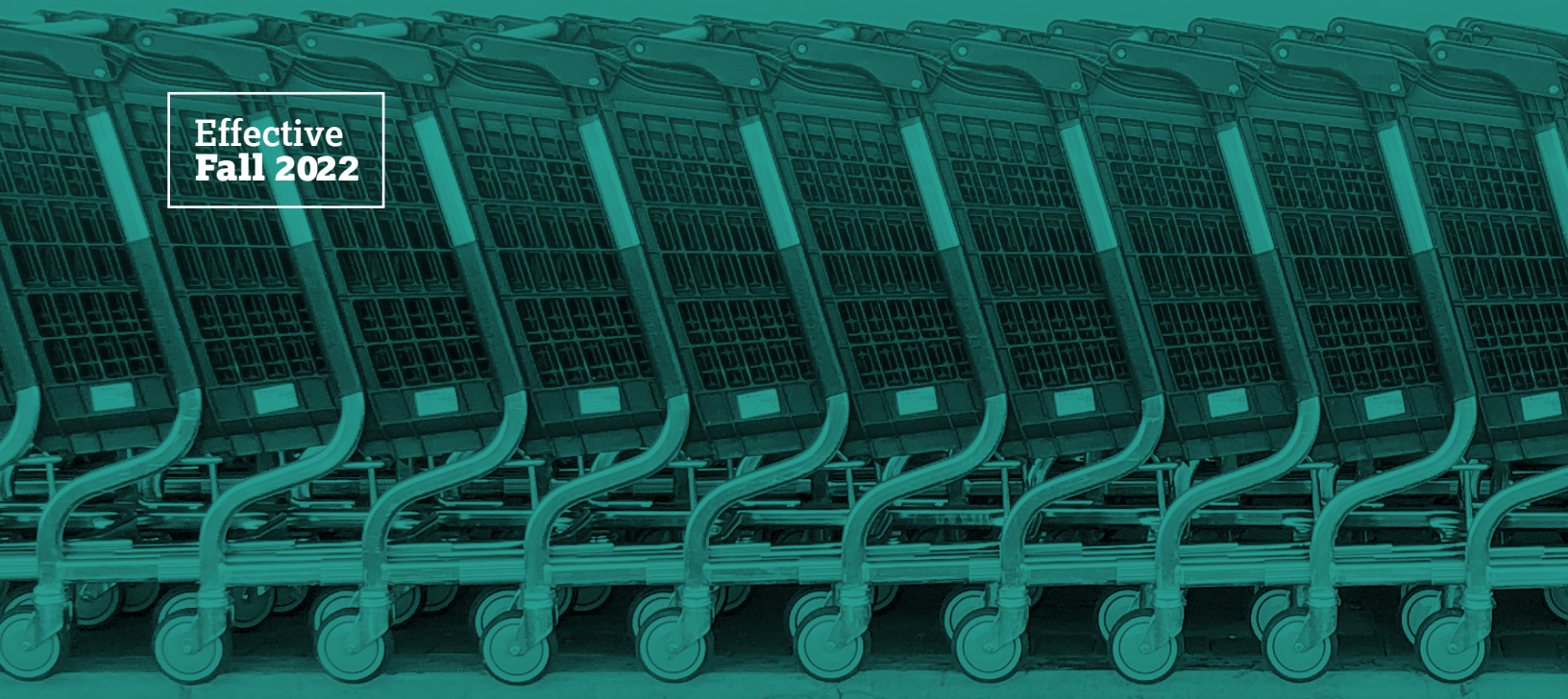
CollegeBoard AP

INCLUDES

- ✓ Course framework
- ✓ Instructional section
- ✓ Sample exam questions
- ✓ Classroom poster

AP® Microeconomics

COURSE AND EXAM DESCRIPTION



Effective
Fall 2022

AP® Microeconomics

COURSE AND EXAM DESCRIPTION

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AP COURSE AND EXAM DESCRIPTIONS ARE UPDATED PERIODICALLY
Please visit AP Central (apcentral.collegeboard.org) to determine whether a more recent course and exam description is available.

About College Board

College Board is a mission-driven not-for-profit organization that connects students to college success and opportunity. Founded in 1900, College Board was created to expand access to higher education. Today, the membership association is made up of over 6,000 of the world's leading educational institutions and is dedicated to promoting excellence and equity in education. Each year, College Board helps more than seven million students prepare for a successful transition to college through programs and services in college readiness and college success—including the SAT® and the Advanced Placement® Program. The organization also serves the education community through research and advocacy on behalf of students, educators, and schools.

For further information, visit **collegeboard.org**.

AP Equity and Access Policy

College Board strongly encourages educators to make equitable access a guiding principle for their AP programs by giving all willing and academically prepared students the opportunity to participate in AP. We encourage the elimination of barriers that restrict access to AP for students from ethnic, racial, and socioeconomic groups that have been traditionally underrepresented. Schools should make every effort to ensure their AP classes reflect the diversity of their student population. College Board also believes that all students should have access to academically challenging coursework before they enroll in AP classes, which can prepare them for AP success. It is only through a commitment to equitable preparation and access that true equity and excellence can be achieved.

Designers: Sonny Mui and Bill Tully

Visit College Board on the web: **collegeboard.org**.

Contents

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Acknowledgments

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Please note that the course framework included in this document was inspired by work originally undertaken by the AP Microeconomics Curriculum Development and Assessment Committee.

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About AP

College Board's Advanced Placement® Program (AP®) enables willing and academically prepared students to pursue college-level studies—with the opportunity to earn college credit, advanced placement, or both—while still in high school. Through AP courses in 38 subjects, each culminating in a challenging exam, students learn to think critically, construct solid arguments, and see many sides of an issue—skills that prepare them for college and beyond. Taking AP courses demonstrates to college admission officers that students have sought the most challenging curriculum available to them, and research indicates that students who score a 3 or higher on an AP Exam typically experience greater academic success in college and are more likely to earn a college degree than non-AP students. Each AP teacher's syllabus is evaluated and approved by faculty from some of the nation's leading colleges and universities, and AP Exams are developed and scored by college faculty and experienced AP teachers. Most four-year colleges and universities in the United States grant credit, advanced placement, or both on the basis of successful AP Exam scores; more than 3,300 institutions worldwide annually receive AP scores.

AP Course Development

In an ongoing effort to maintain alignment with best practices in college-level learning, AP courses and exams emphasize challenging, research-based curricula aligned with higher education expectations.

Individual teachers are responsible for designing their own curriculum for AP courses, selecting appropriate college-level readings, assignments, and resources. This course and exam description presents the content and skills that are the focus of the corresponding college course and that appear on the AP Exam. It also organizes the content and skills into a series of units that represent a sequence found in widely adopted college textbooks and that many AP teachers have told us they follow in order to focus their instruction. The intention of this publication is to respect teachers' time and expertise by providing a roadmap that they can modify and adapt to their local priorities and preferences. Moreover, by organizing the AP course content and skills into units, the AP Program is able to provide teachers and students with formative assessments—Personal Progress Checks—that teachers can assign throughout the year to measure student progress as they acquire content knowledge and develop skills.

Enrolling Students: Equity and Access

College Board strongly encourages educators to make equitable access a guiding principle for their AP programs by giving all willing and academically prepared students the opportunity to participate in AP. We encourage the elimination of barriers that restrict access to AP for students from ethnic, racial, and socioeconomic groups that have been traditionally underserved. College Board also believes that all students should have access to academically challenging coursework before they enroll in AP classes, which can prepare them for AP success. It is only through a commitment to equitable preparation and access that true equity and excellence can be achieved.

Offering AP Courses: The AP Course Audit

The AP Program unequivocally supports the principle that each school implements its own curriculum that will enable students to develop the content understandings and skills described in the course framework.

While the unit sequence represented in this publication is optional, the AP Program does have a short list of curricular and resource requirements that must be fulfilled before a school can label a course "Advanced Placement" or "AP." Schools wishing to offer AP courses must participate in the AP Course Audit, a process through which AP teachers' course materials are reviewed by college faculty. The AP Course Audit was created to provide teachers and administrators with clear guidelines on curricular and resource requirements for AP courses and to help colleges and universities validate courses marked "AP" on students' transcripts. This process ensures that AP teachers' courses meet or exceed the curricular and resource expectations that college and secondary school faculty have established for college-level courses.

The AP Course Audit form is submitted by the AP teacher and the school principal (or designated administrator) to confirm awareness and understanding of the curricular and resource requirements. A syllabus or course outline, detailing how course requirements are met, is submitted by the AP teacher for review by college faculty.

Please visit **collegeboard.org/apcourseaudit** for more information to support the preparation and submission of materials for the AP Course Audit.

How the AP Program Is Developed

The scope of content for an AP course and exam is derived from an analysis of hundreds of syllabi and course offerings of colleges and universities. Using this research and data, a committee of college faculty and expert AP teachers work within the scope of the corresponding college course to articulate what students should know and be able to do upon the completion of the AP course. The resulting course framework is the heart of this course and exam description and serves as a blueprint of the content and skills that can appear on an AP Exam.

The AP Test Development Committees are responsible for developing each AP Exam, ensuring the exam questions are aligned to the course framework. The AP Exam development process is a multiyear endeavor; all AP Exams undergo extensive review, revision, piloting, and analysis to ensure that questions are accurate, fair, and valid, and that there is an appropriate spread of difficulty across the questions.

Committee members are selected to represent a variety of perspectives and institutions (public and private, small and large schools and colleges), and a range of gender, racial/ethnic, and regional groups. A list of each subject's current AP Test Development Committee members is available on **apcentral.collegeboard.org**.

Throughout AP course and exam development, College Board gathers feedback from various stakeholders in both secondary schools and higher education institutions. This feedback is carefully considered to ensure that AP courses and exams are able to provide students with a college-level learning experience and the opportunity to demonstrate their qualifications for advanced placement or college credit.

How AP Exams Are Scored

The exam scoring process, like the course and exam development process, relies on the expertise of both AP teachers and college faculty. While multiple-choice questions are scored by machine, the free-response questions and through-course performance assessments, as applicable, are scored by thousands of college faculty and expert AP teachers. Most are scored at the annual AP Reading, while a small portion is scored online. All AP Readers are thoroughly trained, and their work is monitored throughout the Reading for fairness and consistency. In each subject, a highly respected college faculty member serves as Chief Faculty Consultant and, with the help of AP Readers in leadership positions, maintains the accuracy of the scoring standards. Scores on the free-response questions and performance assessments are weighted and combined with the results of the computer-scored multiple-choice questions, and this raw score is converted into a composite AP score on a 1–5 scale.

AP Exams are **not** norm-referenced or graded on a curve. Instead, they are criterion-referenced, which means that every student who meets the criteria for an AP score of 2, 3, 4, or 5 will receive that score, no matter how many students that is. The criteria for the number of points students must earn on the AP Exam to receive scores of 3, 4, or 5—the scores that research consistently validates for credit and placement purposes—include:

- The number of points successful college students earn when their professors administer AP Exam questions to them.
- The number of points researchers have found to be predictive that an AP student will succeed when placed into a subsequent higher-level college course.
- Achievement-level descriptions formulated by college faculty who review each AP Exam question.

Using and Interpreting AP Scores

The extensive work done by college faculty and AP teachers in the development of the course and exam and throughout the scoring process ensures that AP Exam scores accurately represent students' achievement in the equivalent college course. Frequent and regular research studies establish the validity of AP scores as follows:

AP Score	Credit Recommendation	College Grade Equivalent
5	Extremely well qualified	A
4	Well qualified	A-, B+, B
3	Qualified	B-, C+, C
2	Possibly qualified	n/a
1	No recommendation	n/a

While colleges and universities are responsible for setting their own credit and placement policies, most private colleges and universities award credit and/or advanced placement for AP scores of 3 or higher. Additionally, most states in the U.S. have adopted statewide credit policies that ensure college credit for scores of 3 or higher at public colleges and universities. To confirm a specific college's AP credit/placement policy, a search engine is available at **apstudent.org/creditpolicies**

BECOMING AN AP READER

Each June, thousands of AP teachers and college faculty members from around the world gather for seven days in multiple locations to evaluate and score the free-response sections of the AP Exams. Ninety-eight percent of surveyed educators who took part in the AP Reading say it was a positive experience.

There are many reasons to consider becoming an AP Reader, including opportunities to:

- **Bring positive changes to the classroom:** Surveys show that the vast majority of returning AP Readers—both high school and college educators—make improvements to the way they teach or score because of their experience at the AP Reading.
- **Gain in-depth understanding of AP Exam and AP scoring standards:** AP Readers gain exposure to the quality and depth of the responses from the entire pool of AP Exam takers, and thus are better able to assess their students' work in the classroom.
- **Receive compensation:** AP Readers are compensated for their work during the Reading. Expenses, lodging, and meals are covered for Readers who travel.
- **Score from home:** AP Readers have online distributed scoring opportunities for certain subjects. Check **collegeboard.org/apreading** for details.
- **Earn Continuing Education Units (CEUs):** AP Readers earn professional development hours and CEUs that can be applied to PD requirements by states, districts, and schools.

How to Apply

Visit **collegeboard.org/apreading** for eligibility requirements and to start the application process.

AP Resources and Supports

By completing a simple activation process at the start of the school year, teachers and students receive access to a robust set of classroom resources.

AP Classroom

AP Classroom is a dedicated online platform designed to support teachers and students throughout their AP experience. The platform provides a variety of powerful resources and tools to provide yearlong support to teachers and enable students to receive meaningful feedback on their performance.

UNIT GUIDES

Appearing in this publication and on AP Classroom, these planning guides outline all required course content and skills, organized into commonly taught units. Each unit guide suggests a sequence and pacing of content, scaffolds skill instruction across units, organizes content into topics, and provides tips on taking the AP Exam.

