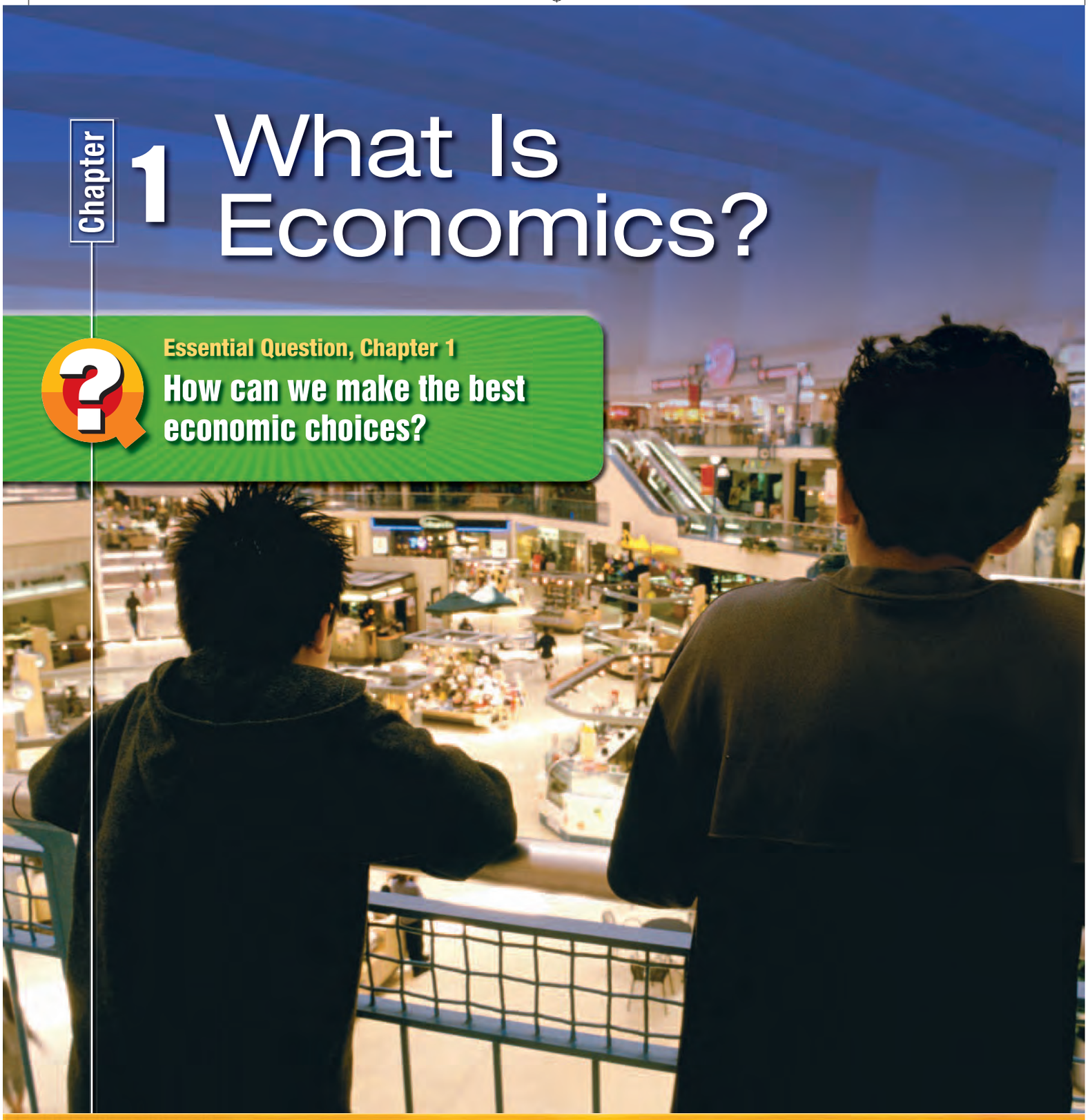
Chapter 1

What Is Economics?



Essential Question, Chapter 1

How can we make the best economic choices?

FL Next Generation Sunshine State Standards

Section 1: Scarcity and the Factors of Production
LA.1112.1.6, SS.912.E.1.1, SS.912.E.2, SS.912.E.2.3

Section 2: Opportunity Cost
LA.1112.1.6, SS.912.E.1.1, SS.912.E.1.7, SS.912.E.3.6

Section 3: Production Possibilities Curves
LA.1112.1.6, MA.912.A.2, SS.912.E.1.2, SS.912.E.2.3

Economics *on the go*

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SECTION 1 Scarcity and the Factors of Production

FL NGSSS

LA.1112.1.6 Use multiple strategies to develop vocabulary.

SS.912.E.1.1 Identify factors of production and their necessity to making goods and services.

SS.912.E.2 Understand the concepts relevant to the national economy.

SS.912.E.2.3 Research the contributions of key individuals of various backgrounds in the development of the U.S.

ECONOMIC DICTIONARY

As you read the section, look for the definitions of these **Key Terms:**

- need
- want
- goods
- services
- scarcity
- economics
- shortage
- entrepreneur
- factors of production
- land
- labor
- capital
- physical capital
- human capital

Guiding Question

How does scarcity force people to make economic choices?

Copy this cause-and-effect chart and fill it in as you read.

Needs and Wants	Resources
A. Definition:	A. Definition:
B. Unlimited	B.
C. Examples:	C. Examples:

→ Necessity of Making Choices

Economics and You

There are so many ways you could spend your money. You really want that new video game. You also want to attend an upcoming concert. At the same time, you need to pay your car insurance. With limited funds, you can't have it all. How will you choose?

What's true for you is also true for your neighbors, your school, the gas station on the corner, a major television network, and the U.S. Congress. Economics is the study of how individuals, businesses, and governments make choices when faced with a limited supply of resources.

Principles in Action Scarcity forces us all to make choices by making us decide which options are most important to us. In this section, you will examine the problem of scarcity as it relates to such varied resources as water and the ingredients needed to make a plate of French fries.

Scarcity and Choice

The study of economics begins with the fact that people cannot have everything they need and want. A **need** is something essential for survival such as food or medical care. A **want** is something that we desire but that is not necessary for survival, such as video games or stylish haircuts.

People satisfy their needs and wants with goods and services. **Goods** are physical objects that someone produces, such as food, clothing, or video games. **Services** are actions or activities that one person performs for another. Medical care and haircuts are services.

need something essential for survival

want something that people desire but that is not necessary for survival

goods the physical objects that someone produces

services the actions or activities that one person performs for another

Visual Glossary online

Go to the Visual Glossary Online for an interactive review of **opportunity cost.**

Action Graph online

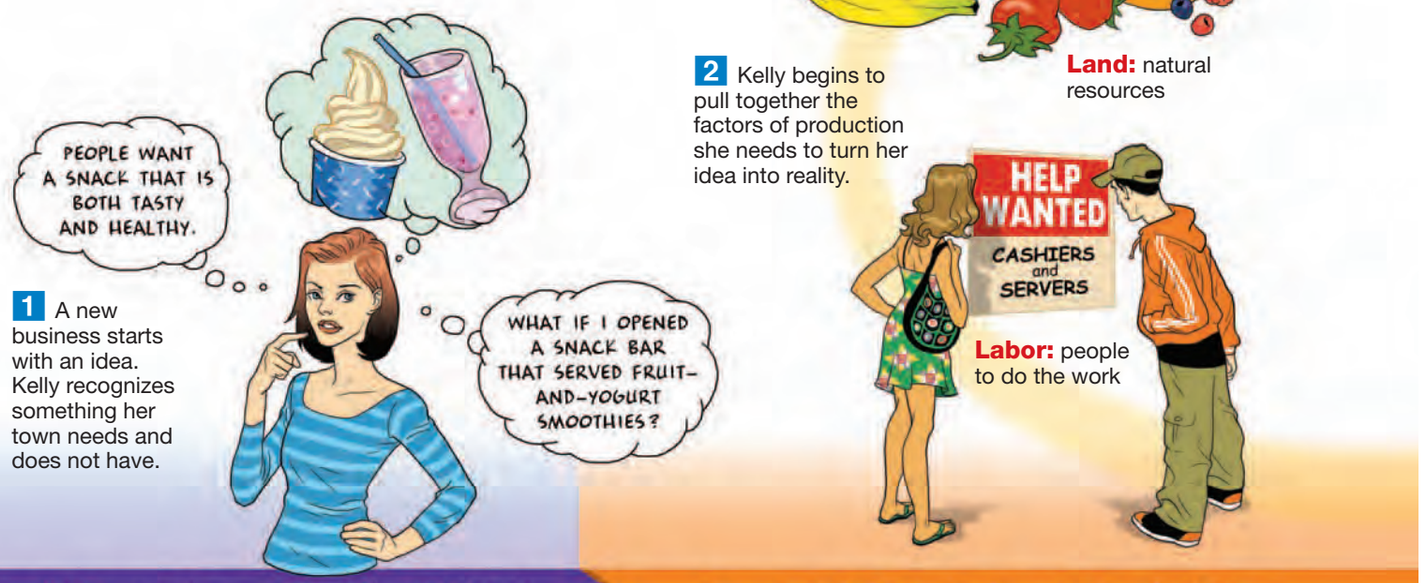
Go to Action Graph Online for animated versions of key charts and graphs.

