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at Work

TEACHER'S GUIDE

Economics at Work is a multimedia, contextual economics curriculum combining videodisc, video, print, and computer software into a comprehensive, one semester course designed around five major economic activities:

ECONOMICS® at Work

Economics at Work includes instructional modules, computer software, and a classroom utilization component.

The five instructional modules contain

- six Level I barcode-driven videodiscs
- five videocassettes (containing linear versions of the videodisc material)
- five annotated teacher's guides
- five ***Economics at Work*** student guides (sold separately)

The computer software and classroom utilization component consist of

- a set of Windows® and Macintosh® software diskettes
- one teacher training video program
- one workshop leader's handbook

TEACHER'S GUIDE

INVESTING

MODULE 5

AGENCY FOR INSTRUCTIONAL TECHNOLOGY

AGENCY FOR INSTRUCTIONAL TECHNOLOGY
P.O. Box A
Bloomington, Indiana 47402

Published 1996. First Edition 1996

ISBN: 0-7842-0803-4

03 02 01 00 99 98 97 96 5 4 3 2 1

Printed in the United States of America

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Special recognition to Robert Highsmith, Ph.D., former vice president for programs and research, National Council on Economic Education, New York, NY, and to the National Council on Economic Education for their cooperation with AIT in the development of *Economics at Work*

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Economic Literacy

We believe that every high school student in America should become economically literate and oriented to private enterprise. Students should understand and use economic ways of thinking and problem solving in order to live and work effectively as citizens in a changing world of commerce. Your use of Economics at Work *with your students will help us accomplish this important goal.*

—Robert F. Duvall
President and CEO
National Council on Economic Education

FOREWORD

ECONOMICS AT WORK: A NEW LEARNING EXPERIENCE FOR STUDENTS OF ECONOMICS

Economics is "a method rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps its possessor to draw correct conclusions."

—John Maynard Keynes

I do not have faith in the market, I have evidence in the market.

—Thomas Sowell

WELCOME to *Economics at Work*. This curriculum should serve you well as your principal tool for teaching economics. It uses the latest instructional technology to prepare students to engage in the economic way of thinking, and it enables students to relate to economics by presenting the concepts and principles of this subject in workplace settings to which they can easily relate.

The economic way of thinking employs a relatively short list of concepts to bring order and understanding to the economic activities of producing, exchanging, consuming, saving, and investing. Students of economics—economists—know how these activities fit together.

These concepts allow us to make sense of economic activities, both as observers and as participants. They also allow us to appreciate the interdependence of economic activity—even if we never fully comprehend it. As a result, we are better prepared to understand that the economic policies we pursue, in an effort to manage pressing social problems, have consequences that are often far different from what we initially predict.

Because these concepts facilitate the understanding of economic activity and policy, it is appropriate to study them within the contexts in which they occur. This is precisely what *Economics at Work* does. Just as the need to know and understand basic economic concepts takes place in the context of the real world, so also students will learn and demonstrate their understanding of the concepts in a context to which they can relate and respond. For example, in the lesson "TicketMax," where students need to learn and understand transaction costs, they develop their understanding of such costs in the context of an actual market for concert and sports tickets.

Students' progress can be measured in many ways in *Economics at Work*. Besides the traditional questions and problems that appear in the printed guides, video-based assessment allows students to answer content questions by drawing on cues and prompts embedded in the video programs. While students should find the video interesting and enjoyable, these programs are far from mere entertainment. They are rigorous in the economics they dramatize, teach, and evaluate.

Videodisc technology not only provides support for the teacher in the form of an "assessment track," but it also provides a "teacher advisement track" that offers suggestions on how to present the material in the lessons as effectively as possible. Teachers may access the advisement component by swiping barcodes, which trigger content and pedagogy instruction that plays over the video students will see. This provides another dimension to the effective use of *Economics at Work*.

As you will see, *Economics at Work* is a complete instructional package, with many aids for teachers and students. But it is your human capital as an educator that is the critical input needed to generate the desired student outputs. I am sure you will find these materials an exciting and rewarding way to teach the concepts and principles of economics.

—DeVon L. Yoho, Ph.D.
Director, EconomicsAmerica

INTRODUCTION

ECONOMICS AT WORK

OVERVIEW AND RATIONALE

BEFORE long your students—the workers and employers of tomorrow—will be making decisions that are vital to the economic health of the nation. To decide wisely, they must have a sound foundation in the principles and concepts of economics, especially those affecting the free market and the workplace. *Economics at Work* is a new kind of resource—multimedia, interactive, and context-based—that will help you provide this essential foundation in economics.

Background

Since the publication of *A Nation at Risk* in 1983, several clear pointers have emerged to guide America's schools in preparing students for the 21st century. Two reports by the Secretary's Commission on Achieving Necessary Skills (SCANS) published in 1991 and 1992, combined with the school-to-work movement, have fueled the development of applied-academics curricula in science, mathematics, and English/communications. In spite of the growing recognition of the value of such curricula, however, no substantial applied-academics resources exist in social studies or business education.

This lack is especially surprising in the field of economics, which is naturally suited to an approach that applies concepts and principles to the problems and decisions of the workplace. As governments at all levels grapple increasingly with economic problems, students who will soon be workers need to be able to understand and discuss these complex issues. The "workplace know-how" advocated in the SCANS reports includes an understanding of economic forces that affect the workplace. Without this practical knowledge, employers and workers at all levels are likely to make poor workplace decisions based on faulty understanding of the principles of economics. As a result, their companies, their jobs, and ultimately their nation's prosperity may fall victim to economic ignorance.

Economics at Work

Exploiting the latest instructional technologies and methods, the Agency for Instructional Technology and the National Council on Economic Education have joined forces to develop a one-semester course that will help all secondary students apply economics to real-life experiences. The 27 lessons (20 of them centered around interactive video), the computer software, and the printed guides for students and teachers will provide your classes with a contextual foundation for the economics that you have been teaching. The materials are designed to support the five competencies and the foundation of skills laid out in the two SCANS reports. The software contains realistic problems involving economics in each of seven different career clusters.

The content of the lessons has been drawn from *A Framework for Teaching the Basic Concepts, with Scope and Sequence Guidelines* (1995), the National Council's Master Curriculum Guide in Economics. *Economics at Work* sets the principles and concepts of economics in an everyday or workplace context and challenges students to draw on a range of information, knowledge, and skills to solve problems, often in cooperation with one another. The curriculum offers you the materials and activities you need to meet the guidelines of these reports as well as the call for a school-to-work curriculum.

Education for Employment

The 1991 SCANS report, *What Work Requires of Schools*, spelled out the five "competencies" that workers need for success on the job. These competencies are listed below, together with a description of how *Economics at Work* addresses each of them. Effective workers can productively use:

- **Resources: allocating time, money, materials, space, staff**—The study of economics is the primary discipline for teaching students how to interpret, analyze, and solve problems involving the

management of time, money, human resources, and materials and facilities.

- **Interpersonal Skills: working on teams, teaching others, serving customers, and leading, negotiating, and working well with people from culturally diverse backgrounds**— Every module concludes with a substantive cooperative learning activity in which students are grouped according to their specific vocational interests and goals. Many of the activities suggested in the print also lend themselves to group work. In addition, many of the documentary and dramatic sequences highlight teams and groups working together to solve problems.
- **Information: acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information**— To solve the problems presented in the video segments and in their guides, students will need to evaluate, organize, interpret, and communicate data from a variety of sources. In the cooperative learning activities, they will also use computers to process information.
- **Systems: understanding social, organizational, and technological systems; monitoring and correcting performance; and designing or improving systems**— By studying the basic concepts in economics—producing, exchanging, consuming, saving, and investing—through examples from realistic business contexts, students will be introduced to the complexities of economic relationships in a market economy.
- **Technology: selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies**— *Economics at Work* is a multimedia curriculum, providing opportunities for students to work with and integrate material from print, video, and software sources. The documentary segments of both the video and print also present contemporary accounts of the effect of developing technologies on various businesses.

Economics at Work also addresses the three "foundation skills" cited in the SCANS report:

- **Basic skills**— reading, writing, arithmetic and mathematics, speaking, and listening
- **Thinking skills**— thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing how to learn, and reasoning
- **Personal qualities**— individual responsibility, self-esteem, sociability, self-management, and integrity

All lessons, both in their interactive video-based components and in the activities presented in the guides, require students to discuss, debate, and defend their decisions. They must also work with others to solve problems and to communicate their results, both orally and in writing.

In the second SCANS report, *Learning a Living: A Blueprint for High Performance* (1992), the commission addressed the changes and reforms that schools must make to implement the SCANS competencies and skills and to "bring all students to a level that, in the past, only a small minority reached." *Economics at Work* emphasizes contextual learning. The curriculum links abstract concepts with "real world" examples, and the challenging assessment suggestions require students to solve actual workplace problems. Field activities bring the community into the classroom and take students into the community, further supporting the recommendations of the report.

School to Work

School-to-work and applied-academics initiatives have flowered in response to the SCANS and other recent reports that have voiced concerns about students' lack of preparation for the workplace. Studies have found that the traditional classroom does not encourage the development of skills that students need to succeed in the workplace. Instruction has commonly been teacher-centered, with the instructor leading the group in practicing textbook problems and solutions. Drills, homework exercises, and tests measure students' achievement in recall and mental manipulation rather than in application or understanding.

Unfortunately, many students, especially those who learn abstract concepts in concrete ways, do not understand the relevance of such mental exercises to the real world. In *Economics at Work*, concepts are introduced not in a traditional linear sequence but rather in a context to which students can more easily relate; the context itself partly determines the concepts that are taught at that point in the lesson.

School-to-work transition programs help learners make the connection between school and employment. They seek to bridge the gap between what schools teach and what the workplace requires. This approach is based on a core of challenging courses in which traditional academic skills are taught by showing how those skills are used in a workplace setting. School-to-work programs prepare learners either for direct entry into the work force as technically skilled employees or for further education leading to advanced certification or academic degrees. School-to-work programs emphasize four key components:

- **Motivation**—Young people must be encouraged to stay in school and graduate.
- **Enablement**—Educators must enable learners to reach high academic achievement.
- **Linkage**—Classroom curricula must link school and work so that learners understand the importance of learning the skills they will need in the workplace.
- **Employment**—Education must lead to initial and continued employment.

In a general way, the entire *Economics at Work* curriculum, with its emphasis on contextual examples and actual workplace problems, supports these guidelines. More specifically, at the end of every module, an application lesson that is presented on computer software permits students to collaborate in applying economics concepts and reasoning strategies to problems set in their particular area of career interest.

This curriculum provides a choice of seven general career clusters. These clusters are categorized in ways that are aligned with—though not necessarily identical to—the career classification systems of most states. The seven areas are:

- agriculture/natural resources
- mechanics and transportation
- business and computer technologies
- health and human services
- engineering technologies
- construction and design
- communication technologies

Instructional Philosophy and Approach

Contextual Learning

The lessons in *Economics at Work* use videodisc technology to present economic issues in the context of actual workplace settings and documentary case studies. For every illustration, students are required to learn, elucidate, and apply basic concepts and principles, often by answering questions that ask them to consider the causes and the consequences of certain events. Interactive lessons within modules present economic problems arising from the challenges that workers face in real-life situations—for example, foreign exchange, transaction costs, and efficiency considerations at a Corvette plant, where many foreign-produced parts are used to manufacture a "domestic" car. Studies have shown that this approach, which asks students to solve actual workplace problems, has proven highly effective for learning outcomes.[1]

Authentic Instruction

Lesson design and student activities are driven by the five standards of authentic instruction described by Newman and Wehlage of the Center on Organization and Restructuring of Schools.[2] These standards are integrated into *Economics at Work* in the following ways.

- **Higher-order thinking**—The course requires students to manipulate economic information and concepts; generalize about events and their effects; speculate and hypothesize about causes and consequences; analyze, interpret, and explain complex workplace situations; and draw conclusions from observation and data.
- **Depth of knowledge**—The course is designed to permit sufficient time and background for students to analyze situations in depth, to make distinctions, to create arguments and construct explanations that support them, and to investigate and explain a variety of consequences.
- **Connectedness outside the classroom**—The illustrations connect economic principles and concepts with actual businesses, with real workers, and with the personal activities and experiences of students.
- **Substantive conversation ("talking to learn and understand the substance of a subject")**—The instructional materials are designed to include

opportunities for group interaction, sharing of experiences, and cooperative analysis and problem solving to reach a coherent and reasoned understanding and consensus.

- **Social support for achievement ("high expectations, respect, and inclusion of all students in the learning process")**—No single curriculum, by itself, can change a school's learning climate and culture; however, the teaching suggestions and inservice information on the videodiscs and in the annotated resource guides will help teachers to convey high expectations, to encourage risk taking, and to challenge students to improve. In addition, the teacher materials encourage interdisciplinary cooperation and promote staff collegiality. The student materials are user-friendly and inviting, but at the same time they require learners to grapple with sophisticated concepts and real problems. The materials are also designed to encourage pair and group activities that foster cooperative learning. Students receive ample opportunities to take pride in genuine achievement.

Cooperative Learning

Reflecting the modern workplace, many activities in the lessons encourage students to work together in pairs or small groups. Extension sections contain numerous optional activities for students who share an interest in the same career cluster (see page x).

In addition, the application activities in the seven software programs, which augment each of the five modules, permit students to select a challenging problem scenario related to the general career area they have chosen. Small groups of students who choose the same career area and program work together to solve the problem posed in the software. This cooperative learning project is designed to help all members of the group learn. By collaborating to attain a shared goal, students improve their social skills at the same time they acquire knowledge.

Limited English Proficiency

Economics at Work demands rigorous thinking on the part of students. The concepts taught in the course and the activities supporting the concepts are designed to stimulate and challenge all students, including those who are academically inclined. For these reasons, students with limited comprehension of English may require extra support and attention. Nevertheless, many features of the curriculum will help them, especially the 20 video programs, which dramatize economic events and the application of economic concepts, and the glossaries contained in the print and the software. Graphics and charts in the print and in the database on the videodiscs will also support their learning and help them understand the printed materials.

Encouraging Cooperative Learning in Your Classroom

IDEALLY, cooperative learning transforms the competitive instinct into teamwork. Much depends on teacher preparation, especially the adoption of effective grouping strategies and the avoidance of potential conflicts. Student choice, ability groups, peer tutorials, and career-interest teams may provide useful bases for grouping. To ensure that authentic collaboration is occurring, it is essential to monitor the interactions, especially in the early stages of group work. Without such monitoring, cooperative learning may fail either because one or more members "free ride" on the work of others, because cliques of students undermine others' cognitive efforts by rushing assignments to conclusion ("task gang-banging"), or because high-ability students lower their output in resistance to being "used" by less able peers.

The "group retest" technique has been shown to facilitate a cooperative social atmosphere. A teacher using *Economics at Work* may use this technique by first administering the assessments, which appear at the end of each lesson, to the class as individuals. Then the class may divide into small groups, which can attempt to answer the same questions cooperatively, discussing items, using appropriate resource materials, and developing and submitting a single answer sheet for the group. This technique may be especially fruitful when group members share a similar career interest. When the whole class gathers again, groups' answers can be discussed, and the next day their results can be posted.

Well-documented research manifests that cooperative activities of this kind enhance achievement, improve social skills, and ease the adjustment to workplace environments that demand collaborative skills.

Course Content and Organization

Course Objectives

Economics at Work is designed to help students achieve five goals:

- understand and interpret relatively commonplace economic events through the study and application of everyday economic concepts
- acquire critical-thinking and decision-making skills needed for workplace and career decision making
- comprehend the economic activities (producing, exchanging, consuming, saving, and investing) of individuals, companies, labor, and government, along with the interdependence of these entities
- understand the market system in a global economy
- comprehend the impact of economic events on careers, the workplace, and lifelong learning

Curriculum Materials

The multimedia curriculum makes use of these resources:

- 11 interactive **videodisc** sides (one to four sides per module); alternatively, five noninteractive **videotapes** can be substituted if videodisc players are unavailable
- five **student resource guides** (one per module)
- five **teacher's guides** (one per module)—annotated versions of the student guides, containing barcodes for accessing the videodisc segments
- **computer software** containing application activities (35 activities, one for each of seven career clusters); these activities are designed to follow each of the five modules
- a special **teacher advisement track** on the videodiscs (but not on the videotapes), offering content enhancement and instructional suggestions
- an **assessment track** on the videodiscs (but not on the videotapes), linked to video segments that are suitable for portfolio as well as traditional assessment procedures
- **classroom utilization component**—a teacher training videotape and a workshop leader's guide

Although the videotapes provide an option when videodisc players are not available, only the videodisc version will permit teachers and learners to take full advantage of the curriculum's interactive design and features.

The student guides provide blank spaces and empty lines for students to work out problems and to answer questions; therefore, the guides may be treated as consumable items. But directions for all written activities in the guides include the option of writing on "a separate sheet of paper," according to school policy or teacher preference. Teachers may also ask students to maintain journals in which they enter all written work. The guides lend themselves well to any of these practices.

The software programs are designed for small groups of students who share an interest in one of the seven career clusters. The 35 software programs (five simulations for each cluster) encourage students to apply the information and understanding they have gained in a module to realistic challenges in their own field of interest. Although the software may be used by individuals, it has been crafted for small teams of from two to four students.

Packaging

The videodisc(s), videotape, and printed guides for each of the five modules are packaged together. A sixth box contains the classroom utilization materials and the computer software diskettes, which contain the career application activities for use with all modules.

Portfolios

Teachers are strongly urged to have students maintain **portfolios** for collecting their work during the course. Module assignments, printouts of software activity, and tests collected in folders will allow instructors and students to track performance across all modules. A portfolio represents a convenient way for the instructor to monitor progress from one module to the next. The student may also find a portfolio advantageous when applying for a job, inasmuch as its contents can demonstrate the applicant's ability to perform key skills.

Module Topics and Treatment

The curriculum is divided into five modules, each organized around a central economic activity: producing, ex-

changing, consuming, saving, and investing. These modules are best taught in the sequence in which they are presented. Each module contains up to eight lessons spanning from 12 to 20 class periods of 50 minutes each. Taken together, the lessons in the five modules provide a comprehensive semester-long experience (75 class periods) in applied economics. The box below contains a brief description of module contents.

Contents of Modules

1. **Producing**— the activities and institutions needed to transform human and nonhuman resources into goods and services that satisfy individual and collective wants; eight lessons plus application and field activities; 20 class periods

   Concepts—resource allocation, demand, supply, costs, market price, profit, efficiency, equity, market structure, input and output prices, competition, comparative advantage, economic stability, economic growth

   Contextual illustrations—profits and loss at a General Motors plant; bicycle sales and manufacturing profits; profits, losses, technology, and competition in architecture and landscaping businesses; unemployment issues in the computer industry; foreign trade and its impact on the athletic shoe industry; labor costs and productivity in the United States and other countries; employment during recessions

2. **Exchanging**— the activities and institutions needed to deliver what is produced to consumers; four lessons plus application and field activities; 14 class periods

   Concepts—costs, transaction costs, markets, efficiency, transportation, merchandising, externalities, functions of money, foreign exchange, debtor, creditor, anticipated and unanticipated inflation, equity, economic stability

   Contextual illustrations—different means of ordering tickets to entertainment events; indirect costs of trash; use of foreign-produced components in the manufacture of cars; Consumer Price Index, inflation, credit and debt, the value of the dollar, and effect of these on a young photographer who needs to invest in new materials and equipment

3. **Consuming**— the activities and institutions needed to satisfy individual and collective wants; six lessons plus application and field activities; 17 class periods

   Concepts—competition, demand, supply, governmental regulation, efficiency, equity, market, public goods, externalities, equilibrium price, incentives, inventory, replacement and acquisition prices, comparative advantage, input prices, transportation costs, income, employment, economic stability

   Contextual illustrations—reasons for local, regional, and national price differences experienced by students traveling during spring break; effect of cost of pollution regulations on prices; price changes of gasoline and building supplies; difference between Mexico's and Korea's consumption of U.S. products; comparison of purchases of goods by unemployed and employed

4. **Saving**— the activities and institutions needed to satisfy the preference to consume more later; four lessons plus application and field activities; 13 class periods

   Concepts—market structure, supply, demand, costs, risk, efficiency, scarcity, income, choice, opportunity cost, interest rate, cost/benefit analysis, profit, equity, disposable income

   Contextual illustrations—difference in bank interest paid on savings and interest charged for 36-month new-car loan; difference between cash and credit prices of cars and stereos; effect of decreasing interest rates on investment decisions in agriculture; rising interest rates and the effect on savings accounts

5. **Investing**— the activities and institutions needed to increase resources and productivity; five lessons plus application and field activities; 11 class periods

   Concepts—productivity, demand, supply, opportunity cost, present value, discounting, interest rate, annuity, human capital, specialization, surplus, economic security, input prices, substitution, profit, efficiency, equity, economic stability, GDP, investment, economic growth

   Contextual illustrations—differences in earning powers of graduates of college, trade school, and high school, as observed at 10- and 20-year high school class reunions; effect of interest rates, present value, and future value on a decision to make a loan; robotics and automation and effect on employment in the medical field; investment in either tools or luxury goods by a young tradeswoman and effect of this kind of decision on GDP

Lesson Design

The first lesson in Module 1 introduces the five module activities (producing, exchanging, consuming, saving, and investing) and dramatizes the effect of economic events on people at work and in their personal lives. The video segments take viewers on a walk down Market Street in Anytown, U.S.A. The interactive feature permits students to see examples of any of the five economic activities they choose and to practice identifying the activities in additional settings.

This lesson also defines the concept of scarcity and explains how this concept, combined with the assumption that all individuals seek to satisfy their needs and wants with the least amount of effort, provides students of economics with a foundation for describing all economic activity and behavior.

All lessons draw their content from the National Council's *Framework*. Every lesson introduces an economic event in general terms in the printed guide ("Econ Briefing" and "Power Up"). When applicable, the guide then presents an introduction to the video segment ("Take a Closer Look"), which is punctuated with questions and problems ("Economic Puzzle Challenge") that draw in the students as active viewers and learners. (Twenty of the 27 lessons are accompanied by video.) This is followed by a "Put It Together" section in which the main themes of the lesson are connected.

Finally, the guide presents a concluding section with summary ("Net Gain"), extension ("Building on Success"), and assessment ("Quality Control") activities.

(Note: Some of the department headings in the seven nonvideo lessons have titles that differ from those of the video lessons. For example, in the print-only lessons "Case in Point" takes the place of "Economic Puzzle Challenge"; however, there is a general correspondence among the two types of lessons.)

Here is the sequence of a typical video lesson:

Introduction of an Economic Event and Related Concepts—Print

In the lesson "Nice Shoes!" the general economic event that is presented could be summarized as "The output of some firms is exported far from the place of production." The guide describes the experience of a young worker in a small town shopping at the only furniture store. This scenario leads students to consider the concept of competition. Students are asked to suggest options for the young worker to find less costly furniture.

Then examples, questions, and activities lead students to explore the economics of the production of oak (for furniture frames) and leather (for luxury upholstery) in order to discuss the concept of absolute advantage. The guide then compares two printing firms to introduce the concept of comparative advantage. Students are asked to decide whether each of the two firms should specialize in one kind of production, and, if so, which kind.

Video Presentation and Problem-Solving Challenges—Video and Print

The video in "Nice Shoes!" features the athletic shoe industry. The program is divided into several parts, which feature the design and production of shoes, a manufacturer's need to import leather for shoe production, the effect of a competitor's lower prices, and the effect of increased exports on U.S.-made shoes.

The videodisc segment pauses on screens that present discussion questions. (The videotape version must be paused manually.) All on-screen questions are also contained in the guides, where they are supported with background information. Some questions may require students to look up information or to do research. After discussion (or during the next class meeting), barcodes in the teacher's version of the guide permit the teacher to resume the videodisc segment.

These on-screen questions form part of a complex, multipart "Economic Puzzle Challenge." In every part of the challenge, students are typically asked to consider several options and to select a course of action or an appropriate response ("Decision Time"). Barcodes permit the teacher to play different portions of the videodisc in order to display the consequences of each option, in response to students' choices. Frequently additional sections in the print ("For More...") provide further information related to the challenge.

Conclusion—Print

The next three sections of the lesson appear in the guide. In "Nice Shoes!" the "Put It Together" section presents several high-interest short readings that explore currency

exchanges, the economic effect of the 1995 Kobe earthquake, and the economic impact of a popular rock group, the Beatles, in the 1960s and today. "Net Gain" offers students a chance to review key concepts and to apply them to other situations and to their own lives. "Building on Success" suggests creative extension activities, often to be completed in pairs or small groups.

Application and Field Activities

After completing the lessons in a module, teachers are encouraged to provide their students with time to complete the application activities related to the seven general career areas contained on the computer diskettes. The problems presented on the diskettes have been carefully designed for group use. All members of a group are required to enter responses to questions and problems. Furthermore, the programs retain all files on which groups work so that teacher or students can review and check them. The programs also delineate the contribution of each member of the group.

Assessment

For video lessons, "Quality Control," the final section of each lesson, contains two sets of questions for assessment purposes. The assessment opportunities are appropriate for both traditional and portfolio assessment methods.

The first set of questions, "On Your Own," appears only in the guides. Students may work on these either at home or in class, as the teacher prefers. The questions may be answered in the guides, on separate sheets of paper, or in journals. Suggested answers are contained in the annotated teacher's version of the guide.

A second part of the assessment section, "In Class," is linked to a special assessment track on the videodisc. By swiping barcodes, teachers can play questions as voice-overs to video footage that students previously viewed. Students are prompted to reflect upon and to apply previously learned material in new contexts. Then they answer the questions in class. (This assessment audiotrack is not available on the videotape version; nor is it accessible on older videodisc players.) Questions and correct answers to the questions are printed in the annotated version of the guide.

Teacher Support

Instructional Suggestions (Teacher Advisement Track)

An additional audiotrack on each of the *Economics at Work* videodiscs offers ongoing suggestions to teachers for introducing material and for managing student activities. Teachers can access these suggestions by swiping barcodes in their guides. (The teacher advisement track is not available on the videotape version of the curriculum.)

Extension Activities

In addition, the guides contain ideas for extension activities involving the community. These include suggestions for business and professional persons whom students might interview, individuals who might be invited to speak in class, "shadowing" or observation activities, research into local companies, and field trips.

Classroom Utilization Component

A videotape demonstrates actual classroom use of the *Economics at Work* curriculum. In addition, a workshop leader's handbook provides agendas and information for workshop leaders whose task is to introduce the curriculum to teachers. These materials are packaged with the software diskettes that contain the application and field activities.

Appendix—Videodisc and Print

The Appendix to every guide includes a glossary of the key terms ("Econcepts") introduced in the lessons. The glossary appears in both the student and teacher versions of the guides.

In addition, the teacher's version of the guides includes a list of resources, featuring a bibliography of books and articles for further information and background. The teacher's resource also contains a database of graphs and charts that are accessible by barcode from any videodisc; for instance, a teacher who wants to display a graph showing the relationship between price levels and output may swipe the appropriate barcode and bring up the graph on the video monitor, no matter which videodisc side is in the player.

Using Multimedia Technology

The *Economics at Work* curriculum takes full advantage of the resources of multimedia technology to stimulate student interest and to involve students in active learning. Interactive videodiscs or videotapes and computer software help deliver and support the lessons in the printed guides.

Instructors receive additional support through the special teacher advisement track, which contains suggestions for optimizing the effectiveness of the lessons. Further support is provided through an assessment track and an extensive database—which are accessible by barcodes in the guides—and through the classroom utilization component.

Interactive Videodiscs

Interactive videodiscs permit instructors to show students any part of a videodisc merely by swiping a barcode either with a wand or an automatic barcode reader. This nonlinear mode of instruction enables teachers to move swiftly from one segment of the videodisc to another for such purposes as exploring related topics or reviewing earlier material.

Instructors may also have students use barcoded material for individual work or remediation. Teachers may also access assessment material, instructional suggestions, or database items by using barcodes. (Note: The assessment and support materials, recorded on separate audiotracks, require LB2 videodisc players.)

Advantages of Videodiscs

Videodiscs offer several advantages over conventional classroom audiovisual materials, including filmstrips, slides, movies, or videotapes.

- Videodiscs are practically indestructible.
- They are easy to use.
- Access is fast and unlimited—an instructor can display any segment on the videodisc within seconds.
- Videodiscs save time, eliminating the need to rewind and fast-forward through a videotape to find a certain part.
- They allow special effects to enhance a classroom presentation. The instructor can freeze individual frames on the TV screen, step through a series of frames one at a time, or show scenes in slow motion.
- Videodiscs reduce storage space. They are compact, yet they hold a large amount of information. The *Economics at Work* videodiscs contain additional assessment questions, instructional suggestions, and an extensive database, all of which are barcoded in the guides.

Videocassettes

For instructors who do not have videodisc players available, a linear version of *Economics at Work* has been developed on videocassettes. The instructional materials on these videotapes are the same as those on the videodiscs; however, tapes do not allow instructors instant access to whatever part of the materials they wish to use. Instructors face the minor inconvenience of having to rewind or fast-forward to reach the desired part of a videotape.

To minimize this problem and to save classroom time, teachers should determine beforehand the exact locations of the segments that they wish to show in class. Each videotape contains a running clock (hour, minute, second) in the upper left-hand corner of the screen. Its purpose is to assist teachers in locating or cuing up specific parts of the tape. In addition, by using the counting display on a videocassette recorder or videocassette player, teachers can quickly move to the exact spot desired.

When viewing tapes, logical places to pause are the still frames containing discussion questions. Upon reaching these points, the teacher should press the Pause button on the tape player (not the Stop button, which may create a loud burst of static). At the end of the discussion period, the instructor may press the Play button to resume the tape.

The videocassettes do not contain the additional audiotracks with assessment and instructional suggestions; nor do they provide programmed interactivity or permit access to the database, which is barcoded in the guides. However, the videocassettes are closed-captioned for hearing-impaired individuals. (Videodisc technology does not allow this feature.)

How to Use a Videodisc Player

Setting Up

***Option A**—If the TV or Monitor Has Separate "Video-In" and "Audio-In" Ports:*

1. Connect the video-out port at the back of the videodisc player to the video-in port of the TV or monitor.
2. Connect the audio signal from the videodisc player to the TV or monitor.
3. Switch the TV to the appropriate source. (A button designated "Ext." or "Aux." will usually be found among the controls on the front of the set.)

***Option B**—If the Monitor Has Only a Single Coaxial-Cable Input:*

1. Connect the videodisc player's "RF" port (if it has one) to the coaxial "Antenna" or "Cable" port on the TV or monitor. (If the videodisc player does not have an RF port, then an RF modulator will be needed. This item can be purchased at an electronics supply store. If a modulator is needed, the videodisc player must be connected to it with the video and audio cables, and the modulator must be connected to the TV or monitor with the single coaxial cable.)
2. Under this option, the picture must be viewed on Channel 3 or Channel 4. Select the one desired on the TV or monitor and, if necessary, on the back of the videodisc player.

General Operating Instructions

1. Turn on the Power switch of the TV or monitor.
2. Turn on the Power switch of the videodisc player.
3. Press the Open/Close button—the videodisc table will extend from the player.
4. Place a videodisc on the table, with the labeled side of the videodisc to be played facing up. Use only one videodisc at a time. Take special care to align the videodisc within the guides on the table.
5. Press the Open/Close button—the table will close.
6. Some videodisc players require that a Play button be pressed to begin use.

Using the Barcode Wand

1. Press and hold down the Read button on the barcode wand.
2. Read (swipe) the barcode while constantly holding down the Read button. Hold the wand in a vertical position as if holding a pencil, and move it horizontally across the barcode in either direction. Be sure to swipe the entire barcode.
3. After the barcode has been read, an electronic "beep" will sound. (If the attempt to read the barcode was unsuccessful, change the angle at which the wand is being held, or modify swiping speed.) Next, aim the wand at the videodisc player and press the Send button.
4. If the barcode wand is hard-wired to the player, the wand automatically sends its instructions to the player after the swipe. If the barcode wand has no wire, press the Send key.

Note: Some of these instructions may not apply if you are using an automatic barcode reader.

Swiping the barcode wand is an acquired skill that takes a little practice. It's all in the wrist, and as time goes on you'll learn how easy the wand is to use. So don't be impatient. Do some "dry runs" before class. There's a learning curve for any new technology. The practice will be worth the effort.

Overall, using a videodisc player might take some practice at first, but once the technique is mastered it's as easy as pushing a button.

Caring for Videodiscs

1. When loading or removing a videodisc, hold it by the edges and try not to touch its playing surfaces.
2. Although fingerprints and other dirt on the videodisc will not actually damage the recorded signal, such soil will reduce the brightness of the light that is reflected from the signal surface. This can impair sound or picture quality. If the videodisc is dirty, clean it with a soft, damp, clean cloth before playing. *Do not clean the videodisc with record-cleaning or static-prevention sprays. Never use a cracked, scratched, or warped videodisc, for this can damage the player.*
3. After using a videodisc, always remove it from the player and replace it in its jacket. Store it vertically, away from excessive heat and humidity.

Follow any other instructions provided by the manufacturer for using the videodisc player and barcode reader.

Software

The software diskettes containing 35 application problems in seven different career clusters are designed for use with either Windows®- or Macintosh®-based operating systems. The software is self-contained and requires no other word- or data-processing program.

Computer Hardware Specifications

WINDOWS

- CPU: 386SX 16 MHz or compatible processor
- 4 MB RAM, 8 MB recommended
- Hard-drive space required, 30 MB
- Windows-compatible sound card, 8 bit DAC, 8 bit ADC
- Video display resolution of at least 640 x 480 with 256 colors
- Windows-compatible printer
- Windows 3.1 or higher; Windows for Workgroups 3.1 or higher; MS-DOS or PC-DOS 3.3 or higher

MACINTOSH

- Mac LCII or better with a minimum of 16 MHz 68020, 68030, or 68040 accelerator; or PowerMac compatible
- 13" monitor (640 x 480) or larger, 8-bit color or grayscale
- Hard-disk space, 30 MB
- At least 4 MB RAM, 2 MB available for program use
- System 6.0.7 or later

Some Compatible Laserdisc Equipment*

- Pioneer 2400, 2600, 8000 Models or later
- Sony MDP 1150, 1700 AR Models or later
- Suggested barcode readers: Pioneer Model V108-BC; Sony Model RM-B1150

*Not all-inclusive

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The Agency for Instructional Technology ("AIT") extends the following warranty to the original customer only.

Warranty Coverage

This warranty covers the media on which the AIT software/data are recorded. This limited warranty does not extend to the information contained on the media and in the accompanying book materials (the "software/data"). The media product is warranted against malfunction due to defective materials or construction.

This warranty is void if the media product is damaged by accident or unreasonable use, neglect, installation, improper service, or other causes not arising out of defects in material or construction.

Warranty Duration

The media product is warranted for a period of three months from the date of the original purchase by the customer.

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A. Any implied warranties that arise out of this sale are limited in duration to the above three-month period. AIT will not be liable for loss of use of the media or other incidental or consequential costs, expenses, or damages incurred by you, the consumer, or any other user. Furthermore, AIT will not be liable for any claim of any kind whatsoever by any other party against the user of the software/data.

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C. Any statements made concerning the utility of software/data are not to be construed as expressed or implied warranties.

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Further Disclaimers of Warranty

AIT will extend no warranty where the software is used on a machine other than that designated on the software package.