PERSONAL PROGRESS CHECKS

Formative AP questions for every unit provide feedback to students on the areas where they need to focus. Available online, Personal Progress Checks measure knowledge and skills through multiple-choice questions with rationales to explain correct and incorrect answers, and free-response questions with scoring information. Because the Personal Progress Checks are formative, the results of these assessments cannot be used to evaluate teacher effectiveness or assign letter grades to students, and any such misuses are grounds for losing school authorization to offer AP courses.*

PROGRESS DASHBOARD

This dashboard allows teachers to review class and individual student progress throughout the year. Teachers can view class trends and see where students struggle with content and skills that will be assessed on the AP Exam. Students can view their own progress over time to improve their performance before the AP Exam.

AP QUESTION BANK

This online library of real AP Exam questions provides teachers with secure questions to use in their classrooms. Teachers can find questions indexed by course topics and skills, create customized tests, and assign them online or on paper. These tests enable students to practice and get feedback on each question.

*To report misuses, please call, 877-274-6474 (International: +1-212-632-1781).

Digital Activation

In order to teach an AP class and make sure students are registered to take the AP Exam, teachers must first complete the digital activation process. Digital activation gives students and teachers access to resources and gathers students' exam registration information online, eliminating most of the answer sheet bubbling that has added to testing time and fatigue.

AP teachers and students begin by signing in to **My AP** and completing a simple activation process at the start of the school year, which provides access to all AP resources, including AP Classroom.

To complete digital activation:

- Teachers and students sign in to or create their College Board accounts.
- Teachers confirm that they have added the course they teach to their AP Course Audit account and have had it approved by their school's administrator.
- Teachers or AP Coordinators, depending on who the school has decided is responsible, set up class sections so students can access AP resources and have exams ordered on their behalf.
- Students join class sections with a join code provided by their teacher or AP Coordinator.
- Students will be asked for additional registration information upon joining their first class section, which eliminates the need for extensive answer sheet bubbling on exam day.

While the digital activation process takes a short time for teachers, students, and AP Coordinators to complete, overall it helps save time and provides the following additional benefits:

- **Access to AP resources and supports:** Teachers have access to resources specifically designed to support instruction and provide feedback to students throughout the school year as soon as activation is complete.
- **Streamlined exam ordering:** AP Coordinators can create exam orders from the same online class rosters that enable students to access resources. The coordinator reviews, updates, and submits this information as the school's exam order in the fall.
- **Student registration labels:** For each student included in an exam order, schools will receive a set of personalized AP ID registration labels, which replaces the AP student pack. The AP ID connects a student's exam materials with the registration information they provided during digital activation, eliminating the need for pre-administration sessions and reducing time spent bubbling on exam day.
- **Targeted Instructional Planning Reports:** AP teachers will get Instructional Planning Reports (IPRs) that include data on each of their class sections automatically rather than relying on special codes optionally bubbled in on exam day.

Instructional Model

Integrating AP resources throughout the course can help students develop skills and conceptual understandings. The instructional model outlined below shows possible ways to incorporate AP resources into the classroom.

Plan

Teachers may consider the following approaches as they plan their instruction before teaching each unit.

- Review the overview at the start of each **unit guide** to identify essential questions, conceptual understandings, and skills for each unit.
- Use the **Unit at a Glance** table to identify related topics that build toward a common understanding, and then plan appropriate pacing for students.
- Identify useful strategies in the **Instructional Approaches** section to help teach the concepts and skills.

Teach

When teaching, supporting resources can be used to build students' conceptual understanding and their mastery of skills.

- Use the topic pages in the **unit guides** to identify the required content.
- Integrate the content with a skill, considering any appropriate scaffolding.
- Employ any of the instructional strategies previously identified.
- Use the available resources on the topic pages to bring a variety of assets into the classroom.

Assess

Teachers can measure student understanding of the content and skills covered in the unit and provide actionable feedback to students.

- At the end of each unit, use **AP Classroom** to assign students the online **Personal Progress Checks**, as homework or as an in-class task.
- Provide question-level feedback to students through answer rationales; provide unit- and skill-level feedback using the progress dashboard.
- Create additional practice opportunities using the **AP Question Bank** and assign them through **AP Classroom**.

About the AP Microeconomics Course

AP Microeconomics is a college-level course that introduces students to the principles of economics that apply to the functions of individual economic decision-makers. The course also develops students' familiarity with the operation of product and factor markets, distributions of income, market failure, and the role of government in promoting greater efficiency and equity in the economy. Students learn to use graphs, charts, and data to analyze, describe, and explain economic concepts.

College Course Equivalent

AP Microeconomics is equivalent to a one-semester introductory college course in economics.

Prerequisites

There are no prerequisites for AP Microeconomics. Students should be able to read a college-level textbook and possess basic mathematics and graphing skills.

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AP MICROECONOMICS

Course Framework

Introduction

The AP Microeconomics course outlined in this framework reflects a commitment to what economics teachers, professors, and researchers have agreed is the main goal of a college-level microeconomics course: to introduce students to the principles that apply to individual economic decision-makers.

The *AP Microeconomics Course and Exam Description* defines concepts, skills, and understandings required by representative colleges and universities for granting college credit and placement. The course prepares students to think like economists by using principles and models to describe economic situations and predict and explain outcomes. Like economists, students do so by using graphs, charts, and data.

Although the course framework is designed to provide a clear and detailed description of the course content and skills, it is not a curriculum. A college-level textbook that covers the required course content should be used, and teachers create their own curricula to meet the needs of their students and any state or local requirements.

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Course Framework Components

Overview

This course framework provides a clear and detailed description of the course requirements necessary for student success.

The course framework includes two essential components:

1 COURSE SKILLS

The course skills are central to the study and practice of economics. Help students develop and apply the described skills on a regular basis over the span of the course.

2 COURSE CONTENT

The course content is organized into commonly taught units of study that provide a suggested sequence for the course. These units comprise the content and conceptual understandings that colleges and universities typically expect students to master to qualify for college credit and/or placement. This content is grounded in big ideas, which are cross-cutting concepts that build conceptual understanding and spiral throughout the course.

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AP MICROECONOMICS

Course Skills

The AP Economics skills describe what a student should be able to do while exploring course concepts. The table that follows presents these skills, which students should develop during the AP Microeconomics and AP Macroeconomics courses. These skills form the basis of the tasks on the AP Exam.

The unit guides later in this publication embed and spiral these skills throughout the course, providing teachers with one way to integrate the skills in the course content with sufficient repetition to prepare students to transfer those skills when taking the AP Exam. Course content may be paired with a variety of skills on the AP Exam.

More detailed information about teaching the course skills can be found in the Instructional Approaches section of this publication.

AP MICROECONOMICS

AP Economics Skills

Skill Category 1	Skill Category 2	Skill Category 3	Skill Category 4
Principles and Models 1 Define economic principles and models.	***Interpretation*** 2 Explain given economic outcomes.	***Manipulation*** 3 Determine outcomes of specific economic situations.	***Graphing and Visuals*** 4 Model economic situations using graphs or visual representations.

SKILLS

1.A Describe economic concepts, principles, or models.	2.A Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.	3.A Determine the outcome of an economic situation using economic concepts, principles, or models.	4.A Draw an accurately labeled graph or visual to represent an economic model or market.
1.B Identify an economic concept, principle, or model illustrated by an example.	2.B Using economic concepts, principles, or models, explain how a specific economic outcome occurs when there are multiple contributing variables or what multiple actions should be taken in order to achieve a specific economic outcome.	3.B Determine the effect(s) of one or more changes on other economic markets.	4.B Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.
1.C Identify an economic concept, principle, or model using quantitative data or calculations.	2.C Interpret a specific economic outcome using quantitative data or calculations.	3.C Determine the effect(s) of a change in an economic situation using quantitative data or calculations.	4.C Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.
1.D Describe the similarities, differences, and limitations of economic concepts, principles, or models.			

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AP MICROECONOMICS

Course Content

Based on the Understanding by Design® (Wiggins and McTighe) model, this course framework provides a clear and detailed description of the course requirements necessary for student success. The framework specifies what students must know, be able to do, and understand, with a focus on big ideas that encompass core principles and theories of the discipline. The framework also encourages instruction that prepares students for advanced economics coursework.

Big Ideas

The big ideas serve as the foundation of the course and allow students to create meaningful connections among concepts. They are often abstract concepts or themes that become threads that run throughout the course. Revisiting the big ideas and applying them in a variety of contexts allows students to develop deeper conceptual understanding. Below are the big ideas of the course and a brief description of each:

BIG IDEA 1: SCARCITY AND MARKETS (MKT)
Limited resources and unlimited wants result in the need to make choices. In a market economy, the choices of buyers and sellers determine market prices and the allocation of scarce resources.

BIG IDEA 2: COSTS, BENEFITS, AND MARGINAL ANALYSIS (CBA)
There are trade-offs associated with any decision. Making optimal decisions requires evaluating the additional costs and benefits of possible actions.

BIG IDEA 3: PRODUCTION CHOICES AND BEHAVIOR (PRD)
Firms seek to minimize costs and maximize profits, which influences their production decisions in the short run and long run.

BIG IDEA 4: MARKET INEFFICIENCY AND PUBLIC POLICY (POL)
Private markets can fail to allocate resources efficiently, and well-designed public policy can endeavor to promote greater efficiency and equity in the economy.

UNITS

The course content is organized into commonly taught units. The units have been arranged in a logical sequence frequently found in many college courses and textbooks.

The six units in AP Microeconomics and their weighting on the multiple-choice section of the AP Exam are listed below.

Pacing recommendations at the unit level and on the Course at a Glance provide suggestions for how to teach the required course content and administer the Personal Progress Checks. The suggested class periods are based on a schedule in which the class meets five days a week for 45 minutes each day, with the assumption that there are approximately 70 instructional days per semester. While these recommendations have been made to aid planning, teachers should of course adjust the pacing based on the needs of their students, alternate schedules (e.g., block scheduling), or their school's academic calendar.

TOPICS

Each unit is broken down into teachable segments called topics. The topic pages (starting on page 34) contain the required content for each topic.

Units	Exam Weighting
Unit 1: Basic Economic Concepts	**12–15%**
Unit 2: Supply and Demand	**20–25%**
Unit 3: Production, Cost, and the Perfect Competition Model	**22–25%**
Unit 4: Imperfect Competition	**15–22%**
Unit 5: Factor Markets	**10–13%**
Unit 6: Market Failure and the Role of Government	**8–13%**

Spiraling the Big Ideas

The following table shows how the big ideas spiral across units.

Big Ideas	Unit 1 *Basic Economic Concepts*	Unit 2 *Supply and Demand*	Unit 3 *Production, Cost, and the Perfect Competition Model*	Unit 4 *Imperfect Competition*	Unit 5 *Factor Markets*	Unit 6 *Market Failure and the Role of Government*
Scarcity and Markets MKT	✓	✓				
Costs, Benefits, and Marginal Analysis CBA	✓		✓			
Production Choices and Behavior PRD			✓	✓	✓	
Market Inefficiency and Public Policy POL		✓				✓

Course at a Glance

Plan

The Course at a Glance provides a useful visual organization of the AP Microeconomics curricular components, including:

- Sequence of units, along with approximate weighting and suggested pacing. Please note, pacing is based on 45-minute class periods, meeting five days each week for a full academic semester.
- Progression of topics within each unit.
- Spiraling of the big ideas and skills across units.

Teach

SKILL CATEGORIES

Skill categories spiral throughout the course.

- 1 Principles and Models
- 2 Interpretation
- 3 Manipulation
- 4 Graphing and Visuals

BIG IDEAS

Big ideas spiral across topics and units.

- MKT Scarcity and Markets
- CBA Costs, Benefits, and Marginal Analysis
- PRD Production Choices and Behavior
- POL Market Inefficiency and Public Policy

Assess

Assign the Personal Progress Checks—either as homework or in class—for each unit. Each Personal Progress Check contains formative multiple-choice and free-response questions. The feedback from the Personal Progress Checks shows students the areas where they need to focus.

UNIT 1 Basic Economic Concepts

~9–11 Class Periods | **12–15%** AP Exam Weighting

MKT 1	1.1 Scarcity
MKT 1	1.2 Resource Allocation and Economic Systems
MKT 4	1.3 Production Possibilities Curve
MKT 1	1.4 Comparative Advantage and Trade
CBA 1	1.5 Cost-Benefit Analysis
CBA 2	1.6 Marginal Analysis and Consumer Choice

Personal Progress Check 1

Multiple-choice: ~20 questions
Free-response: 2 questions
- Short
- **Short**

UNIT 2 Supply and Demand

~13–15 Class Periods | **20–25%** AP Exam Weighting

MKT 4	2.1 Demand
MKT 4	2.2 Supply
MKT 3	2.3 Price Elasticity of Demand
MKT 3	2.4 Price Elasticity of Supply
MKT 3	2.5 Other Elasticities
MKT 2	2.6 Market Equilibrium and Consumer and Producer Surplus
MKT 3	2.7 Market Disequilibrium and Changes in Equilibrium
POL 4	2.8 The Effects of Government Intervention in Markets
POL 4	2.9 International Trade and Public Policy

Personal Progress Check 2

Multiple-choice: ~25 questions
Free-response: 2 questions
- Short
- Short

UNIT 3 Production, Cost, and the Perfect Competition Model

~11–13 Class Periods | **22–25%** AP Exam Weighting

PRD 1	3.1	The Production Function
PRD 4	3.2	Short-Run Production Costs
PRD 1	3.3	Long-Run Production Costs
CBA 1	3.4	Types of Profit
CBA 2	3.5	Profit Maximization
PRD 2	3.6	Firms' Short-Run Decisions to Produce and Long-Run Decisions to Enter or Exit a Market
PRD 4	3.7	Perfect Competition

Personal Progress Check 3

Multiple-choice: ~20 questions
Free-response: 2 questions
- Short
- Short

UNIT 4 Imperfect Competition

~8–10 Class Periods | **15–22%** AP Exam Weighting

PRD 1	4.1	Introduction to Imperfectly Competitive Markets
PRD 4	4.2	Monopoly
PRD 4	4.3	Price Discrimination
PRD 4	4.4	Monopolistic Competition
PRD 2	4.5	Oligopoly and Game Theory

Personal Progress Check 4

Multiple-choice: ~15 questions
Free-response: 2 questions
- Short
- Long

UNIT 5 Factor Markets

~6–8 Class Periods | **10–13%** AP Exam Weighting

PRD 1	5.1	Introduction to Factor Markets
PRD 3	5.2	Changes in Factor Demand and Factor Supply
PRD 2	5.3	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets
PRD 2	5.4	Monopsonistic Markets

Personal Progress Check 5

Multiple-choice: ~10 questions
Free-response: 1 question
- Short

UNIT 6 Market Failure and the Role of Government

~9–11 Class Periods | **8–13%** AP Exam Weighting

POL 2	6.1	Socially Efficient and Inefficient Market Outcomes
POL 4	6.2	Externalities
POL 1	6.3	Public and Private Goods
POL 4	6.4	The Effects of Government Intervention in Different Market Structures
POL 1	6.5	Inequality

Personal Progress Check 6

Multiple-choice: ~15 questions
Free-response: 2 questions
- Short
- Long

AP MICROECONOMICS

Unit Guides

Introduction

Designed with input from the community of AP Microeconomics educators, the unit guides offer teachers helpful guidance in building students' skills and knowledge. The suggested sequence was identified through a thorough analysis of the syllabi of highly effective AP teachers and the organization of commonly assigned classroom resources.