How the Economy Works online

Go to How the Economy Works Online for an interactive lesson on the role of the **entrepreneur.**

What does an entrepreneur do?

All entrepreneurs—whether they are starting a lawn-mowing service or founding a company that makes cars—have two things in common. First, they recognize a need or want. Then, they must assemble the factors of production to meet that need or want.



1 A new business starts with an idea. Kelly recognizes something her town needs and does not have.

2 Kelly begins to pull together the factors of production she needs to turn her idea into reality.

Land: natural resources

Labor: people to do the work

Recognize a Need or Want → **Assemble Factors of Production**

FL **SS.912.E.1.16** Construct a one-year budget plan for a specific career.

The Problem of Limits

People's needs and wants are unlimited. When one want is satisfied, others arise. After eating lunch, you might want to go to a movie or buy some clothes. Goods and services, however, are limited. No one can have an endless supply of anything. Sooner or later, a limit is always reached. The fact that limited amounts of goods and services are available to meet unlimited wants is called **scarcity.**

scarcity the principle that limited amounts of goods and services are available to meet unlimited wants

economics the study of how people seek to satisfy their needs and wants by making choices

shortage a situation in which consumers want more of a good or service than producers are willing to make available at a particular price

At many different levels, scarcity forces people to make choices. You, for example, have to decide how to spend your time. If you decide to study for a test, you cannot go to the mall or do volunteer work at the same time. A store must choose between hiring ten new workers or paying for more advertising to attract new customers. A city council might debate whether to use its money to fix an aging school building or to hire more firefighters.

Economics is the study of how people seek to satisfy their needs and wants by making choices. Because people act individually, in groups (such as businesses), and through governments, economists study all three.

Scarcity Versus Shortage

Scarcity is not the same thing as shortage. A **shortage** occurs when consumers want more of a good or service than producers are willing to make available at a particular price. (You will learn how shortages are related to price in Chapter 6.) Shortages may be temporary or long-term.

Unlike shortages, scarcity always exists. There simply are not enough goods and services to supply all of society's needs and wants. This is because the resources that go into making those goods and services are themselves scarce.

CHECKPOINT ***What is the main focus of economics?***

How the Economy Works online

For an animated, interactive version of this feature, visit **PearsonSchool.com/PHecon**

Entrepreneurs and the Factors of Production

How are scarce resources turned into goods and services? Entrepreneurs play a key role. **Entrepreneurs** are people who decide how to combine resources to create new goods and services. To make a profit, entrepreneurs are willing to take risks. They develop new ideas, start businesses, create industries, and fuel growth.

Anyone who opens a business, large or small, is an entrepreneur. Jean-Baptiste Say, an eighteenth-century French economist, thought the risk-taking entrepreneur so important that he should be considered a fourth factor of production.

The first task facing an entrepreneur is to assemble **factors of production,** or the resources used to make all goods and services. The three main factors of production are land, labor, and capital.

Land

Economists use the term **land** to refer to all natural resources used to produce goods and services. Natural resources are any materials found in nature that people use to make things or to provide services. These resources include fertile land for farming, as well as resources found in or on the land such as oil, iron, coal, water, and forests.

Labor

The second factor of production is labor. **Labor** is the effort people devote to tasks for which they are paid. Labor includes the medical care provided by a doctor, the classroom instruction provided by a teacher, and the tightening of a bolt by an assembly-line worker. Labor is also an artist's creation of a painting or a technician's repair of a television.

FL **SS.912.E.2.3** Research contributions of key individuals of various backgrounds in the development of the U.S.

entrepreneur a person who decides how to combine resources to create goods and services

factors of production the resources that are used to make goods and services

land all natural resources used to produce goods and services

labor the effort people devote to tasks for which they are paid

capital any human-made resource that is used to produce other goods and services

physical capital the human-made objects used to create other goods and services

human capital the knowledge and skills a worker gains through education and experience

Capital

The term **capital** refers to any human-made resource that is used to produce other goods and services. Economists divide capital into two types—physical capital and human capital.

Human-made objects used to create other goods and services are **physical capital.** (Sometimes economists use the term capital goods for physical capital.) The buildings that house a computer manufacturing company are physical capital as are all the equipment and tools needed to make those computers.

In addition to producing physical capital, people can also invest in themselves. The knowledge and skills a worker gains through education and experience is **human capital.** Computer designers go to college to study engineering, electronics, and computers. They build their human capital, making it possible for them to design and build faster and more powerful computers. Auto mechanics also increase their human capital through schooling and experience. This knowledge gives them the skills to diagnose and fix an engine that is not running properly.

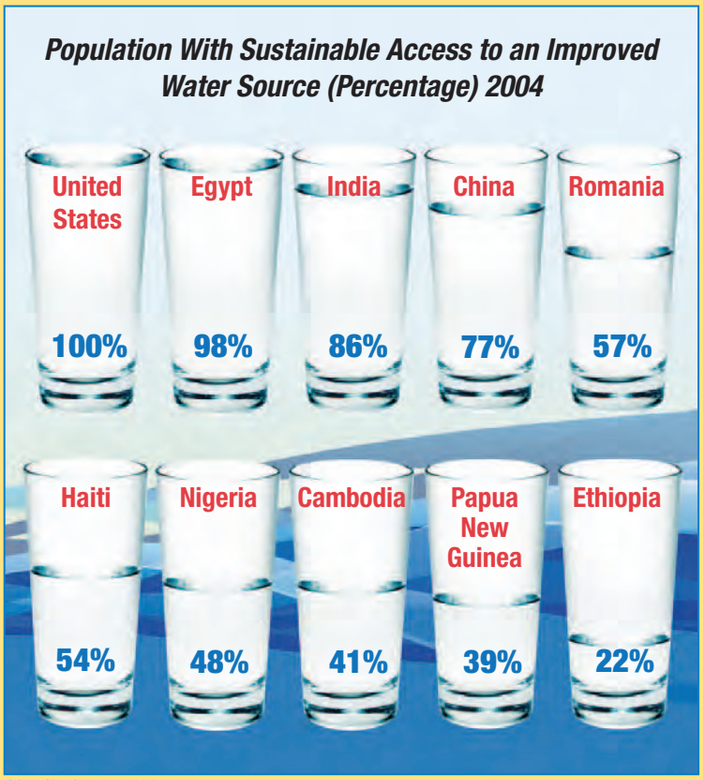
An economy requires both physical and human capital to produce goods and services. Doctors need both stethoscopes and schooling to provide healthcare. Assembly-line workers use tools as well as their own skills acquired through training and practice.

FUTURE WATCH

Global Impact

Water Wars?

Throughout history, wars have been fought over scarce natural resources—from gold to oil. Many experts predict that future wars may be fought over another scarce resource: ***water***. Millions of people around the world already live without access to clean, safe water. ***Predict three economic or social consequences that might occur in a country where water was scarce.***



SOURCE: *Globalhealthfacts.org*

Benefits of Capital

Capital is a key factor of production because people and companies can use it to save a great deal of time and money. Physical capital such as machines and tools help workers produce goods and services more easily and at less cost. As a result, they become more productive. Human capital such as technical knowledge has the same result. The more skills a worker gains, the more productive he or she becomes. Many businesses provide training for their employees for this reason.

To understand the benefit of investing in capital, consider the following example. A family of six people washes dishes by hand after every meal—breakfast, lunch, and dinner. That is a total of 21 meals per week. It takes 30 minutes per meal for two family members working together to scrape, stack, wash, rinse, dry, and put away the dishes. As a result, the family spends 21 hours a week cleaning dishes—time that could have been spent on other more productive activities.

Now, suppose that the family saves up and spends $400 on some physical capital—a dishwasher. Using the dishwasher, it takes only one family member 15 minutes after each meal to stack the dishwasher and another family member 15 minutes at the end of the day to put the

dishes away. A chore that used to require 21 hours to complete now takes only 7 hours. This example shows the typical benefits of using capital:

1. *Extra time* The family saves 14 hours a week. This is time that can be used for other activities.
2. *More knowledge* By learning how to use the dishwasher, family members learn more about using household appliances in general. They can apply that knowledge to using washing machines, dryers, and other appliances.
3. *More productivity* With extra time and more knowledge, family members can use their resources and labor to do other chores, to learn other skills, or simply to enjoy themselves. Every member of the family benefits.

