Prices

Our **modified free enterprise economy**—a free enterprise economy with some government involvement—is one that allows buyers and sellers to freely make the decisions that satisfy their wants and needs. The forces of supply and demand interact to establish prices in a market. Prices, in turn, act as signals, helping producers and consumers to make or even alter their spending decisions.

Prices also influence the allocation of resources across markets. The high price of oil in the 1970s made other energy sources competitive. In the 1980s, the high prices of personal computers attracted producers. Competition soon lowered prices and made the same computers affordable to mass markets.

A market economy has many advantages, including the ability to adjust to change gradually, without the need for government intervention. As long as the forces of supply and demand are allowed to function, they will send producers and consumers the signals needed to reallocate resources. Although no one knows what the future will bring, capitalism has demonstrated its ability to adapt in the past, and it is likely to do so again in the future.

The Triumph of Capitalism

During the 1930s, the forces of socialism and communism were sweeping the world, while capitalist countries were in economic depression. Communism in the Soviet Union had considerable

STANDARD & POOR'S INFOBYTE

Economic Forecasts An economic forecast is a projection regarding the future direction of all or part of the economy. Economists analyze economic data to identify trends, and perform statistical evaluations to build their forecasts. Economists are like scientists in that they study phenomena by making observations based on collected data. The purpose of their studies is to uncover relationships between economic events and variables. An economist may, for example, study trends in the price and sales behavior of the domestic automobile market to arrive at a prediction of future auto sales. Businesses and governments rely on such forecasts for policy-making and goal-setting purposes. Individuals rely on these forecasts for their spending and investing decisions.

impact upon the world, and socialist parties were on the rise in the European colonies in Africa.

Since then, communism in the former Soviet Union has collapsed under the weight of its own inefficiencies. Many socialist countries have embraced capitalism and the discipline of the market system. In addition, many developing countries have chosen capitalism as their economic system. Many emerging economic powers—including Singapore, South Korea, and Taiwan—owe much of their remarkable growth to capitalism.

Capitalism is now the dominant economic force in the world, but it is not the laissez-faire capitalism of the past. Capitalism has changed because people have addressed some of the weaknesses that Karl Marx and others identified many years ago.

The capitalism of the 1930s was ruthlessly efficient in that it provided only for those who produced or earned enough to buy the necessities of life. Early capitalism had little room for the elderly, the ill, or the incapacitated. Many economies today, including that of the United States, have a modified free enterprise economy, or modified private enterprise system. This is a free-market economy based on capitalism, yet modified by its people to satisfy the economic goals of freedom, efficiency, equity, security, full employment, price stability, and economic growth.

Capitalism has evolved over the years, and it shows every sign of continuing to do so in the future. In this respect, capitalism adjusts to change

the same way a market adjusts to small changes in supply and demand—incrementally, with adjustments so small that they are hardly noticed in the short run. This ability to evolve, and to adjust to the demands placed on it, are strengths of capitalism that will continue to ensure its success.

Nature of Capitalism



Adaptability In many industrial countries, capitalism is the prevailing economic system. Capitalism is based on private ownership of the means of production and on individual economic freedom. *How was the capitalism of the past different from the capitalism of today?*

Section 3 Assessment

Checking for Understanding

- 1. Main Idea** How does cost-benefit analysis affect the decision-making process?
- 2. Key Terms** Define cost-benefit analysis, modified free enterprise economy.
- 3. Explain** the reasoned approach to economic decision making.
- 4. Describe** how a market economy adapts to change.
- 5. Explain** how marginal analysis assists in decision making.

Applying Economic Concepts

- 6. Cost-Benefit Analysis** Think of a decision you must make in the next few days. How will you use your estimates of the costs and benefits to make your decision?

Critical Thinking

- 7. Synthesizing Information** Provide an example of how prices act as a signal to you as a buyer and as a seller.



Practice and assess key social studies skills with the *Glencoe Skillbuilder Interactive Workbook, Level 2*.

Making Predictions

Predicting future events is obviously difficult and sometimes risky. The more information you have, however, the more accurate your predictions will be.

Learning the Skill

Follow these steps to help you analyze information in order to make predictions.

- Gather information about the decision or action.
- Use your knowledge of history and human behavior to identify what consequences could result.
- Analyze each of the consequences by asking: How likely is it that this will occur?