This unit structure respects new AP teachers' time by providing one possible sequence they can adopt or modify rather than having to build from scratch. An additional benefit is that these units enable the AP Program to provide interested teachers with formative assessments—the Personal Progress Checks—that they can assign their students at the end of each unit to gauge progress toward success on the AP Exam. However, experienced AP teachers who are satisfied with their current course organization and exam results should feel no pressure to adopt these units, which comprise an optional sequence for this course.

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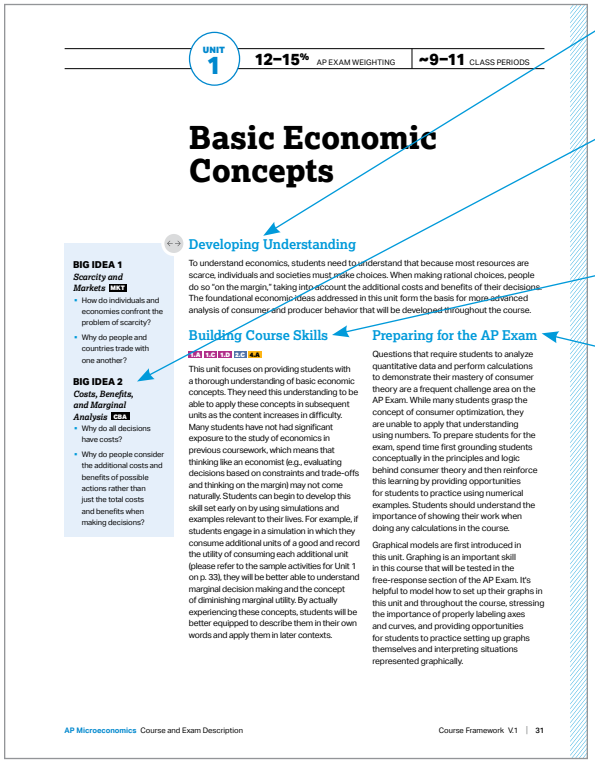
Using the Unit Guides



UNIT 1 | 12–15% AP EXAM WEIGHTING | ~9–11 CLASS PERIODS

Basic Economic Concepts

BIG IDEA 1
Scarcity and Markets MKT
- How do individuals and economies confront the problem of scarcity?
- Why do people and countries trade with one another?

BIG IDEA 2
Costs, Benefits, and Marginal Analysis CBA
- Why do all decisions have costs?
- Why do people consider the additional costs and benefits of possible actions rather than just the total costs and benefits when making decisions?

Developing Understanding

To understand economics, students need to understand that because most resources are scarce, individuals and societies must make choices. When making rational choices, people do so "on the margin," taking into account the additional costs and benefits of their decisions. The foundational economic ideas addressed in this unit form the basis for more advanced analysis of consumer and producer behavior that will be developed throughout the course.

Building Course Skills

1.A 1.B 1.C 2.C 4.A

This unit focuses on providing students with a thorough understanding of basic economic concepts. They need this understanding to be able to apply these concepts in subsequent units as the content increases in difficulty. Many students have not had significant exposure to the study of economics in previous coursework, which means that thinking like an economist (e.g., evaluating decisions based on constraints and trade-offs and thinking on the margin) may not come naturally. Students can begin to develop this skill set early on by using simulations and examples relevant to their lives. For example, if students engage in a simulation in which they consume additional units of a good and record the utility of consuming each additional unit (please refer to the sample activities for Unit 1 on p. 33), they will be better able to understand marginal decision making and the concept of diminishing marginal utility. By actually experiencing these concepts, students will be better equipped to describe them in their own words and apply them in later contexts.

Preparing for the AP Exam

Questions that require students to analyze quantitative data and perform calculations to demonstrate their mastery of consumer theory are a frequent challenge area on the AP Exam. While many students grasp the concept of consumer optimization, they are unable to apply that understanding using numbers. To prepare students for the exam, spend time first grounding students conceptually in the principles and logic behind consumer theory and then reinforce this learning by providing opportunities for students to practice using numerical examples. Students should understand the importance of showing their work when doing any calculations in the course.

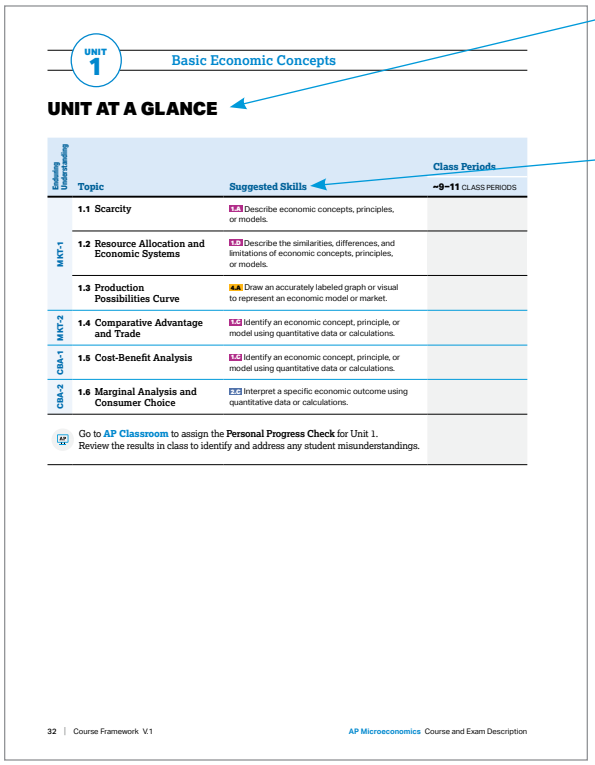
Graphical models are first introduced in this unit. Graphing is an important skill in this course that will be tested in the free-response section of the AP Exam. It's helpful to model how to set up their graphs in this unit and throughout the course, stressing the importance of properly labeling axes and curves, and providing opportunities for students to practice setting up graphs themselves and interpreting situations represented graphically.

Developing Understanding provides an overview that contextualizes and situates the key content of the unit within the scope of the course.

The **big ideas** serve as the foundation of the course and develop understanding as they spiral throughout the course. The **essential questions** are thought-provoking questions that motivate students and inspire inquiry.

Building Course Skills describes specific aspects of the skills that are appropriate to focus on in that unit.

Preparing for the AP Exam provides helpful tips and common student misunderstandings identified from prior exam data.



UNIT 1 | Basic Economic Concepts

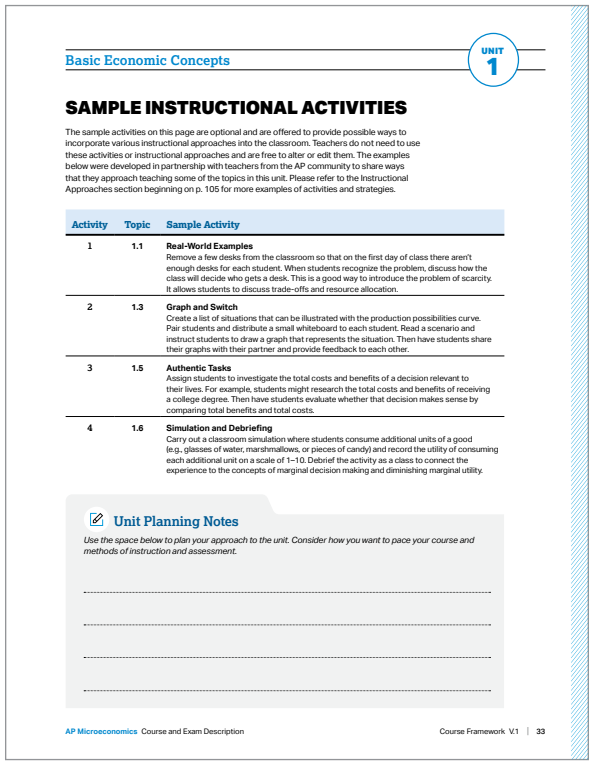
UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods ~9–11 CLASS PERIODS
MKT-1	1.1 Scarcity	1.A Describe economic concepts, principles, or models.	
MKT-1	1.2 Resource Allocation and Economic Systems	1.B Describe the similarities, differences, and limitations of economic concepts, principles, or models.	
MKT-1	1.3 Production Possibilities Curve	4.A Draw an accurately labeled graph or visual to represent an economic model or market.	
MKT-2	1.4 Comparative Advantage and Trade	1.C Identify an economic concept, principle, or model using quantitative data or calculations.	
CBA-1	1.5 Cost-Benefit Analysis	1.C Identify an economic concept, principle, or model using quantitative data or calculations.	
CBA-2	1.6 Marginal Analysis and Consumer Choice	2.C Interpret a specific economic outcome using quantitative data or calculations.	
	Go to AP Classroom to assign the **Personal Progress Check** for Unit 1. Review the results in class to identify and address any student misunderstandings.		

The **Unit at a Glance table** shows the topics, related enduring understandings, and suggested skills. The "class periods" column has been left blank so that teachers can customize the time they spend on each topic.

The **suggested skill** for each topic shows one way you can link the content in that topic to a specific AP Economics skill. The individual skill has been thoughtfully chosen in a way that allows teachers to spiral the skill throughout the course. Students should be able to use multiple skills with each topic, so the suggested skill is not meant to imply an exclusion of other skills.

Using the Unit Guides



Basic Economic Concepts

UNIT 1

SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	1.1	**Real-World Examples** Remove a few desks from the classroom so that on the first day of class there aren't enough desks for each student. When students recognize the problem, discuss how the class will decide who gets a desk. This is a good way to introduce the problem of scarcity. It allows students to discuss trade-offs and resource allocation.
2	1.3	**Graph and Switch** Create a list of situations that can be illustrated with the production possibilities curve. Pair students and distribute a small whiteboard to each student. Read a scenario and instruct students to draw a graph that represents the situation. Then have students share their graphs with their partner and provide feedback to each other.
3	1.5	**Authentic Tasks** Assign students to investigate the total costs and benefits of a decision relevant to their lives. For example, students might research the total costs and benefits of receiving a college degree. Then have students evaluate whether that decision makes sense by comparing total benefits and total costs.
4	1.6	**Simulation and Debriefing** Carry out a classroom simulation where students consume additional units of a good (e.g., glasses of water, marshmallows, or pieces of candy) and record the utility of consuming each additional unit on a scale of 1–10. Debrief the activity as a class to connect the experience to the concepts of marginal decision making and diminishing marginal utility.

Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

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The **Sample Instructional Activities** page includes optional activities that can help tie together the content and skill of a particular topic. Additionally, this page offers space for teachers to make notes on their approach to the individual topics and the unit as a whole.

Basic Economic Concepts

UNIT 1

TOPIC 1.4

Comparative Advantage and Trade

Required Course Content

ENDURING UNDERSTANDING

MKT-2

The consequences of scarcity can be mitigated through specialization in production and by exchange.

LEARNING OBJECTIVE

MKT-2.A

a. Define absolute advantage and comparative advantage.

b. Determine (using data from PPCs or tables as appropriate) absolute and comparative advantage.

MKT-2.B

a. Explain (using data from PPCs or tables as appropriate) how specialization according to comparative advantage with appropriate terms of trade can lead to gains from trade.

b. Calculate (using data from PPCs or tables as appropriate) mutually beneficial terms of trade.

ESSENTIAL KNOWLEDGE

MKT-2.A.1

Absolute advantage describes a situation in which an individual, business, or country can produce more of a good or service than any other producer with the same quantity of resources.

MKT-2.A.2

Comparative advantage describes a situation in which an individual, business, or country can produce a good or service at a lower opportunity cost than another producer.

MKT-2.B.1

Production specialization according to comparative advantage, not absolute advantage, results in exchange opportunities that lead to consumption possibilities beyond the PPC.

MKT-2.B.2

Comparative advantage and opportunity costs determine the terms of trade for exchange under which mutually beneficial trade can occur.

SUGGESTED SKILL

Principles and Models

1.C

Identify an economic concept, principle, or model using quantitative data or calculations.

AVAILABLE RESOURCES

- External Resource > Davidson Next AP Macroeconomics Course—Comparative Advantage & Trade
- Classroom Resources >
  - International Economics and the AP Microeconomics Course
  - International Economics—The Basics of Absolute and Comparative Advantage

AP Microeconomics Course and Exam Description Course Framework V.1 | 37

TOPIC PAGES

The **suggested skill** offers a possible skill to pair with the topic.