CHECKPOINT ***What are the factors of production?***

Scarce Resources

All goods and services are scarce because the resources used to produce them are scarce. Consider French fries. A typical portion of French fries might have started as potatoes in a field in Idaho. Ten gallons of water irrigated the half-foot plot where the potatoes grew. Nurtured with fertilizers and protected by pesticides, the potatoes grew until they were harvested, processed, frozen, and then transported to Seattle. There they were fried in corn oil from Nebraska, sprinkled with salt from Louisiana, and eaten in a restaurant.

All of the factors of production used to produce those French fries are scarce. First, the amount of land and water available for growing potatoes is limited. Second, the labor available to grow the crop and to harvest, process, transport, and cook the potatoes is limited by the size, time, age, and energy of the population. Finally, the amount of physical capital available to create the French fries, such as farm machines or cooking equipment, is also limited.

The same principles apply to a pair of blue jeans, an MP3 player, or a space shuttle. No matter what good or service we look at, the supplies of land, labor, and capital used to produce it are scarce. We would also notice another fact about those resources—each one has many alternative uses. Individuals, businesses, and governments have to choose which alternative they most want.

CHECKPOINT ***Why are goods and services scarce?***

FL **LA.1112.2.2.2, LA.1112.1.6.1, SS.912.E.1.1, SS.912.E.2**

Essential Questions Journal To continue to build a response to the Essential Question, go to your **Essential Questions Journal**.

SECTION 1 ASSESSMENT

Guiding Question

1. Use your completed cause-and-effect chart to answer this question: How does scarcity force people to make economic choices?
2. **Extension** Describe how scarcity of time, money, or resources affected a recent economic decision you made.

Key Terms and Main Ideas

3. What is the difference between **goods** and **services?**
4. How does **scarcity** differ from a **shortage?**
5. What does an **entrepreneur** do?
6. What is a benefit of using both **physical capital** and **human capital?**

Critical Thinking

7. **Classify** Identify the factor of production represented by each of the following: **(a)** fishing waters, **(b)** an office building, **(c)** clerks in a store, **(d)** a tractor, **(e)** a student in a cooking school. Explain.
8. **Infer** If companies can become more productive by increasing their physical capital, why would a company not buy up-to-date computers for all employees each year?
9. **Apply** Think of a good or service that you consumed today. List at least five factors of production used to produce that good or service. Include at least one example each of land, labor, and capital.

Quick Write

10. Look at the How the Economy Works feature in this section. Make a list of the risks an entrepreneur takes and the possible rewards he or she might gain. Then, write a brief paragraph explaining why entrepreneurs are important to the economy of a community or nation.

SECTION 2 Opportunity Cost

FL NGSSS

LA.1112.1.6 Use multiple strategies to develop vocabulary.

SS.912.E.1.1 Identify factors of production and their necessity to making goods and services.

SS.912.E.1.7 Graph and explain how price is determined through marginal cost analysis.

SS.912.E.3.6 Draw conclusions about historical economic theories of economists.

ECONOMIC DICTIONARY

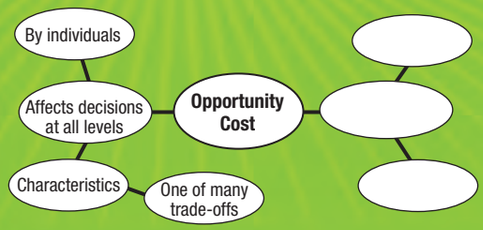
As you read the section, look for the definitions of these **Key Terms:**

- trade-off
- "guns or butter"
- opportunity cost
- thinking at the margin
- cost/benefit analysis
- marginal cost
- marginal benefit

Guiding Question

How does opportunity cost affect decision making?

Copy this concept web and fill it in as you read. Add more ovals if necessary.



Economics and You

You are cleaning your bedroom. Boxes, clothes, and other items cover your bed, the floor, the entire room. Suddenly, your phone rings and a friend invites you to a party. You consider your options and quickly decide that going to the party will be more fun than cleaning your room.

Later, tired but happy, you enter your bedroom and realize that you now have to clear off your bed when all you want to do is sleep. Your decision to go to the party cost you the time you needed to clean up your room. Was the benefit of your choice worth the cost?

Principles in Action Every time we choose to do something, we give up the opportunity to do something else. As you will see, even such a simple decision as how late to sleep in the morning involves weighing costs and benefits. The Economics & You feature shows how scarcity and choice can affect the ways you spend your time and what services your community provides.

Trade-Offs

Economists point out that all individuals, businesses, and large groups of people—even governments—make decisions that involve trade-offs. A **trade-off** is the act of giving up one benefit in order to gain another, greater benefit. Trade-offs often involve things that can be easily measured, such as money, property, or time. But trade-offs may also involve values that are not so easy to measure. Such intangibles include enjoyment, job satisfaction, or the feeling of well-being that comes from helping somebody.

Individuals and Trade-Offs

At every stage of life, you have to make trade-offs. Taking a part in the school play prevents you from playing soccer or getting a part-time job. A few years from now, you might decide to turn down an exciting but low-paying job in favor of a less interesting job that pays better. Still later, you may choose to give up a vacation in order to put more money away for your retirement.

trade-off the act of giving up one benefit in order to gain another, greater benefit

Businesses and Trade-Offs

The decisions that businesses make about how to use their factor resources—land, labor, and capital—also involve trade-offs. A farmer who plants broccoli cannot at the same time use the same area of land to grow squash. A furniture company that decides to use all of its equipment to make chairs eliminates the possibility of using the same equipment to build tables or desks.

Governments and Trade-Offs

National, state, and local governments also make decisions that involve trade-offs. Economists and politicians use the term **"guns or butter"** to describe one of the common choices facing governments: the choice between spending money on military or domestic needs. A country that decides to produce more military goods ("guns") has fewer resources to devote to consumer goods ("butter") and vice versa. The steel needed to produce a tank cannot then be used to produce a tractor.

In November 2007, as U.S. troops fought in Iraq, one commentator described the tough choice facing American leaders and voters:

> "Like Santa with a wish list that cannot be satisfied, the country enters the New Year with a needs list that far exceeds our revenue sources. It appears once again that it is time to wage the debate of guns or butter. . . . Citizens are simultaneously confronted with funding a war abroad and dealing with rising health costs, increased fuel costs and declining human services at home."

—Charles Bogue, "Guns or Butter," *Napa Valley Register*

In the end, the reason for the "guns or butter" trade-off is the same as the reason for any other trade-off: scarcity.

CHECKPOINT ***What are trade-offs?***

Determining Opportunity Cost

In most trade-offs, one of the rejected alternatives is more desirable than the rest. The most desirable alternative somebody gives up as the result of a decision is the **opportunity cost.** Take the farmer in the example above. If squash was the most profitable alternative to broccoli, then the opportunity cost of deciding to plant broccoli was the chance to plant squash.

Even simple decisions carry opportunity costs. Consider the following choices:

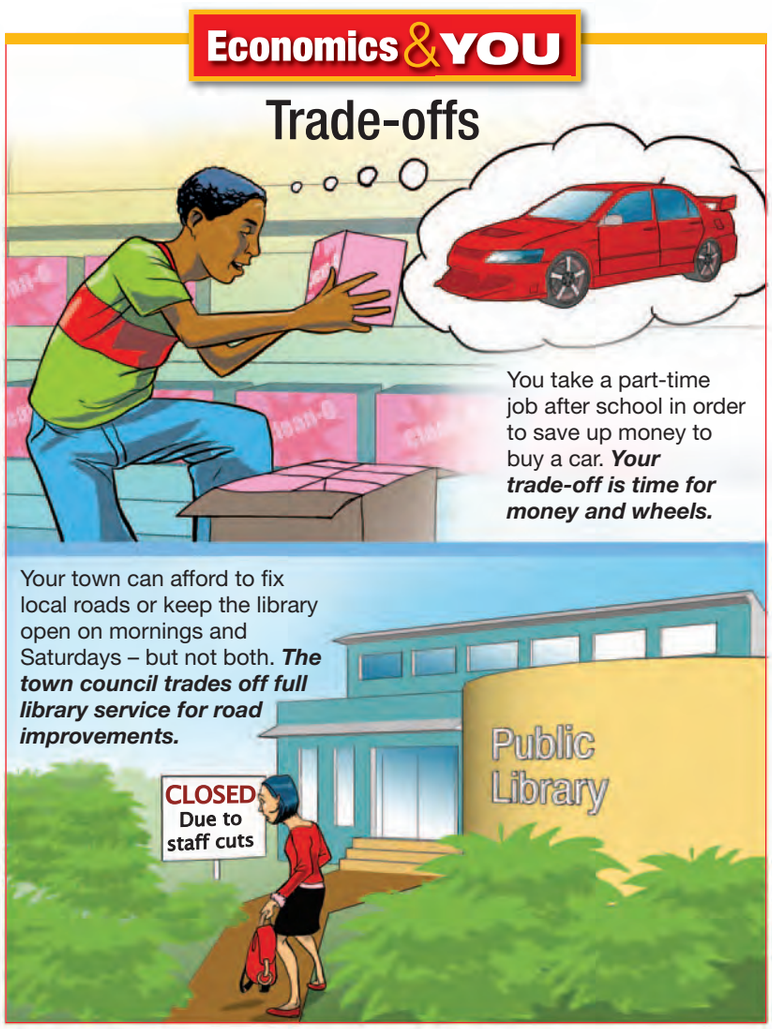
- Sleep late or wake up early to study for a test?
- Sleep late or wake up early to eat breakfast?
- Sleep late or wake up early to go on a ski trip?