Media Replacement

Provided that you, the consumer, have satisfactorily completed and returned a copy of the License Agreement, AIT will replace, during the warranty period, any defective media at no charge. At AIT's option, the defective media must be returned, postage prepaid, along with proof of purchase date. Please contact AIT at the address shown below for return instructions before returning any defective media.

Agency for Instructional Technology
Box A
Bloomington, IN 47402-0120
800/457-4509

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Toll-Free Assistance Number

Support is available to help you with any technical or content problems you may experience with this media product. If you need assistance, call AIT toll-free at 800/457-4509.

If you identify a technical problem, please check your hardware to make sure it is working properly. If the hardware is functioning correctly, contact http://ait.net on the World Wide Web or call the above number. Please have the following information and materials on hand when calling:

- instructor's manual
- list of any error messages
- students' printouts
- description of the problem
- computer type and model
- computer's memory configuration
- version number of operating system
- name and version number of commercial software (if applicable)

You should indicate to the person in customer service whether you have a technical or content question. A specialist will call you back.

Please do not permit your students access to this number. You may also call this number if you want to order software or if you need product information.

Notes

1. Cognition and Technology Group at Vanderbilt, "Anchored Instruction and Its Relationship to Situated Cognition," *Educational Researcher* 19 (1990): 2–11.

2. F. Newman and G. Wehlage, "Standards for Authentic Instruction," *Issues in Restructuring Schools* 4 (1993): 3–6.

SIDE 11
GRAPHICAL DATABASE BARCODES

(Use "step still" function or barcodes below to advance within categories.)

Step Back

Step Forward

Elasticity

Role of Profits

Product Markets

Consumer Behavior Theory

Production Theory

Foreign Exchange Markets

Human Resource Market

Nonhuman Resource Market

Aggregate Supply & Demand

Loanable Funds Market

SIDE 11
TEACHER-TRACK BARCODES

Introduction and Activity

Barriers to School

Opportunity Cost of School

Supply & Demand and Wages (audio only)*

*Swipe any other barcode to restore video.

ECONOMICS at Work

Module 5, Lesson A

REUNION

ECON BRIEFING

LOTTERY fever is sweeping the country! The jackpot hit $45 million in Illinois! Powerball's big prize topped $100 million! Even some little Lotto payouts are more than $100,000! Quick picks, daily games, wipe 'n' wins, peel 'n' plays, scratch 'n' sniffs...so many ways to play...so many ways to win!

Wouldn't it be cool to win the lottery? If you hit a $2 million jackpot, you'd get $100,000 a year for 20 years!

Winning the lottery is pure luck, but the chances are only one in 10 million that you'll pick the right numbers and strike it rich. You might play every week for your entire life and never win a cent.

But there's another way to increase your income—one that has a greater probability of a big payoff. It's not magic, and it's not a secret. It's called **investing in human capital**, and you can start right now to increase your chances to earn more money every year for the rest of your life.

This lesson will help you understand how training and education can increase your earning power. It will examine differences in income and will analyze ways to maximize your earning potential. You will also see that investing in human capital involves opportunity costs and risks.

WHAT YOU'LL LEARN IN THIS LESSON

- Investing in human capital improves skills and enhances knowledge.
- Investing in human capital involves opportunity costs and economic risks to workers, businesses, and society.
- Training and education increase productivity.
- Higher productivity can increase the standard of living.
- The forces of supply and demand affect wages.

2 CLASS PERIODS

Materials

This lesson uses the videodisc (or videotape) program **Reunion**. To complete the activities, students may use the following items: current newspapers; colored pencils, pens, or markers; graph paper; poster board; calculators; a computer with spreadsheet software; and various resource materials, such as encyclopedias, almanacs, and the *Statistical Abstract of the United States*.

INTRODUCTION

This lesson introduces students to the principle that investment in human capital results in a more productive work force. The activities emphasize the interdependence of workers and businesses, as well as the risks and costs they face while making decisions to invest in training and education. The lesson stresses the importance of market forces in determining the equilibrium wage—students will analyze the effects of supply and demand on the price of labor. As students focus on ways to increase labor productivity, they will use decision-making skills and cost-benefit analysis.

GOALS

Students will be able to demonstrate their understanding of the importance of investing in human capital. They will be able to use the economic way of thinking to eval-

uate the benefits and opportunity costs of various decisions. By examining the decisions of others, students will be able to weigh their own options in the job market and to make choices about investing in human capital.

Objectives

Upon completing this lesson, students will be able to:

- calculate opportunity cost
- interpret supply-and-demand graphs
- analyze the risks of investing in human capital
- define an employer's motive for investing in the human capital of workers
- compare salaries in various fields of study
- explain why differences in income exist in different jobs
- describe how changes in supply and demand can affect wages
- examine the costs and benefits of career decisions
- calculate productivity per hour

Payback

> ***"Education and work are the levers to uplift a people. Work alone will not do it unless inspired by the right ideals and guided by intelligence. Education must not simply teach work—it must teach life."***
>
> **—W.E.B. Du Bois, American educator and writer**

Way back in the 19th century, getting an education meant learning the three Rs—reading, 'riting, and 'rithmetic. With those skills, after completing eight years of school, a person could be a prosperous farmer or merchant. Today success in nearly any profession still requires the three Rs, but you must also know how to use computers, be able to communicate effectively, and demonstrate that you can analyze data and make decisions. Eight years of school aren't enough anymore. You need more than an eighth-grade education if you want to get somewhere in today's competitive labor market.

Understanding what it takes to make yourself a more valuable worker will help you prepare for a profession. You'll be able to plan the kind of training and education that you need to begin your career as a computer technician, doctor's assistant, mechanical engineer, or other skilled professional. In the end, your investment in yourself will reward you with increased earnings and a higher standard of living.

Where will you be in 10 years? When Josh and David meet at their 10-year high school reunion, they learn how their investments in human capital have affected what they do—and how much they earn.

Econcepts

demand—the quantity of an input, including labor, that firms are willing and able to buy at various prices during a specific time period

human capital—the skill and knowledge of workers (labor resources)

marginal physical product—the additional output produced when one additional unit of a resource is employed

opportunity cost—the highest valued alternative that must be given up because another option is chosen

productivity—the amount of output produced per unit of input used

supply—the quantity of an input, including labor, that owners are willing and able to sell at various prices during a specific time period

POWER UP

In 1992 the average eighth-grade graduate earned $12,809 and the average high school graduate made $18,737, according to the U.S. Census Bureau. A difference of $5,928 is a good incentive to stay in school through 12th grade. And the longer you stay in school, the better the incentives get.

In that same year a person with some college education earned $20,866, while a college graduate earned $32,629. Simply having that much additional training helped the college grad earn $19,820 more per year than the person with only eight years of schooling. Based on these figures, if you worked for 40 years, you'd earn $792,800 more for continuing your education than you would if you dropped out of high school.

Finishing high school and going on for further education will make you a more productive worker. You'll be more valuable to your employer, and you'll probably earn more money.

But training and education are not free. Choosing to invest in your human capital—that is, improving your skills and knowledge—involves an opportunity cost. Check out the story on the following page.

Lesson Description

This lesson focuses on persons attending a high school reunion to demonstrate how labor productivity can be increased through investment in human capital. The five main characters, Josh, Jen, David, Sandy, and Lisa, display different levels of job satisfaction and dissatisfaction. They discuss how they might gain a sense of achievement. The video follows Josh and his wife, Jen, as they use cost-benefit analysis to make decisions about whether to invest in computer training for Josh. As they examine their options, they learn about the risks and costs of training and education.

Students encounter questions about opportunity cost, salary differences, and the supply of and demand for labor. They are encouraged to examine whether local firms support development of human capital through education and training programs. Understanding how the market determines wages and knowing how businesses seek to improve productivity and profits will help students make career decisions.

Before showing the video, you may wish to ask students to list ways that the following professionals can become more productive in their work: basketball player, secretary, auto mechanic, pilot, electrician, chef, police officer, cabinet maker. Allow students to suggest others if they prefer.

Key Terms

Prepare a poster listing the **Econcepts**, or write these key terms on the chalkboard.

PREVIEW

Ask students to read **Econ Briefing**, including **What You'll Learn in This Lesson** and **Payback** (pages 1–2). Explain that training and education can make workers more productive and that the kind of training that produced successful workers in the past may not be sufficient to ensure their success in the future. Emphasize that as jobs change, the skills required for those jobs also change; as a result, continual learning is essential. To illustrate this, you

may wish to engage students in the following activity.

Present these five statements, one at a time. Write them on the chalkboard, or project them on an overhead screen.

1. IGV C LQD.
2. KDZQM Z RJHKK.
3. TFJUJMJCB FSJVRDB.
4. AVNEORAERERCUYCAD.
5. RLAIIFSTEPYROOUDRUECATRINVIINTGYS.

Ask volunteers to tell you what the first statement says. Although some students may be able to decipher the message, most probably will not. After a few minutes, explain the secret of the code. Explain that the training they are receiving right now will make them more productive as code breakers.

Present the second message. The key to solving this message is different from the

There's No Free Lunch

When Ling was in high school, he worked as a clerk in a computer store. He learned a lot about computers from the salespeople who came to the store and from his boss, Cindy Podgorski. When Ling graduated, Cindy offered him a full-time job at a salary of $13,000 a year. Because Ling was anxious to buy a car and get his own apartment, that $13,000 sounded awfully good.

Before he accepted the offer, however, Ling decided to examine his other alternatives. Some of his friends were going to college; some had enrolled in trade school; others had enlisted in the military; and a few planned to go right into the work force. Ling wondered which would be best for him.

He decided to calculate his cost to determine whether he should work for Cindy or go to school for a year. If he went to technical school and studied computer technology, he'd face a total tuition bill of $7,000 and another $3,000 in fees, books, and transportation expenses. He'd also have to give up the $13,000 he would have earned by working for Cindy.

Uncle Sam Wants You!

DESPITE major cuts in defense spending, the Army, Navy, Marines, Air Force, and Coast Guard are always seeking to recruit young men and women. The military offers recruits many benefits, including job training and money for college.

With the Montgomery GI Bill package, for example, you can earn $14,400 for college or vocational/technical training after you leave the service. (You need to serve for at least three years and invest $100 a month during the first year.) In addition, tuition assistance programs will pay up to 75 percent of the cost of tuition for active-duty personnel who take college courses on their own time. Finally, the Army, Navy, and Marine Corps offer college funds that, when combined with the GI Bill package, can provide maximum education benefits of $30,000.

According to Harlow G. Unger, author of *But What If I Don't Want to Go to College?* the armed services "offer training and work experience in nearly 2,000 occupations, most of which are valuable in civilian life. All training is on-the-job at full pay and at government expense."

—Adapted from *The Word on Business* (St. Louis, November 1994)

The United States Navy

If Ling goes to technical school, what is his opportunity cost? Calculate your answer on the lines below or on another sheet of paper.

_____

_____

Ling wasn't sure whether his investment would pay off in the long run. Then he saw some statistics that showed computer specialists earn an average of $30,523 a year! The $13,000 that Cindy had offered him suddenly looked like small change.

Why is there such a big difference between the earnings of people with only high school diplomas and those with technical school certificates or college degrees? What forces determine wage rates?

Wages are the price of labor. The forces of supply and demand establish that price.

In recent years the demand for computer technicians has increased; this change in demand has occurred because of increased demand for computers. The number of consumers owning computers results in a need for more technicians. As the income of consumers increases, they are able to afford more sophisticated computer equipment, and they need the services of technicians to develop, repair, and service it. Consumer taste also affects the demand for computer technicians: As more consumers choose to buy computers instead of typewriters, they will look to computer experts for help.

On the other hand, the supply of computer experts continues to be low relative to demand. One of the reasons may be the cost of training. A high opportunity cost for computer training may reduce the supply of computer technicians. Some workers may choose not to become computer technicians because of the value of the next best thing they could do with their knowledge and ability. Perhaps they believe their potential earnings would be greater as graphic designers or textbook editors.

If the demand for computer experts is high relative to the supply, the result will be a high wage. If supply is high relative to demand, the wage will be low.

Ling decided that his opportunity cost would be greater if he chose not to continue his education. Even though he'd have to give up the $13,000 salary Cindy had offered, he'd be sacrificing much more—he kept thinking about the $30,523 he could earn as a computer specialist.

Is Ling's decision risk-free? Can he be sure that he will earn $30,000—or even $20,000—when he finishes technical school?

first. Explain that jobs are like these messages: They change, and the skills needed to do a good job change also. Some students may be able to solve this code. Help students to understand that the experience and learning they gained when deciphering the first code are useful in tackling one that is slightly different. Ask students to suggest how this relates to the real world of jobs. *They should respond: Learning one kind of task can make other, similar tasks easier to learn.*

Present the third message, and follow the same procedure as above. Continue to elicit ideas from students about how their investment in human capital (learning new skills and gaining new knowledge) makes them better code solvers each time. Remind them that simulations in the classroom are meant to reflect real situations and experiences. Encourage them to describe how this activity relates to training and education in the workplace. *They should respond: As jobs change, workers need to use the skills they have already acquired, but they also must develop new knowledge to deal with an evolving workplace.*

*Translations: **(1) GET A JOB**—letters in the coded message occur alphabetically two letters after those in the real message; **(2) LEARN A SKILL**—letters in the coded message occur alphabetically one letter before those in the real message; **(3) ACQUIRE ABILITIES**—letters in the coded message occur alphabetically one letter after those in the real message, and the entire message is written in reverse; **(4) ADVANCE YOUR CAREER**—read the first letter, then the 17th, then the second, then the 16th, etc.; **(5) RAISE YOUR EARNINGS [and] LIFT PRODUCTIVITY**—start with the first letter, and read every other letter for the first part of the message; then start with the second letter, and read every other letter for the second part.*

Introduce the **Econcepts** (page 3), and give contextual examples of each. Use situations that relate to students' experiences. Encourage students to refer to these terms whenever necessary during the lesson.

Ask students to read the opening four paragraphs of **Power Up** (page 3). Demonstrate the math calculations on the chalkboard or overhead display:

- $18,737 – $12,809 = $5,928
- $32,629 – $12,809 = $19,820
- $19,820 x 40 years = $792,800

Explain how earning power increases with increased levels of training and education.

Ask students what they think is meant by the title of the section **There's No Free Lunch**. Explain that every choice involves an opportunity cost and that even a free lunch means giving up time or another opportunity. Ask students to read the first three paragraphs of **There's No Free Lunch** (page 4) and to compute Ling's opportunity cost. *Answer: $7,000 + $3,000 + $13,000 = $23,000.*

Have students read as far as the group of questions dealing with the risks that Ling faces (bottom of page 5). Before students answer these questions, explain how the interaction of the supply of labor and the demand for labor determines an equilibrium price for labor, the equilibrium wage.

Demonstrate how increases in supply or demand can affect the equilibrium wage. Invite students to suggest reasons why the supply of or demand for labor might increase or decrease. *They may respond: **increase in supply**—increased population, baby boomers looking for jobs, more college grads in certain fields; **decrease in supply**—drop in population, increase in number of retirees, increase in college tuition (resulting in fewer grads to fill some jobs); **increase in demand**—more factories needing more workers, profitable firms hiring more, demand rising for output that workers produce; **decrease in demand**—factories cut costs because of governmental regulations, demand falls for output that workers produce.*

Now have students discuss the questions about Ling's decision. After the discussion period ends, have them write their answers. *They should respond along these lines: Ling's decision is not risk-free. If the*

How could market forces affect his earning potential? Discuss these questions with your classmates, and then write your conclusions below or on another sheet of paper.

Ling returned to Cindy's store to tell her that he was enrolling in technical school and would not be working for her anymore. To Ling's surprise, Cindy made him another offer. She suggested that he continue to work part-time and go to school part-time. She would even pay half the cost of his education while he went to technical school!

This was an offer he could not refuse. Cindy's proposal had reduced his opportunity cost considerably. He would earn about $6,500 a year, and $5,000 of his education expenses would be paid by Cindy. He compared his opportunity cost before Cindy's offer and after:

Before		After	
Tuition	$7,000	Tuition	$3,500
Fees	$3,000	Fees	$1,500
Lost wages	$13,000	Lost wages	$6,500
Total	$23,000	Total	$11,500

Why did Cindy offer to pay half of Ling's tuition and expenses? Why was she willing to allow him to work part-time? She would have to hire another part-time worker to fill the hours that Ling would be off. What was Cindy's motive? Discuss these questions with the other students in your class, and write the best ideas on the following lines or on your other sheet of paper.

Businesses respond to incentives. Their greatest incentive is profit. Businesses earn bigger profits when they are more productive, and they can be more productive with a skilled, educated work force. When Cindy offered to subsidize Ling's education, she was investing in his human capital. She believed that Ling's new skills and

knowledge would make him a more productive worker. As a more productive worker, he would help her company earn bigger profits.

Cindy faced an opportunity cost too. Besides paying half of Ling's school expenses, she would be losing half of his productive work. She'd also have to hire and train another worker to fill the hours when Ling would be in school. Cindy made her choice because she felt that the benefit Ling would provide to her business outweighed the cost of his education.

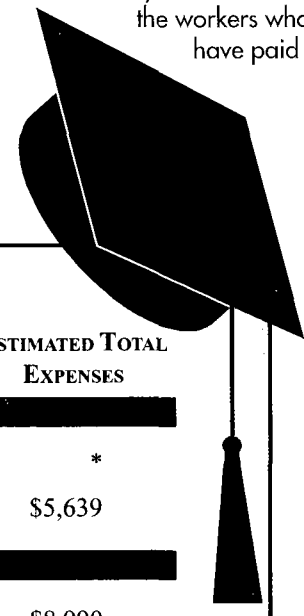
Was Cindy's decision risk-free? Could she be sure that the investment in Ling's human capital would result in bigger profits for her company? What could happen to increase Cindy's opportunity cost? Discuss these questions with your classmates, and then write your conclusions below or on another sheet of paper.

A business such as Cindy's benefits from the increased productivity of skilled workers, but it must compensate those workers with higher wages than it pays unskilled employees. When Ling finishes technical school, he'll expect to earn more than another worker without

demand for computer technicians drops relative to supply, his wage will fall. If the supply of computer technicians increases relative to demand, his wage may not reach the potential he had expected.

Have students read as far as the next set of questions (page 6), which address Cindy's reasons for subsidizing Ling's education. Again encourage whole-class discussion, and then have students write their answers. *They should respond: Cindy's motives include her expectation that Ling will continue to work for her and become a more productive worker because of his increased knowledge. She may also be hoping for bigger profits for her firm because of Ling's increased productivity. She is willing to hire another worker and incur additional expenses because she believes the benefits will outweigh the costs.*

Next, explain that investing in human capital involves risks. Workers face risks because changes in the market may affect their wages. Businesses face risks because market factors may affect the demand for the workers whom they have paid to train.



Sample Undergraduate Student Budget, 1994–95

	Tuition and Fees	Books and Supplies	Room and Board	Car	Personal Expenses	Estimated Total Expenses
2-Year Public						
Resident	$1,298	$566	*	*	*	*
Commuter	$1,298	$566	$1,746	$934	$1,095	$5,639
4-Year Public						
Resident	$2,686	$578	$3,826	$592	$1,308	$8,990
Commuter	$2,686	$578	$1,684	$892	$1,314	$7,154
4-Year Private						
Resident	$11,709	$585	$4,976	$523	$991	$18,784
Commuter	$11,709	$585	$1,809	$844	$1,123	$16,070

*Sample too small to provide meaningful information

—College Entrance Examination Board

Ask students to read as far as the final set of questions, which deal with Cindy's risks. Have students discuss the questions and respond in writing. *Appropriate response: Cindy's decision was not risk-free. Her opportunity cost would increase if Ling took a job with another company after she had invested in his training.*

Encourage students to read the last two paragraphs of this section.

his training. Why? Because Ling's training and education represent a cost to him. He expects to recover the cost through increased earning power. It's a return on his investment in human capital.

Ling's choice to go to technical school meant that he'd have to give up the opportunity to buy a car with the money he would have earned at Cindy's; he'd also be giving up a lot of leisure time, because he'd have to study to pass his courses. But Ling decided the trade-off would be worth it in the long run—he'd earn more money the rest of his life.

VIDEO CORE

Ask students to read the two paragraphs that introduce **Take a Closer Look**. The first video segment introduces students to the idea that job satisfaction and wages often depend upon training and education. Investment in human capital—increasing the skill and knowledge necessary to do a job well—can pay off in a higher salary and a greater sense of accomplishment in the workplace.

TAKE A CLOSER LOOK

WHEN people look back at decisions they have made, some people are satisfied and some are not. Maybe they should have stayed in school...maybe their careers haven't worked out as well as they had hoped...maybe it's time for a change.

A high school reunion forces old friends to examine their choices—especially if they discuss the successes and failures of former classmates. But a reunion is also a time to recognize that it's never too late to make new choices and to realize new benefits.

Why Some Occupations Receive Higher Wages

BECOMING a doctor requires a greater commitment of time and money than becoming a salesclerk. Similarly, someone who studies to be a nuclear engineer has a higher opportunity cost—in postponed earnings and sacrificed leisure—than someone who wants to be a waiter. A doctor and a nuclear engineer expect to be compensated with higher earnings because of their higher costs. In many cases, those who study longer do earn more. The following table shows representative salaries offered to graduates in various fields of study.

FIELD OF STUDY	1990	1992	1994
Accounting	$26,496	$27,179	$28,372
Business	23,318	24,305	25,102
Chemistry	28,226	27,557	28,128
Computer science	29,730	30,523	31,783
Engineering			
Civil	28,040	29,376	29,809
Chemical	35,084	39,203	39,204
Computer	31,212	32,848	33,842
Electrical	$31,817	$33,754	$34,840
Mechanical	32,166	34,462	35,051
Nuclear	30,865	34,447	33,603
Petroleum	35,448	40,679	38,28
Engin. Technology	28,905	31,051	30,509
Humanities	23,659	22,941	23,519
Marketing	23,447	23,914	24,584
Mathematics	26,686	28,434	28,221
Physics	29,530	29,019	28,117
Social sciences	22,179	21,623	23,023

—National Association of Colleges and Employers

A big income is not the only reason to choose one career over another. It's also important to enjoy your job. If you don't like your work, even a high salary won't make up for your discontent and unhappiness.

"In our economy, it's the well-trained and educated people who usually earn more money—sometimes a lot more."

What You'll See on the Screen

The first segment of "Reunion" explains that training and education can increase a worker's productivity. Productive workers earn higher incomes for themselves and higher profits for their employers.

You will learn that becoming more productive means investing in human capital—but it also means taking a risk. Going to technical school or college does not guarantee higher earnings. After all, wages are determined by the interaction of supply and demand in the labor market. You will also learn that education and training involve an opportunity cost—not just dollars and cents for tuition and books, but also the leisure time and earning power that are given up.

In the Economic Puzzle Challenge sequence, you will be asked to analyze the risks and opportunity costs of some career decisions. You will need to think about economic incentives as you answer the questions on the following page.

"People who work sitting down get paid more than people who work standing up."

—Ogden Nash, American humorist

Introduction to the Video

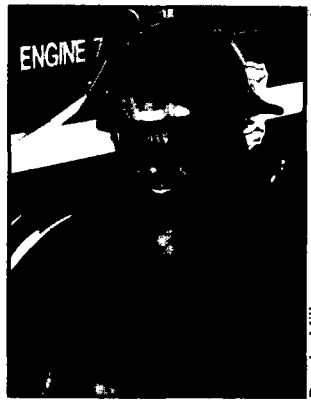
Invite students to read **What You'll See on the Screen**. Ask them to give examples of people they know who have chosen to invest in their human capital. Encourage students to list the opportunity costs these people incurred. Accept any reasonable responses. Make sure students name foregone alternatives as well as the financial costs of education and training.

Engage students in a discussion of how a high school education represents an investment in their own human capital. Ask what other ways they are expanding their learning in ways that might increase their earning power as adults. *They might suggest: after-school jobs that provide training in a field they may enter after high school; extensive reading to improve skills; hobbies that require skills that will be useful in a job; extracurricular activities that relate to career plans.* List their ideas on the chalkboard, and suggest that students refer to these ideas as they watch the video.

What Some People Earn


Douglas Miller

Laurel Hall, 40
Purchasing director
$34,000



Douglas Miller

Brian Rueger, 46
Firefighter
$38,700


Douglas Miller

Matthew Winston, 26
Public relations
$25,000


Ben Brown

Harry Smith, 27
Scaffold carpenter
$28,500

Video-based Activities

Start the videodisc (Side 11), and swipe this barcode to play:

Reunion (introductory segment)

The video will pause on a screen with the following questions (which also appear in the *Student Guide*).

How do the classmates' careers differ in levels of income and satisfaction?

Why do they differ?

Ask students to read **Talk This Over**. When they finish reading, use the chalkboard or an overhead projector to construct a table comparing the five characters' incomes and attitudes on a scale of one to four (four being the best). Invite students to suggest responses as you complete the table. *Possible responses:*

	Josh and Jen	*David*	*Sandy*	*Lisa*
Income	*1*	*2*	*3*	*4*
Satisfaction	*1*	*2*	*3*	*4*

Talk This Over

Why are some people happier than others in their jobs? What makes some careers more appealing than others? What do people look for when they make career choices?

Not everyone likes the same kind of work, but everyone wants a job that provides satisfaction and a good wage. The higher, the better! Cheerleaders, class clowns, football heroes, and even nerds want to benefit from the work they do. In the end, some seem to benefit more than others. As you watch the first part of the video, think about the five main characters and their career choices.

The video will pause on a screen with these questions:

How do the classmates' careers differ in levels of income and satisfaction?

Why do they differ?

Share your thoughts with your classmates, and then write your conclusions on the lines below or a separate sheet of paper.

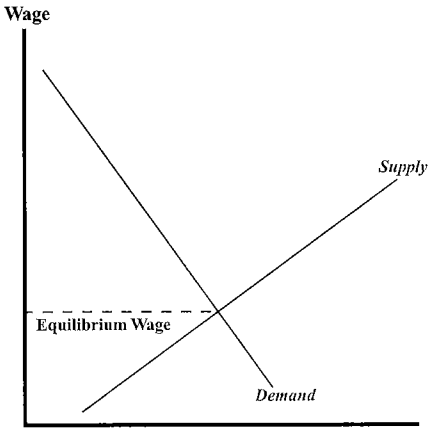
For More...

A hairdresser makes a lot less money than an advertising executive. Why? The forces of supply and demand provide an answer. Becoming an advertising executive requires a big investment of time and money for education. These high input costs restrict the supply of ad execs. When the supply is low relative to demand, the wage increases. On the other hand, the supply of hairdressers is high relative to the demand for them; therefore, the wage of the hairdresser is low.

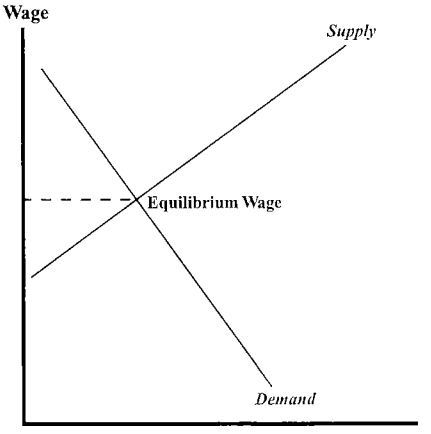
Wages are the price of labor. Supply and demand establish wages. The supply of available workers and the demand for them interact to establish an equilibrium price (wage).

Study the following graphs. Then answer the questions about them. Use the space provided or another sheet of paper for your responses.

Supply and Demand: Two Types of Jobs



Supply of hairdressers is high relative to demand: Wage is low.



Supply of ad executives is low relative to demand: Wage is high.

1. In the graph on the left, what would happen to the wage if the demand for hairdressers increased and supply remained constant? Draw the graph with the new demand curve below, and explain your answer.

Remind students that levels of job satisfaction may not always coincide with income; however, by improving their skills and knowledge in fields that interest them, workers increase their productivity and enhance their opportunities for higher income in jobs they enjoy.

Now ask students to discuss the on-screen questions and then to respond in writing. *Answers will vary, but students should suggest that the classmates' salaries differ because their careers involve different costs in time and training. They are being compensated for the cost of their preparation and/or education. Also, market factors are at work. Some, such as Sandy, hold jobs in which demand is high relative to supply, and their wages are higher. Others—Josh, for instance—hold jobs in which supply is high relative to demand, and the wage is lower.*

Further Discussion

Invite students to read **For More...** on this page. Explain that just as the characters in the video earned different levels of income, workers in various fields of study can expect different incomes. Ask students to comment on the salary offers shown in the table on page 8. Explain that part of the difference in salaries is a result of the number of years of study required for some of the jobs and that the years of study have an opportunity cost. As opportunity cost rises, supply decreases, resulting in a higher wage.

To ensure that students are interpreting the data correctly, ask some questions about it—for example, How much did the average physics graduate earn in 1992? *Answer: $29,019.*

Have students examine the salaries of the persons whose photos appear in the feature on page 10. Ask them to suggest reasons for the differences in pay. *Possible response: Length of time in school, expense of education, danger of job, and difficulty of job determine supply. As these factors increase, supply decreases.*

Next, draw graphs on the chalkboard or on an overhead projector, using the graphs on page 11 as a guide. You may also wish to swipe the next barcode to access the database dealing with the market for human resources.

Human Resource Market Database

Step Back ***Step Forward***

Demonstrate how the demand for and the supply of labor affect the equilibrium wage. Invite students to suggest reasons why the supply of hairdressers or advertising executives might change.

Have students answer the questions about the graphs, then review their answers as a class. *They should respond:*

The wage would increase. At the original wage, a shortage of labor would exist. An increase in the equilibrium wage will eliminate the shortage.

The wage would decrease. At the original wage, a surplus of labor would exist. A decrease in the equilibrium wage will eliminate the surplus.

Video-based Activities, continued

Ask students to read the paragraph that introduces the second **Talk This Over** section. Then swipe the next barcode to generate the following question (which also appears in the *Student Guide*).

How can the classmates improve their career situations?

Encourage whole-class discussion, and then have students answer the question in writing. *Suitable responses: They could go back to school, take a home-study course, change jobs, or start a business.*

2. In the graph on the right (page 11), what would happen to the wage if the demand for ad executives decreased and supply remained constant? Draw the graph with the new demand curve below, and explain your answer.

"The biggest tragedy in America is not the waste of natural resources, though this is tragic. The biggest tragedy is the waste of human resources."

—Oliver Wendell Holmes, American physician and author

Talk This Over

The number of career options that someone has depends upon the number of skills that he or she possesses. Blacksmiths who could make nothing but horseshoes became unemployed when horseless carriages took over the roads. But a blacksmith who was skilled in making cast-iron sinks and furnaces was able to find work in another field. Training and education are the keys to wider career choices.

The screen poses this question:

How can the classmates improve their career situations?

Discuss your thoughts with the other students in your class. Then write your conclusions below or on another sheet of paper.

For More...

When you are dissatisfied with a job, you have two options: Choose a different job or get better at the job you do. By returning to school and learning new skills, you can do your old job more productively. You'll become more valuable to your employer, and you might earn more money too.

Even if you choose a different job, you'll need additional training and education. The training will give you a chance to decide whether the new career is really what you want. You should also investigate the market for your new skills. Is there a demand for them? Before you invest your time and money studying how to repair sundials, you ought to know whether there are any sundials that need fixing.

Further Discussion

Have students read **For More...** on this page. Suggest that as they prepare to make decisions about careers, they investigate which jobs are growing in numbers. Choosing jobs in shrinking fields may mean difficulty in finding work; choosing jobs in growing fields may mean more openings.

"I was just thinking about the reunion. All my friends...they seem to be doing so well—especially compared to me."

Economic Puzzle Challenge, Part 1

Deciding whether to go back to school can be extremely difficult, especially when you've been out of school for a while. Even though Josh feels frustrated with his job, he's nervous about the costs involved in making such a big change.

It'd be easy for Josh to do just what he did right out of high school—decide that he can't afford any more education. But if he doesn't go back to school, he'll be giving up a lot of potential income...

Economic Puzzle Challenge, Part 1

Before swiping the barcode, ask students to read the introductory paragraph to **Economic Puzzle Challenge, Part 1**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 1

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

Should Josh make an investment in human capital and go back to school?

Encourage students, as they respond in writing, to think about the opportunity costs they've encountered in this lesson. Then swipe the barcode of the option you wish to view.

A. No, the $18,000 opportunity cost is too high for a $2/hour raise.

Analysis: Incorrect. Josh is dissatisfied with his income and with his job. If he chooses not to go back to school, he will continue to earn the same wage and will continue in the same boring position. If he decides to continue his education, he will increase his productivity in work he enjoys and may earn a higher salary as well.

B. Yes, the extra training is a wise investment.

Analysis: Correct. Josh and Jen calculated that Josh's increased earnings as a result of his added training would raise his annual income by $3,000. This represents a sizable return on the investment in his human capital.

Economic Puzzle Challenge, Part 2

Before swiping the barcode, ask students to read the introductory paragraph to **Economic Puzzle Challenge, Part 2**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 2

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

Decision Time

At the end of the first part of the Puzzle Challenge, the video presents the following question.

> Should Josh make an investment in human capital and go back to school?

Use the lines provided or a separate sheet of paper to mark your choice and explain your answer. Then watch the video to see the results of your decision.

☐ A. No, the $18,000 opportunity cost is too high for a $2/hour raise.

_____

_____

_____

☐ B. Yes, the extra training is a wise investment.

_____

_____

_____

Both supply and demand are required to determine price. In a labor market, that "price" is a wage rate.

Economic Puzzle Challenge, Part 2

Investment in human capital makes a worker more productive and more in demand in today's workplace. This increase in demand for skilled labor means higher wages. Josh figured that employers would be willing to pay more for his skills after he gained his training.

Decision Time

The video challenges you with this question:

> Why does Josh expect higher wages with more education?

Discuss the three options with your classmates, and then mark your choice. Be sure to explain your response. Use the lines provided or

a separate sheet of paper. Then watch the video to see the consequences of your decision.

☐ A. There are fewer high-skilled workers than low-skilled workers.

☐ B. Companies need workers with the skills he'd acquire.

☐ C. Both A and B are correct.

"A $3,000 net gain against an $18,000 cost—that means the yield on your educational investment is 16.7 percent!"

Why does Josh expect higher wages with more education?

Help students analyze the three possible responses. Remind them of the effects of supply and demand on equilibrium wage, and be sure they understand how market forces determine wages. Then swipe barcodes for the options you wish to view.

A. There are fewer high-skilled workers than low-skilled workers.

Analysis: Partially correct. The supply of workers is important, but demand must be considered too. If the supply of labor increases but demand remains constant, wage will decrease. But if demand increases, wage might increase or remain the same. The relative size of the change in supply and demand determines the equilibrium wage.

B. Companies need workers with the skills he'd acquire.

Analysis: Partially correct. The demand for workers is important, but supply must be considered too. If the demand for workers in a particular profession is high relative to supply, the wage will increase. But if the supply is high relative to demand, the wage will decrease.

C. Both A and B are correct.

Analysis: Yes. If the supply of labor is high relative to demand, the equilibrium wage will be low. If the demand is high relative to supply, the equilibrium wage will be high. Both supply and demand determine the equilibrium wage. (This option will play directly into a screen with discussion questions. See **Talk This Over** on page 16.)

Further Discussion

Remind students that the demand for labor is affected by the price of the product that labor produces and by the marginal physical product of labor. Ask students what would happen to the demand for labor to produce skateboards if they were to become a hot fad again.