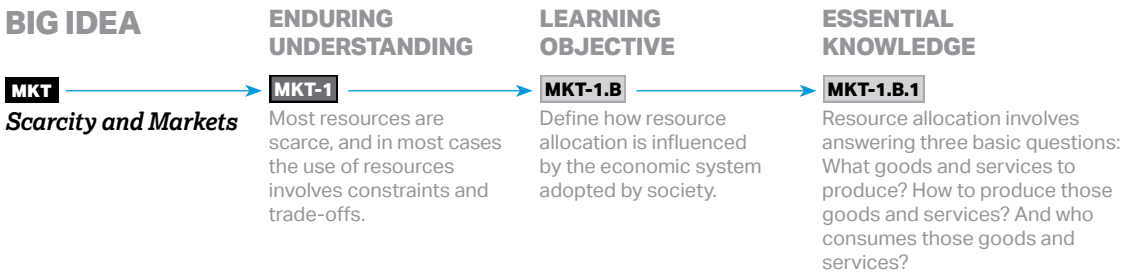
Enduring understandings are the long-term takeaways related to the big ideas that leave a lasting impression on students.

Where possible, **available resources** are listed that might help teachers address a particular topic in their classroom.

Learning objectives define what a student should be able to do with content knowledge in order to progress toward the enduring understandings.

Essential knowledge statements describe the knowledge required to perform the learning objective.

REQUIRED COURSE CONTENT LABELING SYSTEM



NOTE: Labels are used to distinguish each unique element of the required course content and are used throughout this course and exam description. Additionally, they are used in the AP Question Bank and other resources found in AP Classroom. Enduring understandings are labeled sequentially according to the big idea that they are related to. Learning objectives are labeled to correspond with the enduring understanding they relate to. Finally, essential knowledge statements are labeled to correspond with the learning objective they relate to.

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AP MICROECONOMICS

UNIT 1

Basic Economic Concepts

12–15%
AP EXAM WEIGHTING

~9–11
CLASS PERIODS

Remember to go to **AP Classroom** to assign students the online **Personal Progress Check** for this unit.

Whether assigned as homework or completed in class, the **Personal Progress Check** provides each student with immediate feedback related to this unit's topics and skills.

Personal Progress Check 1

Multiple-choice: ~20 questions
Free-response: 2 questions

- Short
- Short

UNIT 1

12–15% AP EXAM WEIGHTING | ~9–11 CLASS PERIODS

Basic Economic Concepts

BIG IDEA 1
Scarcity and Markets MKT

- How do individuals and economies confront the problem of scarcity?
- Why do people and countries trade with one another?

BIG IDEA 2
Costs, Benefits, and Marginal Analysis CBA

- Why do all decisions have costs?
- Why do people consider the additional costs and benefits of possible actions rather than just the total costs and benefits when making decisions?

Developing Understanding

To understand economics, students need to understand that because most resources are scarce, individuals and societies must make choices. When making rational choices, people do so "on the margin," taking into account the additional costs and benefits of their decisions. The foundational economic ideas addressed in this unit form the basis for more advanced analysis of consumer and producer behavior that will be developed throughout the course.

Building Course Skills

1.A 1.C 1.D 2.C 4.A

This unit focuses on providing students with a thorough understanding of basic economic concepts. They need this understanding to be able to apply these concepts in subsequent units as the content increases in difficulty. Many students have not had significant exposure to the study of economics in previous coursework, which means that thinking like an economist (e.g., evaluating decisions based on constraints and trade-offs and thinking on the margin) may not come naturally. Students can begin to develop this skill set early on by using simulations and examples relevant to their lives. For example, if students engage in a simulation in which they consume additional units of a good and record the utility of consuming each additional unit (please refer to the sample activities for Unit 1 on p. 33), they will be better able to understand marginal decision making and the concept of diminishing marginal utility. By actually experiencing these concepts, students will be better equipped to describe them in their own words and apply them in later contexts.

Preparing for the AP Exam

Questions that require students to analyze quantitative data and perform calculations to demonstrate their mastery of consumer theory are a frequent challenge area on the AP Exam. While many students grasp the concept of consumer optimization, they are unable to apply that understanding using numbers. To prepare students for the exam, spend time first grounding students conceptually in the principles and logic behind consumer theory and then reinforce this learning by providing opportunities for students to practice using numerical examples. Students should understand the importance of showing their work when doing any calculations in the course.

Graphical models are first introduced in this unit. Graphing is an important skill in this course that will be tested in the free-response section of the AP Exam. It's helpful to model how to set up their graphs in this unit and throughout the course, stressing the importance of properly labeling axes and curves, and providing opportunities for students to practice setting up graphs themselves and interpreting situations represented graphically.

UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods
			~9–11 CLASS PERIODS
MKT-1	**1.1 Scarcity**	1.A Describe economic concepts, principles, or models.	
MKT-1	**1.2 Resource Allocation and Economic Systems**	1.D Describe the similarities, differences, and limitations of economic concepts, principles, or models.	
MKT-1	**1.3 Production Possibilities Curve**	4.A Draw an accurately labeled graph or visual to represent an economic model or market.	
MKT-2	**1.4 Comparative Advantage and Trade**	1.C Identify an economic concept, principle, or model using quantitative data or calculations.	
CBA-1	**1.5 Cost-Benefit Analysis**	1.C Identify an economic concept, principle, or model using quantitative data or calculations.	
CBA-2	**1.6 Marginal Analysis and Consumer Choice**	2.C Interpret a specific economic outcome using quantitative data or calculations.	

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SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	1.1	**Real-World Examples** Remove a few desks from the classroom so that on the first day of class there aren't enough desks for each student. When students recognize the problem, discuss how the class will decide who gets a desk. This is a good way to introduce the problem of scarcity. It allows students to discuss trade-offs and resource allocation.
2	1.3	**Graph and Switch** Create a list of situations that can be illustrated with the production possibilities curve. Pair students and distribute a small whiteboard to each student. Read a scenario and instruct students to draw a graph that represents the situation. Then have students share their graphs with their partner and provide feedback to each other.
3	1.5	**Authentic Tasks** Assign students to investigate the total costs and benefits of a decision relevant to their lives. For example, students might research the total costs and benefits of receiving a college degree. Then have students evaluate whether that decision makes sense by comparing total benefits and total costs.
4	1.6	**Simulation and Debriefing** Carry out a classroom simulation where students consume additional units of a good (e.g., glasses of water, marshmallows, or pieces of candy) and record the utility of consuming each additional unit on a scale of 1–10. Debrief the activity as a class to connect the experience to the concepts of marginal decision making and diminishing marginal utility.

Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

SUGGESTED SKILL

Principles and Models

1.A

Describe economic concepts, principles, or models.

TOPIC 1.1
Scarcity

Required Course Content

ENDURING UNDERSTANDING

MKT-1

Most resources are scarce, and in most cases the use of resources involves constraints and trade-offs.

LEARNING OBJECTIVE

MKT-1.A

Define resources and the cause(s) of their scarcity.

ESSENTIAL KNOWLEDGE

MKT-1.A.1

Economic trade-offs arise from the lack of sufficient resources (scarcity) to meet society's wants and needs.

MKT-1.A.2

Most factors of production (such as land, labor, and capital) are scarce, but some factors of production (such as established knowledge) may not be scarce due to their non-rival nature.

TOPIC 1.2
Resource Allocation and Economic Systems

SUGGESTED SKILL

Principles and Models

1.D

Describe the similarities, differences, and limitations of economic concepts, principles, or models.

Required Course Content

ENDURING UNDERSTANDING

MKT-1

Most resources are scarce, and in most cases the use of resources involves constraints and trade-offs.

LEARNING OBJECTIVE

MKT-1.B

Define how resource allocation is influenced by the economic system adopted by society.

ESSENTIAL KNOWLEDGE

MKT-1.B.1

Resource allocation involves answering three basic questions: What goods and services to produce? How to produce those goods and services? And who consumes those goods and services?

MKT-1.B.2

Resource allocation is significantly influenced by the economic system adopted by society, such as command economy, market economy, or mixed economy. Each system involves a particular set of institutional arrangements and a coordinating mechanism for allocating scarce resources and distributing output.

SUGGESTED SKILL

Graphing and Visuals

4.A

Draw an accurately labeled graph or visual to represent an economic model or market.

TOPIC 1.3
Production Possibilities Curve

Required Course Content

ENDURING UNDERSTANDING

MKT-1

Most resources are scarce, and in most cases the use of resources involves constraints and trade-offs.

LEARNING OBJECTIVE

MKT-1.C

a. Define (using graphs as appropriate) the production possibilities curve (PPC) and related terms.

b. Explain (using graphs as appropriate) how the production possibilities curve (PPC) illustrates opportunity costs, trade-offs, inefficiency, efficiency, and economic growth or contraction under various conditions.

c. Calculate (using data from PPCs or tables as appropriate) opportunity cost.

ESSENTIAL KNOWLEDGE

MKT-1.C.1

The PPC is a model used to show the trade-offs associated with allocating resources.

MKT-1.C.2

The PPC can be used to illustrate the concepts of scarcity, opportunity cost, efficiency, underutilized resources, and economic growth or contraction.

MKT-1.C.3

The shape of the PPC depends on whether opportunity costs are constant, increasing, or decreasing.

MKT-1.C.4

The PPC can shift due to changes in factors of production as well as changes in productivity/technology.

MKT-1.C.5

Economic growth results in an outward shift of the PPC.

TOPIC 1.4
Comparative Advantage and Trade

SUGGESTED SKILL

Principles and Models

1.C

Identify an economic concept, principle, or model using quantitative data or calculations.

AVAILABLE RESOURCES

- External Resource > Davidson Next AP Macroeconomics Course—Comparative Advantage & Trade
- Classroom Resources >
  - International Economics and the AP Microeconomics Course
  - International Economics—*The Basics of Absolute and Comparative Advantage*

Required Course Content

ENDURING UNDERSTANDING

MKT-2

The consequences of scarcity can be mitigated through specialization in production and by exchange.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
MKT-2.A a. Define absolute advantage and comparative advantage. b. Determine (using data from PPCs or tables as appropriate) absolute and comparative advantage.	MKT-2.A.1 Absolute advantage describes a situation in which an individual, business, or country can produce more of a good or service than any other producer with the same quantity of resources. MKT-2.A.2 Comparative advantage describes a situation in which an individual, business, or country can produce a good or service at a lower opportunity cost than another producer.
MKT-2.B a. Explain (using data from PPCs or tables as appropriate) how specialization according to comparative advantage with appropriate terms of trade can lead to gains from trade. b. Calculate (using data from PPCs or tables as appropriate) mutually beneficial terms of trade.	MKT-2.B.1 Production specialization according to comparative advantage, not absolute advantage, results in exchange opportunities that lead to consumption possibilities beyond the PPC. MKT-2.B.2 Comparative advantage and opportunity costs determine the terms of trade for exchange under which mutually beneficial trade can occur.

SUGGESTED SKILL

Principles and Models

1.C

Identify an economic concept, principle, or model using quantitative data or calculations.

TOPIC 1.5
Cost-Benefit Analysis

Required Course Content

ENDURING UNDERSTANDING

CBA-1

Rational economic decisions require the evaluation of costs and benefits.

LEARNING OBJECTIVE

CBA-1.A

a. Define opportunity cost.
b. Explain the opportunity costs associated with choices.
c. Calculate the opportunity costs associated with choices.

CBA-1.B

a. Explain a decision by comparing total benefits and total costs (using a table or a graph when appropriate).
b. Calculate total benefits and total costs (using a table or graph where appropriate).

ESSENTIAL KNOWLEDGE

CBA-1.A.1

Rational agents consider opportunity costs, whether implicit or explicit, when calculating the total economic costs of any decision.

CBA-1.A.2

Total benefits form the metric "utility" for consumers and total revenue for firms.

CBA-1.B.1

Total net benefits, the difference between total benefits and total costs, are maximized at the optimal choice.

CBA-1.B.2

Some decisions permit rational agents to look at only marginal benefit and marginal cost. Other decisions cannot be broken down into increments in this way and must be evaluated by looking at total benefits and total costs.

TOPIC 1.6
Marginal Analysis and Consumer Choice

SUGGESTED SKILL

Interpretation

2.C

Interpret a specific economic outcome using quantitative data or calculations.

AVAILABLE RESOURCE

- Classroom Resources > Mastering Economic Thinking Skills—Focusing on Marginal Thinking and Game Theory in Microeconomics

Required Course Content

ENDURING UNDERSTANDING

CBA-2

To determine the optimal level at which to pursue an activity whose total benefits exceed total cost, rational economic agents compare marginal benefits and marginal costs.

LEARNING OBJECTIVE

CBA-2.A

a. Define the key assumptions of consumer choice theory.

b. Explain (using a table or graph as appropriate) how a rational consumer's decision making involves the use of marginal benefits and marginal costs.

c. Calculate (using a table or a graph when appropriate) how a rational consumer's decision making involves the use of marginal benefits and marginal costs.

ESSENTIAL KNOWLEDGE

CBA-2.A.1

Consumers face constraints and have to make optimal decisions accounting for these constraints.

CBA-2.A.2

In a model of rational consumer choice, consumers are assumed to make choices so as to maximize their total utility.

CBA-2.A.3

Consumers experience diminishing marginal utility in the consumption of goods and services.

CBA-2.A.4

Consumers allocate their limited income to purchase the combination of goods that maximizes their utility by equating/comparing the marginal utility of the last dollar spent on each good.

X Exclusion:
Indifference curves are beyond the scope of the course and the AP Exam, but equating the ratios of marginal utility to price is within the scope.

continued on next page

LEARNING OBJECTIVE

CBA-2.B

a. Define marginal analysis and related terms.

b. Explain a decision using marginal analysis (using a table or a graph when appropriate).

ESSENTIAL KNOWLEDGE

CBA-2.B.1

Marginal analysis involves comparing the additional benefit of increasing a given activity with the additional cost. Comparing marginal benefit (MB) with marginal cost (MC) helps individuals (firms) decide whether to increase, decrease, or maintain their consumption (production) levels.

CBA-2.B.2

The optimal quantity at any point in time does not depend on fixed costs (sunk costs) or fixed benefits that have already been determined by past choices.

CBA-2.B.3

The optimal quantity is achieved when marginal benefit is equal to marginal cost or where total benefit is maximized.