Practicing the Skill

Study the following passage, then answer the questions that follow.



Market scene, Peru

In 1950, only 42 percent of Latin Americans were city dwellers; today almost 73 percent live in cities, according to the United Nations. This compares with 34 percent in Africa and 33 percent in Asia. Despite oppressive poverty, Peruvians seeking a better life, for example, have been fleeing the countryside for Lima at the rate of more than a thousand a day and building settlements that seem like a never-ending expanse of small straw huts next to a noisy highway. The trend has created megacities throughout the continent.

The equation is similar in many countries. The major city attracts one-quarter to one-third of the country's population, with many living in squalid slums . . . encircling the affluent city. Experts say that by the year 2010, Rio de Janeiro and Sao Paulo will be one continuous megalopolis 350 miles long with almost 40 million people.

—by John L. Petersen, *The Road to 2015*

1. What trend does the passage show?
2. Do you think the trend the writer describes is likely to continue?
3. On what do you base this prediction?
4. What occurrences might have an effect on changing the trend?
5. What are three possible consequences or outcomes of this trend?

Application Activity

Analyze three articles in the business section of the newspaper. Predict three consequences of the actions in each of the articles. On what do you base your predictions?



Practice and assess key social studies skills with the *Glencoe Skillbuilder Interactive Workbook, Level 2*.

Section 1

The Global Demand for Resources (pages 545–550)

- Over 200 years ago, Thomas Malthus predicted many of the population problems some developing nations face today—high birthrates, famine, and the threat of a **subsistence** standard of living.
- Malthus did not foresee advances in technology or that some birthrates would fall and some populations cease to grow.
- Many **nonrenewable resources** such as oil, natural gas, and coal are threatened today.
- The oil **embargo** of the early 1970s raised oil prices and encouraged Americans to seek alternative energy sources, along with alternative and renewable energy sources.
- Some renewable energy resources—hydroelectric power, biomass, solar power, wind power—have been developed, including **gasohol**, a combination of unleaded gasoline and grain alcohol.
- Other resources like water and land are also coming under pressure because of population growth.



Section 2

Economic Incentives and Resources (pages 552–556)

- During the oil embargo of the 1970s, high gas prices provided an incentive to preserve resources. When prices came back down, conservation efforts waned.
- As the population has grown and used more energy resources, people have become concerned about pollution.

- The traditional response to pollution is to have the government pass legislated standards prohibiting it.
- Economists argue that pollution cannot be controlled until the economic incentives to pollute are removed.
- Programs including pollution taxes and **pollution permits** are designed to give firms the incentive to not pollute.
- Markets have the flexibility to adjust to change—an adjustment that affects prices and the allocation of resources.



Section 3

Applying the Economic Way of Thinking (pages 558–561)

- Economics has become a generalized theory of choice and a framework for decision making.
- The National Council on Economic Education has recommended a five-point approach to decision making; the final step involves **cost-benefit analysis**, which compares the cost of a decision to the benefits gained.
- A fundamental knowledge of economics helps people cope with the future, especially now that capitalism has emerged as the dominant type of economic organization in the world today.
- Modern capitalism is not the ruthlessly efficient version of the 1930s; modern capitalism has been modified to suit the economic goals of their people.
- In the markets of the world today, supply and demand establish prices, and prices serve as signals to both producers and consumers.
- The flexibility markets provide enables the modern **modified free enterprise economy** to better deal with the unforeseen events of the future.

ECONOMICS Online



Self-Check Quiz Visit the *Economics: Principles and Practices* Web site at epp.glencoe.com and click on **Chapter 20—Self-Check Quizzes** to prepare for the chapter test.

CLICK HERE

Identifying Key Terms

Write the term that best completes the following sentences.

- | | |
|--|-----------------------|
| a. pollution permits | f. pollution |
| b. biomass | g. aquifer |
| c. modified free enterprise economy | h. embargo |
| d. glut | i. gasohol |
| e. acid rain | j. subsistence |

- The state in which the population produces barely enough to support itself is _____.
- The United States has a(n) _____, a system that has been altered by its people to satisfy economic goals.
- A restriction on the export or import of a commodity in trade is a(n) _____.
- _____ is a mixture of 90 percent unleaded gasoline and 10 percent grain alcohol.
- An underground water-bearing rock formation is a(n) _____.
- The second largest source of renewable energy is _____.