They should respond: The demand for labor to produce skateboards would increase. If supply stays unchanged, the wage rate would increase.

The supply of labor is affected by the opportunity cost of leisure. As the wage rate increases, so does the opportunity cost of leisure; therefore, people work more. Ask students how many hours they would work per day for $5 per hour;...for $7.50;...for $10.

Students should make the point that they would work more hours as the wage rate increases because the opportunity cost of leisure is increasing.

Video-based Questions, continued

Option C of **Economic Puzzle Challenge, Part 2** played directly into a **Talk This Over** section that presents the following questions (which also appear in the *Student Guide*). You may also access these questions by swiping the next barcode.

College really did pay in the '80s. Does it pay today?

What about technical training?

Ask students to read the paragraph that introduces the **Talk This Over** section. Initiate a whole-class discussion based on what David said in the previous video segment, when he compared the supply of and the demand for labor in the '70s and '80s. *Responses will vary. Accept any that students can justify.*

For More...

Both demand and supply affect the price of labor. The demand for labor depends upon the marginal physical product and output price. If the demand for sugar (output) decreases, then the price of sugar decreases, the demand for sugar growers decreases, and the wage paid to sugar growers decreases. Their income will decrease as people buy less of what they have to sell.

In the movie business, by using computer technology to produce films, the marginal physical product of labor increases; therefore, the demand for labor increases. As demand increases, with supply unchanged, the wage increases.

The supply of labor depends upon the opportunity cost of leisure. As the opportunity cost of leisure increases, people choose less leisure and work more. As the size of the work force increases, the supply of labor increases. If the demand for labor remains unchanged, the wage decreases.

Talk This Over

During the '70s many college graduates competed for the same jobs. Employers realized that the supply of labor was high relative to the demand for workers. As a result, salaries of college graduates did not increase so rapidly as they had in previous decades. But in the '80s things changed. Businesses needed educated workers, and the rate of increase in the number of college graduates had slipped. In the '80s the supply of labor was low relative to the demand for an educated work force. Salaries once again began to climb.

The screen poses these questions:

College really did pay in the '80s. Does it pay today?

What about technical training?

Discuss these issues with your classmates.

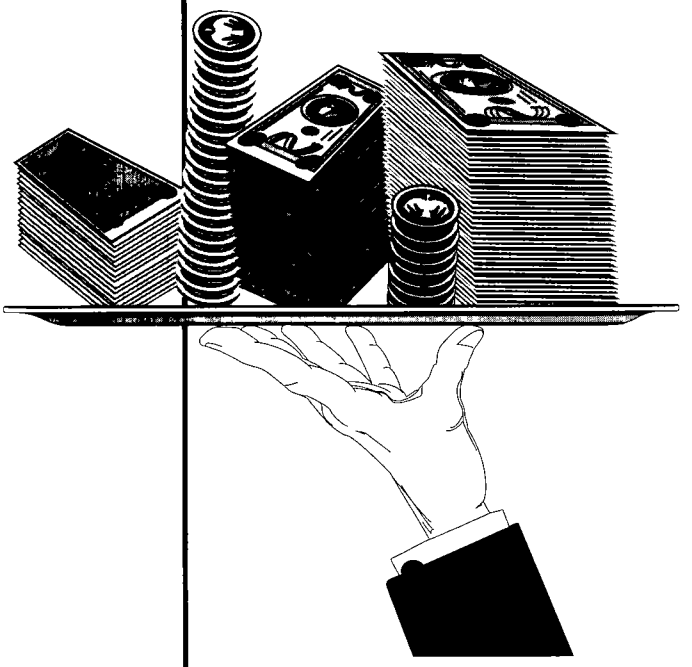
> ***"Each generation of Americans has outstripped its parents in education, in literacy, and in economic attainment. For the first time in the history of our country, the educational skills of one generation will not surpass, will not equal, will not even approach, those of their parents."***
>
> **—Paul Copperman, in National Commission on Excellence in Education, *A Nation at Risk* (1983)**

Average Weekly Income by Level of Education, 1994*

LESS THAN A HIGH SCHOOL DIPLOMA	
Less than one year of high school	$316
One to three years of high school	$357
Four years of high school, no diploma	$463
HIGH SCHOOL GRADUATE OR MORE	
High school graduate, no college	$465
Some college, no degree	$529
Associate's degree	$572
Occupational program	$557
Academic program	$590
COLLEGE GRADUATE OR MORE	
Bachelor's degree	$821
Master's degree	$994
Doctoral degree	$1,244
Professional degree	$1,430

*for persons 16 years old and over

—Bureau of Labor Statistics, U.S. Department of Labor



For More...

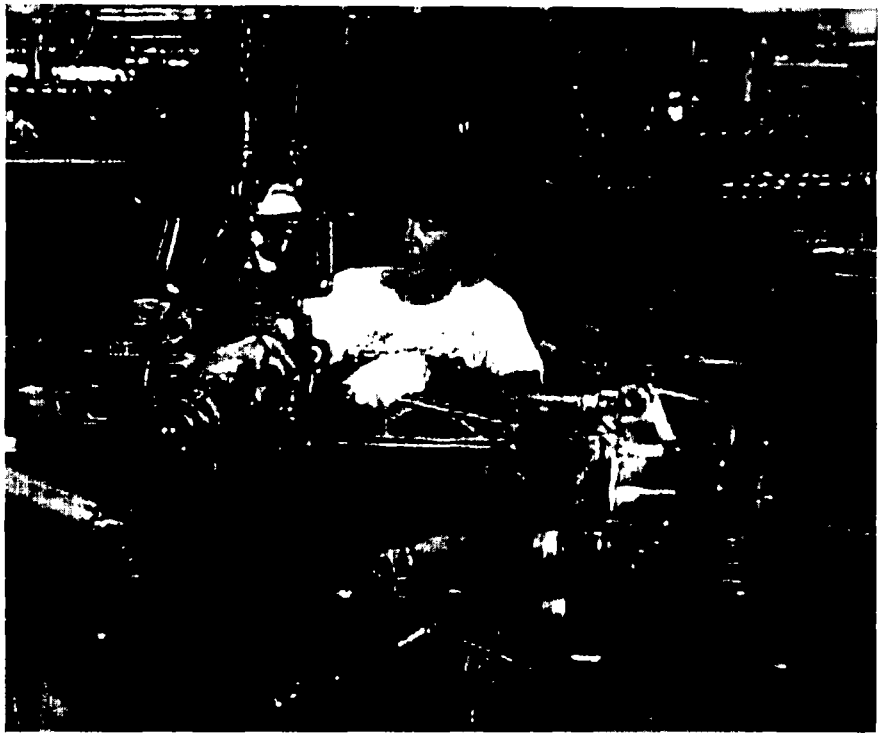
Jen calculated the yield on Josh's investment in himself at 16.7%. Here's how she arrived at that figure:

1. Josh stood to gain a $3,000 net salary increase when he finished his training.
2. The opportunity cost of his training was $18,000.
3. $3,000 is one-sixth of $18,000.
4. One-sixth expressed as a decimal is 0.167.
5. That equals 16.7%.

Jen was correct when she said that the increase in Josh's salary was better than the interest rate on a bond. If Josh invested every penny of his $12,000 income, plus the $6,000 he would spend on his training, and bought an $18,000 bond with an interest rate of 7%, he'd receive a return of $1,260 after one year. That's a lot less than the $3,000 increase in pay he could expect when he finished school.

Further Discussion

Have students read **For More...** on this page. If necessary, help them understand how Jen calculated the 16.7 percent return on Josh's investment in his human capital.



Although investments in human capital can increase a company's productivity, such investments can also have significant opportunity cost and economic risk.

ECONOMIC PUZZLE CHALLENGE, PART 3

Businesses know that productive workers mean bigger profits. When Mr. Archer offered to pay part of Josh's tuition, it was because of the benefits that Josh's skills would bring to the company.

Decision Time

As you answer the next question, think about how employee training and education can help a company become more profitable.

The screen asks:

> Why would a company pay for an employee's continuing education?

Use the lines below or another sheet of paper to mark your choice and explain your reasons. Then watch the video to see the results.

☐ A. Investment in human capital is usually profitable for the company.

_____

_____

_____

ECONOMIC PUZZLE CHALLENGE, PART 3

Before swiping the barcode, ask students to read the introductory paragraph to **Economic Puzzle Challenge, Part 3**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 3

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

Why would a company pay for an employee's continuing education?

Assist students in analyzing each of the three possible responses. Then swipe barcodes for the options you wish to view.

A. Investment in human capital is usually profitable for the company.

Analysis: Yes. As workers become more productive, their value to their employers increases. Their productivity on the job will improve their companies' products and increase profits.

☐ B. Powerful unions often require companies to provide it.

_____

_____

_____

☐ C. It is a risk-free investment for the company.

_____

_____

_____

State of the Unions

MEMBERSHIP in American trade unions grew both in total numbers and in percentage of the work force from 1935 until 1955. Since then, however, the number of union members has decreased, even though the work force has increased.

U.S. UNION MEMBERSHIP, 1930–93

Year	Labor force*	Union members**	Percentage
1930	29,424,000	3,401,000	11.6
1935	**27,053,000**	**3,584,000**	**13.2**
1940	32,376,000	8,717,000	26.9
1945	**40,394,000**	**14,322,000**	**35.5**
1950	45,222,000	14,267,000	31.5
1955	**50,675,000**	**16,802,000**	**33.2**
1960	54,234,000	17,049,000	31.4
1965	**60,815,000**	**17,299,000**	**28.4**
1970	70,920,000	19,381,000	27.3
1975	**76,945,000**	**19,611,000**	**25.5**
1980	90,564,000	19,843,000	21.9
1985	**94,521,000**	**16,996,000**	**18.0**
1990	103,905,000	16,740,000	16.1
1993	**105,067,000**	**16,598,000**	**15.8**

*Doesn't include agricultural employment; 1985, 1990, and 1993 data don't include self-employed or unemployed persons. **Data from 1930 to 1980 include number of dues-paying union members, regardless of their employment status.

—Bureau of Labor Statistics, U.S. Department of Labor

B. Powerful unions often require companies to provide it.

Analysis: Probably not. This may be true, but nonunion companies also choose to invest in human capital. In addition, the strength of unions today is not what it once was. Both numbers and percentages of union members are down.

C. It is a risk-free investment for the company.

Analysis: No. Companies face both risks and opportunity costs when they provide additional education and/or training for their workers. The costs may include tuition and fees, as well as the opportunity cost of lost output while the worker is being trained. The risks include unforeseen changes in the supply of and the demand for the worker's particular skill, as well as in how market forces will affect the equilibrium wage the employer must offer.

"I do not value the labor movement only for its ability to give higher wages, better clothes, and better homes—its ultimate goal is to be found in the progressively evolving life possibilities of those who work."

—Samuel Gompers,
***Seventy Years of Life and Labor* (1925)**

By their 20th high school reunion, the classmates' investments in themselves have really paid off. Sandy owns her own business, and Josh has been promoted by his firm.

Economic Puzzle Challenge, Part 4

During the 1990s many businesses began to "rightsize" or "restructure" their work forces. As a result, workers had to look for jobs with other firms in the same industry or to seek work in different industries. This often meant retraining, which was sometimes a difficult adjustment for workers who had not gone to school for a long time. But many workers discovered that learning is a lifelong experience and that their newly acquired skills would again make them valuable and productive.

Economic Puzzle Challenge, Part 4

Before swiping the barcode, ask students to read the introductory paragraph to **Economic Puzzle Challenge, Part 4**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 4

Video-based Questions

The video will pause on a screen with the following questions (which also appear in the *Student Guide*).

How have things changed since the 10th reunion? Why?

They all have postsecondary schooling, so why are their incomes different?

Allow time for students to discuss these questions and to respond in writing.

Talk This Over

Training and education offer an increased probability of higher income for Josh and his friends—but there are no guarantees.

The video asks these questions:

How have things changed since the 10th reunion? Why?

They all have postsecondary schooling, so why are their incomes different?

Discuss your views with your classmates, and then write your conclusions below or on another sheet of paper.

"In an information society, education is no mere amenity; it is the prime tool for growing people and profits."

—John Naisbitt and Patricia Aburdene, *Re-inventing the Corporation* (1985)

Workers' productivity increases when they acquire additional training or education. Their employers may also benefit by making greater profits. The screen poses these final questions:

> Who benefits more from Josh's additional training, he or his firm? How?

Share your ideas with your classmates, and then write an answer below or on another sheet of paper.

PUT IT TOGETHER

As workers improve their skills and knowledge, they become more productive. Because of this, you might think that by hiring more and more productive workers a firm could keep increasing its output. But that's not how it goes. In any business, the output rises by smaller and smaller margins as more workers are added. This is called the **law of diminishing marginal physical product**. Look at it this way:

> In a certain office, three secretaries can produce 27 documents per day. If a fourth secretary were hired, would 36 documents be produced? If 40 secretaries were working, would 360 documents be produced? The table below shows output in the office as new workers are added.

Number of Secretaries	Number of Documents Produced
0	0
1	8
2	17
3	27
4	36
5	42
6	48
7	53

> With no secretaries, no documents are produced, even though computers, paper, and other materials are available. With one secretary, eight documents are produced. With two secretaries, the number of documents rises to 17. This means the second secretary added nine documents to the output.

They may respond:

Sandy took business management classes and now owns two salons. David and Lisa are married and expecting a child; she has had to cut back on her work hours because of her pregnancy. Josh finished school, has received job promotions, and has benefited from increased salary.

The supply of and demand for each worker's particular skills will affect his or her wage. The costs of training may be compensated by a higher wage.

Swipe the following barcode for a final question (which also appears in the *Student Guide*):

Who benefits more from Josh's additional training, he or his firm? How?

Ask students to discuss these questions and to write down their conclusions. Review how both the company and the worker benefit from investment in human capital. *The worker improves his skills and knowledge and becomes more valuable; the company becomes more productive and earns higher profits.* Students may have different opinions about the degree of benefit to the firm or the individual. Accept any answers they can justify.

Side 11 Menu

Quit Instructions

CLOSING

The section entitled **Put It Together** introduces students to the law of diminishing marginal physical product. Help them understand the concept that additional workers do not necessarily lead to more output. If time permits, you may wish to introduce the following activity.

The Shoe Factory

Use masking tape to outline a two-foot square on the floor. This square represents the shoe factory. Explain that this factory needs workers, paper, and markers. Ask for a volunteer to stand inside the square. Give the student a stack of paper and two markers. While standing in the square, the student must use a marker to trace the outline of his or her foot on as many sheets of paper as possible within 15 seconds. Keep a record of productivity on the chalkboard.

Add another worker to the shoe factory, but do not change the amount of paper and the number of markers. Both students must keep both of their feet within the boundary of the factory. Again allow 15 seconds, and record their productivity. Then add another worker and record. Keep adding workers until the students no longer fit inside the factory.

At the end of this activity, ask if students can explain the law of diminishing marginal physical product in their own words. *Answers will vary, but students should show that they understand that adding workers to fixed inputs—i.e., plant and equipment—will result in less additional output per worker.*

Have students read **Put It Together** as far as the question. Ask them to complete the table. (Note: Your *Teacher's Guide* contains correct answers for the five lines that students must complete.)

Next, have students answer the question. If you chose to present the shoe factory activity, encourage students to refer to it in their responses. *They should respond along these lines: Additional secretaries add less and less to total product (diminishing marginal physical product) because each additional input has less and less of the fixed inputs with which to work.*

SUMMARY

Ask students to read **Net Gain**. Review the four content statements, and ask students to identify examples from their own experience.

How many documents did the third secretary add? How about the fourth? Use the lines below or another sheet of paper to complete the next table.

Secretary	Marginal Physical Product
1	8 documents
2	9 documents
3	10
4	9
5	6
6	6
7	5

- Why do you think additional secretaries add less and less to total output?

_____

_____

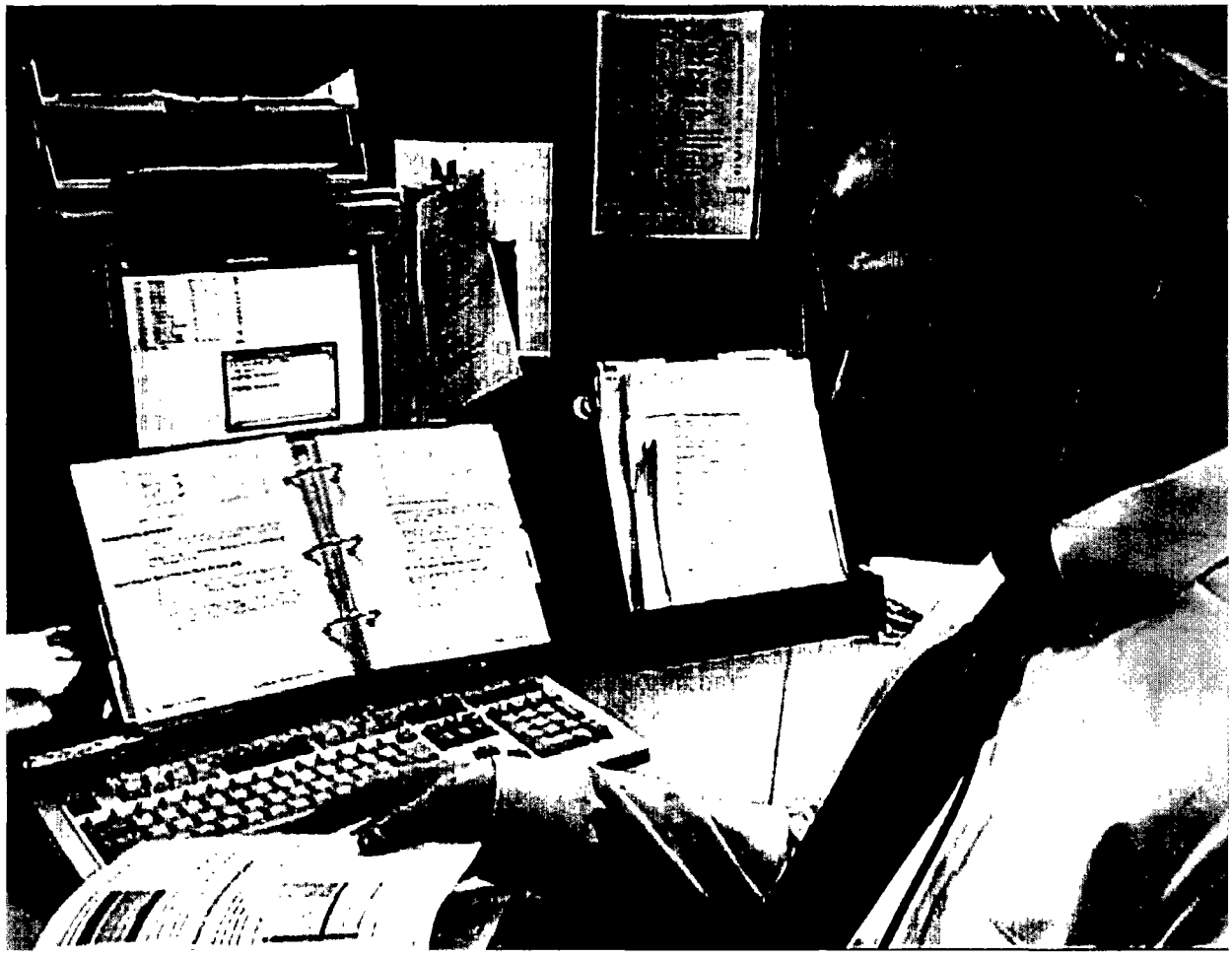
_____

NET GAIN

THIS lesson should help you make decisions about how you can increase your productivity as a student and as a worker. Recall the choices faced by Josh and his friends, and try to remember these points:

1. **Training and education increase a worker's productivity.** When Josh finished his courses in technical school, he knew more about computers and became a more skilled worker. The products you buy are better, stronger, and less expensive because of the productivity of the workers who produced them.

2. **Choosing to invest in human capital involves economic risks and opportunity costs.** Josh had no guarantee that he would earn more when he finished school. His employer had no guarantee that Josh's increased productivity would bring the company more business and higher profits. Both Josh and his employer had to give up other alternatives when they chose to invest in Josh's human capital. As a consumer, you benefit from the risks taken by workers and businesses. Those risks often result in more efficient services for you and other customers.



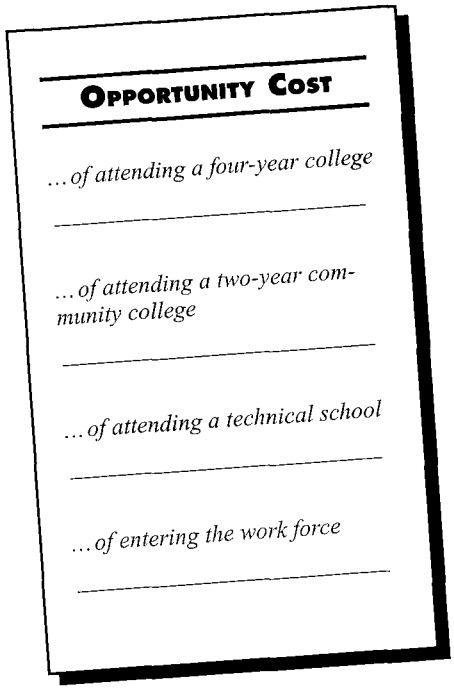
Both Josh and his employer had to give up other alternatives when they chose to invest in Josh's human capital.

3. **Increased productivity means greater output and increased profits.** Sandy's skill as an advertising executive brought new clients to her company and increased its profits. As businesses realize higher profits, they are able to develop new products and better services. You find a bigger selection of goods in stores because businesses choose to reinvest their profits.

4. **The forces of supply and demand determine the price of labor—wages.** Josh hoped that when he finished technical school he would have skills that other workers might not have. That would help him in two ways—the demand for his skills would be high, and the supply would be low relative to demand. He expected his salary to increase as a result. As workers observe that certain jobs are earning high wages, they may choose to enter those job markets. When that happens, the supply of labor will increase and the wage will decrease. That's good for you as a consumer because you won't have to pay as much for the services of those workers.

EXTENSION

Invite students to read **Building on Success** and to form teams. Allow teams to choose any two activities they wish to complete. Encourage students to be creative in the questions they ask during interviews and to do thorough research about each topic. Remind them to create neat but simple posters that contain pertinent information and that do not look cluttered. Review the characteristics of good visual aids by brainstorming with the class. Encourage students to be imaginative and to rehearse their oral presentations.



BUILDING ON SUCCESS

- INTERVIEW several workers who have been at their jobs for at least 10 years. Ask them about the training they received and how it relates to what they are doing today. Find out if they have had additional training or education during their years on the job. Compile your notes in a report about careers, and present your findings to the class.

- Survey local businesses to find out which ones invest in their employees' human capital by reimbursing some or all of the cost of attending technical school. Talk to personnel managers at companies offering tuition-reimbursement plans, and find out what percentage of each one's budget is allocated for additional education for workers. Construct graphs that display your findings, and explain the graphs to your classmates.

- Calculate your own opportunity cost for each of several options upon graduating from high school. You might consider such alternatives as attending a residential university, enrolling in a two-year community college, going to technical school, or entering the work force. Your cost might be the foregone opportunity for earning or the loss of interest on savings (if you have to use the money from your bank account). Ask your teacher to check your work, and then share it with the rest of the class by displaying it on a poster.

- Trace the history of labor unions in the United States by drawing a time line. Talk to some union members you know, and ask them to list the advantages and disadvantages of belonging to a union. Then talk to some nonunion workers, and ask them the same question. Display the time line and your findings on a chart, and share it with your classmates.

If You Think...

"If you think education is expensive, try ignorance."

—Derek Bok, American educator

"Not to know is bad; not to wish to know is worse."

—Nigerian proverb

"Education is not a problem. Education is an opportunity."

—Lyndon B. Johnson, 36th president of the United States

QUALITY CONTROL

On Your Own

Show that you have mastered the concepts in this lesson by answering the following questions. Use the space provided or another sheet of paper for your responses.

1. In 1995 Kevin Garnett, a high school senior and basketball star, decided to enter the NBA draft right out of high school. List the costs and benefits of his options.

Costs of continuing his education

_____

_____

_____

Benefits of continuing his education

_____

_____

_____

Costs of joining the NBA

_____

_____

_____

Benefits of joining the NBA

_____

_____

_____

What do you think Kevin should have chosen to do? Why?

_____

_____

_____

_____

_____

ASSESSMENT

Two types of questions are provided for you to evaluate students' comprehension and mastery of the material presented in this lesson.

On Your Own

The questions that appear in the *Student Guide* under the heading **On Your Own** are intended to be used as a homework assignment; however, you may wish to have students complete some or all of them in class.

Answers:

1. *Costs of continuing his education: tuition, fees, travel, room and board, foregone earnings*

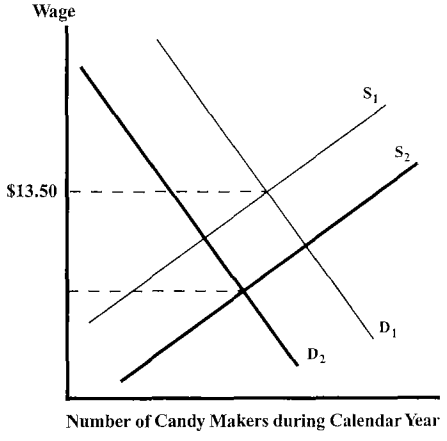
Benefits of continuing his education: learning, chance to play basketball and to excel among his peers, opportunities to meet different people

Costs of joining the NBA: foregone education, having to compete against much more mature players, possibility of sitting on the bench

Benefits of joining the NBA: possible multimillion-dollar salary, opportunity to play with pro stars, challenge of learning from the pros, possible product endorsements

Students' responses to the last question will vary.

2.



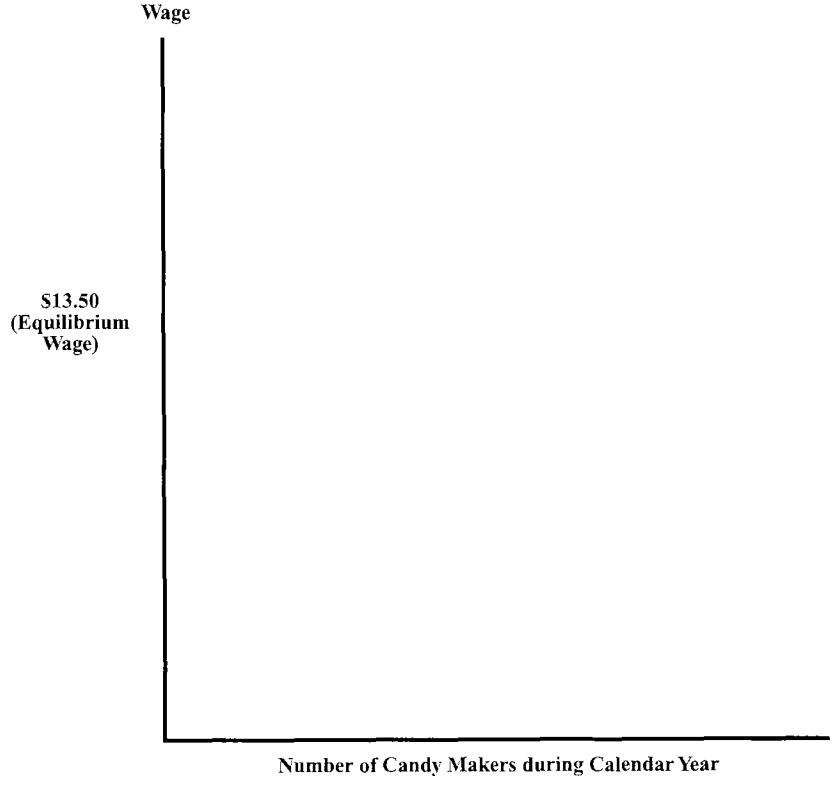
The surgeon general's report will decrease the demand, and wage will fall.

The Confectionery Institute graduates will increase the supply, and wage will fall again.

2. The equilibrium wage for candy makers is $13.50 per hour. Draw supply-and-demand curves on a graph to demonstrate the equilibrium wage. If the United States surgeon general were to launch a campaign against eating too much candy, what would happen to the demand for candy makers? Draw the new demand curve. What would happen to the equilibrium wage? (Show the equilibrium wage with a broken line.)

If, several months later, 200 new candy makers finish their training at the Confectionery Institute, what would happen to the supply of candy makers? Draw the new supply curve. What would happen to the equilibrium wage? (Again, show the equilibrium wage with a broken line.)

Workers and Jobs



3. *It will take more than four years for Emily to repay her parents. (She owes them $11,856 for two years of tuition at $5,928 a year. If her starting salary is $18,000 and she receives 10% wage increases every six months, she will be earning $38,584 after four years.) In the first year she will earn*

3. Emily finished two years at a technical institute whose tuition was $5,928 per year. Her parents had lent her the money for tuition, but they expect to be paid back. Fortunately, they are not charging interest. After graduation, Emily interviewed for a job in the printing industry. She accepted a post with a large firm at a starting salary of $18,000 per year. She was told that her work would be reviewed every six months, and if she did well, she could earn a 10% pay increase after each review. If she stays with this company, gets consistently good reviews, and pays her

parents 10% of her earnings at the end of each year, how long will it take her to repay them?

$18,900 and will pay her parents $1,890; in the second year she will earn $22,869 and will pay $2,287; third year, $27,672 and $2,767; fourth year, $33,483 and $3,348; fifth year, $40,514 and $1,564.

4. A hammer company can produce 37,032 handcrafted hammers per month. If the plant employs 220 workers and if each works an average of 168 hours per month, what is the productivity of one worker per hour? You should round your answer to the nearest tenth.

4. *The productivity is 1.0 hammer per worker per hour (37,032 hammers divided by 220 workers equals 168.327 hammers per worker per month; each worker works 168 hours per month; 168.327 hammers divided by 168 hours equals 1.0019 hammers per hour).*

After the workers receive additional training, the company records the production of 55,448 hammers in a month. What is the productivity of one worker per hour after training? Round to the nearest tenth.

After the training, productivity increased to 1.5 hammers per worker per hour (55,448 hammers divided by 220 workers equals 252.036 hammers per worker per month; each worker works 168 hours per month; 252.036 hammers divided by 168 hours equals 1.5002 hammers per hour).

What effect did the extra training have on the productivity of the workers? How might this affect the firm?

The extra training increased the productivity of the workers by 50 percent. The firm may have enjoyed higher profits because of the increased productivity, or it may have lowered prices.

Assessment-Track Questions

Besides appearing in the *Student Guide*, the questions under the heading **In Class** are contained on a special assessment track of the videodisc for this module. Using the appropriate disc side, you can access each question by swiping its barcode. Each question is presented as a voice-over to part of a video program that students previously watched. The video will provide students with valuable cues, enabling them to generalize previously learned material to new situations.

Assessment Question 1

1. *Additional education and training allow workers to be more productive. The greater the productivity of workers, the more valuable they are to the firm that hires them—or to other firms that are willing to pay for their special skills. Higher productivity usually results in higher earnings. Economists say that the investment in education and training produces human capital, making an analogy to the physical-capital investments that a business makes in buildings and equipment. Human capital is developed by formal schooling, learning, and on-the-job training.*

Assessment Question 2

2. *Spending a year in a training program may increase productivity and skills and lead to higher future income, but it also involves an opportunity cost. This includes not only tuition, books, and other expenses but also the foregone income from the job given up. Education is an investment in oneself. And though the decision to give up work income and invest in human capital may have an opportunity cost today, the cost of not acquiring additional skills can be even more costly, especially in the long run if a person is stuck in a "go nowhere" job. The worker must consider the costs and expected benefits.*

In Class

These questions should be answered while you watch a special section of the videodisc that your teacher will play for you. Write your answers on the lines provided or on a separate sheet of paper.

1. Josh wants to earn higher wages in order to provide more for his family. He is considering going back to night school. How would the additional training and education allow him to achieve his goal?

2. Why was Josh reluctant at first to invest in human capital—himself?

3. Wages are prices. What determines the level of wages paid to workers?

4. Are wages the only consideration when choosing a career? What else might you consider?

Assessment Question 3

3. Like all prices, wages are determined in markets by supply and demand. Here the relevant market is a labor market; the supply curve represents the supply of labor provided by individuals, and the demand curve represents the demand for labor by firms. If supply is relatively low and demand is relatively high, the price (wage) will be relatively high. Workers with specialized skills, training, or valuable talents (i.e., high human capital) are relatively scarce; therefore, their supply is relatively low. The high productivity of these workers also puts them in high demand by firms. This combination of a relatively low supply and high demand results in relatively high wages. The opposite (low wages) would be true for workers with relatively low skills, low human capital, and low productivity.

Assessment Question 4

4. Generally, everyone would prefer a higher salary to a lower salary. But there are job characteristics beyond salary that are important. Some jobs require a higher intensity of work, whereas others are more relaxed. Teachers have long summer vacations; most other jobs do not. Offshore oil workers are required to stay on drilling platforms for weeks at a time, but most accountants get to go home to their families every evening. Besides the salary, jobs offer different levels of fringe benefits, such as health insurance and vacation time. People often care about challenging work, pleasant work surroundings, fringe benefits, etc. Higher wages or fringe benefits are often required to compensate for otherwise unattractive work attributes.

THERE'S NO TIME LIKE THE PRESENT

ECON BRIEFING

POPEYE'S friend Wimpy likes to say, "I will gladly pay you Tuesday for a hamburger today." That's a good deal—at least for Wimpy! Would you be willing to accept payment a few days later, or a year later? Would you be willing to give Wimpy a discount if he paid for his hamburger today? Is money that you receive today the same as money that you will receive in the future? Picture yourself in the following situations.

- Your boss offers you a bonus plan with two options. Under the first option, you would receive an extra $100 every month for the next six months. Under the second option, you would receive a lump sum of $550 at the end of this month. Which would you choose?
- You want a new CD stereo system. South Central has one you like, and it has a price tag of $1,500. South Central is also offering a one-year free-financing deal. If you pay cash, however, the store will give you a $100 discount on the price. You have $1,500 in savings on which you earn 3% interest. What would you do?
- You are planning to attend ACE Technical School for three years. Recently the school sent you a letter explaining a Fixed Tuition Plan (FTP). The letter states that the current tuition of $3,000 is certain to rise every year. If you were to participate in the FTP, however, you wouldn't be affected by price increases. You'd pay $9,000 the first year and nothing after that. But you'd have to borrow the $9,000! The interest rate on your loan would be 5%. What would you do?
- You work at a dental laboratory. The lab gives a 10% discount to dentists who pay their accounts within 15 days. Why does the lab do this?

These are difficult questions. It would help to have more information, wouldn't it? Believe it or not, economics can help you make decisions about future payments and future receipts of money.

1 CLASS PERIOD

Materials

To complete the activities in this lesson, students will need writing paper or a notebook or journal. Calculators are optional.

INTRODUCTION

This lesson introduces students to the concepts of present value and future value. It is important to understand these values when making financial decisions about spending and saving that involve amounts of money to be paid or received in the future. Students also learn how the concept of discounting is important to businesses in making investment decisions.

GOALS

Students will be able to demonstrate their understanding of future and present value. They will be able to explain what these values are, how to calculate them, and why they are useful in personal and in business financial decision making.

What You'll Learn in This Lesson

- Present value is the value today of a payment to be paid or received in the future.
- Discounting is a procedure used to convert a sum of money to be received in the future into its present value. The interest rate used for this conversion is the discount rate.
- The higher the interest rate (or discount rate), the more a given sum of money is discounted and the lower its present value is.
- An annuity is a certain sum of money that is received every year for a specified number of years.