AP MICROECONOMICS

UNIT 2

Supply and Demand

20–25%
AP EXAM WEIGHTING

~13–15
CLASS PERIODS

Remember to go to **AP Classroom** to assign students the online **Personal Progress Check** for this unit.

Whether assigned as homework or completed in class, the **Personal Progress Check** provides each student with immediate feedback related to this unit's topics and skills.

Personal Progress Check 2

Multiple-choice: ~25 questions
Free-response: 2 questions

- Short
- Short

UNIT 2

20–25% AP EXAM WEIGHTING | **~13–15** CLASS PERIODS

Supply and Demand

BIG IDEA 1
Scarcity and Markets MKT
- What determines the market price for a good or service?
- What causes market prices to change?

BIG IDEA 4
Market Inefficiency and Public Policy POL
- How does government policy affect market outcomes?

Developing Understanding

This unit will provide the basis for understanding how markets work by introducing the supply and demand model. Students will build on the concepts of scarcity and choice that were introduced in the first unit and explore the factors that influence consumer and producer behavior. They will learn how the interaction of consumers and producers in competitive markets determines market prices and results in the most efficient allocation of scarce resources. At the end of the unit, students will also begin exploring the effects of government policy on market outcomes, laying the groundwork for additional analysis in the last unit of the course.

Building Course Skills

2.A 3.A 3.C 4.A 4.C

It is important for students to continue to build on their graphing skills in this unit. Many students lose points on the AP Exam for not properly labeling axes and curves on graphs and for not properly demonstrating the effects of changes on graphs. It can help to model the appropriate setup of graphs, stressing the importance of proper labeling, and to provide opportunities for guided practice drawing and manipulating graphs.

Help students to see from the beginning of the course how graphs can be used as tools for making sense of economic situations and predicting and explaining economic outcomes. These are important skills in this unit in the context of learning about supply and demand. Even if a graph is not asked for on the exam, drawing one may help to answer a given question or explain a situation.

Preparing for the AP Exam

On the AP Exam, students frequently have difficulty answering questions that require them to analyze numbers and do calculations that are relevant to the content of this unit (e.g., calculating and interpreting measures of elasticity and calculating areas of consumer surplus, producer surplus, and deadweight loss).

Students may apply the wrong formula or mathematical process, such as when they incorrectly calculate the elasticity of demand as the change in quantity divided by the change in price, when they should instead calculate the percentage change in quantity divided by the percentage change in price. Providing students with opportunities to practice carrying out these calculations and emphasizing the importance of showing their work can help identify these types of mistakes and correct them before the AP Exam.

In other cases, though, calculation errors reveal a lack of understanding of the underlying concept, which manifests itself in an incorrect calculation. For example, students might know how to calculate the area of a triangle when asked to calculate consumer or producer surplus from a given graph but then they calculate the area of the wrong triangle. Analyzing numbers and doing calculations in this course require an understanding of the content itself.

UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods ~13–15 CLASS PERIODS
MKT-3	**2.1 Demand**	4.A Draw an accurately labeled graph or visual to represent an economic model or market.	
	2.2 Supply	4.A Draw an accurately labeled graph or visual to represent an economic model or market.	
	2.3 Price Elasticity of Demand	3.C Determine the effect(s) of a change in an economic situation using quantitative data or calculations.	
	2.4 Price Elasticity of Supply	3.C Determine the effect(s) of a change in an economic situation using quantitative data or calculations.	
	2.5 Other Elasticities	3.C Determine the effect(s) of a change in an economic situation using quantitative data or calculations.	
MKT-4	**2.6 Market Equilibrium and Consumer and Producer Surplus**	2.A Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.	
	2.7 Market Disequilibrium and Changes in Equilibrium	3.A Determine the outcome of an economic situation using economic concepts, principles, or models.	
POL-1	**2.8 The Effects of Government Intervention in Markets**	4.C Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.	
	2.9 International Trade and Public Policy	4.C Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.	
	Go to **AP Classroom** to assign the **Personal Progress Check** for Unit 2. Review the results in class to identify and address any student misunderstandings.		

SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	2.1	**Simulation and Debriefing** Carry out a classroom auction for an item of value to introduce students to the relationship between price and quantity demanded. Use the data from the auction to graph demand. Then simulate a change in one of the determinants of demand (e.g., by providing students with fake money to increase their income) so that students can distinguish between a change in quantity demanded and a change in demand. Debrief the experience with students to ensure that connections are made to the concepts being studied.
2	2.2	**Simulation and Debriefing** Explain a hypothetical scenario in which you need to hire workers for one hour to clean the school bathrooms on Friday afternoon or describe another scenario that is applicable to your students' lives. Create a supply schedule on the board and conduct an auction, asking how many students will work for $0, $1, $2, etc. As students respond, ask them to explain their decisions. Graph the data and discuss the relationship between price and quantity supplied in the context of their decision making.
3	2.7	**Think-Pair-Share** Pair students and tell them to choose an economic good. Provide students with three index cards on which to write three different situations that will change the good's demand or supply. Collect the cards and choose a few to read to the class. For each scenario that is read out loud, students will draw an accurately labeled supply-demand graph that demonstrates the effect of the change on equilibrium price and quantity and check their graphs with their partner. Then call on a student pair to share the graph with the class.

Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

SUGGESTED SKILL

Graphing and Visuals

4.A

Draw an accurately labeled graph or visual to represent an economic model or market.

AVAILABLE RESOURCES

- External Resource > **Davidson Next AP Macroeconomics Course—Supply & Demand**
- Classroom Resources > **Markets—Lesson: A Comparison of Graphs from Microeconomics and Macroeconomics**

TOPIC 2.1
Demand

Required Course Content

ENDURING UNDERSTANDING

MKT-3

Individuals and firms respond to incentives and face constraints.

LEARNING OBJECTIVE

MKT-3.A

a. Define (using graphs as appropriate) key terms and factors related to consumer decision making and the law of demand.

b. Explain (using graphs as appropriate) the relationship between price and quantity demanded and how buyers respond to incentives and constraints.

ESSENTIAL KNOWLEDGE

MKT-3.A.1

A well-defined system of property rights is necessary for the market system to function well.

MKT-3.A.2

Economic agents respond to incentives.

MKT-3.A.3

Individuals often respond to incentives, such as those presented by prices, but also face constraints, such as income, time, and legal and regulatory frameworks.

MKT-3.A.4

The law of demand suggests that a change in the own-price causes a change in quantity demanded in the opposite direction and a movement along a demand (marginal benefit) curve.

MKT-3.A.5

The conceptual relationship between price and quantity stated by the law of demand leads to downward-sloping demand curves explained by the income effect and substitution effect and/or by diminishing marginal utility.

MKT-3.A.6

The market demand curve (schedule) is derived from the summation of individual demand curves (schedules).

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LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
MKT-3.B Explain (using graphs as appropriate) buyers' responses to changes in incentives and constraints.	MKT-3.B.1 Changes in the determinants of consumer demand can cause the demand curve to shift.

SUGGESTED SKILL

Graphing and Visuals

4.A

Draw an accurately labeled graph or visual to represent an economic model or market.

AVAILABLE RESOURCES

- External Resource > **Davidson Next AP Macroeconomics Course—Supply & Demand**
- Classroom Resources > **Markets—Lesson: A Comparison of Graphs from Microeconomics and Macroeconomics**

TOPIC 2.2
Supply

Required Course Content

ENDURING UNDERSTANDING

MKT-3

Individuals and firms respond to incentives and face constraints.

LEARNING OBJECTIVE

MKT-3.C

a. Define (using graphs as appropriate) the law of supply.

b. Explain (using graphs as appropriate) the relationship between price and quantity supplied.

MKT-3.D

Explain (using graphs as appropriate) producers' (sellers') responses to changes in incentives and technology.

ESSENTIAL KNOWLEDGE

MKT-3.C.1

A change in own-price causes a change in quantity supplied in the same direction and a movement along a supply curve.

MKT-3.C.2

The market supply curve (schedule) is derived from the summation of individual supply curves (schedules). The market supply curve is upward-sloping.

MKT-3.D.1

Changes in the determinants of supply can cause the supply curve to shift.

TOPIC 2.3
Price Elasticity of Demand

SUGGESTED SKILL

Manipulation

3.C

Determine the effect(s) of a change in an economic situation using quantitative data or calculations.

Required Course Content

ENDURING UNDERSTANDING

MKT-3

Individuals and firms respond to incentives and face constraints.

LEARNING OBJECTIVE

MKT-3.E

a. Define measures of elasticity.
b. Explain (using graphs where appropriate) measures of elasticity and the impact of a given price change on total revenue or total expenditure.
c. Calculate (using data from a graph or a table as appropriate) measures of elasticity.

ESSENTIAL KNOWLEDGE

MKT-3.E.1

Economists use the concept of elasticity to measure the magnitude of percentage changes in quantity owing to any given changes in the own-price, income, and prices of related goods.

MKT-3.E.2

Price elasticity of demand is measured by the percentage change in quantity demanded divided by the percentage change in price or the responsiveness of the quantity demanded to changes in price. Elasticity varies along a linear demand curve, meaning slope is not elasticity.

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LEARNING OBJECTIVE

MKT-3.E

a. Define measures of elasticity.
b. Explain (using graphs where appropriate) measures of elasticity and the impact of a given price change on total revenue or total expenditure.
c. Calculate (using data from a graph or a table as appropriate) measures of elasticity.

ESSENTIAL KNOWLEDGE

MKT-3.E.3

Ranges of values of elasticity of demand are described as elastic or inelastic with the separating benchmark being a magnitude of 1, where the change in the price and the change in the quantity demanded are proportional.

a. When the magnitude of the value of elasticity is greater than 1, the demand is described as being elastic with respect to that price in the range of the given change.
b. When the magnitude of the value of elasticity is less than 1, the demand is described as being inelastic with respect to that price in the range of the given change.
c. When the magnitude of the value of elasticity is equal to 1, the demand is described as being unit elastic with respect to that price in the range of the given change.

MKT-3.E.4

The price elasticity of demand depends on certain factors such as the availability of substitutes.

MKT-3.E.5

The impact of a given price change on total revenue or total expenditure will depend on whether demand is elastic, inelastic, or unit elastic.

TOPIC 2.4
Price Elasticity of Supply

SUGGESTED SKILL

Manipulation

3.C

Determine the effect(s) of a change in an economic situation using quantitative data or calculations.

Required Course Content

ENDURING UNDERSTANDING

MKT-3

Individuals and firms respond to incentives and face constraints.

LEARNING OBJECTIVE

MKT-3.E

a. Define measures of elasticity.
b. Explain (using graphs where appropriate) measures of elasticity and the impact of a given price change on total revenue or total expenditure.
c. Calculate (using data from a graph or a table as appropriate) measures of elasticity.

ESSENTIAL KNOWLEDGE

MKT-3.E.6

Price elasticity of supply is measured by the percentage change in quantity supplied divided by the percentage change in price, or the responsiveness of the quantity supplied to changes in price.

MKT-3.E.7

Ranges of values of elasticity of supply are described as elastic or inelastic with the separating benchmark being a magnitude of 1, where the change in the price and the change in the quantity supplied are proportional.

a. When the magnitude of the value of elasticity is greater than 1, the supply is described as being elastic with respect to that price in the range of the given change.
b. When the magnitude of the value of elasticity is less than 1, the supply is described as being inelastic with respect to that price in the range of the given change.
c. When the magnitude of the value of elasticity is equal to 1, the supply is described as being unit elastic with respect to that price in the range of the given change.

MKT-3.E.8

The price elasticity of supply depends on certain factors such as the price of alternative inputs.

SUGGESTED SKILL

Manipulation

3.C

Determine the effect(s) of a change in an economic situation using quantitative data or calculations.

TOPIC 2.5
Other Elasticities

Required Course Content

ENDURING UNDERSTANDING

MKT-3

Individuals and firms respond to incentives and face constraints.

LEARNING OBJECTIVE

MKT-3.E

a. Define measures of elasticity.

b. Explain (using graphs where appropriate) measures of elasticity and the impact of a given price change on total revenue or total expenditure.

c. Calculate (using data from a graph or a table as appropriate) measures of elasticity.

ESSENTIAL KNOWLEDGE

MKT-3.E.9

Elasticity can be measured for any determinant of demand or supply, not just the price.

MKT-3.E.10

Income elasticity of demand is measured by the percentage change in the quantity demanded divided by the percentage change in consumers' income. Economists use the income elasticity of demand to determine whether a good is normal or inferior.

MKT-3.E.11

Cross-price elasticity of demand is measured by the percentage change in the quantity demanded of one good divided by the percentage change in the price of another good. Economists use the cross-price elasticity of demand to determine whether goods are substitutes, complements, or not related.

TOPIC 2.6
Market Equilibrium and Consumer and Producer Surplus

SUGGESTED SKILL

Interpretation

2.A

Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.

Required Course Content

ENDURING UNDERSTANDING

MKT-4

Although equilibria are stable, an economy can move from one equilibrium to another if market conditions change.

LEARNING OBJECTIVE

MKT-4.A

a. Define (using graphs as appropriate) market equilibrium, consumer surplus, and producer surplus.

b. Explain (using graphs as appropriate) how equilibrium price, quantity, consumer surplus, and producer surplus for a good or service are determined.

c. Calculate (using data from a graph or table as appropriate) areas of consumer surplus and producer surplus at equilibrium.

ESSENTIAL KNOWLEDGE

MKT-4.A.1

The supply-demand model is a tool for understanding what factors influence prices and quantities and why prices and quantities might differ across markets or change over time.

MKT-4.A.2

In a perfectly competitive market, equilibrium is achieved (and markets clear with no shortages or surpluses) when the price of a good or service brings the quantity supplied and quantity demanded into balance, in the sense that buyers wish to purchase the same quantity that sellers wish to provide.

MKT-4.A.3

Equilibrium price provides information to economic decision-makers to guide resource allocation.

MKT-4.A.4

Economists use consumer surplus and producer surplus to measure the benefits markets create to buyers and sellers and understand market efficiency.