Most likely, you did not choose "sleep late" for all three decisions. Your decision depended on the specific opportunity cost—the value to you of what you were willing to sacrifice.

"guns or butter" a phrase expressing the idea that a country that decides to produce more military goods ("guns") has fewer resources to produce consumer goods ("butter") and vice versa

opportunity cost the most desirable alternative given up as the result of a decision

FL **SS.912.E.3.6** Draw conclusions about historical economic theories of economists.



▲ Every decision we make involves trade-offs. That's why they can be difficult. ***Describe one decision you made this week. Identify the trade-offs involved.***

VISUAL GLOSSARY

FL **SS.912.E.1.14** Compare credit, savings, and investment services.
SS.912.E.1.15 Describe the risk and return profiles of various investments options.

Reviewing Key Terms

To understand *opportunity cost,* review these terms:

need, *p. 3*
want, *p. 3*
scarcity, *p. 4*
trade-off, *p. 8*

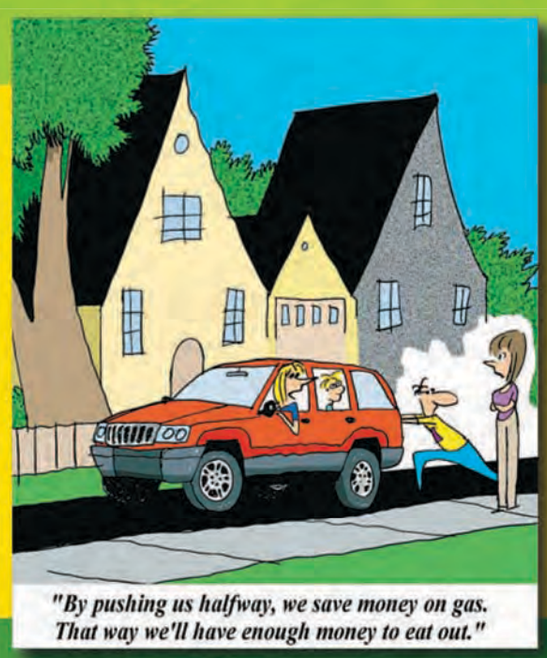
What is Opportunity Cost?

◀ **opportunity cost** the most desirable alternative given up as the result of a decision

KAREN'S DECISION-MAKING GRID

	Alternatives	
	Sleep late	**Wake up early to study**
Benefits	• Enjoy more sleep • Have more energy during the day	• Better grade on test • Teacher and parental approval • Personal satisfaction
Benefits forgone	• Better grade on test • Teacher and parental approval • Personal satisfaction	• Enjoy more sleep • Have more energy during the day
Opportunity cost	**Extra study time**	**Extra sleep time**

Opportunity cost is not just money, but *any* benefit you give up. To determine the opportunity cost of any alternative, you must first identify the benefits you will gain and the benefits you will give up. ***What is Karen's opportunity cost if she decides to sleep late?***



◀ In this cartoon, scarcity of an important resource—money—has forced the family to make a strange decision. ***What decision has the family made? What is the opportunity cost of this decision?***

Visual Glossary online

To expand your understanding of this and other key economic terms, visit **PearsonSchool.com/PHecon**

Using a Decision-Making Grid

At times, the opportunity cost of a decision may be unclear or complicated. Using a decision-making grid like the one in the Visual Glossary, opposite, can help you determine whether you are willing to accept the opportunity cost of a choice you are about to make.

In this particular example, a high school student named Karen is trying to decide whether to sleep late or get up early to study for a test. Because of the scarcity of time, she cannot do both.

To help her make her decision, Karen lists the benefits of each alternative on the grid. Waking up early to study will probably result in her receiving a better grade. She will also receive teacher and parental approval and experience a sense of personal satisfaction.

On the other hand, Karen enjoys sleeping. In addition, the extra sleep would give her more energy during the day. She would have to give up these benefits if she decided to get up earlier.

Making the Decision

Karen is a practical person. After considering the opportunity cost of each alternative, she decides that waking up early to study offers her the most desirable benefits. She knows that she is giving up the pleasure of more sleep and the extra energy it would provide. But she is willing to accept this opportunity cost.

If Karen faced other decisions with other opportunity costs, she might choose differently. What if the choice was between sleeping late and getting up early to have breakfast? What if her decision to sleep late or study was on a Saturday rather than on a school day? With each different set of alternatives, the possible benefits and opportunity costs change as well.

One thing does not change, though. We always face an opportunity cost. As economists say, "Choosing is refusing." When we select one alternative, we must sacrifice at least one other alternative and its benefits.

CHECKPOINT ***Why does every choice involve an opportunity cost?***

Thinking at the Margin

FL **SS.912.G.4.4** Analyze case studies of globalization.

When economists look at decisions, they point out one more characteristic in addition to opportunity cost. Many decisions involve adding or subtracting one unit, such as one hour or one dollar. From an economist's point of view, when you decide how much more or less to do, you are **thinking at the margin.**

To understand what it means to think at the margin, think about folding a piece of paper with important notes on it to put in your pocket. If you fold the paper in half and then in half again, it can just squeeze into your pocket and will lay fairly flat. If you continued folding it in half two or three more times, it would fit more easily in your pocket. But the paper would also become more bulky with each additional fold. The question is, how many folds is the best number for fitting easily into your pocket and laying flat once inside?

FUTURE WATCH

Personal Finance

To see how tradeoffs affect budgeting decisions, see your Personal Finance Handbook in the back of the book or visit **PearsonSchool.com/PHecon**

Cost/Benefit Analysis

Deciding by thinking at the margin is just like making any other decision. Decision makers have to compare the opportunity costs and the benefits—what they will sacrifice and what they will gain. This decision-making process is sometimes called **cost/benefit analysis.**

To make rational, or sensible, decisions at the margin, you must weigh marginal costs against marginal benefits. The **marginal cost** is the extra cost of adding one unit, whether it be sleeping an extra hour or building one extra house. The **marginal benefit** is the extra benefit of adding the same unit. As long as the marginal benefits exceed the marginal costs, it pays to add more units.

Decision-Making at the Margin

Look again at the example of Karen's decision on how late to sleep. The decision-making grid in the Visual Glossary used an "all or nothing" approach. Either Karen was going to wake up early to study, or she was going to sleep late and not study at all that morning.

In reality, Karen could have decided from among several options rather than just two. She could have decided to get up

thinking at the margin the process of deciding whether to do or use one additional unit of some resource

cost/benefit analysis a decision-making process in which you compare what you will sacrifice and gain by a specific action

marginal cost the extra cost of adding one unit

marginal benefit the extra benefit of adding one unit

Figure 1.1 Decision Making at the Margin

Options	Benefit	Opportunity Cost
1st hour of extra study time	Grade of C on test	One hour of sleep
2nd hour of extra study time	Grade of B on test	2 hours of sleep
3rd hour of extra study time	Grade of B+ on test	3 hours of sleep

CHART SKILLS

Compare this chart to the one in the Visual Glossary. By comparing opportunity costs and benefits of each extra hour, Karen can decide how much sleep is the right amount.

1. What is the opportunity cost of one extra hour of sleep? What is the benefit?
2. At what point is Karen paying an added cost with little added benefit?

one, two, or three hours earlier. Making a decision about each extra hour would involve thinking at the margin.

To make a decision at the margin, Karen should look at the marginal cost of each extra hour of studying and compare it to the marginal benefit. In Figure 1.1, we can see that one hour of studying means an opportunity cost of an hour of sleep, while the probable benefit would be passing the test with a C. Two hours of studying means losing two hours of sleep and perhaps getting a B. When Karen gives up three hours of sleep, however, the probable benefit rises only slightly, to a grade of B+.

Karen concludes that the marginal cost of losing three hours of sleep is no longer worth the marginal benefit because her grade will improve only slightly. Based on her cost-benefit analysis, Karen decides to awaken two hours earlier.

Like opportunity cost, thinking at the margin applies not just to individuals, but to businesses and governments as well. Employers think at the margin when they decide how many extra workers to hire. Legislators think at the margin when deciding how much to increase spending on a government program.