Objectives

Upon completing this lesson, students will be able to:

- define and calculate future value
- define and calculate present value
- explain how an annuity works
- explain how businesses use discounting to make investment decisions

Lesson Description

This lesson focuses on two case studies involving the time value of money. **Case in Point: Easy Street** presents the concepts of future value, present value, and discounting. Students will recognize that a dollar today is not the same thing as a dollar in the future. **Case in Point: Gamliche Heating and Cooling** investigates how businesses use the discounting procedure to calculate the present value of a revenue stream and to compare it to the cost of equipment in order to make a careful investment decision.

Payback

This lesson will help you understand why it's better to have money today rather than in the future. In other words, you will recognize that you have a **time preference** for money. This doesn't mean you prefer to have money all the time. It means you would prefer to have a certain amount of money paid today rather than paid in the future. You will also learn how a few calculations enable you to compare a payment that you are expected to receive in the future with a present value.

Why do you need to know this? Because you'll make personal decisions about paying now or paying later whenever you buy a car or

Evita and Carla worked hard to make sure that every guest served by the hotel was served well. Their rewards for such effort were bonus checks for $500. Now they need to make sure their extra income serves them well. Should they spend their bonuses now or later?

some other expensive item. And you'll probably make decisions about receiving money now, as opposed to receiving it in the future. This knowledge is valuable in your personal decision making. It is also important because businesses make decisions about future payments and future receipts. By knowing how to use these principles, you will be better prepared to make these decisions when you begin working in your chosen career.

Econcepts

annuity— a certain sum of money to be received every year for a specified number of years

discounting— the process of converting a sum of money that is to be received in the future into the value it has today

future value— the value in the future of an amount of money today

interest rate— the price paid for the use of someone else's money or the price you receive for lending your money

present value— the value today of an amount of money to be received in the future

POWER UP

IMAGINE that you have graduated from high school, completed a two-year certificate program and an apprenticeship in your field, and landed the job you've always wanted. Go a step further: Imagine that you've been working at this great job for two years and have saved up $5,000.

Finally you can afford the down payment on a sports car. In school you used to dream of owning one, and now you can't wait to buy it. After all, you're 23 years old, and you're tired of driving the wreck you bought after high school.

Here you are, on the couch, after a visit to the car dealer. Driving that sports car was unbelievable! You looked great behind the wheel—especially with those sunglasses. It was neat driving with the top down—the wind, the clouds, the new car smell....That car was just meant for you.

Your father's voice breaks into this perfect daydream. He's telling you, "Don't buy that car! Not now. Be sensible. It's not practical.

KEY TERMS

Prepare a poster listing the **Econcepts**, or write these key terms on the chalkboard.

PREVIEW

Ask students to read **Econ Briefing**, including **What You'll Learn in This Lesson** and **Payback** (pages 31–33). Discuss the central topics, and clarify any points that students do not understand. Brainstorm questions that come up. You may wish to write students' questions on the chalkboard and to display them throughout the lesson. Encourage students to keep notes as they develop ideas about the topics they raise.

Introduce the **Econcepts**, and give contextual examples of each. Encourage students to refer to them whenever necessary throughout the lesson.

Ask students to read **Power Up**. Conduct a whole-class discussion on their responses to the father's advice about buying a sports car.

Blah, blah, blah. There are more important things. Blah, blah, blah." You don't want to hear it. You put up your anti-blahblah screens, but the words keep coming. Finally you sit up to deal with him—he won't leave you alone till you do. Earnestly your father's saying:

Chris Sharp

"Listen, don't buy the car now. Keep your money in the bank and let it grow a couple more years. With the added savings and the extra interest, you'll have a lot more money in a few years. You'll be able to make a way-bigger down payment. Not only that, but in two years, your insurance costs will be lower. That extra money could be applied to the down payment. Waiting is the smart thing to do. Come on! It's only two years. You can handle it!"

How would you reply to this argument? Write a response on the following lines or on a separate sheet of paper.

_____

_____

_____

PRINT CORE

Ask students to read the introductory paragraph of **Take a Closer Look**.

TAKE A CLOSER LOOK

You must admit your dad made some valid points. What should you do, buy the sports car while you're still young enough to enjoy it, or keep saving so you can put more money down and make lower monthly payments in the future? A little economics can help you make careful decisions about problems like this. Right about now you're probably thinking, sure, but the stuff is probably so boring that I won't really want to know. Well, keep reading. This information could be very valuable—not only now, but for the rest of your life!

CONCEPT PRESENTATION

Ask students to read **Focus**. You may wish to have them brainstorm ideas about what they think the time value of money is.

FOCUS

Decisions involving the time value of money are important and challenging. Whenever you make decisions in which some of the benefits and some of the costs will come in the future, you must

consider the time value of money and must discount the value that you will receive or pay in the future. Frequently people don't know how to compare money today with money to be received or paid in the future. This is a problem for individuals when they borrow and lend. But it is also a problem for businesses that want to invest in plant or equipment, to give credit, or to use credit.

Talk This Over

Have you ever dreamed of winning millions of dollars? If you were that lucky, would you be better off taking the money all at once or receiving it in annual payments over 10 or 20 years? Use the following lines or a separate piece of paper for your response, and then share your thoughts with your classmates.

_____

_____

_____

_____

_____

Clarification and Discussion Questions

Have students read **Talk This Over**. Encourage them to share their ideas on the question in this section.

Case in Point: Easy Street

Meet Sandy Sherman. She was lucky enough to win a state lottery, and she will be receiving annual payments for the next 20 years.

Chris Sharp

Easy Street

Sandy recently won $4 million playing her state lottery. She is ecstatic! Now she can buy all those things she could only dream of owning before she struck it rich. But when Sandy was in school, she took a course in economics, and she knows that she could have been even better off than she is. How?

What does Sandy Sherman know, and how could it help you? She knows that the value of money changes over time. If Sandy received the $4 million today and invested it at today's interest rate (for the sake of simplicity, assume the rate is 10%), how much would she have in the future?

To work out the answer to this question, start on a smaller scale. Suppose Sandy put $200 in her savings account today. If the bank paid a 10% interest rate, how much would she have in one year?

Case Study

Ask students to read **Case in Point: Easy Street** as far as **Decision Time 1**.

The Rule of 72

SOMETIMES people want to know how long it will take to double their money. To figure it out, you can use a simple rule called "The Rule of 72." Here's how it works.

Divide 72 by the interest rate (stated as a whole number). The quotient will tell you how many years it will take for your money to double. For example, a 6% interest rate will double your money in 12 years. A 12% interest rate will double your money in six years!

To figure this, multiply $200 by 1.10. The number 1 represents Sandy's principal—the amount of money she deposited ($200). At the end of the year, she has her principal plus the interest it earned. If the bank pays simple interest on her account at the end of the year, she would earn $20 in interest and would have a total of $220, the future value.

$$\$200 \times 1.10 = \$220$$

Future value is the value in the future of an amount of money today. It can be calculated for more than one year. For example, the future value would be $242 in two years, or $\$200 \times 1.10^2$. In three years the future value would be $266.20, or $\$200 \times 1.10^3$. In five years the future value of $200 would be $322.10, or $\$200 \times 1.10^5$. The general formula for computing future value is:

$$\textit{dollar amount today} \times (1 + \textit{interest rate})^n = \textbf{\textit{future value}}$$

where n represents the number of years.

MILESTONE 1

$1.10^4 = (1.10)(1.10)(1.10)(1.10) = 1.4641$

$4,000,000 x 1.4641 = **$5,856,400**

Decision Time 1

Now go back to Sandy's case. If Sandy deposited $4 million today at 10% annual interest and didn't spend any of her principal or interest, how much would she have in four years? Calculate your answer in the following space or on a separate sheet of paper.

What about Wimpy? He didn't say anything about paying you interest! Instead of lending him money for a hamburger, you could put your money in the bank and earn some interest. What would be the better deal? Answer this question on the lines provided or on another sheet of paper.

_____

_____

_____

What if Wimpy agreed to pay you $1.10 next Tuesday? Would that make you change your mind? Why?

_____

_____

_____

Students might respond:

If Wimpy won't pay interest, I would be better off to put my money in the bank. Then I would receive $1.10 a year from now.

I would be better off to lend the money to Wimpy. It would be better to get $1.10 on Tuesday than to wait a year to get $1.10.

Decision Time 2

Think about Sandy again. You have already determined the amount of money that she could have in four years if the state would pay her the full amount of her winnings up front and if she put the money in the bank and left it there. But the state won't give her the entire $4 million today. Instead, Sandy will receive a payment every year for the next 20 years.

The state purchases an **annuity** that will make the payments to Sandy. An annuity is a contract that provides an income for a specified period of time. Each year Sandy will receive $200,000 from the annuity. After 20 years, she will have her $4 million.

She does receive the $4 million, but that's not the issue. The question is: What are Sandy's future payments worth today? In other words, what is the present value of the future payments?

Present value is the current value of a payment to be received in the future. How do you calculate present value? If the future value of $200 at 10 percent interest in one year is $220, then the present value of $220 in one year with an interest rate of 10 percent is $200, or $220 ÷ 1.10 = $200.

If Sandy wanted to have $1,000 in one year, how much money would she have to save today? Assume that the annual interest rate on a one-year certificate of deposit is 10%. Calculate your answer in the space below or on a separate sheet of paper.

You've just computed the present value of $1,000 in one year with an interest rate of 10 percent; however, the present value of $1,000 in two years, three years, or more would be different. Sandy would have to wait even longer for her $1,000.

At this point, it is logical to conclude that the present value would drop for longer periods of time. To test that hypothesis, you must do some more calcula-

Milestone 2

Ask students to read **Decision Time 2** and to answer the question about Sandy. (Note: Sandy would pay income taxes on the entire $4 million, if she received her winnings in one lump sum. She would also have to pay taxes on the interest or dividends she receives on her investments in the future. Of course, in receiving the money over 20 years, she must pay taxes on the annuity amounts. Because this becomes very complicated, the lesson ignores tax effects.)

Answer: $1,000 ÷ 1.10 = ***$909.09***

Have students continue reading as far as **Decision Time 3**.

Comparing Fixed and Variable Annuities

INSURANCE companies offer two kinds of annuities. A fixed annuity provides a monthly income that remains the same from one year to the next. A variable annuity provides a monthly income that changes over time, depending on the performance of the stocks or bonds in which the annuity funds are invested. When a person nears retirement, she may use a large lump sum from her retirement savings to purchase an annuity so that she will have a regular monthly income for the rest of her life.

The table below compares what the monthly income would have been for a fixed and a variable annuity that was purchased in October 1978 at a cost of $140,000. For income to rise in a variable annuity, the value of the stocks and bonds has to exceed a minimum level of growth. In the following table, the minimum levels of growth are 3.5% and 5%.

Year	Fixed	3.5% Variable	5% Variable
1978	$1,226	$1,000	$1,124
1980	1,226	1,091	1,205
1982	1,226	1,279	1,372
1984	1,226	1,816	1,893
1986	1,226	2,340	2,370
1988	1,226	2,674	2,631
1990	1,226	3,602	3,444
1992	1,226	4,282	3,977
1994	1,226	4,440	4,007

It looks as though a variable annuity is the better choice. But remember, hindsight is 20-20. If the stock market had performed poorly, the monthly payout for the variable annuities could have fallen below that of the fixed-rate annuity.

—Table data from Aetna Life Insurance and Annuity Company

tions. The general formula for calculating the value today of money to be received in the future is:

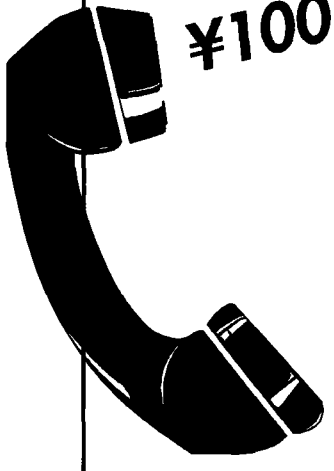
dollar amount to be received in the future ÷ *(1 + interest rate)*^{n} = ***present value***

where *n* represents the number of years.

For example, $1,000 received in three years would have a present value of $751.31 at an interest rate of 10 percent, or $1,000 ÷ 1.10^3 = $751.31.

$1,000 ÷ 1.331 = $751.31

What's happening here? By dividing the amount of money you will receive in the future by (1 + interest rate)^n, you are discounting the value of that future return. It simply isn't worth as much today. **Discounting** is the procedure for converting a sum of money to be received in the future into its present value. The interest rate used for this conversion is also called the discount rate.



Dialing in for Yen

THE odds of winning a pile of money in a lottery are incredibly long, but even that small chance inspires many people to try. In fact, so many listeners called during a phone-in lottery on a Japanese radio station that they set a world record.

The record for most responses to a radio show occurred on June 21–27, 1993, when FM Osaka 85.1 in Osaka, Japan, received 8,091,309 calls from listeners hoping to win the lottery.

The prize was 100,000 yen (around $1,073), and a chance to win it was offered during a 20-minute period every hour, for 10 hours each day. The greatest number of calls received in one day of phone-ins was 1,540,793 on June 23, 1993.

—Adapted from *The Guinness Book of Records* (1995)

Milestone 3

Have students read **Decision Time 3**. Answer any questions they have about the concept of present value for a stream of income. Make sure they understand the calculations for each example.

Decision Time 3

But what about Sandy's winnings? She doesn't receive $4 million all at once at the end of 20 years. She receives $200,000 per year. What is an annual income of $200,000 over 20 years worth today?

This calculation is only slightly more difficult. You must determine the present value of the $200,000 for each year and then add the present values. To make your work easier, a table is provided on the next page. This table shows the present value of $1,000 for different time periods and interest rates.

Present Value of $1,000 per Period

	Interest (Discount) Rate			
Period (n)	3%	5%	10%	15%
1	970.87	952.38	909.09	869.57
2	942.60	907.03	826.45	756.14
3	915.14	863.84	751.32	657.52
4	888.49	822.70	683.01	571.75
5	862.61	783.53	620.92	497.18
6	837.48	746.22	564.47	432.33
7	813.09	710.68	513.16	375.94
8	789.41	676.84	466.51	326.90
9	766.42	644.61	424.10	284.26
10	744.09	613.91	385.54	247.19
11	722.42	584.68	350.49	214.94
12	701.38	556.84	318.63	186.91
13	680.95	530.32	289.66	162.53
14	661.12	505.07	263.33	141.33
15	641.86	481.02	239.39	122.89
16	623.17	458.11	217.63	106.87
17	605.02	436.30	197.85	92.93
18	587.39	415.52	179.86	80.81
19	570.29	395.73	163.51	70.27
20	553.68	376.89	148.64	61.10

"Small change makes large sums."

—Helena Rubinstein, American (Polish-born) cosmetics manufacturer

Take a few minutes to familiarize yourself with the table and to understand what the numbers demonstrate. Here's an example to help you get started:

The present value of $1,000 under the 15% heading in the first period (one year) is $869.57. The present value of $1,000 under the 15% heading in the 16th period is $106.87. The present value keeps declining the longer someone must wait to receive the $1,000. When it comes to money, people have a time preference for today rather than sometime in the future. A dollar in the future is discounted by the person who must wait to receive it. The present value is less than the future value.

If a bond paid $1,000 in three years when it matures and offered a 5% interest rate, what is the bond's present value? To answer this

question, find the number under the 5% interest heading in the row for the third period. The answer is $863.84.

If you wanted $2,000 in the bank in two years and your passbook savings account paid 3% interest, how much would you need to deposit today? To calculate the amount, you must find the number under the 3% heading in the row for the second period and multiply that number by two. You multiply by two because the number in the table is the present value for each $1,000.

Present value is the value today of a payment to be paid or received in the future.

Look at one more example. This is a case where two individuals want to know the present value of a stream of income. Suppose the Smiths are planning for retirement. They want to purchase an annuity that will provide them with $1,000 a year for five years. Assume the interest rate is 10%. How much will they need today to buy this annuity? In other words, what is the present value of this annuity.

To answer this question, you must find the present value for each of the five years and add them together. The answer is $909.09 + $826.45 + $751.32 + $683.01 + $620.92 = $3,790.79.

Back to Sandy again. Use the present-value table to calculate the present value of her lottery winnings. Remember, she doesn't receive it all now, but she doesn't have to wait 20 years to get her first payment. She will receive $200,000 every year for the next 20 years. Assume the interest rate is 5%. Do your calculations in the space provided or on a separate sheet of paper.

Ensure that students understand that they must add the values in the 5% column and multiply the sum by 200.

The sum of the present values in the 5% column is $12,462.22; $12,462.22 x 200 = $2,492,444. The present value of $200,000 a year for 20 years is ***$2,492,444****.*

(Note: On a financial calculator, the present value of the income stream will be computed as $2,492,442.10. The difference occurs because of rounding.)

Now assume that the interest rate is 10%. What is the present value of her future stream of income?

The sum of the present values in the 10% column is $8,513.56; $8,513.56 x 200 = ***$1,702,712*** *= present value.*

(Note: On a financial calculator, the present value of the income stream will be computed as $1,702,712.70. The difference occurs because of rounding.)

What if Sandy received her winnings over a 10-year period instead of a 20-year period? Assume an interest rate of 10%. Calculate the present value.

The sum of the first 10 numbers in the 10% column is $6,144.57; Sandy will be paid over 10 years instead of 20, and her annual payments will be $400,000 ($6,144.57 x 400). The present value of her payment stream is ***$2,457,828****.*

(Note: Make sure students recognize that this present value is higher than the previous example, which also had a 10% interest rate, because it is for a shorter time period. Sandy doesn't have to wait so long; therefore, future payments aren't discounted as much.)

Think about what you have learned from your calculations, and explain why Sandy would prefer to receive the $4 million immediately rather than spread out over a period of time. Write your answer on the lines provided or on a separate sheet of paper.

Students may respond: If Sandy received the $4 million immediately, it would be worth a lot more than the present value of $4 million paid over a long period of time.

Talk This Over

You have learned that there is no time like the present when it comes to money! People prefer receiving money today instead of tomorrow. If they must wait for the money, they want to be paid to wait—they want to be rewarded with interest income.

When people win a big monetary prize, they do not receive the money right away. They are paid their winnings over a period of years (with no interest added to the prize). On the lines below or on another piece of paper, use your knowledge about present value, and explain why the state would prefer to spread out the payments to lottery winners.

Milestone 4

Ask students to read **Talk This Over** and to respond to the question.

Students may respond: The state will have to pay only the present value of the $4 million to purchase the annuity. At 5% interest, the annuity will cost about $1.7 million. The state saves a great deal of money this way.

Case Study

Have students read **Case in Point: Gamliche Heating and Cooling** as far as **Decision Time 1**.

Case in Point: Gamliche Heating and Cooling

Read the following story about four brothers who run their own heating and cooling business.

Chris Sharp

Gamliche Heating and Cooling

Jeff Gamliche and his three brothers took over their father's heating and cooling business when he retired. They've continued to operate the business successfully for more than 15 years. They are located in the northeastern part of the city, but they serve the entire metropolitan area. They have 30 service employees, one secretary, and one bookkeeper.

The brothers want to purchase $35,000 worth of new equipment for their repair vans. They think this investment will pay off in increased productivity. In other words, their service employees will be able to complete many more jobs in a day. They have calculated that this increased productivity will provide an additional $15,000 revenue in each of the next three years. They figure that the equipment will be outdated after that time and will have to be replaced.

Decision Time 1

Imagine that the Gamliche brothers have hired you to be their consultant. They don't know if the expected revenue is enough to make the investment worthwhile. They want you to analyze the situation and make a recommendation about their plan.

Assume the interest rate is 10%. Use the space below or another sheet of paper for any calculations you need for your analysis. You may use the present-value table on page 39.

Write a brief recommendation to the Gamliche brothers about whether you recommend the investment. Use the following lines or a separate piece of paper.

_____

_____

_____

_____

Milestone 1

Ask students to read the section. Then have them calculate the present value and write a recommendation.

To calculate the present value of the $15,000-per-year income stream, add the first three amounts in the 10% column and multiply by 15. *The sum is $2,486.86; $2,486.86 x 15 =* ***$37,302.90****.*

Students may respond: It would be a wise investment to purchase the equipment. You would spend $35,000 today for the equipment. The present value of the $45,000 income stream ($15,000 a year for three years) is $37,302.90, which is greater than the $35,000 investment.

Decision Time 2

If the interest rate rose to 15%, would you change your recommendation to the Gamliche brothers? Use the space below or another piece of paper for any calculations that will help you do your analysis.

If your recommendation changed, explain why on the lines below or on another sheet of paper.

_____

_____

_____

_____

Milestone 2

Have students read the opening paragraph, which contains a new problem. Encourage them to calculate the present value and to write their recommendations.

The sum of the first three numbers in the 15% column is $2,283.23; $2,283.23 x 15 = ***$34,248.45****, the present value.*

Students may respond: Do not buy the equipment; it is not a good investment. The equipment will cost $35,000 today. The present value of the future $45,000 income is only $34,248.45. The cost exceeds the present value of the expected return.

Milestone 3

Ask students to read **Talk This Over** and to answer the questions.

Talk This Over

Businesses frequently must make decisions similar to the one the Gamliche brothers faced. When businesses invest in plant and equipment, they pay the costs today, but the revenues from the use of the plant and equipment come in the future. Present-value calculations are necessary for businesses to make careful investment decisions.

Another way to analyze this kind of business decision is to compare the rate of return on the investment with the interest rate that a firm would pay if it borrowed the money. For example, a $5,000 piece of equipment that lasts only one year but generates enough income to cover its cost and provide a profit of $500 has a 10% rate of return ($500 ÷ $5,000 = 0.10). If the business borrowed at a 5% interest rate, the 10% rate of return would make the investment a good idea. (Of course, if the $500 profit were returned over a period of years, a different present value would have to be calculated for the return.)

The higher the interest rate (or discount rate), the more a given sum of money is discounted and the lower its present value is.

But don't worry about how the rate of return is calculated. Just use this rule of thumb: Other things being equal, invest if the rate of return on the equipment is greater than the interest rate, but do not invest if the rate of return on the equipment is lower than the interest rate.

A comparison of the rate of return on an investment with the interest rate is a method that businesses use to help them make investment decisions.

Now think about this: A business has a choice of purchasing a piece of equipment that will yield a 3% rate of return. The business could put the same amount of money in the bank and earn 6% interest. What should the firm do? What if it had to borrow the money? Answer these questions on the following lines or on a separate sheet of paper.

Students might respond: The business would be better off putting the money in the bank and receiving the higher yield, other things being equal. If the business had to pay a higher interest rate to borrow the money than the rate of return on the investment, the business would be worse off. Costs of the investment would exceed the benefits. (Note: These questions and answers simplify the investment decision. There are many other factors—for example, risk and inflation—that affect a business's decisions about its discount rate. As a result, a business's discount rate may exceed the interest rate.)

PUT IT TOGETHER

THE Econ Briefing at the beginning of this lesson included four questions about the future or present value of money. Use what you have learned in this lesson to answer those questions. Write your answers on the lines provided or on another sheet of paper.

Chris Sharp

- Your boss offers you a bonus plan with two options. Under the first option, you would receive an extra $100 every month for the next six months. Under the second option, you would receive a lump sum of $550 at the end of this month. Which would you choose?

- You want a new CD stereo system. South Central has one you like, and it has a price tag of $1,500. South Central is also offering a one-year free-financing deal. If you pay cash, however, the store will give you a $100 discount on the price. You have $1,500 in savings on which you earn 3% interest. What would you do?

- You are planning to attend ACE Technical School for three years. Recently the school sent you a letter explaining a Fixed Tuition Plan (FTP). The letter states that the current tuition of $3,000 is certain to rise every year. If you were to participate in the FTP, however, you wouldn't be affected by price increases. You'd pay $9,000 the first year and nothing after that. But you'd have to borrow the $9,000! The interest rate on your loan would be 5%. What would you do?

CLOSING

Questions that first appeared in **Econ Briefing** reappear in this section. Encourage students to answer them and to provide explanations.

Suitable responses:

I must compare the options on the same present-value basis. The present value of the $100-a-month option cannot be determined unless I know the interest (discount) rate. Then I can use the discounting process to compute the present value of that option and compare it to the $550 lump-sum option.

If I take $1,400 out of my savings, I give up the 3% interest I would have earned. If the amount of the interest is less than the $100 I save by paying cash, I should pay cash. If not, I should use the free financing.

If tuition is expected to rise by more than 5% each year, then I would borrow the money and buy the FTP. If tuition is not expected to rise by more than 5%, I would be better off if I paid tuition during the regular school years.

The lab management offers discounts to customers who pay within 15 days because it recognizes that money received today is more valuable than money received in the future. If the managers calculated the present value of the future payments, they must have compared them to the money received within 15 days and realized they would be better off with early, discounted payments.

▶ You work at a dental laboratory. The lab gives a 10% discount to dentists who pay their accounts within 15 days. Why does the lab do this?

_____

_____

_____

_____

When Business Pays the Price

EARTHLY Elements, Inc., didn't anticipate how much an overdue payment could hurt. When the maker of dried floral gifts and accessories landed a $10,000 order from a national home-shopping service in November 1993, its founder, Thomas Re, threw a party. The order represented 20% of the firm's $50,000 in orders for 1993.

But by the end of February, Earthly Elements was no longer rejoicing. Fulfilling the order cost 25% more than expected, and then the payment was 30 days overdue. Faced with a worsening cash crunch, Mr. Re delayed paying his own bills and began to lay off employees.

Mr. Re, who started the Randolph, New Jersey, business in March 1993 by borrowing against his house, wasn't willing to borrow more. In March 1994 he closed shop. By the time the customer paid in April, "it was way too late to revive the company."

—Adapted from Michael Selz, "Big Customers' Late Bills Choke Small Suppliers," *Wall Street Journal* (June 22, 1994); adapted by permission of *Wall Street Journal*, ©1994 Dow Jones & Company, Inc.; all rights reserved worldwide

SUMMARY

Have students read **Net Gain**. Ask them to provide examples of each of the major points made in the lesson. Correct any misunderstandings they may have.

NET GAIN

WITH your knowledge about present and future value, you should become a more careful and informed consumer and saver. If you become the owner or manager of a business, you will be better able to analyze investment decisions. You now have a lot of knowledge that most people don't have. Congratulations!

Here are the major points made in this lesson:

1. People have a time preference for money.
2. Future value is the value in the future of an amount of money today.
3. Present value is the value today of a payment to be paid or received in the future.

4. Discounting is the procedure for converting a sum of money to be received in the future into its present value. The interest rate used for this conversion is the discount rate.

5. The higher the interest rate, or discount rate, the more a given sum of money is discounted and the lower its present value is.

6. An annuity is a certain sum of money received each year for a specified number of years.

7. Businesses make decisions about investment by comparing the present value of the expected revenue stream with the price of the investment. They also compare the rate of return with the interest rate.

BUILDING ON SUCCESS

EXTEND what you have learned in this lesson to the real world around you—the world of personal finance and business.

- Invite a financial planner to class to explain how analyses of present and future value are used in planning for a financially sound future.

- In past lessons you learned that investing in your human capital may be a wise investment. People with more skills and knowledge tend to earn more money. Research how much you are likely to earn annually in a career that interests you. Then find out how much it will cost to obtain the education and/or training you will need to get that job. Assuming that the interest rate is 5%, calculate the present value of a 20-year stream of income. The present-value table on page 39 will help you with your calculations. Compare the present value to the cost of the education/training. From a financial point of view, do you think you should make the personal investment in your human capital?

  Write an informal essay in which you present the results of your research, your calculations, and your personal conclusions.

- Interview a business owner or manager to find out how investment decisions are made in his or her business. Does the person compare the present value of the revenue stream with the cost of an investment? Does he or she compare the expected rate of return with the interest rate? If not, what does this person do?

  Prepare an oral report on your interview, and share it with your classmates.

EXTENSION

The activities in this section are designed to be completed outside the classroom. You may wish either to assign the activities or to invite students to choose which ones they would like to complete.

You may wish to have students share their work on the last two activities.

ASSESSMENT

Assessment questions are provided for you to evaluate students' comprehension and mastery of the material presented in this lesson. You may wish to assign the questions as homework or to use them as a formal in-class assessment tool.

Answers:

1. (a)

2. (d)

3. (b)

4. (c)

QUALITY CONTROL

DEMONSTRATE your understanding of the concepts presented in this lesson by answering the following multiple-choice questions or by completing the statements. For each item, circle the answer that you think is correct, or use a separate sheet of paper.

1. If the interest rate is 2%, what is the present value of $1,000 to be received in one year?
   a. $980.39
   b. $998.00
   c. $1,000
   d. $1,002

2. If the interest rate is 5%, what is the future value of $500 in two years?
   a. $453.51
   b. $500
   c. $550
   d. $551.25

3. An annuity is:
   a. the sum of money received as a lump sum at some future time
   b. a certain sum of money received each year for a specified period of time
   c. an investment that is more valuable in the future than today
   d. the future value of the present value of a business investment

4. If the interest rate is 10%, how much must you save now in order to receive $3,000 in three years?
   a. about $750
   b. about $2,100
   c. about $2,250
   d. about $3,900

5. Bill and Ted are thinking about investing in an espresso coffee machine. They believe that the machine will generate additional revenue of $1,000 each year for the next three years. The machine costs $2,800 and will last three years. Their discount rate is 5%. Should they invest in the machine? *5. (d)*

a. Bill and Ted should invest in the machine because the machine costs $2,800 and the revenue will be $3,000.

b. Bill and Ted should invest in the machine because the machine costs $2,800 and the future value of $1,000 a year is $3,450.

c. Bill and Ted should invest in the machine because the interest rate is greater than the discount rate.

d. Bill and Ted should not invest in the machine because the present value of revenues is lower than the price of the machine.

6. You would lend Wimpy $1 for a hamburger if: *6. (d)*

a. the future value is less than the present value

b. the present value is greater than the future value

c. the interest rate is greater than 10%

d. he paid a return to you that is greater than the interest rate

Side 11
Graphical Database Barcodes

(Use "step still" function or barcodes below to advance within categories.)

Step Back

Step Forward

Elasticity

Role of Profits

Product Markets

Consumer Behavior Theory

Production Theory

Foreign Exchange Markets

Human Resource Market

Nonhuman Resource Market

Aggregate Supply & Demand

Loanable Funds Market

Side 11
Teacher-Track Barcodes

***Economics and Risks** (audio only)**

***Economic Risks of Education** (audio only)**

People Economize

Investing in Human Capital

***The Risk of Investing** (audio only)**

A Class Discussion on Risk

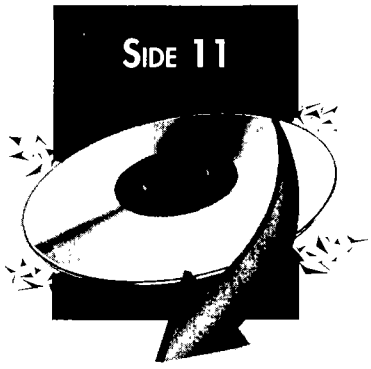
Discussing Job Markets

More Career Activities

*Swipe any other barcode to restore video.

ECONOMICS® at Work

Module 5, Lesson C



BACK TO YOUR FUTURE

ECON BRIEFING

Look around. Who's sitting next to you, behind you, and way in the back of the room? About 25 years from now, you'll probably meet some of these people at a school reunion, and the conversation may start with, "So, what are you doing now?" What will you say?

In the movie *Back to the Future*, a seemingly minor change in the past drastically altered the future. George McFly, a real geek, was transformed into a totally cool dad after his son Marty traveled back in time and got involved in George's past. But you don't need a Delorean time machine to save you from a dismal future. You can change your future right now. As a matter of fact, everything you do determines your future. You will use all the knowledge that you have gained over the years and apply it to your career. And, as in the movie, the future is never carved in stone. You can continue to reshape your future by going back to school for training and education that will keep your skills up-to-date.

Years ago, typical advice given to a high school graduate was to get a job with IBM, Sears, AT&T, or some other large corporation. Counselors assured students that if they landed a job with one of these firms, they could work there until retirement and then relax and collect their pensions. Well, you can't count on that advice anymore. Today it's estimated that the average worker will change jobs six or seven times throughout his or her career.

The work force of the future must be ready for lots of changes. The signs are already here. Companies seek to maximize profits by "right-sizing"—reducing the labor force to cut costs. The end of the Cold War has reduced the threat of conflict among the superpowers, and this has reduced the demand for workers who produce military equipment. As new technologies have been developed, workers have found themselves with obsolete skills. These trends are

> ***"Change is happening faster than we can keep tabs on and threatens to shake the foundations of the most secure American business."***
>
> **—U.S. Congress Office of Technology**

2 CLASS PERIODS

Materials

This lesson uses the videodisc (or videotape) program **Back to Your Future**. To complete the activities, students may use the following items: recent editions of the *Occupational Outlook Handbook*, program and course catalogs published by trade schools and community colleges in your area, job application forms from a local business, newspaper employment ads, and the salary schedule from your school district.

INTRODUCTION

In this lesson students examine how investment in human capital enhances productivity and job mobility. They examine the effect of such investment in providing workers with more options in the job market, and they learn that the level of education and training allows greater movement within and among occupations.

GOALS

Students will be able to demonstrate their understanding that investment in human capital makes them more valuable in the workplace. They will recognize that the value of workers is measured in terms of productivity and that, as workers' value increases, their options in the labor market increase. Students will also be able to show they understand how economic events affect the labor market and how wages are determined in the labor market through the interaction of supply and demand.

OBJECTIVES

Upon completing this lesson, students will be able to:

- explain the incentives to invest in human capital
- explain the economic risks that investment in human capital involves
- explain why people change jobs
- identify the factors that enhance job mobility

likely to continue. What are you doing to prepare for the future? When you see your high school friends 25 years from now, what will you have to report?

WHAT YOU'LL LEARN IN THIS LESSON

- Workers, businesses, and governments invest in education, training, and health care, partly to increase their productivity and incomes.
- Although investment in capital resources and in human capital can increase productivity, such investments have significant opportunity costs and economic risks.
- Workers change jobs for voluntary and involuntary reasons.
- Workers invest in human capital to enhance job mobility—the ability to advance in their careers.

PAYBACK

"The future's so bright, I gotta wear shades," Timbuk3 sang in the hit song. And that's true—there's no reason to be pessimistic about the future, as long as you're ready for it. You've been preparing for your future ever since you were born. You didn't learn to read and write with your future productivity in mind, but your success will depend on these skills—and many others. Your productivity will depend on the human capital you develop throughout your life. If your education ends with high school, you may end up with skills that will be obsolete in just a few years.

Just because you graduate from cooking school doesn't guarantee that you'll land a job as a chef. Investing in human capital can be risky, but it's one of the best ways to reach your potential.

The workplace is constantly changing, as businesses install new technology, invest in capital resources, and demand greater productivity from their employees. Your schooling, your on-the-job training, and your capacity to adapt to changing times will be factors in your marketability as a worker. The human capital you are developing now—in economics and your other courses—is your key to future success and personal satisfaction.