Reviewing the Facts

Section 1 (pages 545–550)

- Describe** why, despite Malthus's predictions, certain parts of the world have enjoyed steadily increasing standards of living.
- Explain** where the most rapid rates of population growth are found.

- List** the four major nonrenewable energy resources.
- Describe** the major drawback of nuclear energy.

Section 2 (pages 552–556)

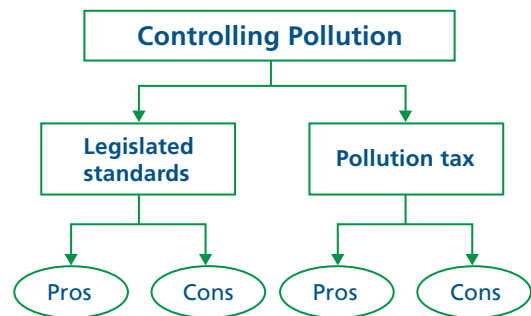
- Explain** how American consumers and the automobile industry reacted to the oil price increases of the 1970s.
- Explain** how the reluctance of oil and gas producers to drill for shallow gas was consistent with the law of supply.
- Describe** what the EPA hopes to accomplish by issuing pollution permits.
- State** how the price system in a market economy helps ensure that resources are used wisely.

Section 3 (pages 558–561)

- List** the steps involved in economic decision making.
- State** the importance of cost-benefit analysis.
- Explain** why adapting to change is important for an economic system.

Thinking Critically

- Making Comparisons** If you had to decide to use legislated standards or a pollution tax to reduce pollution, which would you choose? In your reasoning, explain the pros and cons of each approach. Use a graphic organizer similar to the one below to organize your answer.



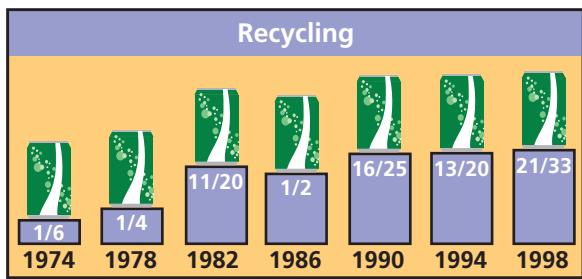
- 2. Making Predictions** In what ways can Americans ensure the wise use of resources? How might the world be different in 50 years if we do not use resources wisely today?

Applying Economic Concepts

- 1. Scarcity** Scarce natural resources are a problem that concerns citizens throughout the world. What can you personally do to help conserve resources?
- 2. Modified Free Enterprise Economy** The United States has a modified free enterprise economy in which the government regulates some industries. Do you think the government should play a smaller or larger role in regulating the American economy? Give reasons to support your answer.

Math Practice

Many people all over the world recycle their aluminum cans in order to help our environment. The graph below shows the percentage of aluminum cans that have been recycled over the years. Study the information presented in the graph, then answer the questions.



Source: The Aluminum Association, Inc.

- During which year was the largest percentage of aluminum cans recycled?
- In 1974, 2.3 billion cans were recycled. Write a formula to show the total number of cans consumed during that year.

Thinking Like an Economist

Renewable energy resources only account for a small portion of our total energy production. Explain the changes that would have to take place in order for people to make greater use of renewable energy resources.

Technology Skill

Using a Database Create a database on recycling centers in your community. Look in the telephone book to locate the nearest recycling centers. Find out the name, address, phone number, and operation hours of each service, and what services each provides. Use this information to create a database, making separate fields for the materials, the locations, and the rebates paid for recycled items. Print and distribute your database to the rest of the class.

Building Skills

Making Predictions The table below depicts the median inflation rate for advanced economies, developing countries, and countries in transition for selected years. Study the table, then answer the questions that follow.

	1997	1998	1999	1980–89	1990–99
Countries in Transition	14.8	11.0	7.7	1.2	165.6
Developing Countries	5.6	4.8	4.1	9.9	8.4
Advanced Economies	1.7	2.1	2.1	6.9	2.8

Source: *World Economic Outlook*

- Which economies do you predict to maintain a relatively low rate of inflation? Why do you think this is the case?
- If trends continue, do you project the median inflation rate for developing countries to rise, decrease, or stay at about the same level? Why?



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