CHECKPOINT ***How can a cost/benefit analysis help people make decisions?***

FL **LA.1112.1.6.1, LA.1112.2.2.2, SS.912.E.1.7, SS.912.E.2.2, SS.912.E.3.6**

SECTION 2 ASSESSMENT

Essential Questions Journal — To continue to build a response to the Essential Question, go to your **Essential Questions Journal.**

Guiding Question

1. Use your completed concept web to answer this question: How does opportunity cost affect decision making?
2. **Extension** Identify the opportunity cost of the most recent consumer purchase you made. Explain what you gave up and why you chose to purchase the item you did.

Key Terms and Main Ideas

3. Why do all economic decisions involve **trade-offs?**
4. How does the phrase **"guns or butter"** express the principle of trade-offs?
5. Why do many economic decisions involve **thinking at the margin?**
6. Why is it important to compare **marginal costs** to **marginal benefits?**

Critical Thinking

7. **Give Examples** Give two examples of a decision that your school or local government might have to make. Explain how each decision involves trade-offs.
8. **Analyze** Identify a possible opportunity cost for each of the following choices: **(a)** studying for a test on a Saturday afternoon, **(b)** using all the money you received for your birthday to pay for downloading songs, **(c)** spending four hours playing a video game on a Tuesday night, **(d)** having four slices of pizza for lunch.
9. **Make Decisions** What marginal costs and benefits might a business owner have to consider when trying to decide whether to hire one, two, or three additional workers?

Math Skills

10. You have a part-time job where you work 10 hours a week and earn $6 an hour. A friend tells you about another job, at a restaurant, where the pay is only $4 an hour, but in 10 hours of work you can earn as much as $25 in tips. Calculate the probable hourly pay rate for each job. What is the opportunity cost of taking the restaurant job? Would you change jobs? Why or why not?

Visit PearsonSchool.com/PHecon for additional math help.

SECTION 3 Production Possibilities Curves

FL NGSSS

LA.1112.1.6 Use multiple strategies to develop vocabulary.

MA.912.A.2 Draw and interpret graphs of relations.

SS.912.E.1.2 Analyze production possibilities curves to explain choice.

SS.912.E.2.3 Research the contributions of key individuals of various backgrounds in the development of the U.S.

ECONOMIC DICTIONARY

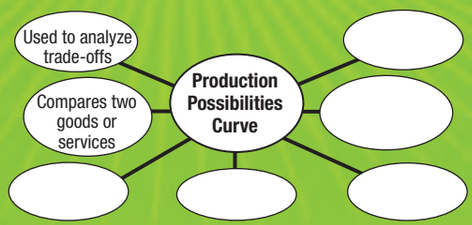
As you read the section, look for the definitions of these **Key Terms:**

- production possibilities curve
- production possibilities frontier
- efficiency
- underutilization
- law of increasing costs

Guiding Question

How does a nation decide what and how much to produce?

Copy this concept web and fill it in as you read. Add more ovals if necessary.



Economics and You Your class decides to sponsor a community breakfast as a fundraiser. Can you make more money by serving eggs or pancakes? Should you offer both? To decide, you'll have to look at the cost of ingredients, the number of workers you have, and the size of the kitchen. Also, does it take more time to scramble eggs or to flip pancakes? What you decide will affect how much money you make.

Nations face similar decisions about what to produce. For nations, however, the consequences of these decisions can be far more serious.

Principles in Action To decide what and how much to produce, economists use a tool known as a production possibilities curve. You will see how an imaginary country uses this tool to decide between producing two very different products: shoes and watermelons.

Production Possibilities

Economists often use graphs to analyze the choices and trade-offs that people make. Why? Because graphs help us see how one value relates to another value. A **production possibilities curve** is a graph that shows alternative ways to use an economy's productive resources. The axes of the graph can show categories of goods and services, such as farm goods and factory goods or capital goods and consumer goods. The axes can also display any pair of specific goods or services, such as hats on one axis and shoes on the other.

Drawing a Production Possibilities Curve

To draw a production possibilities curve, an economist begins by deciding which goods or services to examine. In this example, we will look at a fictional country called Capeland. Government economists in Capeland must decide whether to use the nation's scarce resources to manufacture shoes or to grow watermelons. The economists determine that, if Capeland used all of its resources to produce only shoes, it could produce 15 million pairs of shoes. At the other extreme, if Capeland used all of its resources to produce only watermelons, it could produce 21 million tons of watermelons.

production possibilities curve a graph that shows alternative ways to use an economy's productive resources

Figure 1.2 Production Possibilities Curve

GRAPH SKILLS

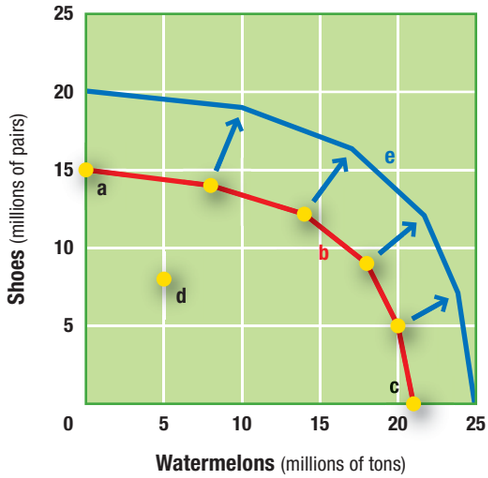
The table shows six different combinations of watermelons and shoes that Capeland could produce using all of its factor resources. These figures have been used to create a production possibilities curve.

1. How much watermelon can Capeland produce if they are making 9 million pairs of shoes? What will the opportunity cost be if Capeland increases shoe production to 12 million?
2. Why would production at point d in the graph on the right represent an underutilization of resources?

Action Graph online

For an animated version of this graph, visit PearsonSchool.com/PHecon

Watermelons (millions of tons)	Shoes (millions of pairs)
0	15
8	14
14	12
18	9
20	5
21	0



KEY

a. No watermelons, all possible shoes
b. A production possibilities frontier
c. No shoes, all possible watermelons
d. A point of underutilization
e. Future production possibilities frontier

FL **SS.912.E.1.2** Analyze production possibility curves to explain choice.

SS.912.E.1.15 Describe the risk and return profiles of various investment options.

The Capeland economists use this information to create a production possibilities curve (Figure 1.2). The vertical axis of the graph represents how many millions of pairs of shoes Capeland's factories can produce. The horizontal axis shows how many millions of tons of watermelons Capeland's farmers can grow. At Point **a,** Capeland is producing 15 million pairs of shoes but no watermelons. At Point **c,** Capeland is producing 21 million tons of watermelons but no shoes.

There is a third, more likely alternative. The citizens of Capeland can use their resources to produce *both* shoes and watermelons. The table shows four different ways that Capelanders could use their resources to produce both shoes and watermelons. Using the made-up data from the table, we can plot points on the graph. This line, is called the **production possibilities frontier,** shows combinations of the production of both shoes and watermelons. Any spot on that line represents a point at which Capeland is using all of its resources to produce a maximum combination of those two products.

production possibilities frontier a line on a production possibilities curve that shows the maximum possible output an economy can produce

Trade-Offs

Each point on the production possibilities frontier reflects a trade-off. Near the top of the curve, factories produce more shoes, but farms grow fewer watermelons. Further down the curve, farms grow more watermelons, but factories make fewer pairs of shoes.

These trade-offs are necessary because factors of production are scarce. Using land, labor, and capital to make one product means that fewer resources are left to make something else.

CHECKPOINT ***How do production possibilities curves show alternative uses of resources?***

Efficiency, Growth, and Cost

Production possibilities curves give useful information. They can show how efficient an economy is, whether an economy is growing, and the opportunity cost of producing more of one good or service.

Efficiency

A production possibilities frontier represents an economy working at its most efficient level. **Efficiency** is the use of resources in such a way as to maximize the output of goods and services. However, sometimes economies operate inefficiently. For example, suppose some workers were laid off. The farms or factories where they worked would produce fewer goods.

Any point inside the production possibilities frontier indicates **underutilization,** or the use of fewer resources than the economy is capable of using. At Point **d** in Figure 1.2, Capeland is growing 5 million tons of watermelons and making 8 million pairs of shoes. This is inefficient because it is less than the maximum possible production.

Growth

A production possibilities curve is a snapshot. It reflects current production possibilities as if a country's resources were frozen in time. In the real world, however, available resources are constantly changing. If the quantity or quality of land, labor, or capital changes, then the curve will move. For example, a wave of immigration may increase a nation's labor supply. This rise in a factor of production increases the maximum amount of goods the nation can produce.

When an economy grows, economists say that the production possibilities curve has "shifted to the right." To see such a shift, look at line e in Figure 1.2. Notice that the possible output of both shoes and watermelons has increased at each point along the line.