Econcepts

capital resources—manufactured goods, such as buildings, tools, and machinery, that are produced for the purpose of making other goods

human capital—the stock of knowledge and ability that people possess

investment in capital resources—expenditures by businesses on new capital goods (plant, building, and equipment purchases) and by households on new homes

investment in human capital—expenditures of time, effort, and money to improve the stock of knowledge and ability that people possess

marginal physical product—the additional output produced when one additional unit of a resource is employed

marginal revenue product—the change in the total revenue of the firm when it employs one additional unit of a resource

opportunity cost—the highest valued alternative that must be given up because another option is chosen

Lesson Description

This lesson focuses both on the benefits of investing in human capital and on the costs and risks associated with such investment. Workers who increase their skills have more options in choosing occupations and greater opportunities for advancement. Their greater productivity has a direct effect on their wages. On the other hand, every investment in human capital carries a cost. The video program features Hector and Evelyn, who have jobs repairing telephone lines. Evelyn recently completed an extensive training course and received a promotion. Hector finds the possibility of moving up in the company appealing, but he isn't sure he can accept the opportunity costs and the risks: The training would force him to make a temporary move to another state, and he would have to give up the second income he receives from an evening job. He is also aware of the fact that going through the training doesn't guarantee a promotion—there is always a risk associated with investment decisions.

Key Terms

Prepare a poster listing the **Econcepts**, or write these key terms on the chalkboard.

POWER UP

Some people seem to know, while they're little kids, exactly what they want to be when they grow up. For most people, though, it takes a lot of time and careful thought to decide on a career track. Most of all, it takes some awareness of the different opportunities out there. For example, you're probably familiar with the duties involved in police work, fire protection, and teaching. You've been around teachers most of your life, and law-enforcement officers and firefighters are familiar figures. But what do you know about a career in herpetology, systems analysis, technical writing, or economics? Not much maybe, but the important thing is to keep an open mind. Be open to new possibilities.

It's possible that you haven't even heard of the job you'll be doing someday. It's important to grab every opportunity to learn. You know that math you think you'll never need? Don't be so sure. You could miss out on a great career as a lab technician, carpenter, or draftsman simply because you slept through math class.

PREVIEW

Ask students to read **Econ Briefing** (pages 51–52) and to name companies in their area that have recently reduced their work forces. Have students discuss possible reasons for the cutbacks.

Ask students to read **What You'll Learn in This Lesson** and **Payback** (page 52). Discuss the main topics, and brainstorm any questions that students may have. You may wish to write their questions on a chart or chalkboard and to display the questions throughout the lesson. Encourage students to keep notes as they develop ideas about the topics of their questions.

Introduce the **Econcepts**, and give contextual examples of each. Ask students to refer to them as needed during the lesson.

Ask students to read **Power Up** beginning on page 53 and to complete the activity in this section.

Every now and then you see an article predicting which jobs will be in demand in the future. Such projections usually include salaries. This can be both dangerous and enlightening. Many students choose what to study in technical school or college on the basis of the salaries they expect to receive in certain jobs. Hey, a $75,000 salary sounds pretty good—but you have to enjoy what you do too.

If you base your career choice simply on a salary projection but find the work unsatisfying, you will be bitterly disappointed. On the other hand, if you pursue a career that's interesting to you, then you will look forward to going to work every day, and furthering your education in that field will be more enjoyable.

Look through this year's *Occupational Outlook Handbook* for your "dream job." In particular, look at the sections entitled "Expected Earnings," "Training Required," and "Market Expectations." Then complete the following activity on the lines provided or a separate sheet of paper.

- List three careers that you have been considering.

_____

_____

_____

- What is the outlook for these occupations in the following three categories?

	Job 1	Job 2	Job 3
Expected Earnings	_____	_____	_____
Training Required	_____	_____	_____
Market Expectations	_____	_____	_____

- List three occupations that you don't know much about.

_____

_____

_____

- How can you learn more about these jobs?

Students may respond: Interview people holding this position; talk to a guidance counselor; discuss the occupation with an instructor in that field.

_____

_____

_____

_____

_____

Is It Right for You?

GET to know all you can about occupations you are considering. It is extremely important to research the entry requirements and other characteristics so that you will know what to expect out of the job. Above all, remember that it is important to make a career choice that is good for you. The demand for skilled workers will remain strong. Will you be ready?

—Theresa Cosca, "High Earning Workers Who Don't Have a Bachelor's Degree," *Occupational Outlook Quarterly* (Winter 1994–95)

Hot Jobs for the Future

Early Education Teachers

Training: Preschool teachers need at least a high school diploma and state certification. Kindergarten teachers need a bachelor's degree and certification.

Salary range: $16,600 to $32,200

Related hot jobs: Bilingual education, special education teachers

Medical Assistant

Training: On-the-job training is common. To become a certified medical assistant, students must pass a national exam.

Salary range: $15,500-$30,000

Related hot jobs: Dental assistant, licensed practical nurse, physical therapist

Technical Trainer

Training: Requirements are job-specific. College degrees are often not required, but five to 15 years of experience as a technician are expected.

Salary range: $37,200 to $70,000

Related hot jobs: Diversity manager, team trainer

Computer-Assisted Reporter

Training: Reporting experience and familiarity with computers, databases, and spreadsheet programs are required.

Salary range: $21,000 to $60,000

Related hot jobs: Informational-graphics designer

Correctional Officer

Training: High school diploma and state-provided training are required.

Salary range: $16,000 to $51,000

Related hot jobs: Police officer, systems analyst

Merchandise Planner/Distributor

Training: Most work their way up from the assistant-buyer level. Retail chains often require candidates to complete rigorous in-house training programs.

Salary range: $21,500 to $75,000

Related hot jobs: Preferred-customer representative, travel sales, home health-care sales

—Adapted from "20 Hot Job Tracks," *U.S. News & World Report* (October 31, 1994)

- List three occupations ranked "good to very good" under "Market Expectations" in which you might be interested.

_____

_____

_____

- How can you prepare yourself for the one that interests you most?

_____

_____

_____

_____

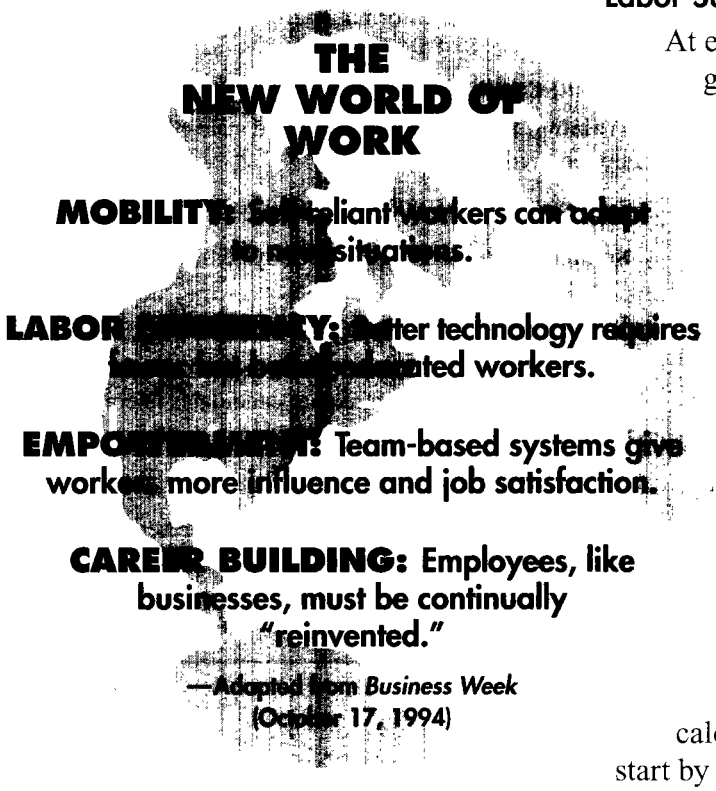
Students may respond: Attend training classes; sharpen basic skills associated with the job; read books and articles related to the occupation.

VIDEO CORE

Have students read the five paragraphs that open **Take a Closer Look**. As they read, clarify any points they do not understand about using supply-and-demand analysis. You may wish to refer to the database for information on the market for labor.

TAKE A CLOSER LOOK

How much do you and your friends earn in your part-time jobs? It's typical for youths to get only the minimum wage. For that kind of money, you're probably not willing to work more than 20 hours a week—after all, you need some time to do other things with your life. But what if you were offered $10 an hour? You might want to work every hour that you're not in school or in bed. And suppose you were offered a job that pays $30 an hour—how many hours would you be willing to work then? You might decide to give up day school, work all day, and take some classes at night.



Labor Supply

At each increase in wage, you would be willing to give up a little more of your leisure time, because each increase in the wage rate increases your opportunity cost—the time you could spend doing other things, such as playing tennis, watching TV, or cruising with your friends. Labor is a resource, and in the market for labor, you are the supplier. The price of your labor is the wage rate that you receive. The quantity is the number of hours that you're willing to supply. The higher the price, the larger the quantity of labor hours you are willing to supply.

Labor Demand

You and all the other hardworking people in the labor market sell labor to businesses. And businesses hire labor. Businesses know how to calculate just how much labor they will hire. They start by determining how much additional product each worker produces. For instance, a single worker may produce 10 widgets, but when a second worker is added, the total output may go to 25 widgets, which means hiring the additional worker resulted in the production of 15 additional widgets. This can happen when the physical capacity of the plant—the number of workstations, the size of machines—is large enough to support the increase in workers. The additional output produced by each worker is that person's **marginal physical product** (MPP).

The firm multiplies the MPP by the market price of the output. This gives the company the **marginal revenue product** (MRP), which indicates how much additional revenue each worker generates for the firm. As long as the MRP is greater than or equal to the wage paid

for the job, the worker will be hired or will stay employed. If the price of the product goes up, then MRP goes up, and more workers will be hired. If the price of the product goes down, then MRP goes down, and the firm will stop hiring and may even start laying off workers.

Economists say the demand for labor is a **derived demand**. This means the number of workers demanded is based on (derived from) the market price of the product that the workers produce and on the workers' marginal physical product.

What You'll See on the Screen

Introduction to the Video

Have students read **What You'll See on the Screen**. The documentary segment of the video explains how investment in capital resources as well as in human capital can increase productivity.

In "Back to Your Future" you will meet Hector and Evelyn, two workers who are thinking hard about their futures. Evelyn chose to attend training classes, and the training helped put her in line for a promotion. Now Hector is getting his opportunity to train. But it's not always easy to decide whether to accept additional training—there are always opportunity costs. Take a look at what happened to Bob.

On the Job with Bob

During a recent tour of a transformer factory, a group of students stopped at a station where Bob was hard at work punching a computer keyboard. The tour guide introduced Bob as a 20-year employee and asked him to explain to the students what he was doing.

"My job is to cut slots in the exterior panels of the transformer, according to the customer's specifications," he explained. "If the work order isn't clear, I just key in the order number, and the specifications pop up. Sometimes the measurements of the slots aren't clear on the work order. When that happens, I display a drawing of the panel, indicate the area I need measured, and the computer spits out the answer."

This was relatively new technology to the factory. Bob said that before the computer was introduced, he had to call the office for the specifications when they weren't clear. It sometimes took over an hour to get the kind of information he could now get in seconds. Bob admitted he had been scared of this new method at first, but he took some training classes. "Now I can't imagine doing things the old way," he said.

> ***"I hated every minute of the training, but I said, 'Don't quit. Suffer now and live the rest of your life as a champion.'"***
>
> **—Muhammad Ali, American professional boxer and world heavyweight champion**

Bob faced an opportunity cost in his training decision. He had to spend time away from his station, and then he had to catch up on the orders when he returned. His company also had an opportunity cost in introducing the computer: When a new capital resource comes on line, there's almost always a period of time when productivity declines while the employees learn the new method.

In the opening segment of the video, you will see how the development of capital, especially human capital, is an investment in a worker's future, as well as society's. Then in the Economic Puzzle Challenge sequence, you'll see why the decision to invest in human capital isn't always easy to make.

"Sure, it was hard work getting that extra education, but it was an investment in human capital. My productivity's gone up; I have marketable skills; and now my investment is paying off."

Video-based Activities, Part 1

Have students read the introductory paragraphs of **Talk This Over**. Then start the videodisc (Side 11), and swipe this barcode to play:

Back to Your Future (introductory segment)

Talk This Over

The concert tickets will go on sale at 10 o'clock this morning. You got your line ticket two weeks ago, and now you're at the music store an hour early for the line lottery. The clerk calls for attention and shouts, "The first place in line goes to line ticket number 46."

Bingo! That's you! Waving your arms, you run to the front of the line and wait for the clock to tick off the final minutes. Then at 10 the clerk starts entering ticket orders. "Oh no," she whines, "the computer is down." By the time the store is back on-line, all the good seats are gone. You won't trust that store for tickets anymore.

People used to camp out all night to get a shot at the supply of tickets the store had behind the counter. But today the ticket-selling process is all done by computer. If the store is using an old unreliable computer, it won't get the business.

To remain competitive, companies must invest in the latest technology and capital. Similarly, workers must invest in their human capital if they want to be competitive. Workers must keep up with changes in the workplace by constantly updating their skills.

When the video pauses, two questions appear on the screen. Answer them on the lines below or on a separate sheet of paper. Then discuss your ideas with your classmates.

Why do individuals invest in themselves?

_____

_____

_____

Why does a society invest in its citizens?

_____

_____

_____

What's the Difference?

The words "capital" and "investment" can be confusing. The problem is that in finance—a subject area that is closely linked with economics—these terms have different meanings than they have in economics.

To a financier, "capital" means money, and "investment" refers to a financial instrument, such as a stock or bond. Stocks and bonds are really only another type of money. Each is a medium of exchange, but they are less "liquid" than cash, which means they can't be spent as easily.

To an economist, "capital" refers to such things as the machinery, equipment, and tools that are used to create goods and services. "Investment" occurs when companies choose to employ capital to increase their productivity.

For More...

Any society that wants to have a growing economy must invest in developing the human capital of its citizens. Different societies provide this investment in different ways. For instance, some countries offer their citizens a government-provided education all the way through college. In the United States, the federal, state, and local governments use tax revenues to subsidize the education of students from kindergarten through high school, and they continue to offer varying degrees of support through college. As a result, tuition at state universities is generally lower than it is at private institutions. The federal government spends approximately $250 billion per year on education. In addition, student loans and grants are available to students pursuing higher education.

Does the U.S. government invest too much in education? Too little? What would you have the government do differently? Discuss these questions with your classmates.

The video will pause on a screen with the following questions (which also appear in the *Student Guide*).

Why do individuals invest in themselves?

Why does a society invest in its citizens?

Encourage students to answer the questions in writing and then to discuss their ideas.

They may respond:

People invest in themselves to increase their productivity, to be competitive in the labor market, and to increase job opportunities.

Investment in human capital increases productivity, which leads to an increase in the standard of living. Investment in citizens will increase people's financial independence and reduce the need for welfare programs.

Further Discussion

Ask students to read **For More...** on this page. Encourage discussion based on the questions at the end of the section.

Video-based Activities, Part 2

Have students read the introductory paragraph of the second **Talk This Over** section. Then swipe this barcode to play:

Back to Your Future
(introductory segment, continued)

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

Why is education considered an investment?

Encourage students to respond in writing and then to discuss their answers. *Possible responses: Education provides continuous benefits, one of which is income. It increases the value of workers by increasing their productivity. In a larger sense, education increases productivity, bringing about economic growth.*

Further Discussion

Ask students to read **For More...** on this page. Distribute program and course catalogs published by trade schools and community colleges in your area. Have students gather information on entering certain occupations. Alternatively, assign students to call a local trade school or community college, obtain the catalogs, choose an occupation, and write a brief description of the course work involved in preparing for that occupation.

Video-based Activities, Continued

Ask students to read the paragraph that introduces the third **Talk This Over** section. Then swipe the next barcode for these questions (which also appear in the *Student Guide*):

What kinds of investments in human capital have you made recently?

What have you given up to make them?

Talk This Over

How can you be sure you'll always be able to get a job? One way would be to acquire many different skills: You could become a veterinarian, a carpenter, a plumber, a newspaper reporter, and an airplane mechanic. You would surely be able to find a position in one of these fields. But it would take a lot of time and money to master all these trades. So how can you enhance your ability to advance in your career or to accept different positions? In other words, how can you enhance your **job mobility**? The trick is to learn all you can in the career you choose. Be sure to stay on top of all the latest information and technology in your field.

The screen poses another question:

Why is education considered an investment?

Write your answer on the following lines or another piece of paper. Then discuss this issue with your classmates.

For More...

You now understand that to enhance your job mobility, you have to engage in lifelong learning. So how do you get started? How do you acquire the skills that will get you through the company door to a good job?

Here's one way: Call a technical school or community college, and ask for a program and course catalog. The program will tell you what types of career training are offered, and the course catalog will list all courses that the institution teaches; it will also provide a breakdown of the skills you will acquire as you move through the program.

Talk This Over

In this lesson you have been giving some thought to how you will invest in your human capital in the future. But what have you done about it lately? You've been building your human capital for a long time. The video challenges you with two more questions. Answer them on the lines provided on page 62 or on a separate piece of paper, and then discuss your responses with your classmates.

What kinds of investments in human capital have you made recently?

What have you given up to make them?

Selecting a Vocational-Technical School

MORE and more people are considering a technical education as an alternative to college. There are many vocational and trade schools that are very good, but some are not. The bad schools are more interested in money than in their students.

If you're considering technical training, here are some questions to ask:

1. **How much will it cost?** What are the costs of tuition, books, supplies, and application fees? Some 18-month programs at private vocational schools cost more than attending some colleges.

2. **How long will it take to complete the program?** Will you have to wait several months until the courses you need are offered? What if you need remedial work—will it cost extra?

3. **Does the school have a good reputation?** Is it accredited (approved) by an association of technical schools? The absence of accreditation should send up a red flag. You may want to call the local Better Business Bureau to ask if any complaints against the school have been filed.

4. **Can I transfer my course credits to another school or college?** If you have another school or college in mind, call to verify exactly which credits are transferable.

5. **What will this program do for me?** Don't be deceived by impressive-sounding titles. A "climate control technician" may simply be someone who repairs furnaces.

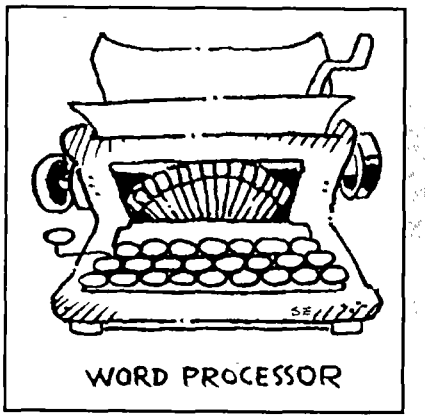
6. **Will I need an additional license or outside certification?** If you need to pass an exam to qualify for a job, how successful have the school's graduates been in passing the exam? Can you return for remedial training at no cost if you fail the exam?

7. **What is the overall job placement rate?** Can the school provide data showing the number of students who started courses at the school, the number who graduated, the number who were placed in jobs by the school? Does school staff help with job interviewing skills and résumé writing? You might even call recent graduates to ask if they were satisfied with their training.

8. **What kind of entry-level salary can I expect to earn?** Many schools will quote a range of $8 to $9 an hour. Don't be fooled. In 1994, average starting salaries were about $5 to $6 an hour, and most companies want you to have some type of experience.

9. **Who will be teaching?** What are the instructors' education and experience? How long have they been teaching at the school? What is the student-teacher ratio?

10. **What equipment will I be trained on?** Be sure to see the equipment. If the typewriters are manual, you should be suspicious. Also ask about the ratio of students to equipment.



11. **What is the refund policy?** Most schools offer a cooling-off period (usually three days) in which a student can reconsider and get a full refund. If it is offered, get it in writing.

12. **What about loans and financial aid?** Be sure the school explains the difference between a loan and a grant. If the school indicates you can make money for yourself by getting financial aid, walk away!

—Adapted from Bob Jenkins, "Take Care in Selecting a Voc-Tech," *The Word on Business* (St. Louis, January 1994)

Have students respond in writing. Encourage whole-class discussion. *They may respond: Attending school, studying, and doing homework are ways of investing in human capital. The opportunity costs for this investment include giving up some leisure time or some income from an after-school job.*

Further Discussion

Ask students to read **For More...** on this page and to answer the questions in writing. Encourage them to share their ideas.

Economic Puzzle Challenge, Part 1

Before swiping the barcode to continue, ask students to read the four paragraphs that introduce **Economic Puzzle Challenge, Part 1**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 1

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

What can Hector expect to gain by getting additional training?

Assist students in analyzing each of the possible responses. Then swipe barcodes for the options you wish to view.

A. The new job

Analysis: No. Training and education do not guarantee a job. Many workers may have the same level of training and education. The ability to find a job is a function of market conditions, the worker's level of ability, level of experience, and investment in human capital. This option is incorrect.

For More...

When you answered the preceding questions, did you include any steps you have taken to improve your health and physical fitness? Caring for your health is an important investment in your human capital. Answer the following questions, then share your thoughts with the class.

- What are you doing to take care of your health and fitness?

- What could you do differently to improve your health now and in the future?

Economic Puzzle Challenge, Part 1

An article in the July 3, 1995, issue of *Time* magazine related the story of William Robinson, a man working 80 hours a week for a total income of less than $20,000 a year. Robinson laments, "If I could do it all again, I would go to college, become a doctor. Just at the time, I didn't feel like going."

Of all career choices, medical school probably requires the greatest commitment of time and money. For this choice, the opportunity cost is tremendous. What Mr. Robinson may be saying is that he didn't feel like entering into eight years of intense studying. To do so would have meant giving up other educational opportunities, the income from other employment, and a great deal of leisure time. He was faced with many alternatives among careers. He weighed his alternatives based on the things that were important to him at the time and then made his choice, giving up his next-best alternative.

Mr. Robinson made his choice based on his opportunity cost. At the time, he did not consider the advantages of becoming a doctor to be

worth the opportunity cost. Most career decisions are less costly, but each requires careful thought.

In the first part of the Puzzle Challenge you will see another person—Hector—facing an important career choice. Hector knows he must consider his opportunity cost in his investment decision.

The pay's better; the working conditions are better; and the hours are better. No wonder Evelyn likes being a technician.

Decision Time

The following question appears on the screen.

> What can Hector expect to gain by getting additional training?

Use the lines below or a separate sheet of paper to mark your choice and to explain your answer. Then watch the video to see the result of your decision.

☐ A. The new job

_____

_____

_____

☐ B. Greater lifetime earnings

_____

_____

_____

☐ C. Easier work at higher wages

_____

_____

_____

B. Greater lifetime earnings

Analysis: Yes. Statistics indicate a direct relationship between educational attainment and lifetime earnings. This option is correct. (This option will play directly into **Economic Puzzle Challenge, Part 2.**)

C. Easier work at higher wages

Analysis: No. Skilled work may be less physical, but it is not generally considered "easier." In general, wage rates reflect job conditions. Jobs that require skilled labor or that involve greater levels of responsibility are compensated more highly. This option is incorrect.

Further Discussion

Ask students to read **For More...** beginning on this page. Emphasize the future stream of benefits that can be acquired through education.

For More...

How long do you expect to work? You will graduate from high school when you're about 18 years old, and you'll retire somewhere around the age of 65 or 70. You'll work approximately 50 years—that's 600

Everyone's a Consultant

In a work-to-70 culture, those who hope to stay ahead are going to have to readjust their mental career clocks. Workers instinctively think of their 30s and 40s as a time to build their careers.... Then, often, they slip into cruise mode for the rest of their careers.

What is the No. 1 rule for employment longevity in the 21st century? Now that companies think "task" instead of "job," everyone is a consultant and must think like one. Who will be chosen for these tasks? Persons who have up-to-date skills, are willing to move laterally, and have broadened their skills with training.

—Adapted from "Stop Working? Not Boomers," *U.S. News & World Report* (June 12, 1995)

months! Why convert the years into months? Because statistically your monthly income after attending a vocational school or completing a college program will be nearly double the monthly income you would receive if you didn't finish high school. In other words, your lifetime earnings may double for a three- to four-year investment in further education. It's almost like winning the lottery!

Here's more to think about. There is a 20 percent likelihood that you will earn below the poverty level if you don't get your high school diploma. Compare this with the two percent chance that a college graduate will live in poverty.

Whether you go on to college, continue your education in technical school, or go to work after you graduate from high school, each level of education that you achieve will give you more financial stability.

Economic Puzzle Challenge, Part 2

Option B of **Economic Puzzle Challenge, Part 1** played through the introduction to **Part 2**. If you wish to review the introductory part of the video, swipe the following barcode.

Economic Puzzle Challenge, Part 2

Economic Puzzle Challenge, Part 2

Decision Time

Young adults entering the work force are often impatient. In the same article featuring William Robinson, *Time* magazine reported

"But don't get too excited. I didn't get the job yet, you know.... Taking the training doesn't guarantee anything."

on Bev Schroeder, a counselor at the Indianapolis branch of Training, Inc. She meets with people who hope to sharpen their work skills.

"When I do presentations," she says, "I'm struck by the number of people who ask, 'How much will I make in the end?' I talk about process. They say, 'I can't take $7.50 an hour. I need at least $30,000 a year.' I say, 'What do you have now?'"

It's important to realize that, for most people, it takes a lot of hard work to acquire the good things in life. You can't count on winning the lottery. People who are successful in their work are those who have accepted the risks and opportunity costs associated with investing in their human capital. They recognize that education and training are part of a process that requires patience and diligence.

And every investment involves some risk. It's possible that you won't get your dream job. It's possible that you won't earn a six-figure salary. But if you take the risk of investing in your human capital, you are likely to do better in your career than if you refuse to make the investment.

The video challenges you with this question:

> What about the risks associated with Hector's decision to invest in human capital?

Use the following lines or a separate sheet of paper to mark your choice and to explain your answer. Then watch the video to see the results.

☐ A. There aren't any.

_____

_____

_____

☐ B. Workers experience the risks.

_____

_____

_____

☐ C. Employers undertake the risk.

_____

_____

_____

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

What about the risks associated with Hector's decision to invest in human capital?

Ask students to read **Decision Time**, and assist them in analyzing each of the possible responses. Then swipe barcodes for the options you wish to view.

A. There aren't any.

Analysis: No. Every investment involves risk. Some factors associated with the labor market are beyond the control of the worker. This option is incorrect.

B. Workers experience the risks.

Analysis: Yes. Choosing an occupation and then investing in the human capital required involves risk on the part of workers. If many people are interested in the same occupation, the supply of workers will be great relative to the demand. This option is correct.

C. Employers undertake the risk.

Analysis: Yes. The demand for labor is a derived demand, which means that the demand for any input is dependent on the demand for the product in which the input is used. When the demand for a firm's product decreases, the firm may be forced to reduce costs by reducing its labor force. Thus, a firm that invested in employees' human capital might lose its investment. This could also happen if an employee that the firm had trained decided to quit his job and work for another company. Because employers face some risks when they invest in human capital, this option is also correct. (This option will play directly into **Economic Puzzle Challenge, Part 3**.)

Further Discussion

Encourage students to read **For More...** on this page. You may wish to ask them to discuss ways to increase their marketability in the labor force.

For More...

Yes! You've finally graduated. Now you can go out and earn some real money. As you apply for jobs, what can you say about yourself? What will persuade an employer to give your application a second look?

Many employers are willing to provide on-the-job training—but you have to show that you're trainable. They don't want to risk the time and money involved in training sessions unless they are reasonably sure an employee will be successful. It sounds incredible, but there are some high school graduates who can't read or write well enough to perform common, everyday tasks—they are "functionally illiterate." Employers encounter such people all the time.

Some firms require a job candidate to fill out the application in the presence of an interviewer. They want to be sure that the applicant doesn't have someone else complete the form. Sometimes employers receive so many applications that they base their judgment on an applicant's handwriting, spelling, and grammar. If they can't read the application, or if the applicant can't write a complete sentence, the application gets tossed.

Given this situation, what can you do to edge out the competition? Here are a few tips:

- **Get Armed**—Job applications are pretty much the same. Prepare a sample application and a list of your skills and interests. Be sure to have a list of personal and professional references, including addresses and phone numbers. Place all of this information in a file, and take it with you when you apply for a job.
- **Get Informed**—Research the business in which you are interested. If you are submitting a résumé, include in your cover letter some special information to show that you already are familiar with the company and its policies. For instance, if the company is involved in employee empowerment or total quality management (TQM), and if you hold similar philosophies, mention your dedication to these business practices.
- **Get Affiliated**—Is there a trade or professional organization in your chosen field? Get involved. These are valuable contacts.
- **Get Experienced**—No one starts at the top. Don't refuse to do menial tasks. To get a foot inside the door, be willing to serve as an intern or take a temporary position. These can be stepping-stones to a regular job.
- **Get Prepared**—Before you leave the house for your job interview, ask your mom or dad or some other adult how you look.

Risk Takers

"How can you hesitate? Risk! Risk anything! Care no more for the opinion of others, for those voices. Do the hardest thing on earth for you. Act for yourself. Face the truth."

—Katherine Mansfield, English (New Zealand-born) writer

"People who don't take risks generally make about two big mistakes a year. People who do take risks generally make about two big mistakes a year."

—Peter Drucker, American management consultant

"A ship in port is safe, but that is not what ships are built for."

—Benazir Bhutto, prime minister of Pakistan

The acceptable styles among your friends may not be suitable for a professional interview. Keep in mind that the person interviewing you is probably the same age as your parents. Carry your résumé in a folder or envelope. Have several people proofread it to be sure it contains no spelling or grammatical errors.

Economic Puzzle Challenge, Part 3

Decision Time

"What I do know is what I want: more opportunities. So, whatever happens, whether I get this particular technician's job or not, I think the training will be good for me."

Hector is eager to move into the technician's position. But what if he had chosen not to go into the training? He would still have his job selling CDs, which provided him not only extra money but also an employee discount. As things stand now, he's given up his second job, and he has no guarantee that he will be selected for the technician's position. The video asks:

Why do people change jobs?

Mark your choice and explain your reasons on the following lines or another piece of paper. Then watch the video to see what happens as a result.

☐ A. For voluntary reasons

_____

_____

_____

☐ B. For involuntary reasons

_____

_____

_____

Economic Puzzle Challenge, Part 3

Option C of **Economic Puzzle Challenge, Part 2** played through the introduction to **Part 3**. If you wish to review the introductory part of the video, swipe the following barcode.

Economic Puzzle Challenge, Part 3

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

Why do people change jobs?

Ask students to read **Decision Time**. Allow students to brainstorm responses, and then have them answer in writing. Swipe the barcode for either option you wish to view.

A. For voluntary reasons

Analysis: Yes. Voluntary changes in jobs are generally viewed as positive events in the economy. Voluntary changes result when workers feel they possess a higher level of skills than is demanded in the job. Labor resources then gravitate to the areas in which they are most productive. This is a correct response.

B. For involuntary reasons

Analysis: Yes. Changes in market conditions can bring about changes in the level of employment. When demand for goods and services is down, layoffs (either permanent or temporary) can occur. Workers may also lose their jobs if the product they produce becomes obsolete or if technological advances have rendered their skills obsolete. This answer is also correct.

Further Discussion

Ask students to read **For More...** on this page and to discuss whether investing in human capital provides greater job security in the work force.

For More...

What is the "Market Expectation" for communication-equipment mechanics, according to the *Occupational Outlook Handbook*? Actually, the outlook is rather grim—a sharp decline in employment is likely through 2005.

In recent years the telephone industry has virtually reinvented itself. The old electromechanical system of handling calls has been replaced by a completely electronic one. Fewer workers are needed for maintenance and repair because the new digital systems are more reliable and have self-diagnostic features, which detect the causes of problems and direct technicians to the defective parts. It's less expensive to replace these parts than to repair them.

Will Hector have more job security now that he has received additional training? Discuss this point with your classmates.

ECONOMIC PUZZLE CHALLENGE, PART 4

Before swiping the barcode to continue, have students read the introductory paragraphs to **Economic Puzzle Challenge, Part 4**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 4

ECONOMIC PUZZLE CHALLENGE, PART 4

It pays to be prepared. Most of your success will depend on hard work, training, and persistence. You might as well apply these qualities right from the start, as you look for your first full-time job.

Make finding that job a full-time occupation. Tell everyone you know that you are looking. Respond quickly to job leads. Follow up every application with a phone call and every interview with a

"Angela? No, she didn't get the job either. But listen to this—we both got calls from the training center in Florida, and we've both been offered jobs as technicians there!"

thank-you letter. Sometimes it takes a little luck to land a job: Good positions may open up for a variety of reasons, such as unexpected resignations or business expansions. If you happen to be in the right place at the right time—and if you have the right stuff—you could fall right into a great job. So don't get discouraged and give up your job hunt. Be persistent—it's a quality that employers admire.

What is your idea of a great job? How important do you think it is to be highly paid? Maybe you're looking for a job that would allow you to travel. Or perhaps your ideal job would be in a field that provides certain social benefits.

Talk This Over

A series of screens will present the following questions. Discuss the questions on each screen with your classmates, and write your conclusions on the lines provided or on a separate sheet of paper.

What can you expect to earn in your career of choice?

How are the positive or negative aspects of that career reflected in the expected salary?

_____

_____

_____

_____

What are some risks you face in achieving your career of choice?

Are they supply-side or demand-side risks?

_____

_____

_____

_____

What are some specific ways of maximizing your employment opportunities and increasing job mobility?

_____

_____

_____

_____

Video-based Questions

The video will pause on a screen with the following questions (which also appear in the *Student Guide*).

What can you expect to earn in your career of choice?

How are the positive or negative aspects of that career reflected in the expected salary?

Ask students to share their thoughts as a class. Then have them express their individual views in writing.

Swipe the following barcode for a second pair of questions (which also appear in the *Student Guide*):

What are some risks you face in achieving your career of choice?

Are they supply-side or demand-side risks?

Encourage students to respond in writing.

Swipe the following barcode for a final question (which also appears in the *Student Guide*).

What are some specific ways of maximizing your employment opportunities and increasing job mobility?

Encourage whole-class discussion of this question. Then have students express their conclusions in writing.

Side 11 Menu

Quit Instructions

CLOSING

Ask students to read **Put it Together** and to respond in writing to the activity outlined in the section.

PUT IT TOGETHER

THE United States economy is one huge marketplace. And the market in which labor is exchanged is one of the biggest in the world. With advances in technology and investment in capital resources, new occupations are appearing all the time. The job you will hold 20 years from now might not even exist today.

The size of the salary you can expect to receive depends on many conditions in the market. For example, occupations that offer pleasant working conditions will attract workers, as will jobs that offer high levels of compensation and excellent benefits. If the supply of workers who are attracted to these jobs increases but businesses' demand for employees holds constant, the wage rate will decrease. However, though the wage rate is extremely important, it is only one aspect of a job. In any occupation, it is important to look at the total package.

The demand side of the labor market is based on the activity of businesses. If a business is experiencing an increase in the demand for its product, it will probably look for more workers to increase output. On the other hand, if a technological breakthrough enables the present labor force to become more productive, there may be no change in the demand for labor—or demand may even decrease. When there is an increase in demand but the supply remains constant, wage rates increase. When there is a decrease in demand but the supply remains constant, wage rates fall.

> ***"If you prepare yourself at every point as well as you can, with whatever means you have, however meager they may seem, you will be able to grasp opportunity for broader experience when it appears. Without preparation you cannot do it."***
>
> **—Eleanor Roosevelt, American writer and United Nations delegate**

Why may the wage rates for forest rangers, scuba divers, ski instructors, or pie tasters be low relative to other occupations? Answer this question on the following lines or on a separate sheet of paper. Then share your ideas with your classmates.