MKT-4.A.5

Market equilibrium maximizes total economic surplus in the absence of market failures, meaning that perfectly competitive markets are efficient.

SUGGESTED SKILL

Manipulation

3.A

Determine the outcome of an economic situation using economic concepts, principles, or models.

AVAILABLE RESOURCES

- External Resource > **Davidson Next AP Macroeconomics Course—Supply & Demand**
- Classroom Resources > **Markets—Lesson: A Comparison of Graphs from Microeconomics and Macroeconomics**

TOPIC 2.7

Market Disequilibrium and Changes in Equilibrium

Required Course Content

ENDURING UNDERSTANDING

MKT-4

Although equilibria are stable, an economy can move from one equilibrium to another if market conditions change.

LEARNING OBJECTIVE

MKT-4.B

a. Define a surplus and shortage.

b. Explain (using graphs where appropriate) how changes in underlying conditions and shocks to a competitive market can alter price, quantity, consumer surplus, and producer surplus.

c. Calculate (using data from a graph or table as appropriate) changes in price, quantity, consumer surplus, and producer surplus in response to changes in market conditions or market disequilibrium.

ESSENTIAL KNOWLEDGE

MKT-4.B.1

Whenever markets experience imbalances—creating disequilibrium prices and quantities, surpluses, and shortages—market forces drive price and quantity toward equilibrium.

MKT-4.B.2

Factors that shift the market demand and market supply curves cause price, quantity, consumer surplus, producer surplus, and total economic surplus (within that market) to change. The impact of the change depends on the price elasticities of demand and supply.

TOPIC 2.8
The Effects of Government Intervention in Markets

Required Course Content

ENDURING UNDERSTANDING

POL-1

Government policies influence consumer and producer behavior and therefore affect market outcomes.

LEARNING OBJECTIVE

POL-1.A

a. Define forms of government price and quantity intervention.
b. Explain (using graphs where appropriate) how government policies alter consumer and producer behaviors that influence incentives and therefore affect outcomes.
c. Calculate (using data from a graph or table where appropriate) changes in market outcomes resulting from government policies.

ESSENTIAL KNOWLEDGE

POL-1.A.1

Some government policies, such as price floors, price ceilings, and other forms of price and quantity regulation, affect incentives and outcomes in all market structures.

POL-1.A.2

Governments use taxes and subsidies to change incentives in ways that influence consumer and producer behavior, shifting the supply and demand curves accordingly.

POL-1.A.3

Taxes and subsidies affect government revenues or costs.

POL-1.A.4

Government intervention in a market producing the efficient quantity through taxes, subsidies, price controls, or quantity controls can only decrease allocative efficiency.

POL-1.A.5

Deadweight loss represents the losses to buyers and sellers as a result of government intervention in an efficient market.

POL-1.A.6

The incidence of taxes and subsidies imposed on goods traded in perfectly competitive markets depends on the elasticity of supply and demand.

SUGGESTED SKILL

Graphing and Visuals

4.C

Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.

SUGGESTED SKILL

Graphing and Visuals

4.C

Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.

AVAILABLE RESOURCES

- Classroom Resources >
  - International Economics and the AP Microeconomics Course
  - International Economics

TOPIC 2.9
International Trade and Public Policy

Required Course Content

ENDURING UNDERSTANDING

POL-1

Government policies influence consumer and producer behavior and therefore affect market outcomes.

LEARNING OBJECTIVE

POL-1.B

a. Define tariffs and quotas.
b. Explain (using graphs where appropriate) how markets are affected by public policy related to international trade.
c. Calculate (using data from a graph or table as appropriate) changes in market outcomes resulting from public policy related to international trade.

ESSENTIAL KNOWLEDGE

POL-1.B.1

Equilibria in competitive markets may be altered by the decision to open an economy to trade with other countries; equilibrium price can be higher or lower than under autarky, and the gap between domestic supply and demand is filled by trade. Opening an economy to trade with other countries affects consumer surplus, producer surplus, and total economic surplus.

POL-1.B.2

Tariffs, which governments sometimes use to influence international trade, affect domestic price, quantity, government revenue, and consumer surplus and total economic surplus.

POL-1.B.3

Quotas can be used to alter quantities produced and therefore affect price, consumer surplus, and total economic surplus.

Exclusion:
The graphing of quotas is beyond the scope of the course and the AP Exam, but understanding how quotas affect quantities produced is within the scope.

AP MICROECONOMICS

UNIT 3

Production, Cost, and the Perfect Competition Model

22–25%
AP EXAM WEIGHTING

~11–13
CLASS PERIODS

Remember to go to **AP Classroom** to assign students the online **Personal Progress Check** for this unit.

Whether assigned as homework or completed in class, the **Personal Progress Check** provides each student with immediate feedback related to this unit's topics and skills.

Personal Progress Check 3

Multiple-choice: ~20 questions
Free-response: 2 questions

- Short
- Short

UNIT 3

22–25% AP EXAM WEIGHTING | **~11–13** CLASS PERIODS

Production, Cost, and the Perfect Competition Model

BIG IDEA 2
Costs, Benefits, and Marginal Analysis CBA
- How do businesses use marginal analysis to make decisions?

BIG IDEA 3
Production Choices and Behavior PRD
- What drives producers' decision making?
- How can a market be perfectly competitive?

Developing Understanding

Unit 3 focuses on firm behavior and culminates with an introduction to the perfect competition model, which will form a basis of comparison for other market structures in the next unit. This unit builds on the idea of supply, which was introduced in the previous unit, and explores in more detail what drives the decisions that firms make. Thinking like a firm may be challenging for students, who are more used to acting as consumers in their everyday lives. Drawing connections to students' own experiences and carrying out classroom simulations can help bring these concepts to life. Reminding students of the ways in which the behavior of firms is consistent with the ideas of cost-benefit analysis and marginal decision-making addressed in the first unit of the course may also be helpful in elucidating these concepts.

Building Course Skills

1.A 1.C 1.D 2.A 4.A

In this unit, students will be expected to describe the production function, the costs of production, and firms' profit-maximizing behavior. Students should be able to represent these concepts graphically and numerically. It is important to devote sufficient time to introducing new vocabulary to students and may be helpful for students to create a vocabulary notebook. Since grasping the behavior of firms is not always intuitive for students, consider beginning this unit by carrying out a factory simulation in the classroom and having students graph the data generated and interpret the outcomes of the simulation. It helps to debrief the simulation during and immediately following the activity to clarify misconceptions and deepen students' understanding of relevant concepts. Students should have additional opportunities to practice graphing, interpreting given graphs, and doing numerical problems in the context of the content covered in this unit. Proper graphing habits should continue to be reinforced throughout this unit and the entire course.

Preparing for the AP Exam

The perfect competition model is foundational to the study of market structures in this course and is frequently tested on the AP Exam. It's important to ground students in the conceptual underpinnings of perfect competition, including the concept of efficiency and production in both the short run and the long run. Students will benefit from having multiple opportunities to practice drawing and interpreting graphs that represent perfect competition; past AP Exams may be helpful in this exercise. If students are able to grasp the concepts behind perfect competition and how it's graphically represented, they will be better able to understand imperfect market structures in the next unit.

Questions on the AP Exam that cover long-run production costs are often challenging for students. It may be helpful to provide students with opportunities to practice identifying and explaining given situations to reinforce their understanding of long-run production. Keep in mind, though, that while this is a difficult topic for students, it does not comprise a significant portion of the AP Exam.

UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods ~11–13 CLASS PERIODS
PRD-1	**3.1 The Production Function**	1.A Describe economic concepts, principles, or models.	
	3.2 Short-Run Production Costs	4.A Draw an accurately labeled graph or visual to represent an economic model or market.	
	3.3 Long-Run Production Costs	1.D Describe the similarities, differences, and limitations of economic concepts, principles, or models.	
CBA-2	**3.4 Types of Profit**	1.C Identify an economic concept, principle, or model using quantitative data or calculations.	
	3.5 Profit Maximization	2.A Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.	
PRD-2	**3.6 Firms' Short-Run Decisions to Produce and Long-Run Decisions to Enter or Exit a Market**	2.A Using economic concepts, principles, or models, explain how a specific economic outcome occurs, or what action should be taken in order to achieve a specific economic outcome.	
PRD-3	**3.7 Perfect Competition**	4.A Draw an accurately labeled graph or visual to represent an economic model or market.	

Go to **AP Classroom** to assign the **Personal Progress Check** for Unit 3.
Review the results in class to identify and address any student misunderstandings.

SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	3.1	**Simulation and Debriefing** Carry out a factory simulation in which students take on the role of producers in a firm. Begin the simulation with a few fixed capital resources and no workers. Then add workers one at a time and record production data as students seek to produce additional units of a good (e.g., paper links). Connect the concepts of total product, marginal product, and average product to their results when debriefing the experience.
2	3.2	**Think-Pair-Share** Provide students with a list of formulas for short-run production costs. Include formulas that show total, average, and marginal costs. Some formulas on the list should be correct and some should be incorrect. Students should then determine which are or are not correct and explain why to a partner.
3	3.4	**Real-World Examples** The difference between accounting profit and economic profit is often difficult for students to understand, so it can be helpful to solidify students' understanding by using concrete examples. You can provide students with the salary and costs associated with a particular job and discuss whether that person makes accounting profit. Then discuss what implicit costs are and whether that person makes economic profit.

Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

SUGGESTED SKILL

Principles and Models

1.A

Describe economic concepts, principles, or models.

TOPIC 3.1
The Production Function

Required Course Content

ENDURING UNDERSTANDING

PRD-1

Firms' production and cost constraints over different input and output levels shape optimal decisions in the short run and long run.

LEARNING OBJECTIVE

PRD-1.A

a. Define (using graphs where appropriate) key terms and concepts relating to production and cost.

b. Explain (using graphs where appropriate) how production and cost are related in the short run and long run.

c. Calculate (using data from a graph or table as appropriate) the various measures of productivity and short-run and long-run costs.

ESSENTIAL KNOWLEDGE

PRD-1.A.1

The production function explains the relationship between inputs and outputs both in the short run and the long run.

PRD-1.A.2

Marginal product and average product change as input usage changes, and hence, total product changes.

PRD-1.A.3

Diminishing marginal returns occur as the firm employs more of one input, holding other inputs constant, to produce a product (output) in the short run.

TOPIC 3.2
Short-Run Production Costs

SUGGESTED SKILL

Graphing and Visuals

4.A

Draw an accurately labeled graph or visual to represent an economic model or market.

Required Course Content

ENDURING UNDERSTANDING

PRD-1

Firms' production and cost constraints over different input and output levels shape optimal decisions in the short run and long run.

LEARNING OBJECTIVE

PRD-1.A

a. Define (using graphs where appropriate) key terms and concepts relating to production and cost.

b. Explain (using graphs where appropriate) how production and cost are related in the short run and long run.

c. Calculate (using data from a graph or table as appropriate) the various measures of productivity and short-run and long-run costs.

ESSENTIAL KNOWLEDGE

PRD-1.A.4

Fixed costs and variable costs determine the total cost.

PRD-1.A.5

Marginal cost, average (fixed, variable, and total) cost, total cost, and total variable cost change as total output changes, but total fixed cost remains constant at all output levels, including zero output.

PRD-1.A.6

Production functions with diminishing marginal returns yield an upward-sloping marginal cost curve.

PRD-1.A.7

Specialization and the division of labor reduce marginal costs for firms.

PRD-1.A.8

Cost curves can shift in response to changes in input costs and productivity.

SUGGESTED SKILL

Principles and Models

1.D

Describe the similarities, differences, and limitations of economic concepts, principles, or models.

TOPIC 3.3
Long-Run Production Costs

Required Course Content

ENDURING UNDERSTANDING

PRD-1

Firms' production and cost constraints over different input and output levels shape optimal decisions in the short run and long run.

LEARNING OBJECTIVE

PRD-1.A

a. Define (using graphs where appropriate) key terms and concepts relating to production and cost.

b. Explain (using graphs where appropriate) how production and cost are related in the short run and long run.

c. Calculate (using data from a graph or table as appropriate) the various measures of productivity and short-run and long-run costs.

ESSENTIAL KNOWLEDGE

PRD-1.A.9

In the long run, firms can adjust all their inputs, and as a result, all costs become variable.

PRD-1.A.10

The relationship between inputs and outputs in the long run is described by the scale of production—increasing, decreasing, or constant returns to scale.

PRD-1.A.11

The long-run average total cost is characterized by economies of scale, diseconomies of scale, or constant returns to scale (efficient scale).

PRD-1.A.12

The minimum efficient scale plays a role in determining the concentration of firms in a market and the market structure.

TOPIC 3.4
Types of Profit

SUGGESTED SKILL

Principles and Models

1.C

Identify an economic concept, principle, or model using quantitative data or calculations.

Required Course Content

ENDURING UNDERSTANDING

CBA-2

To determine the optimal level at which to pursue an activity whose total benefits exceed total cost, rational economic agents compare marginal benefits and marginal costs.

LEARNING OBJECTIVE

CBA-2.C

a. Define the different types of profit.
b. Explain how firms respond to profit opportunities.
c. Calculate a firm's profit or loss.

ESSENTIAL KNOWLEDGE

CBA-2.C.1

Firms respond to economic profit (loss) rather than accounting profit.

CBA-2.C.2

Accounting profit fails to account for implicit costs (such as cost of financial capital, compensation for risk, or an entrepreneur's time), which, if fully compensated, result in normal profit.

SUGGESTED SKILL

Interpretation

2.A

Using economic concepts, principles, or models, explain how a specific economic outcome occurs, or what action should be taken in order to achieve a specific economic outcome.

AVAILABLE RESOURCE

- Classroom Resources > **Mastering Economic Thinking Skills—*Marginal Thinking: Key Concepts and Questions***

TOPIC 3.5
Profit Maximization

Required Course Content

ENDURING UNDERSTANDING

CBA-2

To determine the optimal level at which to pursue an activity whose total benefits exceed total cost, rational economic agents compare marginal benefits and marginal costs.