However, when a country's production capacity decreases, the curve shifts to the left. A decrease could occur, for example, when a country goes to war and loses part of its land as a result.

efficiency the use of resources in such a way as to maximize the output of goods and services

underutilization the use of fewer resources than an economy is capable of using

FL **SS.912.E.2.3** Research the contributions of key individuals of various backgrounds in the development of the U.S.

Innovators

Steven Levitt

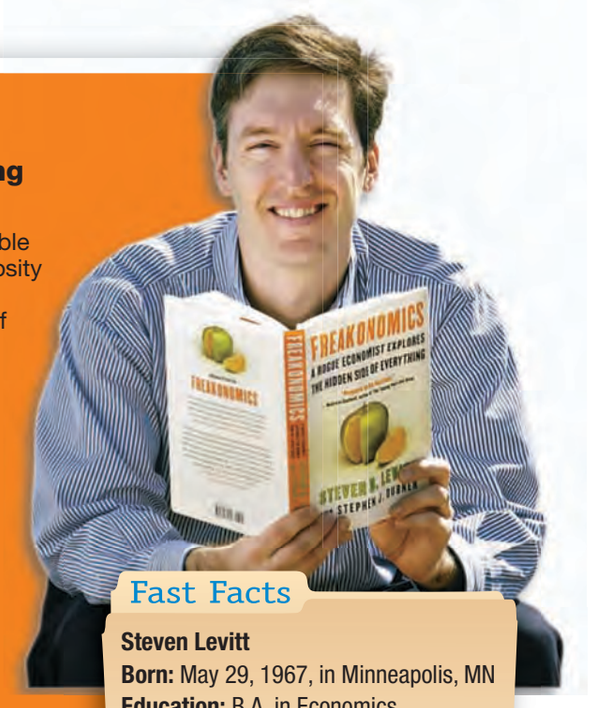
"I just wander through life looking for anything that interests me," says economist Steve Levitt. "And every once in a while I stumble onto something that turns into a research idea." This wide curiosity has led him to publish books and articles on topics from illegal drug use to sumo wrestling. Levitt is one of a new generation of economists who are using economic principles such as scarcity and trade-offs to explore all human behavior.

When he was still barely in his early forties, Levitt was already a full professor at a major university. Brilliant but unorthodox, Levitt has shown a rare ability to observe human interactions and create mathematical models that predict future outcomes. He has done ground-breaking work on important "real world" issues, including:

- Does the prison system deter criminal behavior?
- Will adding more police lower the local crime rate?
- What strategies work best to combat drunk driving?

This innovative thinker has an ambition that may seem unusual for an economist. "I'd like to put together a set of tools that lets us catch terrorists," he says. For Levitt, catching terrorists is a matter of finding the right data.

Critical Thinking: ***How can the concept of scarcity help explain a wide range of human behavior?***



Fast Facts

Steven Levitt

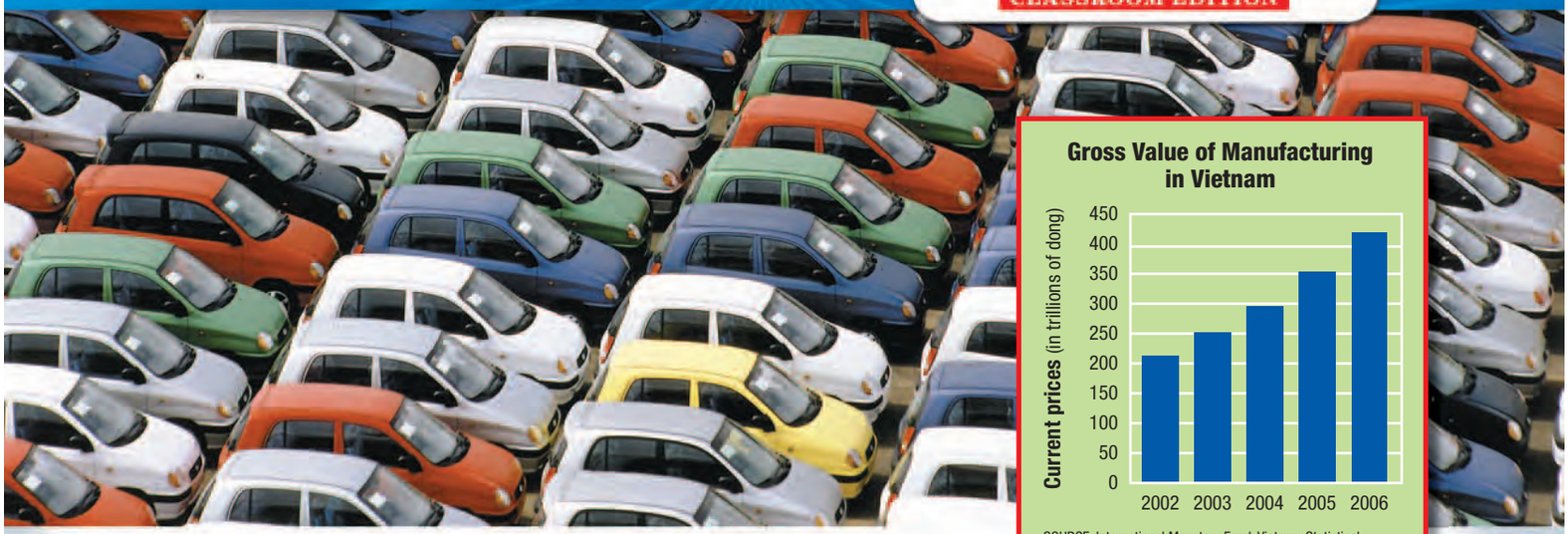
Born: May 29, 1967, in Minneapolis, MN

Education: B.A. in Economics from Harvard; Ph.D. in Economics from M.I.T.

Claim to Fame: Co-author of the best selling book *Freakonomics*

Case STUDY

THE WALL STREET JOURNAL. CLASSROOM EDITION



The Vietnam Era?

PRODUCTION POSSIBILITIES

Many low-skill manufacturing jobs have migrated overseas. Now some higher-tech work is beginning to follow them out.

By Norihiko Shirouzu
The Wall Street Journal

FL **SS.912.G.4.4** Analyze case studies of globalization.

Vietnam is barely on the map of the global auto industry, but that is about to change. Nissan Motor sees the southeast Asian nation as a key piece in a strategy to dramatically reduce the cost of developing cars and to compete in the future with rising auto manufacturers from such countries as China and India.

For years, car makers have been slashing expenses by building assembly plants in low-cost countries such as Russia, Turkey and Mexico. Now, high-skill design and engineering operations, which have long remained in industrialized countries like the U.S., Germany and Japan, are starting to follow.

Honda Motor last year announced plans to create a development center in Guangzhou, China with one of its Chinese partners. General Motors has begun designing interiors in China for Buicks it will sell in the U.S.

Nissan has been aggressive among big car makers in moving engineering operations to the developing world. In downtown Hanoi, the capital of Vietnam, Nissan has assembled a team of 700 Vietnamese engineers who are designing basic auto parts such as fuel pipes and nozzles—at a fraction of the cost of doing the work in the auto maker's main engineering center in Japan. The Vietnamese engineers, many of whom have never driven a car before, earn about $200 a month—a 10th of what their counterparts bring home in Japan, according to Nissan.

Over time, Nissan is counting on shifts like these to save hundreds of millions, if not billions, of dollars and sees them as critical to surviving in a world where the cost of cars for consumers in developing markets is falling rapidly.

"If you have an engineer in Hanoi as compared to Japan, there is a lot of savings you can make," says Carlos Ghosn, CEO of Nissan.

But the auto makers like Nissan are still taking a risk. Among the big challenges Nissan faces is a lack of experience among the new college graduates it is recruiting in Vietnam and elsewhere.

Part of what makes it possible for Nissan to allow these engineers to design more of a car are continued advances in computer-aided design tools. But an over-reliance on "virtual engineering" tools at some auto makers' established design centers instead of working with actual components has bred quality problems in recent years.

Applying Economic Principles

Companies, like countries, can increase their productive capacity by shifting factors of production. Based on the above story, what changes did Nissan make in either land, labor, or capital?

Video News Update Online Powered by *The Wall Street Journal* Classroom Edition

Use videos at **PearsonSchool.com/PHecon** as a springboard for a discussion on a current topic.

Cost

We can also use production possibilities graphs to determine the cost involved in a decision. Remember that cost does not necessarily mean money. To an economist, cost always means opportunity cost.

Looking at the table in Figure 1.2, we can see that the opportunity cost of moving from producing no watermelons to producing 8 million tons of watermelons is 1 million pairs of shoes. In other words, in order to produce 8 million tons of watermelons, Capeland had to sacrifice the opportunity to produce 1 million pairs of shoes. In the same way, if Capeland later decides to increase watermelon production from 8 million tons to 14 million tons—an increase of only 6 million tons—it costs 2 million pairs of shoes. In the first step, those 8 million tons of watermelons cost 1 million pairs of shoes. In the second step, an increase of only 6 million tons of watermelons cost an additional 2 million pairs of shoes. This amounts to 3 million pairs of shoes for 14 million tons of watermelons.