Students should respond in words to this effect: These are all occupations with attractive benefits. They are regarded as having pleasant working conditions or as being exciting. These benefits can be considered a type of compensation.

*When a firm buys new computers that enable employees to work more efficiently, it is making an investment in physical **and** human capital.*

NET GAIN

THE work force is a competitive place, and the more you invest in your human capital, the more opportunities you will have to advance in your career. Remember these key points. They can help you stay a step ahead of your competition.

1. **Workers, businesses, and governments invest in education, training, and health care.** One reason they do this is to increase their productivity and incomes. Productivity! Walk through any plant—you'll see productivity charts all over the place. Productivity is a universal gauge for measuring improvements in companies. Firms want employees who can learn through on-the-job training. Many firms offer training classes and tuition reimbursement. Some even install workout rooms, pay for their employees' health club memberships, sponsor "stop-smoking" and Weight Watchers groups, and pay for alcohol and drug treatment. Their goal is to increase productivity by building a well-trained and physically fit work force. If you can enter the work force with strong reading, writing, math, and computer skills, you will have a leg up on the competition. Companies are willing to invest in people who show initiative. And remember—your productivity will have an effect on your income.

2. **Although investment in capital resources and human capital can increase productivity, such investments have significant**

SUMMARY

Have students read **Net Gain**. Review the four content statements, and encourage students to provide real examples for each one.

opportunity costs and economic risks. Devoting your time, effort, and money to building your human capital can be a painful experience. You may have to forego income or sacrifice your leisure time. But look at it this way: Time is going to pass anyway. In five years, you could be five years older and well-trained or just five years older. If you happen to be well-trained, you will be more productive in the labor force—and that translates into bigger bucks and better opportunities.

> ***"Doing the best at this moment puts you in the best place for the next moment."***
>
> **—Oprah Winfrey, American talk-show host and actress**

3. **Workers change jobs for voluntary and involuntary reasons.** As you build your skills, you create all sorts of opportunities. Like Hector and Evelyn in the video, you will find that additional training positions you to move on to bigger and better things. Changing jobs voluntarily is good for you and good for the economy. Voluntary movement means that workers are applying their human capital in the most efficient manner. The down side is that some job changes are not voluntary. Companies have streamlined their work forces to keep costs as low as possible. You can better secure your position by developing your skills and by working hard.

4. **Workers invest in human capital to enhance job mobility.** How many people do you know who started their careers doing something different from what they're doing now? The skills you acquire can be applied in many ways. For instance, some of the same skills that make a good teacher also make a good salesperson. Someone who is skilled in giving instruction would certainly be thoroughly able to explain the benefits of a product to a potential buyer. Take advantage of the opportunities that come your way. Every bit of training and education you acquire allows you more choices.

EXTENSION

Assign one or more of the activities in **Building on Success**. Encourage students to apply the concepts they have learned in this lesson and to refer to the **Econcepts** (page 53) whenever necessary.

BUILDING ON SUCCESS

▶ THINK about the opportunities available to you because of the skills you have acquired. If you can read this, you've acquired an essential skill. Far fewer opportunities would be available if you

couldn't read. Many of the skills you acquire can be transferred from job to job and from firm to firm.

Look through the employment ads in a newspaper, and circle the jobs calling for basic computer skills. Then place an "X" through those that call for knowledge of specific applications, such as word processing or spreadsheets. Write an essay describing how knowledge of basic computer operations and specific applications can enhance your job mobility. Be prepared to share your work with the class.

▶ Occupations that offer pleasant working conditions, prestige, or other nonmonetary benefits generally offer lower wages relative to other positions. But this isn't always the case.

Can you think of anything more enjoyable than playing baseball for a living? Prepare a talk explaining why you think Major League baseball players receive such big salaries. Be prepared to deliver your talk in class.

▶ Obtain the salary schedule for teachers in your school district. In many districts, the pay that teachers receive depends on the level of higher education they attained and the number of years they have taught. In the mid-1990s, the average monthly compensation for a worker with a bachelor's degree was $2,489, and the average monthly compensation for a worker with a master's was $3,211. Note how your school district's salary schedule compares with these averages. Arrange an interview with one of your teachers or administrators, and ask that person to explain any differences between your district's salary schedule and the national averages. Write a report, and be prepared to present your findings to the class.

QUALITY CONTROL

On Your Own

As in every other market, the price of labor and the quantity of labor exchanged are determined by events in the marketplace. Based on the following events, use supply-and-demand analysis to depict changes in the wage rate. Circle the appropriate changes in wage rate and in the quantity of labor exchanged—or write your answers on another sheet of paper.

1. For 20 years, Sara has worked for Ajax Industries, producers of Soft Skin hand cream. In her position as a box assembler, she

ASSESSMENT

Two types of assessment are provided for you to evaluate students' comprehension and mastery of the material presented in this lesson.

On Your Own

The first assessment section contains four scenarios. Students have an opportunity to demonstrate their knowledge of the labor market through supply-and-demand analysis. They should indicate how wage rate and quantity of labor exchanged would be affected by the development in each scenario. Though this section is intended as a homework assignment, you may wish to have students complete part or all of it in class.

stands at the end of a filler line constructing boxes for the packers. Ajax has decided to modernize the plant, incorporating a newly developed machine that folds, tapes, and packs boxes. The firm can now supply more hand cream to the market. The increased supply will drive down the price of hand cream, and marginal revenue product will fall. Given the development of this machine, what do you think will happen in the market for box assemblers?

Answers:

- The demand for labor will

1. decrease

increase decrease not change

- The supply of labor will

not change

increase decrease not change

- The wage rate will

decrease

increase decrease not change

- The quantity exchanged will

decrease

increase decrease not change

2. Many people have called for reductions in the price of health care. In response, some companies have established health plans that limit employees' choices of doctors they may use. In other words, if an employee's regular doctor is not among those participating in the company's plan, the employee must make a choice. He can either switch to a doctor within the plan or stay with his usual doctor and pay the fee. To lighten their load, doctors within the plan hire physician's assistants. How might the development of these managed-care health plans affect the market for doctors?

- The demand for labor will

2. decrease

increase decrease not change

- The supply of labor will

not change

increase decrease not change

- The wage rate will

decrease

increase decrease not change

- The quantity exchanged will

decrease

increase decrease not change

3. Historically, teachers have had the summer months off, as well as extended Christmas holidays. Recently there has been a move toward holding school year-round, with only periodic one- or two-week breaks. How might this affect the market for teachers?

   - The demand for labor will

     increase decrease not change **3.** *not change*

   - The supply of labor will

     increase decrease not change *decrease*

   - The wage rate will

     increase decrease not change *increase*

   - The quantity exchanged will

     increase decrease not change *decrease*

4. During the past 50 years, the standard of living in the United States has increased dramatically. Generally, as the standard of living increases and people's basic wants are met, they turn their attention to other "quality of life" issues. Some people have become concerned with the quality of air and water. They worry about how pollutants may affect their health and well-being. How might an increase in the standard of living affect the market for environmental engineers?

   - The demand for labor will

     increase decrease not change **4.** *increase*

   - The supply of labor will

     increase decrease not change *not change*

   - The wage rate will

     increase decrease not change *increase*

   - The quantity exchanged will

     increase decrease not change *increase*

Assessment-Track Questions

Besides appearing in the *Student Guide*, the questions under the heading **In Class** are contained on a special assessment track of the videodisc for this module. Using the appropriate disc side, you can access each question by swiping its barcode. Each question is presented as a voice-over to part of a video program that students previously watched. The video will provide students with valuable cues, enabling them to generalize previously learned material to new situations.

Assessment Question 1

1. *All investments are flows of expenditures devoted to projects for producing output that is not intended for immediate consumption. This is true of both physical and human capital. Factories and office computers may be costly today, but they allow a firm to produce output that will be sold in the future. Likewise, education requires time, energy, tuition, and foregone income and consumption for a person to achieve the skills necessary to earn future income.*

Assessment Question 2

2. *The basic reason for investing in human capital is to increase productivity and potential earnings. As with investments in physical capital, investments in human capital raise the productivity of labor and cause wages, expected annual incomes, standards of living, and wealth to rise. A more qualified labor force will increase productivity and create wealth for individuals as well as for society as a whole.*

In Class

These questions should be answered while you watch a special section of the videodisc that your teacher will play for you. Write your answers on the lines provided or on a separate piece of paper.

1. Office buildings, factories, and office computers are all investments in physical capital. Like these, education is also considered an investment. Why is the creation of human capital an investment?

2. Schooling, work-related training, and experience are ways to acquire human capital. What are the incentives to invest in human capital?

3. Markets may allocate resources in an efficient manner, but a society is also concerned with matters of equity. What are some equity concerns a society may have?

Assessment Question 3

3. *Society is often concerned with poverty and other matters of equity. A market-determined distribution of income encourages economic efficiency, but the resulting income distribution may be unacceptable to some people. Without some sort of income transfer, the elderly, sick, disabled, and others who do not work might not be able to survive. Income-transfer programs such as medicare, medicaid, and unemployment compensation are a few of the social insurance policies that the U.S. uses to address issues of equity.*

4. Successful economies strive to increase their overall wealth. How can a society's increased wealth be used to address the equity concerns that it may have?

Assessment Question 4

4. *Wealthy countries are better able to afford the opportunity cost of transfer programs. Such programs shift income from people who earned it to those who did not. This represents a trade-off between economic efficiency and equality of income—that is, greater equality of income among citizens is achieved by accepting a lower level of overall output. A country "pays" for antipoverty programs and social services because the resources used to support them have an opportunity cost of foregone output. Countries with successful economies are better able to forego that output.*

SIDE 12
GRAPHICAL DATABASE BARCODES

(Use "step still" function or barcodes below to advance within categories.)

Step Back

Step Forward

Elasticity

Role of Profits

Product Markets

Consumer Behavior Theory

Production Theory

Foreign Exchange Markets

Human Resource Market

Nonhuman Resource Market

Aggregate Supply & Demand

Loanable Funds Market

SIDE 12
TEACHER-TRACK BARCODES

Economic Productivity

A Key to Comprehension

The Fairness of Capitalism

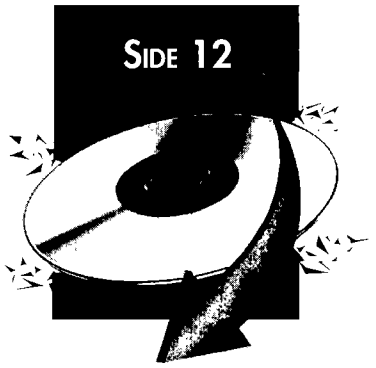
Economic Goals

Economic Equity

Application Activity

ECONOMICS® at Work

Module 5, Lesson D



INVASION OF THE ROBOTS

ECON BRIEFING

MOM's out of town on business. Dad's working late. Your brother Marcus has football practice until eight o'clock. You're on your own tonight.

No big deal. Check the messages on the telephone answering machine; pop a frozen dinner in the microwave; speed-dial your pal Jason on the cellular phone to get some help for tomorrow's quiz; surf the channels with your remote to see the latest videos; jam a load of dirty clothes into the washer. Then sit down at the computer and finish the paper you've been putting off all week. If only technology could advance a little further and write the paper for you!

Automation has made many jobs easier, faster, safer, and more efficient. That sounds good—everybody wants less work and more leisure time. But is it fair to the worker who finds herself unemployed because of new machines in the office? And how does new technology affect the construction worker who loses his job because electric drills, high-speed staplers, and rechargeable screwdrivers enable one worker to do the work that it used to take two persons to do?

This lesson will help you understand how machines increase the productivity of workers and firms. It will demonstrate how workers are affected by automation and how the government seeks to assist people who lose their jobs because of new technology. You will also find out that fairness in the workplace applies to business owners as well as employees.

WHAT YOU'LL LEARN IN THIS LESSON

- Productivity is measured in terms of outputs and inputs.
- Productivity can be increased by improving human capital and by developing better capital resources.
- Economic incentives encourage businesses to invest in new technology.

1 CLASS PERIOD

Materials

This lesson uses the videodisc (or videotape) program **Invasion of the Robots.** To complete the activities, students may use the following items: calculators; samples of paycheck stubs (showing FICA and tax withholding); a copy of the *Statistical Abstract of the United States;* graph paper; colored pencils, pens, or markers; and print or CD-ROM encyclopedias. Copies of current newspapers and magazines would be helpful to students as they learn about technology in the workplace.

INTRODUCTION

This lesson introduces students to the idea that businesses can increase productivity by investing in new technology and by improving the human capital of their workers. The concept of opportunity cost is applied: If one worker operating a machine can be as productive as two workers operating that machine, then the choice is one worker and one machine; the alternative (two workers and one machine) is the opportunity cost; one worker will be laid off. Students learn that technology can also benefit workers. As they enhance their skills, workers become more valuable in the workplace, and they are better able to find new jobs if they are displaced by automation. Students evaluate the economic efficiency and economic equity of governmental transfer programs.

In **Put It Together** students are introduced to production possibilities, and in **Building on Success** they are asked to differentiate between the national debt and the federal budget deficit.

Goals

Students will be able to demonstrate that they understand how productivity is increased through the decisions of workers, businesses, and governments. They will be able to show that they grasp the ideas that (1) automation may displace workers, but (2) as workers learn technological skills, they become more valuable and better able to find employment in an increasingly high-tech workplace.

Students will also show that they understand governmental programs that assist displaced workers. They will be able to evaluate education and training programs and to demonstrate knowledge of governmental programs that transfer funds from income earners to persons whose income has been interrupted because they have lost their jobs.

Objectives

Upon completing this lesson, students will be able to:

- define productivity
- explain how productivity is increased
- explain what motivates businesses to invest in new technology
- differentiate between gross earnings and net earnings
- calculate net earnings, given a paycheck stub
- explain how automation can result in the loss of jobs
- draw and analyze a "production-possibilities curve"
- describe how governments provide for workers who lose jobs because of automation
- New technology and equipment can result in the loss of jobs.
- Governments seek to assist workers who have lost jobs because of automation.

Payback

Robots in factories can perform boring, repetitive tasks 24 hours a day without stopping for a coffee break. They don't get sick. They don't oversleep and show up late for work. They perform some tasks more efficiently than humans do. But that doesn't mean they can do everything.

As new technology on the job replaces human workers, those workers are able to use their special skills and knowledge to do other things—for example, they can invent better equipment, create clever advertising jingles, or solve complicated problems. Robots and computers actually free workers to become more skilled and highly trained; in the end, those skilled workers will be more valuable in the labor market.

As you begin your career as an auto mechanic, a construction supervisor, a dental technician, or other skilled professional, you will learn to use and operate the latest equipment. The skills you master will increase your productivity and open up even more opportunities for you in the future.

Who benefits from automation? Firms benefit when they produce goods at lower cost and make more profit, and consumers benefit when they buy innovative new products at lower prices. But some workers lose their jobs to automated technology.

Econcepts

economic efficiency—a situation that occurs when the benefits of economic action outweigh the costs

economic equity—the application of concepts of what is fair and unfair to matters of economic policy

input—resources used to produce goods and services

output—goods and services that are produced and provided to the public

productivity—the amount of output produced per unit of input used

profit—the return to business that results when the value of sales exceeds the cost of the goods or services sold

POWER UP

BACK in 1820, nearly 72 percent of the population of the United States was made up of farmers. They worked hard to produce enough food for themselves and to have some left over to sell to the other 28 percent of the people. By 1991, farmers made up only 2.5 percent of the population; even so, thanks to better farming methods and equipment, they were able to produce enough crops to feed the people of the United States and millions of others all over the world.

When a farmer can produce crops with fewer workers—or when the same number of farm workers can produce a greater harvest—that's an increase in productivity. Increased productivity occurs for a number of reasons.

What Increases Productivity?

Education and training can make workers more productive. Perhaps the first time you sat down at a computer keyboard it took you a long time to write a report. But as you learned the positions of all the different keys and began to understand the computer's special functions, you were able to type faster and make fewer mistakes. Now you can generate your reports faster than ever. You have become more productive.

Machines and other capital resources can also make workers more productive. Stuffing together several different advertising circulars

- explain the difference between the national debt and the federal budget deficit
- calculate productivity per hour
- suggest how inventions result in productivity increases

Lesson Description

This lesson focuses on workers in a medical laboratory to introduce students to the idea that productivity can be increased through the introduction of new technology. The managers of the lab are faced with decisions about investing in new equipment, training workers, and laying off one technician. Angie is the technician who will lose her job as the lab seeks to maximize its profits. Students are asked to evaluate the lab's decision in terms of economic efficiency and economic equity; they are also asked to examine governmental programs that attempt to redistribute income from those who are earning income to those who have lost their jobs.

Before showing the video, encourage students to think about new technology and innovations that they have encountered at home, on the job, or in school.

Key Terms

Prepare a poster listing the **Econcepts**, or write these key terms on the chalkboard.

PREVIEW

Ask students to read **Econ Briefing**, including **What You'll Learn in This Lesson** (pages 79–80). Discuss unfamiliar terms, and invite students to respond to each of the bulleted statements by suggesting examples from their own experiences. You may wish to encourage students to look through current newspapers and magazines to find additional examples of uses for new technology. These articles could be displayed on a bulletin board for use during this lesson and beyond. Some students might be assigned to organize the collected articles, sorting them according

to the industry in which the new technology is being used.

Ask students to read **Payback** (page 80). After they finish, have them form small groups based upon their career goals. Assign each group an industry, and allow time for them to brainstorm from five to 10 innovations that have made that industry more productive. Discuss their ideas briefly.

Introduce the **Econcepts** (page 81), and give contextual examples of each. Encourage students to refer to these concepts whenever appropriate during this lesson.

Have students read **Power Up**, including the section **What Increases Productivity?** (beginning on page 81). Invite them to brainstorm opinions about job losses related to automation; then have them respond in writing.

and then inserting them in newspapers is a long, slow, tedious job. But specialized inserting machines can complete the task in a fraction of the time it would take several workers—without the hours of monotony.

An office manager knows that trained secretaries can complete more documents in a day than untrained ones. More documents mean more satisfied clients, and satisfied clients mean bigger profits.

The small-town cable-TV operator understands that customers expect fast, efficient service for their monthly fees. If he can provide faster service by having his installers use a bucket truck instead of a ladder to reach the lines, he will have more satisfied customers—and bigger profits. He won't need as many installers either, because the bucket truck allows the workers to get the job done faster.

The main goal of a business is to maximize its profits. Shareholders expect firms to make decisions that will mean more sales, better service, and higher profits. But decisions to train workers or to switch to mechanical production methods sometimes cause workers to lose their jobs. If secretaries are trained to use a new computer program, they will be able to work faster and analyze more data in less time. But then other secretaries may no longer be needed by the firm—their jobs will be eliminated.

Need a Job? Maybe Uncle Sam Can Help

On October 1, 1983, the Job Training Partnership Act (JTPA) began providing job-training and employment services for disadvantaged youths and adults, "dislocated" workers, and those facing barriers to employment. The act seeks to move as many jobless workers as possible into permanent employment. By June 30, 1993, it had provided approximately 10 million Americans with training and employment services. With a placement rate near 69 percent, the act is one of the most successful job and training efforts ever established.

One program funded by the act provides job and training assistance for dislocated workers:

- Workers who lose their jobs due to plant closings or mass layoffs
- Long-term unemployed persons with limited local opportunities for jobs in their fields
- Farmers, ranchers, and other self-employed persons who become jobless because of general economic conditions or natural disasters
- Displaced homemakers

Other programs funded by the act include the Job Corps and a summer youth program offering basic and remedial education and on-the-job training. Every year, the Job Corps enrolls approximately 100,000 persons aged 16 to 21 in residential job-training centers throughout the United States.

—Employment and Training Administration, U.S. Department of Labor

What happens to the ad-insert stuffers, the secretaries, and the installers who are no longer needed when new machines appear on the scene? How does modern society deal with displaced workers?

With your classmates, brainstorm ideas about what happens to workers who lose their jobs because of automation. Write the ideas on the lines provided here or on another sheet of paper.

> ***"History teaches us...that, by and large, workers displaced by technological advance have moved rapidly into other employment, ultimately to better-paying jobs. This is why we have had rising personal incomes rather than mass unemployment as new technology has come into use and productivity has increased."***
>
> **—Henry Ford II, American automobile executive**

Where Have All the Workers Gone?

Some workers who are displaced by machines will find work in other productive areas; the cable installer may use his special skills to become a construction worker, or he may choose to acquire additional skills, thereby improving his human capital.

Human capital includes the skill and the knowledge you develop in school, on the job, and through everyday life experiences. The skills you learn on one job can help you as you seek another one. The training you receive to use new computer software in the legal profession can make you a more valuable worker in other professions as well.

But what about workers who lose their jobs and don't have enough training to move right into another one? When people lose jobs and cannot support their families, society steps in to help. Training programs and educational opportunities are available for workers to develop and improve their human capital. The training increases the likelihood that they will find jobs that require their new skills.

Society also provides **transfer programs**; these programs transfer income from those who are earning money to those who are not. Unemployment compensation, social security, and welfare are transfer programs. A portion of the salaries of those who **are** working is given to qualified persons who are **not** working.

Ask students to read **Where Have All the Workers Gone?** You may wish to have them comment on the following themes, which are introduced in this section.

- Automation leads workers to improve their human capital.
- Governments provide assistance programs for workers who lose their jobs.
- The taxes of workers become transfer payments to those who do not work.

Students' comments may be recorded and displayed. Later, students might examine their initial perceptions about efficiency and equity and compare them to their attitudes at the end of the lesson.

> ***"Sometimes a life, like a house, needs renovating.... One rebuilds because the structure deserves a renewing."***
>
> **—Doris Schwerin, American writer**

The money needed to pay for training programs and transfer programs comes from the wages of people who are working. Income-tax withholding provides funds for job training, welfare, and other programs. Social security deductions are transferred to retired persons. Employers pay employment tax, which the federal and state governments use to provide unemployment checks to people who have lost their jobs.

If you have a job, take a look at your paycheck stub. Your take-home pay is substantially less than the gross wages you earn. Some portion of your pay is withheld as taxes, and part of your salary goes to social security. Look at the sample check stub below, and then answer the questions on the lines provided or on another sheet of paper.

Employee Name: Pat Q. Worker Social Security Number: 123-45-6789

Base Pay: $681.30 Gross amount: $681.30 Net Pay: $_____

Federal Income Tax:	$138.20
FICA:	$42.24
State Tax:	$18.34
Medicare:	$9.88

1. How much of this paycheck is withheld for federal income tax? $_____

2. FICA stands for the Federal Insurance Contributions Act. Most people call it the social security deduction from their wages. How much of this paycheck goes for social security? $_____

3. The net pay is your take-home amount after all deductions for federal and state taxes and for social security and medicare have been subtracted. What is the net pay for this paycheck? $_____

Ask students to answer the three questions on this page.

Answers:

1. *$138.20*

2. *$42.24*

3. *$472.64*

VIDEO CORE

Ask students to read the introductory paragraph of **Take a Closer Look**. The first video segment points out that automation in the workplace allows businesses to increase productivity and to maximize profits. It also suggests that increased productivity sometimes results in the laying off of workers. Students should consider the issues of economic efficiency and economic equity as they follow the story about Angie and the automation that occurs in her medical lab.

TAKE A CLOSER LOOK

AUTOMATED assembly lines and mechanized blood scanners are just two of the thousands of modern devices that increase employees' productivity. Both autoworkers and medical technicians feel the effects of automation—in faster production and in loss of jobs. The measures that society takes to help people deal with changes in production are meant to provide both economic efficiency and economic equity or fairness.

What You'll See on the Screen

The first segment of "Invasion of the Robots" demonstrates how robots and other machines help to increase productivity. Workers who are trained to operate new high-tech lab equipment become more productive too. The training that workers receive makes them more valuable to their companies; it also improves their chances of getting new jobs if they lose their old ones.

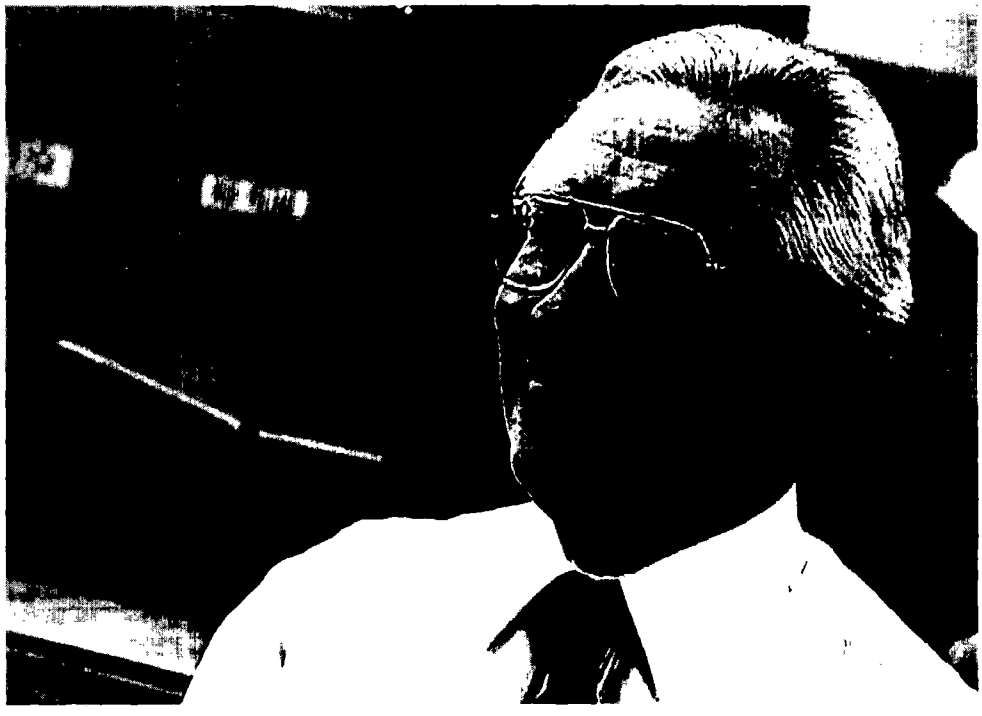
You will learn that workers sometimes lose their jobs because automation reduces the need for large work forces in some industries. You will see that as firms attempt to increase outputs and maximize profits, they must make hard decisions—decisions such as laying off workers. Firms must be sure that their decisions are good for the company. After all, if a company does not run efficiently, it will no longer be profitable, and it may go out of business. That would mean many more lost jobs.

You will also see that society makes provisions to improve human capital. Employers often provide training because they know that a skilled labor force is more productive than workers who are untrained. The government seeks to assist displaced workers through training programs and transfer programs.

In the Economic Puzzle Challenge sequence, you will examine the decisions that firms and governments make about jobs and workers. You will need to think about efficiency and fairness as you respond to the questions.

Introduction to the Video

Ask students to read **What You'll See on the Screen**. Clarify any points they do not understand.



It used to take three machinists to make a part at the Naval Air Warfare Center in Indianapolis, according to Ron Adams, professional development specialist. Now an automated system does the part in one step.

Video-based Activities

Have students read the introductory paragraph of **Talk This Over**. Urge them to think about income equality and guaranteed incomes as they watch the program. Then start the videodisc (Side 12), and swipe this barcode to play:

Invasion of the Robots (introductory segment)

The video will pause on this question (which also appears in the *Student Guide*):

How much of your earnings are you willing to let the government redistribute to reduce income inequality?

Ask students to respond in writing. When they finish writing, encourage them to share their ideas. Because students may have different perceptions of fairness, remind them that each student's opinion is valuable and that the rules of brainstorming permit any point of view to be expressed. Students should be cautioned not to criticize views expressed during brainstorming sessions.

Talk This Over

When lab technicians lose their jobs because of the introduction of new equipment, they will no longer be earning income. Is that fair? Should everyone receive guaranteed wages? What would be a fair guaranteed wage?

If everyone earned the same income, there would be little incentive for people to work hard. You might even say that there would not be much incentive to work at all. Some early settlers in the United States tried to develop a society in which everyone contributed to a central storehouse of food and other goods. What happened? Some people worked hard, while others were slackers. If the workers and slackers received the same portion of goods, where was the incentive to work?

As you watch the first part of the video, think about fairness in society. The video will pause to ask you this question:

> How much of your earnings are you willing to let the government redistribute to reduce income inequality?

Write your answer on the following lines or a separate sheet of paper, then discuss your views with your classmates.

_____

_____

_____

The Poverty Line

Who's living in poverty in the United States? This table shows how much income a single person or a family would have had to receive in recent years to rise above the official poverty line.

Persons	1988	1990	1992	1994*
1	$6,022	$6,652	$7,143	$7,551
2	$7,704	$8,509	$9,137	$9,655
3	$9,435	$10,419	$11,186	$11,817
4	$12,092	$13,359	$14,335	$15,141
5	$14,304	$15,792	$16,952	$17,896
6	$16,146	$17,839	$19,137	$20,223
7	$18,232	$20,241	$21,594	$22,966
8	$20,253	$22,582	$24,053	$25,474
9+	$24,129	$26,848	$28,745	$30,285

*Estimated

—Bureau of the Census, U.S. Department of Commerce

Another question appears on the screen:

> What social institutions do you think should address income inequality?

Express your views on the lines provided here or on a separate piece of paper, and then discuss your thoughts.

Swipe the next barcode for another question (which also appears in the *Student Guide*):

What social institutions do you think should address income inequality?

Ask students to respond in writing and to share their views.

For More...

One of the toughest problems facing society is how to deal with the difference between the rich and the poor. How much must a family earn to be considered "rich"? How little income puts you in the "poor" category. You may be surprised by the following statistics, which demonstrate that a household income of as little as $50,000 ranks among the top 27 percent in the United States. Put another way, two working adults who earn $25,000 each are nearly in the top quarter of America's income earners. This table shows annual income levels and the percentage of Americans at each level:

Under $5,000	4.6%
$5,000–$9,999	10.0%
$10,000–$14,999	9.5%
$15,000–$24,999	16.8%
$25,000–$34,999	14.8%
$35,000–$49,999	17.1%
$50,000–$74,999	16.1%
$75,000–$99,999	6.1%
$100,000+	4.9%

A household income of as little as $50,000 ranks among the top 27 percent in the United States.

Further Discussion

Ask students to read **For More...** on this page. Make sure students understand the table in this section. Encourage comments about the statistics in the table. Some students may wish to compare the quintile breakdown of income distribution in other countries. Suggest that they check with the reference librarian in a public library to help them find pertinent information.

Economic Puzzle Challenge, Part 1

Medical equipment can be extremely expensive. Machines such as an MRI (Magnetic Resonance Imaging) scanner cost more than $1 million. Yet hospitals and medical labs need to use the most current techniques in diagnosing diseases and in treating patients. When faced with decisions about investing in new equipment, medical professionals need to examine the costs and benefits of their alternatives.

As you watch the first part of the Puzzle Challenge, consider the advantages and disadvantages that a lab would face in buying the latest piece of medical equipment.

Economic Puzzle Challenge, Part 1

Before swiping the barcode to continue, ask students to read the two paragraphs that introduce **Economic Puzzle Challenge, Part 1**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 1

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

What should the medical lab do?

Assist students in analyzing each of the possible responses. Then swipe barcodes for the options you wish to view.

A. Limit the number of customers it serves

Analysis: No. The lab is considering modern equipment because its customers want faster, more efficient service. Better service means an increase in productivity. Discouraging new customers would have the opposite effect. By limiting the number of customers it serves, the lab would decrease output.

B. Invest in an automated sampling machine

Analysis: Yes. Productivity increases when output rises without an equal rise in input—or when output remains constant despite a reduction in input. If investing in new equipment produces a "least cost" way of serving its customers, the lab should make the investment, even if it means laying off a technician.

C. Hire an additional worker

Analysis: No. The lab will increase its productivity more by investing in new equipment than by hiring an additional worker. The equipment will provide fast analyses of blood samples and a computer printout of results. An additional worker would be less efficient than the machine in performing these tasks.

Decision Time

The video presents another question:

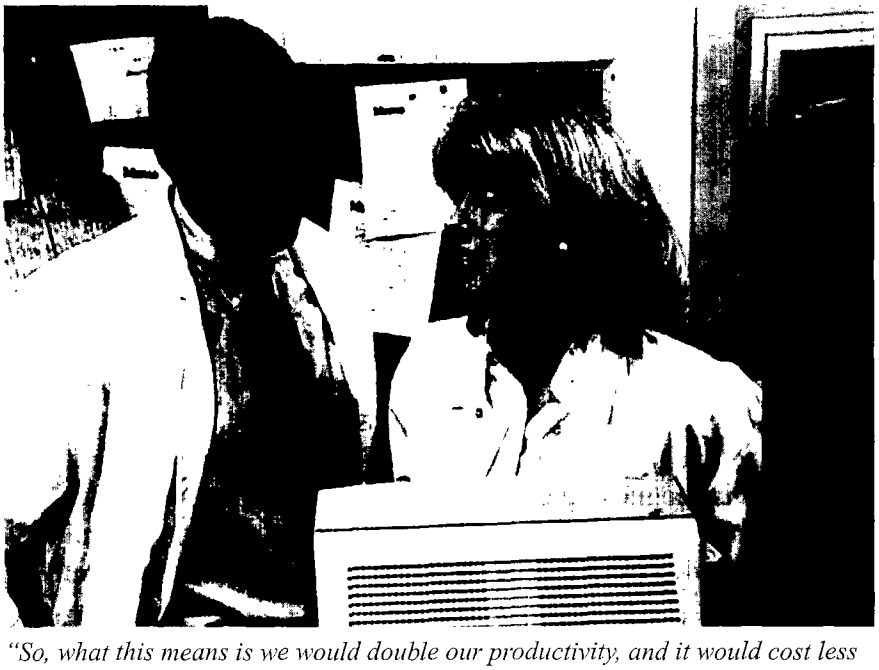
What should the medical lab do?

Use the lines provided or a separate sheet of paper to mark your choice and to explain your response. Then watch the video to see the results of your decision.

☐ A. Limit the number of customers it serves

☐ B. Invest in an automated sampling machine

☐ C. Hire an additional worker



"So, what this means is we would double our productivity, and it would cost less than half what it would cost to keep an extra technician on the payroll. We're basically eliminating the need for one of our ***current*** *technicians."*

"We couldn't keep that extra technician busy, at least not in the immediate future."

Economic Puzzle Challenge, Part 2

New technology allows firms to be more productive. Whether it's farmers who produce more corn or medical labs that analyze more blood samples, the simple fact is that productive firms serve their customers better. By being more productive, any firm can serve its customers better and earn more profits for its owners. Keep this in mind as you watch the video.

Decision Time

The video challenges you with this question:

Why is the firm motivated to purchase the new equipment?

Consider the three responses, and decide which one you think is best. Use the following lines or a separate piece of paper to indicate and explain your choice. When you're finished, watch the video to see the results of your decision.

☐ A. To produce the output more profitably

_____

_____

_____

Economic Puzzle Challenge, Part 2

Before swiping the barcode to continue, ask students to read the introductory paragraph to **Economic Puzzle Challenge, Part 2**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 2

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

Why is the firm motivated to purchase the new equipment?

Ask students to discuss the question and to choose a response. Then swipe barcodes (below and on page 90) for the options you wish to view.

A. To produce the output more profitably

Analysis: Yes. A firm's goal is to maximize profits. It can do this by increasing output and lowering prices. The use of automated equipment will result in higher productivity, and as it increases output, the firm will be able to lower its prices. As more customers respond to the incentive of lower prices, the firm's profits will increase.