LEARNING OBJECTIVE

CBA-2.D

a. Define (using graphs or data as appropriate) the profit-maximizing rule.

b. Explain (using a graph or data as appropriate) the profit-maximizing level of production.

ESSENTIAL KNOWLEDGE

CBA-2.D.1

Firms are assumed to produce output to maximize their profits by comparing marginal revenue and marginal cost.

TOPIC 3.6
Firms' Short-Run Decisions to Produce and Long-Run Decisions to Enter or Exit a Market

Required Course Content

ENDURING UNDERSTANDING

PRD-2

Firms' short-run decisions to produce output, and long-run decisions to enter or exit a market, are based on profitability.

LEARNING OBJECTIVE

PRD-2.A

Explain (using graphs or data where appropriate) firms' short-run decisions to produce positive output levels, or long-run decisions to enter or exit a market in response to profit-making opportunities.

ESSENTIAL KNOWLEDGE

PRD-2.A.1

In the short run, firms decide to operate (i.e., produce positive output) or shut down (i.e., produce zero output) by comparing total revenue to total variable cost or price to average variable cost (AVC).

PRD-2.A.2

In the absence of barriers to entry or exit, in the long run (i.e., once factors that are fixed in the short run become variable), firms enter a market in which there are profit-making opportunities and exit a market when they anticipate economic losses.

SUGGESTED SKILL

Interpretation

2.A

Using economic concepts, principles, or models, explain how a specific economic outcome occurs, or what action should be taken in order to achieve a specific economic outcome.

SUGGESTED SKILL

Graphing and Visuals

4.A

Draw an accurately labeled graph or visual to represent an economic model or market.

AVAILABLE RESOURCE

- Classroom Resources > Markets—Product and Factor Markets

TOPIC 3.7
Perfect Competition

Required Course Content

ENDURING UNDERSTANDING

PRD-3

Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.

LEARNING OBJECTIVE

PRD-3.A

a. Define (using graphs as appropriate) the characteristics of perfectly competitive markets and efficiency.

b. Explain (using graphs where appropriate) equilibrium and firm decision making in perfectly competitive markets and how prices in perfectly competitive markets lead to efficient outcomes.

c. Calculate (using data from a graph or table as appropriate) economic profit (loss) in perfectly competitive markets.

ESSENTIAL KNOWLEDGE

PRD-3.A.1

A perfectly competitive market is efficient. Firms in perfectly competitive markets face no barriers to entry and have no market power.

PRD-3.A.2

In perfectly competitive markets, prices communicate to consumers and producers the magnitude of others' marginal costs of production and marginal benefits of consumption and provide incentives to act on that information (i.e., price equals marginal cost in an efficient market).

PRD-3.A.3

In perfectly competitive markets, firms can sell all their outputs at a constant price determined by the market.

PRD-3.A.4

At a competitive market equilibrium, firms are price takers and select output to maximize profit by producing the level of output where the marginal cost equals marginal revenue (at the price).

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LEARNING OBJECTIVE

PRD-3.A

a. Define (using graphs as appropriate) the characteristics of perfectly competitive markets and efficiency.

b. Explain (using graphs where appropriate) equilibrium and firm decision making in perfectly competitive markets and how prices in perfectly competitive markets lead to efficient outcomes.

c. Calculate (using data from a graph or table as appropriate) economic profit (loss) in perfectly competitive markets.

ESSENTIAL KNOWLEDGE

PRD-3.A.5

At a competitive market equilibrium, the price of a product equals both the private marginal benefit received by the last unit consumed and the private marginal cost incurred to produce the last unit, thus achieving allocative efficiency.

PRD-3.A.6

In a short-run competitive equilibrium, price can either be above or below its long-run competitive level resulting in profits or losses, motivating entry or exit of firms and moving prices and quantities toward long-run equilibrium.

PRD-3.A.7

In a long-run perfectly competitive equilibrium, productive efficiency implies all operating firms produce at efficient scale, price equals marginal cost and minimum average total cost, and firms earn zero economic profit.

PRD-3.A.8

Firms may be in a constant cost, increasing cost, or decreasing cost industry. Long-run prices depend on the portion of the long-run cost curves on which firms operate.

PRD-3.A.9

A perfectly competitive market in long-run equilibrium is allocatively and productively efficient.

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AP MICROECONOMICS

UNIT 4

Imperfect Competition

15–22%
AP EXAM WEIGHTING

~8–10
CLASS PERIODS

Remember to go to **AP Classroom** to assign students the online **Personal Progress Check** for this unit.

Whether assigned as homework or completed in class, the **Personal Progress Check** provides each student with immediate feedback related to this unit's topics and skills.

Personal Progress Check 4

Multiple-choice: ~15 questions
Free-response: 2 questions

- Short
- Long

UNIT 4

15–22% AP EXAM WEIGHTING | **~8–10** CLASS PERIODS

Imperfect Competition

BIG IDEA 3
Production Choices and Behavior PRD

- What drives producers' decision making?
- How are imperfectly competitive markets inefficient?

Developing Understanding

In the real world, firms rarely operate in perfectly competitive markets. In this unit, students will encounter the ways in which imperfectly competitive markets depart from the model of perfect competition introduced in Unit 3. Students will continue to build on their understanding of what it means for a market to be efficient or inefficient as they consider the welfare implications of imperfect markets. In the context of learning about oligopoly behavior, students will be introduced to the field of game theory as an approach to studying strategic decision making.

Building Course Skills

1.D 2.C 4.B 4.C

In this unit, students should be able to describe the similarities and differences between market structures. To help students develop this skill, consider first approaching the topic by using real-world examples and having students describe distinguishing characteristics of those examples. Using graphic organizers such as Venn diagrams might also be helpful to keep track of similarities and differences.

Graphing continues to be essential in this unit, and graphing each market structure can be difficult for some students. Be deliberate in modeling the differences between a license/patent monopoly and a natural monopoly, as well as a monopolistically competitive firm both in the short-run (with profits or losses) and at long-run equilibrium. While it is critical that students understand the differences between the graphs in each of these models, it is also important to stress the similarities. For example, a common characteristic of all imperfect product market graphs is that the marginal revenue curve lies below the demand curve. Regardless of the market structure, students should practice neatly drawing each graph and labeling it appropriately until they can do so flawlessly.

Preparing for the AP Exam

Game theory is an important concept in the field of economics and is a challenge for some students on both the multiple-choice and free-response sections of the AP Exam. Students should have sufficient opportunities for guided practice interpreting payoff matrices, identifying dominant strategies and Nash equilibria, and redrawing payoff matrices after given changes. Answering past free-response questions on the topic (e.g., **2013 AP Exam Question #2**) is a good way to practice.

UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods ~8–10 CLASS PERIODS
PRD-3	**4.1 Introduction to Imperfectly Competitive Markets**	1.D Describe the similarities, differences, and limitations of economic concepts, principles, or models.	
	4.2 Monopoly	4.B Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.	
	4.3 Price Discrimination	4.C Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.	
	4.4 Monopolistic Competition	4.B Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.	
	4.5 Oligopoly and Game Theory	2.C Interpret a specific economic outcome using quantitative data or calculations.	
	Go to **AP Classroom** to assign the **Personal Progress Check** for Unit 4. Review the results in class to identify and address any student misunderstandings.		

SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	4.1	**Response Groups** Divide students into four groups representing a monopoly, an oligopoly, monopolistic competition, and perfect competition. Each group should come up with real-world examples that represent its assigned market and use those examples to describe the distinguishing characteristics of its market type. After working in small groups, a presenter will share each group's findings with the class.
2	4.2	**Socratic Seminar** Following instruction on the characteristics of a monopoly, provide students with several articles containing varied analysis of an antitrust case. Ask students to discuss and evaluate whether the situation meets the criteria of a monopoly, using economic vocabulary and referencing the articles.
3	4.5	**Systematic and Explicit Instruction** Demonstrate to students how to identify a dominant strategy and Nash equilibrium in a 2 × 2 payoff matrix. Then provide students with sample problems to work through on their own.

Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

SUGGESTED SKILL

Principles and Models

1.D

Describe the similarities, differences, and limitations of economic concepts, principles, or models.

TOPIC 4.1
Introduction to Imperfectly Competitive Markets

Required Course Content

ENDURING UNDERSTANDING

PRD-3

Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.

LEARNING OBJECTIVE

PRD-3.B

a. Define (using graphs where appropriate) the characteristics of imperfectly competitive markets and inefficiency.

ESSENTIAL KNOWLEDGE

PRD-3.B.1

Imperfectly competitive markets include monopoly, oligopoly, and monopolistic competition in product markets and monopsony in factor markets.

PRD-3.B.2

In imperfectly competitive output markets and assuming all else is constant, a firm must lower price to sell additional units.

PRD-3.B.3

In imperfectly competitive markets, consumers and producers respond to prices that are above the marginal costs of production and/or marginal benefits of consumption (i.e., price is greater than marginal cost in an inefficient market).

PRD-3.B.4

Incentives to enter an industry may be mitigated by barriers to entry. Barriers to entry—such as high fixed/start-up costs, legal barriers to entry, and exclusive ownership of key resources—can sustain imperfectly competitive market structures.

TOPIC 4.2
Monopoly

SUGGESTED SKILL

Graphing and Visuals

4.B

Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.

Required Course Content

ENDURING UNDERSTANDING

PRD-3

Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.

LEARNING OBJECTIVE

PRD-3.B

b. Explain (using graphs where appropriate) equilibrium, firm decision making, consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets and why prices in imperfectly competitive markets cannot be relied on to coordinate the actions of all possible market participants and can lead to inefficient outputs.

c. Calculate (using data from a graph or table as appropriate) areas of consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets.

ESSENTIAL KNOWLEDGE

PRD-3.B.5

A monopoly exists because of barriers to entry.

PRD-3.B.6

In a monopoly, equilibrium (profit-maximizing) quantity is determined by equating marginal revenue (MR) to marginal cost (MC). The price charged is greater than the marginal cost.

PRD-3.B.7

In a natural monopoly, long-run economies of scale for a single firm exist throughout the entire effective demand of its product.

SUGGESTED SKILL

Graphing and Visuals

4.C

Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.

TOPIC 4.3
Price Discrimination

Required Course Content

ENDURING UNDERSTANDING

PRD-3

Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.

LEARNING OBJECTIVE

PRD-3.B

b. Explain (using graphs where appropriate) equilibrium, firm decision making, consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets and why prices in imperfectly competitive markets cannot be relied on to coordinate the actions of all possible market participants and can lead to inefficient outputs.

c. Calculate (using data from a graph or table as appropriate) areas of consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets.

ESSENTIAL KNOWLEDGE

PRD-3.B.8

A firm with market power can engage in price discrimination to increase its profits or capture additional consumer surplus under certain conditions.

PRD-3.B.9

With perfect price discrimination, a monopolist produces the quantity where price equals marginal cost (just as a competitive market would) but extracts all economic surplus associated with its product and eliminates all deadweight loss.

TOPIC 4.4
Monopolistic Competition

SUGGESTED SKILL

Graphing and Visuals

4.B

Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.

Required Course Content

ENDURING UNDERSTANDING

PRD-3

Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.

LEARNING OBJECTIVE

PRD-3.B

b. Explain (using graphs where appropriate) equilibrium, firm decision making, consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets and why prices in imperfectly competitive markets cannot be relied on to coordinate the actions of all possible market participants and can lead to inefficient outputs.

c. Calculate (using data from a graph or table as appropriate) areas of consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets.

ESSENTIAL KNOWLEDGE

PRD-3.B.10

In a market with monopolistic competition, firms producing differentiated products may earn positive, negative, or zero economic profit in the short run. Firms typically use advertising as a means of differentiating their product. Free entry and exit drive profits to zero in the long run. The output level, however, is smaller than the output level needed to minimize average total costs, creating excess capacity. The price is greater than marginal cost, creating allocative inefficiency.

SUGGESTED SKILL

Interpretation

2.C

Interpret a specific economic outcome using quantitative data or calculations.

AVAILABLE RESOURCES

- Classroom Resources >
  - **Mastering Economic Thinking Skills—*Focusing on Marginal Thinking and Game Theory in Microeconomics***
  - **Mastering Economic Thinking Skills—*Teaching About Game Theory***

TOPIC 4.5
Oligopoly and Game Theory

Required Course Content

ENDURING UNDERSTANDING

PRD-3

Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.

LEARNING OBJECTIVE

PRD-3.C

a. Define (using tables as appropriate) key terms, strategies, and concepts relating to oligopolies and simple games.

b. Explain (using tables as appropriate) strategies and equilibria in simple games and the connections to theoretical behaviors in various oligopoly market and non-market settings.

c. Calculate (using tables as appropriate) the incentive sufficient to alter a player's dominant strategy.

ESSENTIAL KNOWLEDGE

PRD-3.C.1

An oligopoly is an inefficient market structure with high barriers to entry, where there are few firms acting interdependently.

PRD-3.C.2

Firms in an oligopoly have an incentive to collude and form cartels.

PRD-3.C.3

A game is a situation in which a number of individuals take actions, and the payoff for each individual depends directly on both the individual's own choice and the choices of others.

PRD-3.C.4

A strategy is a complete plan of actions for playing a game; the normal form model of a game shows the payoffs that result from each collection of strategies (one for each player).

PRD-3.C.5

A player has a dominant strategy when the payoff to a particular action is always higher independent of the action taken by the other player.

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LEARNING OBJECTIVE

PRD-3.C

a. Define (using tables as appropriate) key terms, strategies, and concepts relating to oligopolies and simple games.

b. Explain (using tables as appropriate) strategies and equilibria in simple games and the connections to theoretical behaviors in various oligopoly market and non-market settings.

c. Calculate (using tables as appropriate) the incentive sufficient to alter a player's dominant strategy.

ESSENTIAL KNOWLEDGE

PRD-3.C.6

A Nash equilibrium is a condition describing the set of actions in which no player can increase his or her payoff by unilaterally taking another action, given the other players' actions.