The switch from shoes to watermelons has increasing costs. Each time Capeland grows more watermelons, the sacrifice in terms of shoes increases. Eventually, it costs Capeland an additional 5 million pairs of shoes to increase watermelon production by only 1 million tons.

Economists explain these increasingly expensive trade-offs through the **law of increasing costs.** This principle states that as production shifts from making one item to another, more and more resources are necessary to increase production of the second item. Therefore, the opportunity cost increases.

Why does the cost increase? According to Figure 1.3, it is because some resources are better suited for use in farming while others are more appropriate for manufacturing. Moving resources from factory to farm production means that farmers must use resources that are not as suitable for farming. For example, when deciding to produce 8 million tons of watermelon, Capeland devoted its most fertile land to this crop. That shift used up the country's best land, so with each additional step, farmers had to use poorer land that produced less per acre than the fertile land could. To increase output on

law of increasing costs an economic principle which states that as production shifts from making one good or service to another, more and more resources are needed to increase production of the second good or service

Simulation *Activity*

Kitchen Challenge
You may be asked to take part in a role-playing game about increasing costs and efficient use of resources.

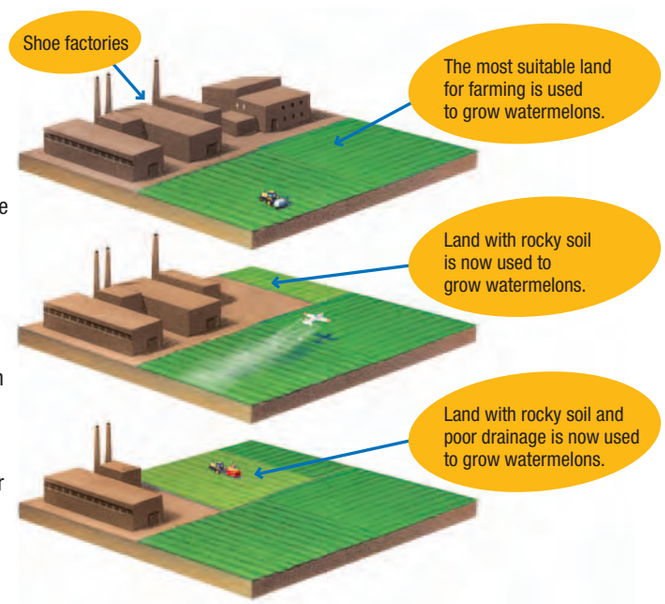
FL **LA.1112.6.3.1** Distinguish between propaganda and ethical reasoning.
SS.912.E.1.2 Analyze production possibility curves to explain choice.

Figure 1.3 Law of Increasing Costs

STEP 1
Initially, resources are used efficiently to make a balance of watermelons and shoes.

STEP 2
A decision is made to grow more watermelons. Less suitable resources are shifted to farm production. Farm production increases. Shoe production decreases.

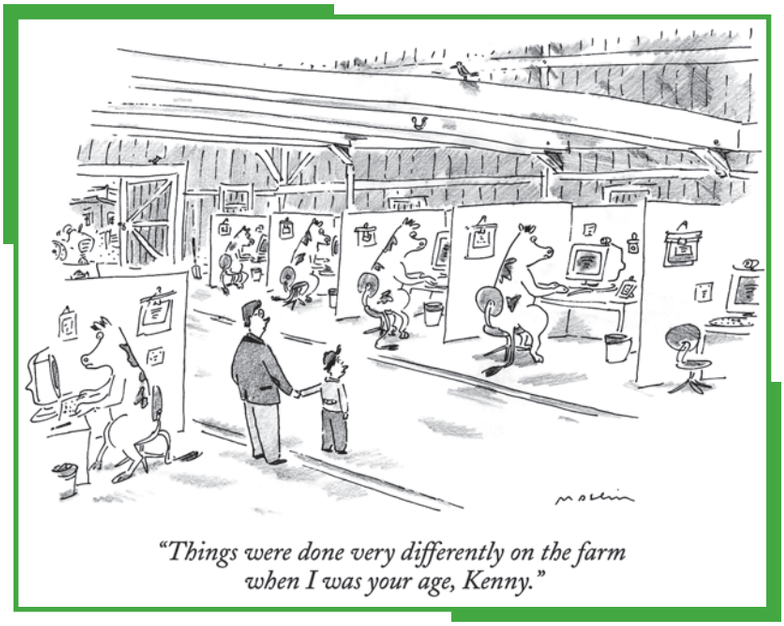
STEP 3
A decision is made to grow even more watermelons, and more resources are shifted to farm production. Because the added land is less productive, a greater amount of it must be cultivated. Farm output increases. Shoe output decreases by an even greater amount.



GRAPH SKILLS

This diagram illustrates the law of increasing costs. As production shifts from shoes to watermelons, more and more resources are needed.

1. Why would moving from Step 1 to Step 2 use up more resources than staying at Step 1?
2. Why do you think Capeland might decide to increase watermelon production in spite of the increasing costs?



"Things were done very differently on the farm when I was your age, Kenny."

▲ Technology has changed agriculture—but not quite in the way this cartoon shows. ***What is one example of technology that really could help this dairy farmer increase production?***

the poorer land, farmers had to use more land and other resources. This left even fewer resources for producing shoes.

The law of increasing costs explains why production possibilities curve. As we move along the curve, we trade off more and more for less and less added output.

CHECKPOINT ***What information can a production possibilities curve reveal?***

Technology and Education

When economists collect data to create production possibility curves, they must first determine which goods and services a country can produce with its current resources. A country's resources include its land and natural resources, its workforce, and its physical and human capital.

Both human and physical capital reflect a vital ingredient of economic growth—technology. Technology is the process used to create goods and services. At any time, countries have used different forms of technology to produce shoes or watermelons or any of the thousands of products that are made. So economists must assess each country's level of technological know-how. Do workers in Capeland pick watermelons by hand? Do they use assembly lines to make shoes?

Technology is one of the factors that can increase a nation's efficiency. Therefore, many governments spend money investing in new technology. For the same reason, they may also invest in education and training so that its people can develop and use new technologies. Highly-skilled workers can increase efficiency and lead to economic growth.

CHECKPOINT ***How does technology increase production possibilities?***

FL **LA.1112.1.6.1, LA.1112.2.2.2, MA.912.A.2, SS.912.E.1.2**

SECTION 3 ASSESSMENT

Essential Questions Journal To continue to build a response to the Essential Question, go to your **Essential Questions Journal**.

Guiding Question

1. Use your completed concept web to answer this question: How does a nation decide what and how much to produce?
2. **Extension** Explain why a country might stop growing food and shift its resources to manufacturing clothing.

Key Terms and Main Ideas

3. What is a **production possibilities curve?**
4. What do economists mean by **efficiency?**
5. What do economists mean by growth? What factors can produce economic growth?
6. What is the impact of **underutilization** of resources?

Critical Thinking

7. **Judge** Suppose you were an economic adviser to the leader of Capeland. Based on the production possibilities curve in Figure 1.2, what combination of watermelons and shoes would you recommend? Why? What other information might help you make the best decision?
8. **Compare** How is the law of increasing costs similar to the concept of decision making at the margin?
9. **Apply** Explain how each of the following circumstances is likely to affect a nation's production possibilities frontier: the opening of a new college of engineering; an earthquake in the nation's chief farming region; a new type of chemical fertilizer; a shortage of oil.

Math Skills

10. Use the information in the table below to create a production possibilities curve. Then, identify which of the following points on the graph would represent the least efficient use of resources: 3 units of capital goods to 25 units of consumer goods; 9 units of capital goods to 20 units of consumer goods; 12 units of capital goods to 2 units of consumer goods.

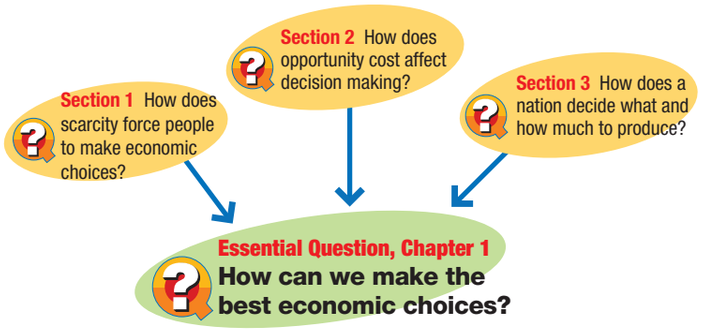
Visit PearsonSchool.com/PHecon for additional math help.