B. To save costs by laying off the employee

Analysis: No. Although firms do seek to reduce costs, laying off employees is not necessarily the best way to accomplish this goal. Employees are necessary to keep the business running. Without employees, the business cannot continue to operate.

C. To maximize sales revenues

Analysis: No. Although higher revenues may seem like a good thing, firms might have to use additional input resources to reach this goal. As inputs increase, the firm's cost of production also increases. In this case, productivity has not increased; in fact, it has decreased.

☐ B. To save costs by laying off the employee

☐ C. To maximize sales revenues

"I came here straight out of school. I don't know where to begin to look for another job."

Economic Puzzle Challenge, Part 3

Before swiping the barcode to continue, ask students to read the three paragraphs that introduce **Economic Puzzle Challenge, Part 3**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 3

Economic Puzzle Challenge, Part 3

A new sorting machine eliminates the need for three workers at the local post office.... The latest computerized cash register can keep track of every nail and washer sold at the Super Hardware Mart.... Workers who used to sort mail and keep track of inventory are no longer needed. Is it fair that they lose their jobs?

Fairness is a big issue. But just as price increases and interest rates affect different people differently, decisions to eliminate workers have different consequences for workers, customers, and manage-

ment. If a certain bagel shop owner invests in better ovens and stoves, she won't need 10 employees. But if she feels sorry for her workers and does not lay off any of them, they won't have much to do at the bagel shop. The owner will be paying them to stand around. That's not productive. If the business is not productive, it will lose money. If it loses too much money, it might have to fold up. Then all 10 bagel makers would lose their jobs.

Business owners must make decisions based upon an analysis of costs and benefits to their customers, their workers, and themselves. Think about this as you watch the next part of the Puzzle Challenge.

Decision Time

The video poses another question for you:

> Is the firm's decision to automate "fair" to all of the people affected?

Consider the firm's costs and benefits as you discuss the two options with your classmates. Make your decision, and then write your response below or on another sheet of paper. Be sure to explain your answer. Then watch the video to see how its conclusions compare with yours.

☐ A. Yes. Fairness issues are considered in this decision.

_____

_____

_____

☐ B. No. Fairness issues are not considered when laying off workers.

_____

_____

_____

Other Voices, Other Views

"America's technology has turned in upon itself; its corporate form makes it the servant of profits, not the servant of human needs."

—Alice Embree, American political activist

"We believe that if men have the talent to invent new machines that put men out of work, they have the talent to put those men back to work."

—John F. Kennedy, 35th president of the United States

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

Is the firm's decision to automate "fair" to all of the people affected?

Ask students to read **Decision Time**. Remind them that unproductive firms will go out of business and all employees will lose their jobs. Have them choose an option and respond in writing. When they finish writing, swipe the barcode of either option you wish to view.

A. Yes. Fairness issues are considered in this decision.

Analysis: When a firm considers its choices, it must consider consequences to the whole firm, not just to the employees who may be laid off. As the firm serves its customers better, it becomes more productive and more profitable. Its remaining employees will also benefit from the firm's increased profitability. (This option, as well as option B, will play directly into **Economic Puzzle Challenge, Part 4**.)

B. No. Fairness issues are not considered when laying off workers.

Analysis: If a firm could not lay off employees when necessary, its costs might rise so much that it would be forced out of business. If it shut down, ***all*** *the workers would lose their positions. While the loss of a job presents a hardship for a worker and his or her family, the firm must consider the consequences to all its workers, to its owners, and to its customers.* (This option, as well as option A, will play directly into **Economic Puzzle Challenge, Part 4**.)

Further Discussion

Ask students to read **For More...** on this page and to think about the choices and opportunity costs involved in making decisions about the allocation of tax revenues. You may wish to have students find newspaper and magazine articles related to the uses of tax dollars. Remind them that people often disagree about how taxes should be spent.

For More...

Skilled workers will always be needed, whether to operate machines or to create new inventions. As they become trained to run computer programs, electronic troubleshooting equipment, or other advanced devices, workers increase their value in the job market.

When Angie learns to use the hematology analyzer, she will become a more valuable worker. Her new skills will also make it easier for her to find a job in another lab. If Angie doesn't find a job right away, she may be eligible for assistance from the government in the form of unemployment compensation. Or she might enroll in a government-sponsored training program where she can learn more about high-tech medical equipment. The taxes that workers pay are used to support such programs for people who do not have jobs.

> ***"The point to remember is that what the government gives it must first take away."***
>
> **—John S. Coleman, American businessman**

But it's not easy to make decisions about how to spend tax money. Should your tax dollars be used to fund local welfare programs or to send rockets into outer space? Should the government train workers or try to reduce the budget deficit? Should unemployment benefits be increased, or should schools receive more money? Every decision involves an opportunity cost.

Economic Puzzle Challenge, Part 4

Both options A and B of **Economic Puzzle Challenge, Part 3** played through the introduction to **Part 4**. If you wish to review this introductory part of the video, swipe the following barcode.

Economic Puzzle Challenge, Part 4

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

What products made by automation do you consume?

Ask students to read the first two paragraphs of **Talk This Over**. Allow time for them to discuss their ideas, and then have them respond in writing.

Economic Puzzle Challenge, Part 4

Talk This Over

Often firms such as medical labs must invest in new technology in order to remain competitive. If your neighborhood bank did not invest in ATMs or drive-up windows—if it offered only inside banking to its customers—it would lose a lot of business to other banks that provide more convenient services. Before long, the bank might lose too many customers and go out of business. In that case, its decision not to invest in the latest technology would mean that all the workers who were employed by the bank would be without jobs.

Other banks probably laid off some workers when they switched to automated banking services. Sometimes a piece of bad news, such as getting a pink slip, can be turned into a good opportunity. The workers who lost their positions were free to pursue other kinds of work. They could use their skills to do more productive things.

Consider your own use of ATMs and other innovative machines as you respond to this video question:

What products made by automation do you consume?

Brainstorm ideas with your class, and write the best ones on the lines below or on your other sheet of paper.

"If a firm does not consider using available technology, it risks losing business to competitors, or even going out of business altogether."

Governmental assistance programs are supported by tax dollars. Because tax dollars are limited, any choice about how to spend them involves an opportunity cost. Think about the different ways that tax dollars can be spent as you consider this final video question:

> How might the government's equity programs [such as medicaid and Aid to Families with Dependent Children] be affected by policies aimed at reducing the national debt?

After discussing your ideas with your classmates, write a response on the lines below or on your other paper.

Swipe the next barcode for a final on-screen question:

How might the government's equity programs [such as medicaid and Aid to Families with Dependent Children] be affected by policies aimed at reducing the national debt?

Remind students that every choice has an opportunity cost. Choosing to reduce the debt will mean that less money will be available for equity programs. Encourage a brief discussion, and then have students express their conclusions in writing. Inform them that they will revisit the idea of the national debt and the federal deficit in **Building on Success** (page 97).

Side 12 Menu

Quit Instructions

Higher Tech = Higher Sales

A RECENT study by Erik Brynjolfsson of the Massachusetts Institute of Technology's Sloan School of Management suggests that customers have indeed bought more from those firms that had invested more in the technology needed to churn out a greater variety of higher-quality products at high speed than from their rivals.

—**"What Computers Are For,"** ***The Economist*** **(January 22, 1994)**

CLOSING

In **Put It Together**, students are introduced to the concept of production possibilities. They are given examples of production in a factory that can use its productive resources to produce nachos or pretzels. Students are reminded that as productive resources are shifted from one type of production to another, the opportunity cost increases. This is because each additional output of one good requires greater additional inputs of resources to produce it.

PUT IT TOGETHER

PRODUCTIVITY involves choices and opportunity costs. Because resources are scarce, firms need to choose which goods and services they will produce. If workers produce automobiles, they cannot produce computers at the same time. If students work as printers' helpers, they cannot use their talents to design jewelry at the same time. In economics, the term **production possibilities** refers to the notion that to be productive in one area means giving up the opportunity to be productive in another. The following situation will help you understand this concept.

Pretzels or Nachos?

The new manager of a snack company did a study of its productive resources. She concluded that when the factory is working at full capacity, employing all of its resources, it can produce either 300 cases of nachos or 300 cases of pretzels per hour. If it uses all the natural, human, and capital resources available to it to make only nachos, then no pretzels will be produced. If it makes only pretzels, then the opportunity cost is the nachos that could have been produced.

Of course, the company could produce both nachos and pretzels. But if it produces some pretzels, the output of nachos will be reduced; if it produces some nachos, the output of pretzels will be lower. As productive resources are switched from one good to the other, the opportunity cost of one good in terms of the other increases.

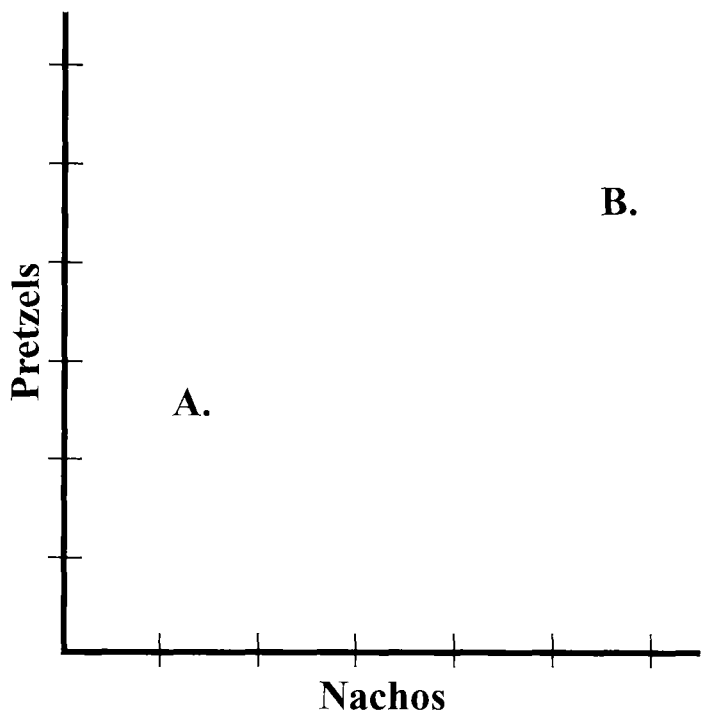
The factory had been producing only nachos. The manager decided to use some of the resources to produce pretzels. The first workers who were transferred to pretzel production were those who were skilled dough rollers—they would not be missed too much in the nacho division. As pretzel production increased, however, more workers had to be switched. Those who could tie nice knots went next—they weren't essential to nacho production either.

As pretzel production increased, the only workers left in the nacho division were those who were the best nacho producers. Because pretzels had become so popular with consumers, there was little choice but to shift even the expert workers from nacho to pretzel production. The last workers to switch represented a greater opportunity cost than the first ones did, because they were more valuable as nacho makers than as pretzel twisters.

If you learn a new skill, you will be able to complete a job quicker or better. Your increased productivity will make you more valuable in the workplace.

Use the following data from the factory to complete a graph—or draw one on a separate sheet of paper. When you finish, you will have a **production-possibilities curve**.

Cases of nachos the factory can produce in one hour	Cases of pretzels the factory can produce in one hour
300	0
275	50
240	100
195	150
140	200
75	250
0	300



The curve represents the maximum output of this firm. At Point A, the firm is producing less than its potential. What about Point B? How can a company reach beyond the limit of its production possibilities?

Here's how: Technology and automation can increase productivity so that production possibilities increase. By using resources in a faster, safer, more efficient way, a firm can expand its production possibilities and generate increased output.

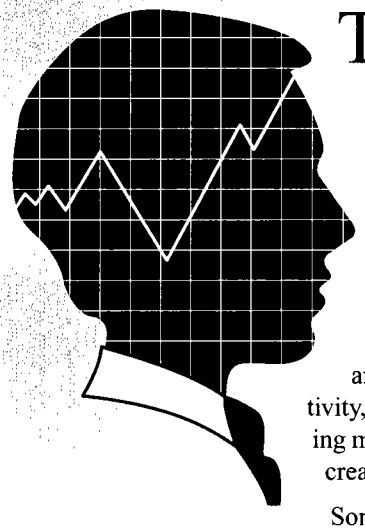
Ask students to complete the graph on this page. Point out how each increase in the output of pretzels results in an increasing cost in terms of nachos that are not produced: When the first 50 cases of pretzels are produced, the cost is 25 cases of nachos; when the second 50 cases of pretzels are produced, the cost is 35 cases of nachos; when the final 50 cases of pretzels are produced (and pretzel production is at 300 cases) the cost in nachos is up to 75 cases. You may wish to show this production-possibilities curve on the chalkboard or overhead display to help students understand the concept.

Nachos		*Pretzels*
300	**25**	0
275	**35**	50
240	**45**	100
195	**55**	150
140	**65**	200
75	**75**	250
0		300

	50
	50
	50
	50
	50
	50

Answers to the questions about Point A and Point B on the graph appear in the *Student Guide;* however, further class discussion may enhance students' understanding of the concept.

Productivity Is Rising Fast—and So's Job Insecurity



THE number of people who have been displaced by technology is soaring. Automation has been shrinking manufacturing payrolls for years, and now it is spreading into the much larger service sector. Smart machines and networks are raising service productivity, but they are also destroying many jobs and slowing the creation of new jobs.

Some economists think the pain caused by today's technology may last longer than the pain caused by earlier technological advances. They cite two reasons for this. First, tractors put only farmers out of work, and machine-tool automation replaced only factory workers, but smart devices and computer networks can invade almost every job category involving computing, communicating, or simple deduction. They can fill out and check mortgage-loan forms, transfer phone calls, and even allow cows to milk themselves. Second, the power of devices and networks run by microprocessors and software is increasing rapidly, roughly doubling in performance about every 18 months. This trend leads to reductions in the cost of microchip-based technology, allowing it to be used much more widely and rapidly.

"The pace and intensity of technological advance are without historical precedent," says Robert M. White, president of the National Academy of Engineering. "The creation of new industries may not provide enough jobs fast enough to replace those lost as a result of technologically caused productivity increases."

Although automation "generally benefits everyone over time," says Michael Zucchini, vice chairman of Fleet Financial Group, Inc., "the question is, how long until that time comes?"

SUMMARY

Ask students to read **Net Gain**. Review the four content statements, and encourage discussion to elicit actual examples of each.

NET GAIN

How do high-tech blood scanners and displaced workers help you understand productivity in the economy? If you think about the choices that were made by workers and businesses in this lesson, you should recall the following points:

1. **Productivity is a measure of output related to input.** If outputs rise with no increase in input, that's an increase in productivity. If inputs are reduced without a loss of output, that too is an increase in productivity. If you learn a new skill, you will be able to complete a job quicker or better. Your increased productivity will make you more valuable in the workplace.

2. **Businesses choose to invest in new technology because it can increase productivity.** Automation is one way to increase productivity, because machines allow workers to complete a task in less time or with less effort. As you begin your career, you will be more productive as you learn to use new technology. Every new skill you learn enhances your human capital and your productivity.

3. **Economic efficiency and economic equity involve trade-offs and opportunity costs.** Using machines may mean giving up

jobs, and jobless citizens may not be able to support their families adequately. Households, businesses, and governments must make tough decisions about productivity, and every choice means giving up something else. Your decisions in the workplace and at the ballot box will affect your job and the jobs of others.

4. **Governmental programs seek to assist displaced workers.** Training programs and transfer programs help workers. Training improves their human capital, and transfer programs provide income until they find new jobs. When you work, you provide tax dollars to programs such as social security, medicaid, and others that help people who do not have jobs and income.

BUILDING ON SUCCESS

PART of the federal budget is allocated to support social programs. Programs such as Supplemental Security Income (SSI) and Aid to Families with Dependent Children (AFDC) depend on tax dollars.

Another part of the budget is spent on the national debt. As the national debt grows, a larger portion of the budget is needed to pay interest on the debt. (People who own savings bonds or U.S. Treasury bills, notes, and bonds receive much of that interest.) Some people believe that social programs would receive more funding if the national debt were eliminated.

What is the national debt? And how does it differ from the federal budget deficit?

Demonstrate your understanding of the difference between the deficit and the debt by completing the following activities.

1. Use the library or a computer service to find data about the federal deficit and the national debt from 1945 until the present. Use charts, tables, and graphs to illustrate your findings. Be sure you can explain increases and decreases in both the deficit and the debt. Be prepared to share what you learn with the other members of your class.

2. Look through current magazines and newspapers for articles about the national debt and the budget deficit. After reading the articles, design your own plan for deficit and debt reduction. Present your plan to the class.

3. Find out whether other countries have deficits and debts. Design a poster that compares these nations: Japan, Germany, France, Canada, and the United States. Display your poster in class.

EXTENSION

Ask students to read **Building on Success**. Help them understand the difference between the federal budget deficit and the national debt. (The deficit is the amount by which the government's expenditures exceed its revenues in a year; the national debt is the total of a government's deficits over time.) Encourage students to use the library to find information about the size of the debt and the size of the deficit in the past fiscal year (the federal government's fiscal year begins October 1).

When students have obtained the information they need, they should display their findings using charts, graphs, and tables. Each student should be prepared to present a short statement outlining his or her approach to reducing the deficit and the debt. Remind them that each choice has a cost: Their decisions to cut some programs will mean that the people who benefit from those programs will no longer receive assistance. Although the issue of equity is not addressed in these activities, students may introduce it. Encourage discussion of both efficiency and equity.

ASSESSMENT

Two types of assessment are provided for you to evaluate students' comprehension and mastery of the material presented in this lesson.

ON YOUR OWN

This activity is designed to be completed as homework, but you may wish to have students do some or all of it in class.

Answers:

1. *55 keys per hour*

   59 keys per hour

   58 keys per hour

   56 keys per hour

   Nicky is the most productive worker.

   Pat would be laid off because Pat is the least productive worker.

2. *The correct matches are:*

   Frank Sprague, high-speed electric elevator

   Thomas Edison, phonograph

   Joseph Dixon, graphite pencils

   Edmund Cartwright, loom

   R. Buckminster Fuller, geodesic dome

   Vladimir Zworykin, iconoscope

QUALITY CONTROL

ON YOUR OWN

You have learned a lot about productivity and workers in this lesson. Use what you now know to help you solve the following problems. Do your figuring in the blank space on this page, and write your answers on the lines provided, or use a separate sheet of paper.

1. Compute the productivity per hour of the workers at the Aardvark Key Company.

   - Pat produces 275 keys in 5 hours.
   - Nicky produces 354 keys in 6 hours.
   - Chris can make 406 keys in 7 hours.
   - Jamie's output is 504 keys in 9 hours.

   Which worker is the most productive?

   Which worker would you lay off if a new machine allowed three workers to do the work of four? Why?

2. Do a little research in an encyclopedia or other reference work and match the machine on the left with its inventor on the right.

a. phonograph	Frank Sprague	___
b. geodesic dome	Thomas Edison	___
c. iconoscope (movie camera tube)	Joseph Dixon	___
d. power loom	Edmund Cartwright	___
e. graphite pencil	R. Buckminster Fuller	___
f. high-speed electric elevator	Vladimir Zworykin	___

3. Choose any two of the inventions listed in the preceding activity, and explain how they increased the productivity of the industries in which they were used.

3. Accept any suitable responses.

"You must learn day by day, year by year, to broaden your horizons. The more things you love, the more you are interested in, the more you enjoy...the more you have left when anything happens."

—Ethel Barrymore, American actress

In Class

These questions should be answered while you watch a special section of the videodisc that your teacher will play for you. Write your answers on the lines provided or on a separate piece of paper.

1. We've seen that many tasks that were once done by hand are now automated. How does automation increase productivity?

Assessment-Track Questions

Besides appearing in the *Student Guide*, the questions under the heading **In Class** are contained on a special assessment track of the videodisc for this module. Using the appropriate disc side, you can access each question by swiping its barcode. Each question is presented as a voice-over to part of a video program that students previously watched. The video will provide students with valuable cues, enabling them to generalize previously learned material to new situations.

Assessment Question 1

1. Productivity in the United States has more than doubled since 1948. Productivity can be increased by providing workers with additional capital goods, such as tools and machines, together with the knowledge to operate them. Machines often perform tasks that are repetitive and dangerous and that require extreme precision, great strength, great speed, or some combination of these. Automation of these tasks frees human labor to engage in higher-skilled and higher-wage jobs.

Assessment Question 2

2. A firm makes its decisions with the primary goal of maximizing its profits. By doing so, it benefits the owners, the employees, and the market it serves. Sometimes this pursuit of profit results in the substitution of machines for people. Workers can protect their livelihoods by acquiring the higher level of skills that the modern workplace increasingly requires.

2. This medical lab is considering the purchase of a blood-analysis machine, which performs a task lab technicians used to do. Why would this lab, and other firms, take steps to have machines do the work people once did?

Assessment Question 3

3. Automation often increases productivity and profits, with the result that a firm's owners and stockholders benefit. Automation often can increase the production of a good or service; therefore, consumers benefit by getting a final output of higher quality. Furthermore, the workers who are needed to operate the automated process are generally more highly skilled, and so they benefit by earning higher wages.

3. Is there anything good about automation? Are workers really replaced by it?

4. When firms replace people with machines, they do so to pursue greater efficiency. But a society also values equity. How do we, as a society, deal with equity concerns as automation in the workplace increases?

Assessment Question 4

4. *Some societies, including that of the United States, believe that when the market results in incomes that are so low that people cannot sustain a minimum standard of living, the government should redistribute income to assist them. The government has a variety of programs to help the poor and the jobless (including workers who have been displaced by automation). The government's main tools have been job-training and income-transfer programs. But the pursuit of equity often comes at a cost of less efficiency and less incentive to be productive.*

SIDE 12
GRAPHICAL DATABASE BARCODES

(Use "step still" function or barcodes below to advance within categories.)

Step Back

Step Forward

Elasticity

Role of Profits

Product Markets

Consumer Behavior Theory

Production Theory

Foreign Exchange Markets

Human Resource Market

Nonhuman Resource Market

Aggregate Supply & Demand

Loanable Funds Market

SIDE 12
TEACHER-TRACK BARCODES

What's Investment?

Activity—Opportunity Cost

Invest or Buy Now

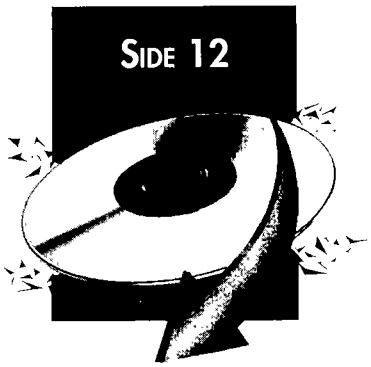
Government Transfer Programs

Concluding Activities *(audio only)**

*Swipe any other barcode to restore video.

ECONOMICS® at Work

Module 5, Lesson E



TOTALLY COOL INVESTMENT TOOL

ECON BRIEFING

BE cool—stay in school! Okay, you've heard it before. It sounds hokey, like some adult trying to sound hip. So forget the slogan. It's not the slogan that keeps kids in school anyway. It's the realization that every day you spend in school increases your personal marketability. School is an investment in your future.

Investment comes in many shapes and sizes, but it falls into two main categories. **Investment in human capital** is investment in education and training—it's an investment in human resources. **Investment in capital goods** is investment in the tools, machines, buildings, and other capital resources that will allow society to produce things now and in the future. Both forms of investment ensure that society will have economic growth.

WHAT YOU'LL LEARN IN THIS LESSON

- Investment in human capital makes labor more productive.
- Increasing productivity increases a society's standard of living.
- All investment, whether in human capital or capital goods, has an opportunity cost and involves taking risks.
- Creating more capital goods involves a trade-off: fewer consumer goods or services in the present in return for higher expected productivity in the future.
- Economic growth means producing increasing quantities of goods and services over the long term.
- A nation's potential Gross Domestic Product (GDP) depends on the quality and quantity of its natural resources, the size and skills of its labor force, and the size and quality of its capital resources.

> ***"None of us suddenly becomes something overnight. The preparations have been in the making for a lifetime."***
>
> **—Gail Godwin, American writer**

2 CLASS PERIODS

Materials

This lesson uses the videodisc (or videotape) program **Totally Cool Investment Tool**. To complete the activities, students should use recent issues of newspapers.

INTRODUCTION

In this lesson students examine the role of investment in economic growth. Economic growth is measured as Gross Domestic Product (GDP). GDP is not a perfect measurement in that it doesn't account for environmental quality, nonmarketed goods and services, or the underground economy. Despite its shortcomings, however, it is a useful measuring rod for economic progress and the standard of living. Achieving economic growth requires investment in capital resources and in human capital. Both types of investment involve opportunity cost and risk.

GOALS

Students will be able to demonstrate their understanding of the costs and benefits of investing in the economy. They will increase their awareness of development of human capital—the combination of skills, education, and other qualities that will increase their marketability and productivity in the work force. They will recognize that a direct relationship exists between investment in capital resources and economic

growth and that economic growth leads to a higher standard of living. They will also recognize that every investment entails an opportunity cost and associated risk.

Objectives

Upon completing this lesson, students will be able to:

- evaluate the opportunity cost and trade-offs of investing in capital goods and human capital
- explain the relationships among investment, productivity, and creation of wealth by a nation
- explain how a government may use its country's increased wealth to address concerns of equity

Lesson Description

This lesson focuses on investment in capital resources and in human capital as a means of increasing the economic well-being of society and the individual. For society, investment in capital resources and human capital leads to increased productivity and a higher standard of living. For the individual, investment in capital resources and human capital leads to increased productivity and a higher income. In the video, two friends—coworkers in the construction industry—discuss the opportunity costs, risks, and benefits associated with investment in capital resources (tools for the job) and human capital (education).

Payback

A typical 16th birthday...

"Look, Mom, Aunt Bertha sent me $100 for my birthday!"

"You're going to want me to put $50 of that money in your bank account, aren't you?"

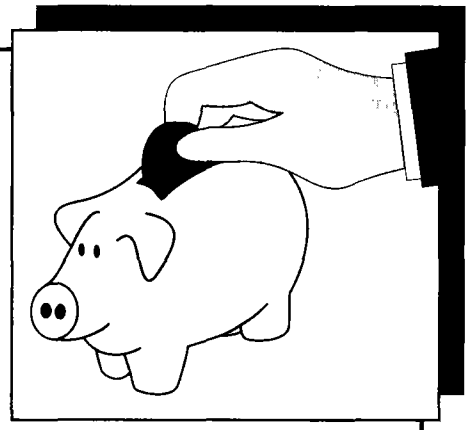
It sounds like a question, but it's really an order. And you thought it was **your** money!

You might receive money as a gift, or you may have to work for it. If you already earn a paycheck, you know that some of your pay is withheld for taxes. The money left over after taxes are deducted is your disposable income, and there are two things you can do with it: spend it or save it. If you spend it now, you are using it for current consumption. If you save it, you are setting it aside for future consumption. But if you're going to use it for consumption in either case, why shouldn't you spend the money on what you want right now instead of waiting?

Maybe your mom or dad has started a savings account for you. Or maybe you opened your own. If so, what are you saving for? You might have something specific in mind: a car of your own...a computer system...future education. Whatever your goal, one thing is certain: You're saving because it takes more than what you get in your weekly paycheck or allowance to pay for the big things in life. You have to give up some of the smaller things you'd like to have now in order to accumulate enough money to pay for a big-ticket item in the future.

Have you ever heard someone say, "I'm saving for a rainy day"? The "rainy day" stands for tough times, when money might be

American Savings Fall Short



In the past 20 years, Americans have saved an average of 6.8 percent of their disposable income. This may seem like a lot, but look at the savings rates of other countries. In the same period, the personal savings rate was 17.3 percent in Japan, 12.7 percent in West Germany, and 12.5 percent in Canada. Why is a low savings rate a problem? It all goes back to supply and demand. When Americans save less, there is less money to lend to persons and companies that want to invest in human and physical capital. When the supply of money is low, the demand for it bids up the cost of money, raising the cost of capital.

short. Saving is a way to achieve your economic security; it's a way of investing in your future.

It's hard to save money. As a matter of fact, most Americans save very little for the future. Most people want expensive things, and they want them now!

In this lesson you will learn that building human capital is an investment in your future. Investment in human capital, along with investment in capital resources, will increase your productivity. This is a benefit for you and for society as a whole. For you, increased productivity will lead to increased wages. For society, increased productivity will lead to a higher standard of living.

The opportunity cost of night school is the extra pay Chris would give up.

Econcepts

capital resources—manufactured goods, such as buildings, tools, and machinery, that are produced for the purpose of making other goods

current consumption—income used to purchase goods and services and not saved for future consumption

Gross Domestic Product (GDP)—the total market value, expressed in dollars, of all final goods and services produced in an economy in a given year

investment in capital resources—expenditures by businesses on new capital goods (plant, building, and equipment purchases) and by households on new homes

investment in human capital—expenditures of time, effort, and money to improve the stock of knowledge and ability that people possess

opportunity cost—the highest valued alternative that must be given up because another option is chosen

saving—income earned but not used for current consumption

trade-off—accepting or choosing less of one thing to get more of something else

Key Terms

Prepare a poster listing the **Econcepts**, or write these key terms on the chalkboard.

PREVIEW

Ask students to read **Econ Briefing**, including **What You'll Learn in This Lesson** and **Payback** (pages 103–105). Discuss the main topics, and brainstorm any questions that students may have. You may want to put their questions on a chart or chalkboard and to display it throughout the lesson.

Introduce the **Econcepts**, and give contextual examples of each. Ask students to refer to them as needed during the lesson.

Ask students to read **Power Up** and to complete the activities in this section. Students will discuss the difference between a consumer good and a capital resource. Make sure they understand that the same good can be both a consumer good and a capital resource, depending on its use.

POWER UP

WHAT do a hammer, a baseball glove, a computer, and a stove have in common? They are all consumer goods (sometimes). And they are all capital resources (sometimes). It depends on how they are used.

If a good is used in a business—if it helps workers do their jobs—it is a capital resource. A hammer can be used around the house to pound a nail into a wall, or it can be used by a carpenter to build a house. In the first case, it's a consumer good; in the second, a capital resource. A baseball glove is a consumer good when a Little Leaguer wears it onto the field, but on Ozzie Smith's hand it's a golden capital resource. A computer is a capital resource in a school or business. A stove is a capital resource in a restaurant.

Look around the classroom. How many capital goods can you spot? List them on the following lines or on a separate sheet of paper.

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Students may respond:

desks, pencil sharpener, computer, bookshelves, chalkboard, television, VCR

Desks, pencil sharpener, computer, bookshelves, television, VCR could all be consumer goods.

Pencil sharpener, computer, bookshelves, chalkboard, television, and VCR could all be found in a real-estate or doctor's office; a computer, television, and VCR might be found at a department-store cosmetics counter or in a hardware or building-supply store.

Now discuss these questions with your class:

- Which capital goods on your list could also be consumer goods?
- In what businesses could the capital resources on your list be used?

VIDEO CORE

Have students read the five paragraphs that introduce **Take a Closer Look**. Clarify any points they have difficulty understanding, and then have them complete the activity at the end of the section.

TAKE A CLOSER LOOK

WHEN capital resources are used in a business or to help perform work, they are investments, and investments help to ensure future economic growth. Look at it this way. Every good or service that a firm provides must come from the same stock of resources; therefore, the quantity of goods and services that can be produced is limited. In economics, this limit is called the **production-possibilities frontier**. It is the point where all of a country's resources are being used—they are fully employed. When full employment has been reached, one more unit of a good cannot be produced without giving up some amount of another good.

There are ways to increase the ability to produce. First, firms can **develop new technologies**. Technological advances in agricultural science, for example, have led to plants that resist insects and crops that

can survive harsh climates. So even though the U.S. population keeps growing, there is more than enough food for everyone. What's more, that food is grown on less land than formerly was needed, and fewer workers are used to produce it.

Another way to expand the frontier is to **increase resources**. You might think that all available resources have already been discovered. But technology leads to new discoveries and new uses for old materials. Natural substances that once were thought to have no value have become valuable through technology. For example, farmers clean out their livestock pens and dump the waste into compost heaps. A pile of straw and manure might look absolutely worthless, but the process of composting produces methane gas, which can be turned into methanol fuel. Human resources can increase too. A society can experience an increase in population, which increases its labor force. More important, the quality of the labor force can be increased by developing human capital through education and training.

Finally, a country can **invest in capital resources**. Farms provide another example: Crops originally were gathered by hand. Eventually resources were used to manufacture machines for harvest. People had to give up some current consumption in order to divert resources to the production and consumption of farm equipment.

Give an example of how the U.S. has experienced economic growth through new technologies, discoveries of new resources, or investment in capital. Use the following lines or another sheet of paper to express your ideas, and then share them with your classmates.

Where Corn Is Going

PIONEER Hi-Bred International, Inc., has been dedicated to traditional plant breeding and advanced plant science for more than 50 years. The following timeline shows how innovation and technology can improve both production and the product.

1940s—Pioneer plant breeders recognize economic importance of insects and begin breeding plants for European corn borer tolerance.

1962—Scientists discover ancestor of modern corn in the Tehuacan Valley, Mexico.

1965—U.S. corn harvest jumps to 74.1 bushels per acre.

1969—Pioneer® Brand 3369A brings a new level of yield to the Southern Corn Belt.

1972—Pioneer releases four of the first specialty corn hybrids ever developed (a hybrid is a type of plant developed from different varieties of the plant); U.S. corn harvest averages 97 bushels per acre.

1980s—Pioneer begins testing hybrids with increased oil content.

1982—U.S. corn harvest averages 113.2 bushels per acre.

1987—Pioneer begins focusing on biotechnology as an approach to developing hybrids with insect resistance.

1990s—Technology allows corn to be used in more than 300 products, including compostable plastics and biodegradable packing "peanuts."

1990—Pioneer introduces its first herbicide-resistant hybrid, providing growers with more ways to control weeds.

1992—Field testing begins on Pioneer hybrids that have European corn borer resistance developed through biotechnology; U.S. corn harvest averages 131.4 bushels per acre. A Pioneer hybrid wins National Corn Growers yield contest with yields at 330 bushels per acre.

1994—Pioneer dedicates a new research facility, expanding efforts to deliver products that help farmers increase their yields, reduce input costs, and create more uses for crops.

—Pioneer Hi-Bred International, Inc.

"Every dollar an individual or firm spends on investments today is money that can't be spent on the next best alternative."

What You'll See on the Screen

Investment is definitely a good thing, but it has a down side. One problem is that every investment has an opportunity cost. For every dollar spent on investment, one dollar less is available for present consumption. "Shop Till You Drop"..."I Brake for Malls"...bumper-sticker sayings like these suggest how much Americans like to consume. Another problem is that investment often involves a risk. Think how you would feel if you had invested four years of your life studying engineering in college, only to discover, when you graduated, that companies weren't hiring engineers; in fact, they were laying them off. It's happened.

In "Totally Cool Investment Tool," you'll see two young construction workers discussing their investment options. In the opening segment of the video, you'll get a clear picture of the opportunity cost and risk associated with investment, and you'll learn why investment is important to economic growth.

Then in the Economic Puzzle Challenge sequence, you'll see why investment is not an easy decision—it's that "opportunity cost" thing again.

Introduction to the Video

Have students read **What You'll See on the Screen**. The documentary segment explains that investment in capital resources and human capital brings about economic growth and that opportunity cost and risk are associated with investment.