Capital Goods (units)	Consumer Goods (units)
0	25
4	24
10	21
18	16
28	9
40	0

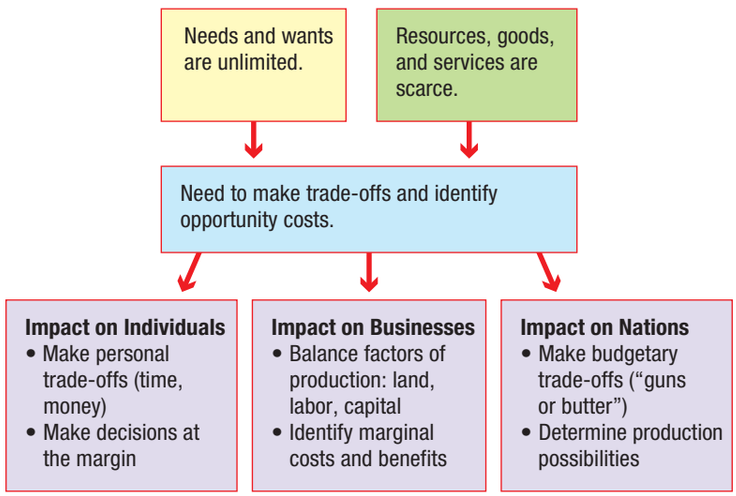
QUICK STUDY GUIDE

QUICK STUDY GUIDE

Chapter 1: What Is Economics?



Impact of Scarcity



Economic Dictionary

need, *p. 3*
want, *p. 3*
goods, *p. 3*
services, *p. 3*
scarcity, *p. 4*
economics, *p. 4*
shortage, *p. 4*
entrepreneur, *p. 5*
factors of production, *p. 5*
land, *p. 5*
labor, *p. 5*
capital, *p. 6*
physical capital, *p. 6*
human capital, *p. 6*
trade-off, *p. 8*
"guns or butter", *p. 9*
opportunity cost, *p. 9*
thinking at the margin, *p. 11*
cost/benefit analysis, *p. 11*
marginal cost, *p. 11*
marginal benefit, *p. 11*
production possibilities curve, *p. 13*
production possibilities frontier, *p. 14*
efficiency, *p. 15*
underutilization, *p. 15*
law of increasing costs, *p. 17*

CHAPTER 1 ASSESSMENT

Self-Test online To test your understanding of key terms and main ideas, visit **PearsonSchool.com/PHecon**

Key Terms and Main Ideas

To make sure you understand the key terms and main ideas of this chapter, review the Checkpoint and Section Assessment questions and look at the Quick Study Guide on the preceding page.

Critical Thinking

1. **Give Examples (a)** What are the three factors of production? **(b)** Choose a business in your community. Give two examples of each factor of production that would apply to that business.
2. **Apply (a)** What do entrepreneurs do? **(b)** Give two examples of people you consider to be successful entrepreneurs. **(c)** List three qualities you think an entrepreneur needs in order to succeed. Explain why each one would be important.
3. **Decide** Cars that weigh more tend to be safer than lightweight cars. At the same time, they use more gasoline because they are heavier. **(a)** Identify the trade-offs and opportunity cost involved in choosing either alternative. **(b)** Based on this information, which car would you choose to buy and why? **(c)** Would your answer change if the price of gasoline doubled? If you inherited a million dollars? If you had children? Explain how each factor would affect your cost/benefit analysis.

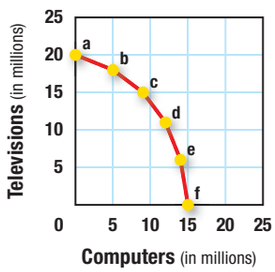
4. **Predict (a)** If a drought struck a country, what would happen to the production possibilities curve of all farmers in the country? Why? **(b)** Would the production possibilities curve of other industries be affected by this drought? Why or why not?

Applying Your Math Skills

Interpreting Data From Graphs

Imagine that you are the chief economist of a country with the following production possibilities curve. Use your math skills to answer the following questions.

Visit PearsonSchool.com/PHecon for additional math help.



5. How do the maximum amounts of each product differ?
6. Assume this economy is producing at full efficiency. How many computers are being produced when there are 18 million televisions being produced?
7. What is the opportunity cost of producing 5 million computers?
8. What is the opportunity cost of producing 9 million computers?
9. What is the opportunity cost of each 1 million computers at point a compared to point b?

FL LA.1112.6.3

Essential Question Activity

Essential Questions Journal To respond to the chapter Essential Question, go to your **Essential Questions Journal**.

10. Complete this activity to answer the Essential Question **How can we make the best economic choices?** As you have learned, scarcity and opportunity cost lie at the heart of all economic decisions—including those you make. You have limited time and limited resources. Every time you choose one alternative, you give up something else. Using the worksheet in your Essential Questions Journal or the electronic worksheet available at **PearsonSchool.com/PHecon,** keep track of how you use your resources for the next three days.
    (a) In Column 1, record at least three items on which you spent your money and three activities on which you spent your time.
    (b) In Column 2, list the opportunity cost for each entry in Column 1. Remember that the opportunity cost is the next most desirable alternative—the thing you gave up when you made your choice.

    After completing the chart, review your choices. Then, for each of the choices you made, answer the following questions: If you had it to do over again, would you make the same choice? Why or why not? Write your answers in Column 3.
11. **Modify** You have listed your choices and your trade-offs and evaluated your outcomes. Now, consider how your choices might have differed if your resources had differed. Write an answer to each of the following:
    (a) How would your choices change if you had 10 percent more money to spend?
    (b) What would you give up if you had five fewer hours of free time to use in those three days?
    (c) Pick one of the opportunity costs on your list. What conditions might have led you to make the opposite choice? Explain.

CHAPTER 1 ASSESSMENT

DOCUMENT-BASED ASSESSMENT

Should the federal government spend money on space exploration?

Since the 1950s, the federal government has spent billions of dollars on its space program. While many have applauded the achievements of astronauts and space scientists, some Americans think the money could have been better spent at home.

Document A

"The fundamental goal of this vision is to advance U.S. scientific, security, and economic interests through a robust space exploration program. In support of this goal, the United States will:

- Implement a sustained and affordable human and robotic program to explore the solar system and beyond;
- Extend human presence across the solar system, starting with a human return to the Moon before the year 2020, in preparation for human exploration of Mars and other destinations;
- Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and
- Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests."

—President George W. Bush, "A Renewed Spirit of Discovery," January 14, 2004

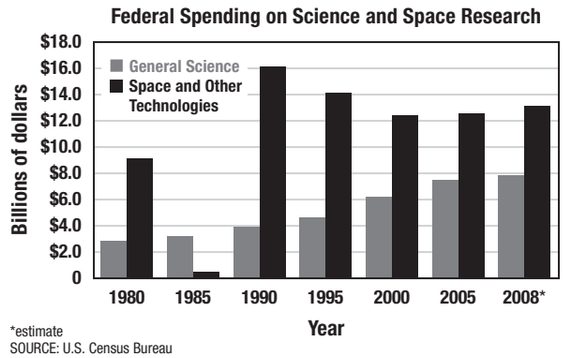
Document B

We are 50 years into the space age, and yet space travel is just as expensive as it always was. . . .

One of the primary missions of NASA should have been to drive down the cost of space travel. Instead of spending half a billion dollars on each shuttle mission, it should have diverted some of the funds to make research and development a primary focus. New materials, new fuels and innovative concepts, which would make space exploration less expensive, should have been prioritized. The space station costs upward of $100 billion, yet its critics call it a "station to nowhere." It has no clearly defined scientific purpose.

—Michio Kaku, "The Cost of Space Exploration," Forbes.com July 16, 2009

Document C



FL LA.1112.1.6.2, LA.1112.6.3, MA.912.A.2.2

ANALYZING DOCUMENTS

Use your knowledge of opportunity costs and Documents A, B, and C to answer questions 1–3.

1. **According to Document A, the primary goal of the American space program should be to**
   - **A.** land humans on the moon.
   - **B.** focus on unmanned, or robot, missions.
   - **C.** prepare for human exploration of Mars.
   - **D.** advance the interests of the United States.

2. **According to Document B, money for space exploration has been misspent because**
   - **A.** shuttle missions have been unsuccessful.
   - **B.** research has not been a primary focus.
   - **C.** the space station has many critics.
   - **D.** the space station remains in a fixed orbit.

3. **Document C shows that when spending on space and other technology has gone down, spending on general science research**
   - **A.** has gone up.
   - **B.** has gone down.
   - **C.** has stayed the same.
   - **D.** has surpassed it.

WRITING ABOUT ECONOMICS

Spending on programs like NASA's space exploration is an ongoing issue. Use the documents on this page and on the Web site below to answer the question: ***Should the federal government spend money on space exploration?*** Use the sources to support your opinion.