Video-based Activities, Part 1

Have students read the two introductory paragraphs of **Talk This Over**. Then start the videodisc (Side 12), and swipe this barcode to play:

Totally Cool Investment Tool (introductory segment)

Talk This Over

Henry Ford...Andrew Carnegie...John D. Rockefeller...Can you imagine what they'd say if they could see the United States today? They might say the same thing your relatives used to say about you: "Look how you've grown!" These famous entrepreneurs boldly invested in new processes, accepting the opportunity cost and the risk and helping the U.S. advance. The standard of living that Americans enjoy today was, in part, furnished by the investments these three persons made.

Economic investment can take many forms. But all investments have something in common—they cost. In the video, Buzz is busy increasing his human capital. His textbooks play a part in his development into a productive player in the labor force. But he recognizes that he is giving up all the goods he could buy with his textbook money. It can be a tough decision.

The video pauses on a screen with the following questions.

Have you ever made an investment?

How is education an investment?

Answer the first question on the lines below or on a separate sheet of paper. Describe an investment you made (if any), and then discuss that investment with the other members of your class.

Now think about ways in which education can be considered an investment. Write your ideas on the lines below or on your other paper, and then share your thoughts with your classmates.

The video will pause on a screen with the following questions (which also appear in the *Student Guide*).

Have you ever made an investment?

How is education an investment?

Encourage students to respond in writing. Then lead a discussion of the various investments that they list.

Students should make these points: Education provides people with knowledge and skills that will make them valuable and productive in the labor force. Productivity is directly related to income, and so education provides future economic security.

For More...

What kinds of investments could you make today? Do you think you're too young to be a serious investor? Actually, you're never too young to enhance your future opportunities. Maybe the investment you can make is in yourself—your own physical well-being or your knowledge and skills. Investments in good health and education and training are investments in human capital.

The nutritional and recreational habits you develop now may be with you as long as you live. The healthier you are, the more productive you will be. It's important to invest in good health now. You may feel healthy and strong today, but you won't be young forever. As for education, sure, schoolwork is hard, but no pain no gain. The higher your educational attainment, the higher your future earnings, on average.

Furthering your education can take many directions. The trades, such as carpentry, plumbing, and electrical work, maintain their own training facilities in many cities. You can also learn these trades and many

Further Discussion

Have students read **For More...** beginning on this page. Ask them to discuss educational and job-training programs with which they are familiar.

A more highly skilled work force increases productivity, not just for individuals and firms but for the whole country.

Video-based Activities, continued

Have students read the introductory paragraph to the second **Talk This Over** section. Then swipe this barcode to generate the following questions (which also appear in the *Student Guide*).

What investments have been made by businesses in your community?

What were the opportunity costs?

Again encourage students to respond in writing and to share their thoughts.

Economic Puzzle Challenge, Part 1

Before swiping the barcode, ask students to read the introductory paragraph of **Economic Puzzle Challenge, Part 1**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 1

other careers in technical schools. Community colleges offer specific career certificates and associate degrees. Even employers offer classes and training to develop the skills that their workers need. Look at your various options, and take advantage of opportunities to obtain the training you need and to grow in your job.

Talk This Over

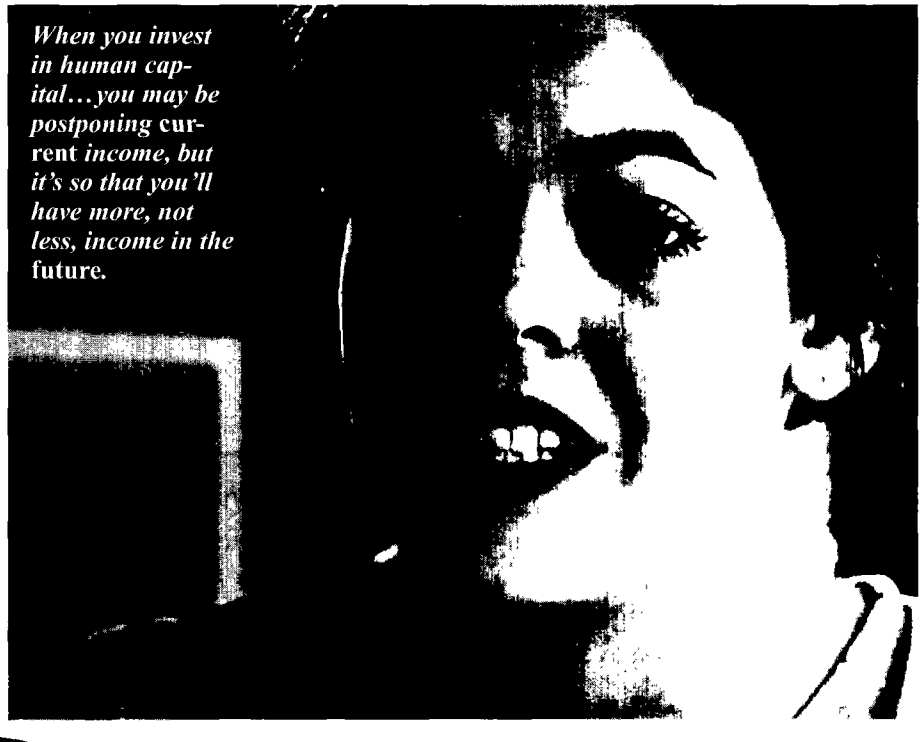
Where do you like to shop? Where do you buy your clothes, your sunglasses, your CDs? Where are your parents employed? Where do you work? All of these places are businesses that were established by someone who was willing to take a risk.

The video has more questions for you to answer:

What investments have been made by businesses in your community?

What were the opportunity costs?

Write your answers on these lines or on another piece of paper. Then discuss your ideas with the other students.



***When you invest in human capital...you may be postponing* current *income, but it's so that you'll have more, not less, income in the* future.**

Economic Puzzle Challenge, Part 1

Carla is heavily into learning. As an apprentice carpenter, she is learning a trade from someone with more experience. But that's not all. She's also investing in her human capital through classes, because she'd like to start her own firm someday. But when she completes her training and education, she'll still be only part of the way to her goal. As you watch the next part of the video, think about other types of investment that Carla will need to make if she wants to have her own company.

Decision Time

At the end of the first part of the Puzzle Challenge, the screen poses this question:

> Which investments are matched correctly with an opportunity cost?

Use the lines below or a separate piece of paper to mark your choices and to explain your answers. Then watch the video to see the results of your decisions.

☐ A. Night school—Less leisure time [i.e., some time is given up]

_____

_____

_____

☐ B. Night school—Less future income

_____

_____

_____

☐ C. New tools—Night school

_____

_____

_____

☐ D. New tools—No skates [i.e., new skates are given up]

_____

_____

_____

Changing and Moving On

"If we don't change, we don't grow. If we don't grow, we are not really living."

—Gail Sheehy, American journalist and writer

"A dead end is one of the strongest motivators for making people look elsewhere."

—Michael Stern, American businessman

Video-based Questions

The video will pause on a screen with the following challenge (which also appears in the *Student Guide*).

Which investments are matched correctly with an opportunity cost?

Assist students in analyzing each of the possible responses. Then swipe barcodes for the options you wish to view.

A. Night school—Less leisure time [i.e., some time is given up]

Analysis: Night school is an investment in human capital and, as with all investments, carries an opportunity cost. The opportunity cost is the next best use of the resources—for example, leisure activities.

B. Night school—Less future income

Analysis: Investing in human capital enhances future income. This answer is incorrect.

C. New tools—Night school

*Analysis: Although night school **could** be the opportunity cost of new tools, in Carla's case she is not giving up night school to buy tools. She is giving up new skates.*

D. New tools—No skates [i.e., new skates are given up]

Analysis: Investment in capital resources uses dollars that could be used for current consumption. In this case, the opportunity cost of investing in capital resources (new tools) is current consumption (new skates).

Further Discussion

Encourage students to read **For More...** on this page and to discuss their plans to further their education. Be sure to have them discuss the opportunity cost of any decision.

Possible responses include: loss of income because of postponement of full-time employment, loss of current consumption, loss of other educational opportunities.

For More...

Every investment has an opportunity cost. Sometimes it's a snap to decide whether to invest. For instance, Carla seemed to have little trouble giving up a night or two to go to school. For Chris, the decision was more difficult—he was reluctant to give up his leisure time. For Chris, the opportunity cost of night school was greater than it was for Carla.

After high school, you will have some decisions to make. Where do you plan to continue your education? What will be the opportunity cost of this investment? Discuss these questions with the other members of your class.

Some of a country's economic growth depends on its natural resources. But research shows that investment in human capital has the biggest impact on growth and on the creation of wealth.

Economic Puzzle Challenge, Part 2

Before swiping the barcode, ask students to read the introductory paragraph of **Economic Puzzle Challenge, Part 2**. Then swipe this barcode to play:

Economic Puzzle Challenge, Part 2

Economic Puzzle Challenge, Part 2

Investment takes many forms. People invest in themselves. Businesses invest in employees and in new buildings and equipment. Governments invest in people and capital resources, including roads and bridges—it would take a lot longer to get oranges and grapefruits from Florida to Minnesota if it weren't for the interstate highway system.

Decision Time

The screen challenges you with another question:

What is the outcome of investing scarce resources?

Mark your choice and explain your answer on the following lines or a separate piece of paper. Then watch the video to see the consequences of your decision.

☐ A. Greater equality of income among society members

_____

_____

_____

☐ B. Increased future productivity and wealth

_____

_____

_____

☐ C. Reduced scarcity of currently available resources

_____

_____

_____

For More...

How can a nation tell if its economy is moving backward or forward? It's not easy. Depending on where you live and how the economy is treating you, you might see the current economy as a boom or a bust. The United States and most other countries use Gross Domestic Product (GDP) to measure growth. **GDP is the market value of all final goods and services produced within a country in a given year.** It may help you to understand GDP by analyzing this definition piece by piece:

- **"Market value"** is the price that was paid for a good or service.
- The phrase **"all final goods and services"** means that intermediate production, which happens along the way to the finished product, is not counted. For instance, consider how a car is produced. It starts out as raw iron ore, rubber, and petroleum, which eventually become steel doors, tires, and plastic dashboards. Sheet steel is produced from the iron ore, but the market price of the sheet steel is not counted in GDP. Then doors and other parts are built and sent on to the assembly plant, but the market prices of these parts are not counted in GDP. Finally, the door and other parts are assembled, and the car is sold. Only now are the separate parts, such as the doors, accounted for in GDP, which includes the market value of the final good, the finished car. If the market

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

What is the outcome of investing scarce resources?

Assist students in analyzing each of the possible responses, and then swipe barcodes for the options you wish to view.

A. Greater equality of income among society members

Analysis: No. Investment in capital resources and human capital increases productivity and, therefore, economic growth and wealth. These outcomes appear to be the main goal of most societies. The increase in economic growth and wealth can be used to address income equity. Tax revenues increase as income increases, providing more money for public assistance programs.

B. Increased future productivity and wealth

Analysis: Yes. This is the primary goal of investment. Economic growth increases wealth and enhances society's standard of living. (This option will play directly into **Economic Puzzle Challenge, Part 3**.)

C. Reduced scarcity of currently available resources

Analysis: No. Investment requires the use of scarce resources; however, diverting resources from present use to future use increases economic growth and enhances the standard of living.

Further Discussion

Ask students to read **For More...** beginning on this page. It contains a discussion of Gross Domestic Product. Clarify any points students do not understand.

value of all the intermediate goods were counted, GDP would be greatly exaggerated. Now, back to the definition.

- The phrase "**produced within a country**" means all things produced within that country's borders, even if the manufacturing plant is owned by a company whose headquarters are overseas.

GDP is not a perfect measurement. For one thing, if there is no record of an activity, it's not counted as part of GDP. Barter activity is not usually counted in GDP, and illegal activities certainly aren't counted. For another thing, productive activities for which no one is paid are not counted. Cleaning the house or running errands are productive activities, but unless they are paid positions, they aren't considered part of GDP.

Despite its shortcomings, GDP is a useful measuring rod for economic progress and the standard of living.

Although the GDP measurement is not perfect, it is still a valuable way to track economic growth. As long as it's counted the same way every year, a nation can use it to spot changes in growth. If GDP shows a 2.5 percent rate of economic growth one year and a 3.5 percent rate of growth the next, then the economy is growing at an increasing rate. If in the third year the economy grows at only 1.5 percent, economic growth is slowing and governmental policy may be needed to stimulate it.

Economic Puzzle Challenge, Part 3

Option B of **Economic Puzzle Challenge, Part 2** played through the introduction to **Part 3**. If you wish to review the introductory part of the video, swipe the following barcode.

Economic Puzzle Challenge, Part 3

Economic Puzzle Challenge, Part 3

Decision Time

That job offer paying $5 an hour sounds good, but don't spend the money yet. After taxes, you'd probably take home less than $4.50 an hour. You have a lot of company—just about everyone has the same complaint about taxes. And the more a person makes, the greater the tax burden.

The U.S. income tax is a **progressive tax**, which means that people who earn higher incomes pay a greater proportion of their incomes in taxes than those with lower earnings. Just be glad you're not making $100,000 a year—you'd be paying about one-third of your taxable income to the government. No wonder many wealthy persons invest in tax-free municipal bonds!

Where do your taxes go? Tax revenue is used to purchase government goods and services. Tax revenue also funds **transfer payments** that enhance people's human capital and/or increase their standard of living.

The More You Make, the More You Pay

WHAT will I do? How much will I make? You've probably thought a lot about these questions, but have you considered a third question: How much will I pay in taxes? Knowing the answer to the third question will give you a better idea of how much of the money you earn will actually make it to your paycheck. These were the tax rates for 1994:

Single		Married filing jointly	
Tax rate	**Taxable income**	**Tax rate**	**Taxable income**
15%	$0 to $22,750	15%	$0 to $38,000
28%	$22,751 to 55,100	28%	$38,001 to $91,850
31%	$55,101 to $115,000	31%	$91,851 to $140,000
36%	$115,001 to $250,000	36%	$140,001 to $250,000
39.6%	More than $250,000	39.6%	More than $250,000

The term "taxable income" refers to the amount of income on which you actually pay taxes. The personal exemption and other deductions lower your taxable income. The most common deductions are the standard deduction and the deduction for interest paid on a home mortgage. If you were single and your annual salary was $24,000 in 1994, claiming the personal exemption of $2,450 and the standard deduction of $3,800 would have lowered your taxable income to $17,750 and your tax rate from 28% to 15%. Your federal income tax would have been $2,662.50.

The video presents this question:

> How does greater wealth affect government's ability to address income inequality?

Use the lines provided here or a separate piece of paper to mark your choice and to explain your answer.

☐ A. Greater wealth = More tax revenue for transfer payments

_____

_____

_____

☐ B. Greater wealth = Less tax revenue for transfer payments

_____

_____

_____

For More...

When the economy is growing, there is a greater demand for goods and services, and so more people are working. When more people

Video-based Questions

The video will pause on a screen with the following question (which also appears in the *Student Guide*).

How does greater wealth affect government's ability to address income inequality?

Ask students to read **Decision Time** (page 114) and **The More You Make, the More You Pay** on this page. Assist them in analyzing the two possible responses. Then swipe the barcode of the option you wish to view.

A. Greater wealth = More tax revenue for transfer payments

Analysis: Yes. Greater wealth means higher incomes. Higher incomes provide more tax revenue, and so transfer payments may be increased. (This option will play directly into **Economic Puzzle Challenge, Part 4.**)

B. Greater wealth = Less tax revenue for transfer payments

Analysis: No. See analysis A.

Further Discussion

Ask students to read **For More...** beginning on this page and to discuss the questions at the end of the section.

are working, the government collects more tax revenue. A portion of the additional tax revenue can be distributed through various governmental programs to reduce income inequality.

One argument against transfer payments is that they diminish people's incentive to work. In the U.S., some people receiving assistance report that they would be worse off if they went back to work. They point out that they would lose medicaid benefits and that their child care expenses would eat up much of their income.

Contributing to the welfare of others through welfare programs is not just a case of charity. In reality, both the taxpayer who provides the transfer payment and the person who receives it benefit from the program. To understand why this is true, look back at the issue of human capital. Children whose homes are too cold in the winter and who are underclothed and underfed are likely to grow up unhealthy and undereducated.

> ***"The current welfare state is projected to grow from $300 billion in 1994 to almost $500 billion by the turn of the century. The average American working family currently pays $3,800 a year to support the existing welfare state."***
>
> **—Senator Charles E. Grassley, "Welfare Reform," *Congressional Record* (July 18, 1994)**

What kind of labor force can be expected from this group of people? Think about it. Also think about how the condition of the labor force affects productivity and economic growth. Discuss these issues with your classmates. Be sure to address the question of how taxpayers benefit by providing the funds used for transfer payments.

Economic Puzzle Challenge, Part 4

Option A of **Economic Puzzle Challenge, Part 3** played through the introduction to **Part 4.** If you wish to review this introductory part of the video, swipe the following barcode.

Economic Puzzle Challenge, Part 4

Economic Puzzle Challenge, Part 4

Talk This Over

Chris has discovered that the opportunity cost of choosing to invest comes in many forms. You know that for every dollar invested, you give up a dollar's worth of current consumption. But you can also choose among different kinds of investments, and selecting one investment opportunity means giving up another.

Chris could use his $500 in a variety of ways—present consumption, a miter saw, or night classes. The miter saw and night classes are both

"You know, I've been thinking about your advice. Maybe I'll slack off on my hot dates and take a night class."

forms of investment, but he can't have them both. You will face similar investment decisions and experience similar opportunity costs.

Another set of questions appears on the screen:

Could you be investing more?

What would you be willing to sacrifice?

What would you gain?

Brainstorm ideas with the class, and then write your final response on the following lines or on a separate piece of paper.

PUT IT TOGETHER

USE what you've learned in this lesson to analyze the economic behavior of the residents of Beaverville. Then, using the lines provided or another piece of paper, answer the questions on page 118.

Beaverville

Welcome to Beaverville. Its residents are an industrious bunch, busily chopping down trees all night long. The trees

Video-based Questions

The video will pause on a screen with the following questions (which also appear in the *Student Guide*).

Could you be investing more?

What would you be willing to sacrifice?

What would you gain?

Ask students to read the two paragraphs that introduce **Talk This Over**. Then have them brainstorm the questions. Encourage students to consider all aspects of investment, including investment in their health. Could they be taking better care of themselves? Could they be eating differently? When the brainstorming session ends, ask them to respond to the on-screen questions in writing.

Side 12 Menu

Quit Instructions

CLOSING

Have students read **Put It Together**, which contains a brief fable about the economic system in Beaverville. Ask students to answer the questions that follow the story.

They should respond:

1. *The second harvest represents capital investment because the beavers use these logs to build a storage pond and shelter. This investment allows them to gather and store more logs in the future.*
2. *The third harvest represents saving for future consumption. This wouldn't be possible without the storage facility. Now the beavers will be secure during the winter, when logging becomes too difficult.*

can be used for food, shelter, and storage space. The night's first harvest is the next morning's breakfast. The second harvest is used to dam up a stream, forming a shallow pond over which the beavers build a shelter. The pond also serves as a storage facility for the third batch of trees, which are saved for food. Now that they have a food supply, their logging can be devoted to more shelters and ponds. The additional ponds will hold all the food they will need to get through the winter.

—Adapted from *Stock Market Unit*, provided by Missouri Secretary of State's Investor Education Project, Missouri Council on Economic Education

Courtesy U.S. Fish and Wildlife Service

One of the largest rodents in the world, a beaver can swim underwater for half a mile and can hold its breath for as long as 15 minutes.

1. Which batch of trees represents capital investment? Explain.

2. Which batch of trees represents savings? Explain.

3. The opportunity cost of saving trees for future consumption is current consumption of the trees. The beavers could chew on all of the logs now.

4. Beaverville will experience economic growth because the beavers have invested in storage facilities and shelters, and they have saved for future consumption. The beavers will be safe and well-fed, guaranteeing a healthy work force in the future. Providing shelter and food will allow the colony to grow.

3. What is the opportunity cost of cutting trees and saving them for future consumption?

4. How does investment in capital provide economic growth in Beaverville?

NET GAIN

In this lesson you have learned that sound investments in capital resources and in human capital can enhance your future, both as an individual and as a member of society. Such investment can make you more prosperous and secure. In particular, remember the importance of investing in yourself by getting the right education and training. By investing in your own human capital, you will be able to obtain better jobs and achieve a higher level of satisfaction throughout your career.

Here are the major points of this lesson:

1. **Investment in human capital makes labor more productive.** Strive to develop your own human capital by getting the education and training you need to succeed in the workplace. Your productivity will depend on how well you develop your human capital. The government also has an interest in enhancing the labor force through investment in human capital, because an educated and skilled work force will be able to develop and use new technologies that increase productivity and because greater productivity will benefit society as a whole.

2. **Increasing productivity increases a society's standard of living.** Your productivity will determine your income and economic security throughout your career. Your productivity will also benefit the entire economy, and a thriving economy will benefit you. In other words, the more productive every member of the labor force is, the more economic growth there will be. The increase in the supply of goods and services stemming from economic growth will allow you and the rest of society to have a higher standard of living.

3. **All investment, whether in capital goods or human capital, has an opportunity cost and involves taking risks.** Investment in capital goods stimulates growth; however, dollars invested in capital goods or human capital can't be spent on CDs, cars, stereos, and other desirable goods. Investment also carries a risk. What if a company spends millions of dollars investing in capital goods and human capital to produce a new product, but then the product doesn't sell? And what if you invest a great deal of your time and money going to school, but then you can't get the kind of job you want? This is always a possibility; even so, investment in education is never wasted. Your success in school shows a prospective employer that you are willing and able to learn. Employers want willing workers. You will stand a much better chance of getting a good job if you come across as a person who has demonstrated the ability to learn new skills.

SUMMARY

Have students read **Net Gain**. Review the six content statements, and encourage students to suggest other examples for each one.

4. **Creating more capital resources involves a trade-off of fewer consumer goods or services in the present in return for higher expected productivity in the future.** Resources can go into the production of consumer goods and services and the creation of capital resources; however, because resources are scarce, society must make decisions about how much current consumption it is willing to sacrifice for future growth. The same holds true for you: Every investment you make to enhance your future means that you must give up something now. It may be tough to set aside your spending money, but every investment that you make now will allow you more opportunities in the future.

> ***"You cannot hope to build a better world without improving the individuals. To that end each of us must work for his own improvement, and at the same time share a general responsibility for all humanity...."***
>
> **—Marie Curie, French physicist**

5. **Economic growth means producing increasing amounts of goods and services over the long term.** The increasing productivity associated with economic growth creates a greater supply of goods and services, which provide a higher standard of living. Every member of the work force, including you, contributes to this economic growth. And every member of society, including you, benefits from economic growth.

6. **A country's potential Gross Domestic Product depends on the quality and quantity of its natural resources, the size and skills of its labor force, and the size and quality of its capital resources.** Gross Domestic Product is the market value of all final goods and services produced in a country in a given year. If a society invests in ways that increase GDP, everyone benefits. If you have a job, you are already providing a good or a service that is added to the GDP. Even if you're not working presently, your investment in your education is adding to the country's potential GDP. Future economic growth depends on the quality of your investment.

BUILDING ON SUCCESS

▶ TAKE a look at the employment ads in the newspaper. Choose a job that interests you, and contact the company that placed the ad. Arrange an interview with a person who holds a position similar to the one advertised, and request a tour of the facility. Be sure to ask the employee questions about the position, including necessary qualifications for the job.

EXTENSION

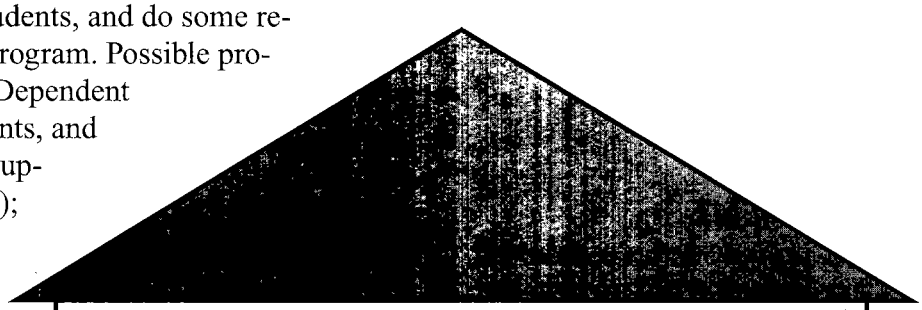
Assign one or more of the activities in **Building on Success**. Encourage students to apply the concepts learned in the lesson and to refer to the **Econcepts** (page 105) as needed.

Here are several questions you might ask:

- What does the company produce?
- How many workers does the firm employ?
- What are your responsibilities?
- What kind of training and education are required for this job?
- Does the company offer student internships?
- Does the company provide on-the-job training?
- Will the company pay for additional education of its workers?

Use as many of these questions as you wish, and add your own to the list. If the idea of conducting an interview makes you nervous, do a little research into the proper technique of interviewing. You will find some good tips in books about technical and professional writing. After you conduct the interview, write a report about this career opportunity. Be prepared to share your findings with your classmates.

▶ Work with two or three other students, and do some research into a public assistance program. Possible programs are Aid to Families with Dependent Children (AFDC); Women, Infants, and Children (WIC); food stamps; Supplemental Security Income (SSI); public housing through the Department of Housing and Urban Development (HUD). Prepare an oral report for the class. Be sure to outline eligibility requirements, the history of the program, and its costs. Don't forget the opportunity costs—the other possible uses for the tax revenues. Discuss the following issues. Does the program benefit society as a whole? Does it reduce income inequality? Is the program worth what it costs? Should it be expanded or cut back?



Putting a Roof over Their Heads

"Welfare hotel" costs are staggering. The cost of a welfare hotel room runs as high as $2,600 a month per family. That much money could support two or three families in their own homes.

- In New York 333 hotels are used to shelter more than 1,400 families at an average cost per family of $2,640 per month.
- In Massachusetts 55 hotels are used to serve more than 400 families at an average cost per family of $2,100 per month.
- In New Jersey 18 hotels serve more than 450 families at an average cost of $1,571 per month.
- The monthly $2,100-per-family payment to welfare hotels in Boston is three times the monthly cost of renting an apartment.

—Adapted from Collin C. Peterson, "Introduction of the Permanent Housing for Homeless Families Act," *Congressional Record* (May 18, 1994)

▶ Imagine you're an advertising agent and you've been assigned the Sudsy Soap account. The first thing you would have to do is define Sudsy Soap, create an

"image" for it. What are its qualities? In what ways is it different from other soaps? It's not easy. Sudsy Soap smells good, but so do most other soaps. Sudsy Soap is "gentle to the skin." Big deal—have you ever used a soap that left burns or blisters? So what would you say? The truth is, most soaps are pretty much alike, and people often buy soap according to the price. Human resources can be a lot like soap. To set themselves apart from everyone else, they need to develop certain skills and abilities.

What if **you** were the "product" being advertised? What would the ad say? You probably have a lot of good qualities: You're smart, honest, personable, diligent....These are all solid, marketable characteristics. But many people have these qualities. How can you advertise yourself so that you stand out from the crowd?

The first thing to do is create a print ad. But don't make it look like a display ad in a newspaper. Write a résumé instead. A résumé is a lot like an ad, and you will need one when you apply for a job. You can find a sample résumé in a book that tells you how to apply for a job. List your educational background and your special talents and skills. Describe your work experiences and your special interests. Be prepared to share your résumé with your classmates.

ASSESSMENT

Two types of assessment are provided for you to evaluate students' comprehension and mastery of the concepts presented in this lesson.

On Your Own

The first assessment asks students to demonstrate their knowledge of investment by answering several questions regarding the development of a business. Then students are asked to write a brief report on how they might invest to develop the business.

Appropriate responses:

1. *Educational investment may include classes in botany, horticulture, geometry, accounting, business writing, office management, and computer software. Students may also cite efforts in physical development.*

QUALITY CONTROL

On Your Own

Could you apply what you have learned in this lesson to develop a business of your own? Try it. Use your knowledge of investment to answer the following questions on how you would develop a landscaping firm. Landscaping is a big money-maker in many parts of the country. It may involve everything from simple grass cutting to planning and maintaining large gardens.

Use the blank lines provided or a separate sheet of paper for your responses.

1. What kind of investment in human capital could you make now to prepare yourself for developing a landscaping business?

2. What are some ways you might attain the human capital you would need to succeed in this business?

_____

_____

_____

_____

2. Technical schools, community colleges, and universities may offer programs in this area. One might also work part-time for a landscaping firm to receive on-the-job training and to obtain professional experience.

3. What opportunity costs might be involved in developing your human capital for this career?

_____

_____

_____

_____

3. Answers will vary, but in general training in this area will divert time, effort, and money away from the next best alternative.

4. What capital resources would be useful in this enterprise?

_____

_____

_____

_____

4. Lawn mowers, gardening equipment, trucks, and trailers are some of the capital resources necessary in this line of work.

5. What could you do now to position yourself for acquiring these capital resources in the future?

_____

_____

_____

_____

5. Some amount of current consumption must be given up in order to acquire future capital resources.

Look at your various options, and take advantage of opportunities to obtain the training you need and to grow in your job.

Assessment-Track Questions

Besides appearing in the *Student Guide*, the questions under the heading **In Class** are contained on a special assessment track of the videodisc for this module. Using the appropriate disc side, you can access each question by swiping its barcode. Each question is presented as a voice-over to part of a video program that students previously watched. The video will provide students with valuable cues, enabling them to generalize previously learned material to new situations.

Assessment Question 1

1. *All investment dollars, allocated to either physical or human capital, have an opportunity cost of foregone consumption today. Every dollar of investment spent today represents resources that could have been used to satisfy consumer wants now. Societies and individuals must choose between consuming today and consuming tomorrow. People invest in capital and incur the opportunity cost of current consumption in order to increase their ability to produce and consume more output in the future.*

Assessment Question 2

2. *Today's investments create tomorrow's wealth. Wealth can be measured by the amount of real output that an individual, firm, or society is able to produce. Individuals invest in themselves and their children through human capital. Firms invest in new plant, equipment, and inventory. Governments invest in infrastructure, such as roads and bridges, and in the education of their citizens. Increasing these investments today helps to create a skilled work force and a larger productive capacity that individuals, firms, and societies can use to generate more output in the future.*

In Class

The following questions should be answered while you watch a special section of the videodisc that your teacher will play for you. Write your answers on the lines provided or on a separate sheet of paper.

1. Anytime you make an investment there's an opportunity cost. What are the opportunity costs and trade-offs of investing in capital goods and human capital?

2. Individuals, households, firms, and governments all make investments. What is the relationship between investing and the creation of wealth?

3. Human capital increases our productivity, our earnings, and our standard of living. But don't charge that Rolls-Royce just yet. Human capital, like any investment, has risks. What are some risks involved in human-capital investment?

Assessment Question 3

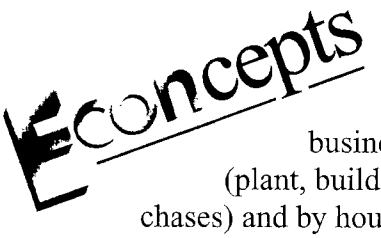
3. Although investments in physical and human capital raise productivity and wages, they also have opportunity costs and economic risks. The future is always uncertain. A job for which someone spent two years sacrificing, studying, and training may not materialize or might not pay as well as the person expected. Risks can come either from the supply side of the market, such as when a surplus of workers keeps wages low for those who do find jobs, or from the demand side, such as when firms react to a slowdown in business by laying off workers.

4. People change jobs and even careers. Why is job mobility a desirable trait for workers to have?

Assessment Question 4

4. Factors that increase job mobility increase people's value in a labor market. With increased mobility, workers have more options available to them. The most important factor that results in employment opportunities for workers is the market value of skills that the laborer possesses. If a person has a particular talent—or a collection of skills that are valuable to a local or national labor market—the opportunities to earn income and the probability of overall success increase greatly. On the other hand, if a person's level of skills is low, options are few and wages are likely to be low in any labor market.

GLOSSARY



annuity—a certain sum of money to be received every year for a specified number of years

capital resources—manufactured goods, such as buildings, tools, and machinery, that are produced for the purpose of making other goods

current consumption—income used to purchase goods and services and not saved for future consumption

demand—the quantity of an input, including labor, that firms are willing and able to buy at various prices during a specific time period

discounting—the process of converting a sum of money to be received in the future to the value it has today

economic efficiency—a situation that occurs when the benefits of economic action outweigh the costs

economic equity—the application of concepts of what is fair and unfair to matters of economic policy

future value—the value in the future of an amount of money today

Gross Domestic Product (GDP)—the total market value, expressed in dollars, of all final goods and services produced in an economy in a given year

human capital—the stock of knowledge and ability that people possess; the skill and knowledge of workers (labor resources)

input—resources used to produce goods and services

interest rate—the price paid for the use of someone else's money or the price you receive for lending your money

investment in capital resources—expenditures by businesses on new capital goods (plant, building, and equipment purchases) and by households on new homes

investment in human capital—expenditures of time, effort, and money to improve the stock of knowledge and ability that people possess

marginal physical product—the additional output produced when one additional unit of a resource is employed

marginal revenue product—the change in the total revenue of the firm when it employs one additional unit of a resource

opportunity cost—the highest valued alternative that must be given up because another option is chosen

output—goods and services that are produced and provided to the public

present value—the value today of an amount of money to be received in the future

productivity—the amount of output produced per unit of input used

profit—the return to business that results when the value of sales exceeds the cost of the goods or services sold

supply—the quantity of an input, including labor, that owners are willing and able to sell at various prices during a specific time period

trade-off—accepting or choosing less of one thing to get more of something else

ADDITIONAL RESOURCES

BACKGROUND ON ECONOMICS

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Help with Using Technology

"Decision Maker's Guide to Laserdiscs and CD-ROMs." *Curriculum Administrator* 29:8 (1995).

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Organizations Providing Information for High School Economics Teachers

- Agency for Instructional Technology
  P.O. Box A
  Bloomington, Indiana 47402-0120
  (800) 457-4509

  (Call or write for information on *Understanding Taxes* and *Taxes in U.S. History.*)

▶ ERIC Clearinghouse for Social Studies/Social Science Education (ERIC/Chess)
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Boulder, Colorado 80302
(303) 492-8434

(Write for list of free materials. Custom computer searches and duplicate printouts of computer searches of social studies materials are available.)

▶ National Council on Economic Education
1140 Avenue of the Americas
New York, New York 10036
(212) 730-7007

(Ask for checklist of publications.)

▶ U.S. Federal Reserve Board

(Write the banks for instructional materials of the Federal Reserve system. Federal Reserve Banks also offer various educational services.)

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  Public Information Department
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  Public Affairs Department
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- Federal Reserve Bank of Dallas
  Department of Communications, Financial, and Community Affairs
  400 South Akard Street
  Dallas, TX 75222
  (214) 651-6222

- Federal Reserve Bank of San Francisco
  Public Information Department
  101 Market Street
  San Francisco, CA 94105
  (415) 974-2246

Internet Resources

Economic Bulletin Board (EBB)
Gopher://una.hh.lib.umich.edu/11/ebb

Economic Education
http://unicorn.unomaha.edu/dept/econ/econed.htm

Economic Resources
http://soig.escr.bris.ac.uk.subjects/econ.html

Reach-Net
reach.ICEE.niu.edu

Resources for Economists on the Internet
This resource can be accessed through: *Shortcut to All Resources Link*
http://econwpa.wustl.edu/EconFAQ/EconFAQ.html

YaHoo's Economy Economics
http:/www.yahoo.com/Economy/Economics/

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