Exclusion:

Dominant strategies and Nash equilibrium with more than two players or more than two actions per player, mixed-strategy equilibria, extensive form games, and normal form games with more than two players or more than two actions per player are beyond the scope of the course and the AP Exam.

PRD-3.C.7

Oligopolists have difficulty achieving the monopoly outcome for reasons similar to those that prevent players from achieving a cooperative outcome in the Prisoner's Dilemma; nevertheless, prices are generally higher and quantities lower with oligopoly (or duopoly) than with perfect competition.

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AP MICROECONOMICS

UNIT 5

Factor Markets

10–13%
AP EXAM WEIGHTING

~6–8
CLASS PERIODS

Remember to go to **AP Classroom** to assign students the online **Personal Progress Check** for this unit.

Whether assigned as homework or completed in class, the **Personal Progress Check** provides each student with immediate feedback related to this unit's topics and skills.

Personal Progress Check 5

Multiple-choice: ~10 questions
Free-response: 1 question

- Short

UNIT 5

10–13% AP EXAM WEIGHTING | **~6–8** CLASS PERIODS

Factor Markets

BIG IDEA 3
Production Choices and Behavior PRD

- How are prices for resources determined?
- How do firms use resource prices to make decisions?

Developing Understanding

By this point in the course, students are familiar with how product markets operate and what drives firm decision making. In this unit, students will apply many of the concepts they learned previously but now in the context of factor markets. Like with product markets, the laws of supply and demand apply to factor markets with an upward-sloping supply curve and a downward-sloping demand curve. In factor markets, firms hire additional resources up to the point at which the resource's marginal revenue product is equal to its marginal resource cost. This decision is another application of the idea first introduced in Unit 1 of making an optimal choice by equating marginal benefit with marginal cost and firms' decisions to maximize profits where marginal revenue equals marginal cost.

Building Course Skills

1.A 2.A 2.C 3.B

In this unit, students should be able to describe the principles of factor markets so that they can apply that understanding in context. Devote sufficient time to introducing students to new concepts and vocabulary while also connecting key terms and concepts to items addressed previously in the course.

Students should also be able to represent factor markets graphically in this unit. It helps to explain the basis of each model and the underlying assumptions so that students can create properly labeled graphs to represent economic situations and interpret given graphs.

Students will continue to build their quantitative skills by solving problems in which they interpret how firms should allocate inputs to minimize costs or maximize profits. Once again, it's important to spend time conceptually grounding students in the underlying concepts of these quantitative problems and provide ample time for numerical examples and practice.

Preparing for the AP Exam

Factor markets are one of the biggest challenge areas for students on the AP Exam. There can be a tendency to rush through this unit because it only accounts for a small percentage of the multiple-choice section of the AP Exam and is near the end of the course. Sufficient time should be devoted to introducing the concepts and providing opportunities for student practice to properly prepare students for factor market questions on the exam. It may also be helpful to teach factor markets as another application of concepts such as supply and demand and marginal analysis so that students can see the connections to previous content and the ways in which factor markets differ. For example, cost minimization by firms works like utility maximization by consumers when you equalize the marginal product per dollar for each input.

UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods
			~6–8 CLASS PERIODS
PRD-4	**5.1 Introduction to Factor Markets**	1.A Describe economic concepts, principles, or models.	
	5.2 Changes in Factor Demand and Factor Supply	3.B Determine the effect(s) of one or more changes on other economic markets.	
	5.3 Profit-Maximizing Behavior in Perfectly Competitive Factor Markets	2.C Interpret a specific economic outcome using quantitative data or calculations.	
	5.4 Monopsonistic Markets	2.A Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.	
	Go to **AP Classroom** to assign the **Personal Progress Check** for Unit 5. Review the results in class to identify and address any student misunderstandings.		

SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	5.1	**Activating Prior Knowledge** Refer students back to the simulation that was carried out in Topic 3.1 in which students acted as producers in a firm to show total product, marginal product, and diminishing marginal returns. Now introduce the price of the output being produced in order for students to calculate the value of the marginal product, also called marginal revenue product or factor demand.
2	5.2	**Graph and Switch** Provide students with a series of scenarios that introduce changes in the determinants of labor demand and labor supply. Have students graph each scenario and then switch papers or whiteboards with a partner to review each other's work.
3	5.3	**Model Questions** After introducing students to the content covered in Topic 5.3, provide an opportunity for students to practice answering previous free-response questions to reinforce their learning (e.g., **2011 AP Exam Question #2**, **2010 AP Exam Question #2**).

Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

SUGGESTED SKILL

Principles and Models

1.A

Describe economic concepts, principles, or models.

TOPIC 5.1
Introduction to Factor Markets

Required Course Content

ENDURING UNDERSTANDING

PRD-4

Factor prices provide incentives and convey information to firms and factors of production.

LEARNING OBJECTIVE

PRD-4.A

a. Define (using graphs where appropriate) key terms and concepts relating to factor markets.

b. Explain (using graphs where appropriate) the relationship between factors of production, firms, and factor prices.

c. Calculate (using data from a graph or table where appropriate) the marginal revenue product and marginal resource cost.

ESSENTIAL KNOWLEDGE

PRD-4.A.1

Factors of production (labor, capital, and land) respond to factor prices (wages, interest, and rent), and employers' (firms') decision to hire is based on the productivity of the factors, output price, and cost of the factor.

PRD-4.A.2

The quantity of labor demanded is negatively related to the wage rate, while the quantity of labor supplied is positively related to the wage rate in a given labor market, other things constant.

TOPIC 5.2
Changes in Factor Demand and Factor Supply

SUGGESTED SKILL

Manipulation

3.B

Determine the effect(s) of one or more changes on other economic markets.

Required Course Content

ENDURING UNDERSTANDING

PRD-4

Factor prices provide incentives and convey information to firms and factors of production.

LEARNING OBJECTIVE

PRD-4.B

Explain (using graphs where appropriate) firms' and factors' responses to changes in incentives and constraints.

ESSENTIAL KNOWLEDGE

PRD-4.B.1

Changes in the determinants of labor demand, such as the output price and the productivity of the worker, cause the labor demand curve to shift.

PRD-4.B.2

Changes in the determinants of labor supply (such as immigration, education, working conditions, age distribution, availability of alternative options, preferences for leisure, and cultural expectations) cause the labor supply curve to shift.

SUGGESTED SKILL

Interpretation

2.C

Interpret a specific economic outcome using quantitative data or calculations.

AVAILABLE RESOURCES

- Classroom Resources >
  - Markets—*Product and Factor Markets*
  - Mastering Economic Thinking Skills—*Marginal Thinking: Key Concepts and Questions*

TOPIC 5.3

Profit-Maximizing Behavior in Perfectly Competitive Factor Markets

Required Course Content

ENDURING UNDERSTANDING

PRD-4

Factor prices provide incentives and convey information to firms and factors of production.

LEARNING OBJECTIVE

PRD-4.C

a. Define (using graphs as appropriate) the characteristics of perfectly competitive factor markets.

b. Explain (using graphs where appropriate) the profit-maximizing behavior of firms buying labor (with other inputs fixed) in perfectly competitive markets.

c. Calculate (using data from a graph or table where appropriate) measures representing the profit-maximizing behavior of firms buying labor (with other inputs fixed) in perfectly competitive markets.

ESSENTIAL KNOWLEDGE

PRD-4.C.1

In a perfectly competitive labor market, the wage is set by the market and each firm hires the quantity of workers, where the marginal factor (resource) cost (wage) equals the marginal revenue product of labor. A typical firm may be a perfect competitor in the labor market even if it is an imperfect competitor in its output markets.

PRD-4.C.2

A typical firm hires labor in a perfectly competitive labor market as long as the marginal revenue product of labor is greater than the market wage.

PRD-4.C.3

To minimize costs or maximize profits, firms allocate inputs such that the last dollar spent on each input yields the same amount of marginal product.

LEARNING OBJECTIVE

PRD-4.C

a. Define (using graphs as appropriate) the characteristics of perfectly competitive factor markets.

b. Explain (using graphs where appropriate) the profit-maximizing behavior of firms buying labor (with other inputs fixed) in perfectly competitive markets.

c. Calculate (using data from a graph or table where appropriate) measures representing the profit-maximizing behavior of firms buying labor (with other inputs fixed) in perfectly competitive markets.

ESSENTIAL KNOWLEDGE

PRD-4.C.4

Marginal revenue product of a factor of production is the change in total revenue divided by the change in that factor of production, which is also equal to the marginal physical product of that factor multiplied by the marginal revenue ($MRP = MP \times MR$). Firms in a perfectly competitive output market will have marginal revenue product of labor that is equal to the value of the marginal product of labor ($VMPL = MPL \times P$) because marginal revenue for each unit of output is equal to price.

SUGGESTED SKILL

Interpretation

2.A

Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.

TOPIC 5.4
Monopsonistic Markets

Required Course Content

ENDURING UNDERSTANDING

PRD-4

Factor prices provide incentives and convey information to firms and factors of production.

LEARNING OBJECTIVE

PRD-4.D

a. Define (using graphs as appropriate) the characteristics of monopsonistic markets.
b. Explain (using graphs where appropriate) the profit-maximizing behavior of firms buying labor (with other inputs fixed) in monopsonistic markets.
c. Calculate (using data from a graph or table where appropriate) measures representing the profit-maximizing behavior of firms buying labor (with other inputs fixed) in monopsonistic markets.

ESSENTIAL KNOWLEDGE

PRD-4.D.1

In a monopsonistic labor market, a typical firm hires additional labor as long as the marginal revenue product is greater than the marginal factor (resource) cost (the wage of a new unit of labor plus the wage increase given to all existing labor).

PRD-4.D.2

When a typical firm hires additional workers in a monopsonistic labor market, the marginal factor (resource) cost is greater than the supply price of labor.

AP MICROECONOMICS

UNIT 6

Market Failure and the Role of Government

8–13%
AP EXAM WEIGHTING

~9–11
CLASS PERIODS

Remember to go to **AP Classroom** to assign students the online **Personal Progress Check** for this unit.

Whether assigned as homework or completed in class, the **Personal Progress Check** provides each student with immediate feedback related to this unit's topics and skills.

Personal Progress Check 6

Multiple-choice: ~15 questions
Free-response: 2 questions

- Short
- Long

UNIT 6

8–13% AP EXAM WEIGHTING | **~9–11** CLASS PERIODS

Market Failure and the Role of Government

BIG IDEA 4
Market Inefficiency and Public Policy POL

- How do markets fail?
- What role should the government play in markets?

Developing Understanding

This unit prepares students to understand the theoretical arguments for and against government intervention in markets and therefore has important public policy applications. Students will examine the conditions under which markets may fail and the effectiveness of government policies that are designed to correct market failures. In exploring the idea of market failures and government interventions to correct them, students will build on their understanding of efficiency and what it means for a firm to produce the socially optimal quantity or not. Students will also learn about how inequality is measured and the sources of income and wealth inequality.

Building Course Skills

1.A 1.B 2.A 4.B 4.C

Students will have had multiple opportunities to practice the course skills by this point in the course. This unit provides various opportunities to engage students in identifying economic concepts and principles, interpreting given outcomes, and predicting and explaining the effects of economic situations using real-world examples that are relevant to their lives and role as citizens in a democratic republic.

Continue to appropriately model and provide opportunities for students to practice graphing economic situations and the effects of changes in economic situations. This is particularly important in the context of graphing externalities and the effects of government intervention, which are frequent challenge areas for students on the AP Exam.

Preparing for the AP Exam

As in Unit 5, the topics addressed in this unit (namely, externalities and the effects of government intervention in different market structures) appear in some of the most frequently missed questions on the AP Exam. Again, there may be an inclination to rush through this unit since overall it accounts for only a small percentage of the multiple-choice questions on the AP Exam and is at the very end of the course when there may be limited time left before the exam. However, it is important to prepare students to answer questions about positive and negative externalities, deadweight loss, and government interventions.

UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods
			~9–11 CLASS PERIODS
POL-2	**6.1 Socially Efficient and Inefficient Market Outcomes**	2.A Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.	
POL-3	**6.2 Externalities**	4.B Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.	
	6.3 Public and Private Goods	1.B Identify an economic concept, principle, or model illustrated by an example.	
POL-4	**6.4 The Effects of Government Intervention in Different Market Structures**	4.C Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.	
POL-5	**6.5 Inequality**	1.A Describe economic concepts, principles, or models.	

Go to **AP Classroom** to assign the **Personal Progress Check** for Unit 6. Review the results in class to identify and address any student misunderstandings.

SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	6.2	**Response Groups** Working in small groups, provide students with examples of situations that describe either a negative or positive externality. Give each group a different situation. Each group should identify the externality, graph the market failure indicating the deadweight loss, and then offer solutions to correct the situation. A presenter from each group will demonstrate the findings for the class.
2	6.3	**Socratic Seminar** Tell students a true or fictional story of a public good problem. For example, explain that you live on a lake that is no longer safe for swimming because of an algae bloom. Provide pictures and compelling details. Engage students in a classroom discussion to determine how and why a private market could or could not solve this problem. Challenge students to propose a cost-effective solution.
3	6.4	**Practice Modeling** First, demonstrate to students how to graphically model the effect of a government policy action in the context of a specific market structure. Then change the scenario by considering a different action or market structure. Provide an opportunity for students to practice generating the graph with appropriate labels. Allow students to provide feedback to one another and circle the room to clarify questions and misunderstandings.

Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

SUGGESTED SKILL

Interpretation

2.A

Using economic concepts, principles, or models, explain how a specific economic outcome occurs, or what action should be taken in order to achieve a specific economic outcome.

TOPIC 6.1
Socially Efficient and Inefficient Market Outcomes

Required Course Content

ENDURING UNDERSTANDING

POL-2

Perfectly competitive markets allocate resources efficiently, but imperfect competition often results in market inefficiencies.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
POL-2.A a. Define social efficiency. b. Explain (using graphs where appropriate) why resource allocation in perfectly competitive markets is socially efficient.	**POL-2.A.1** The optimal quantity of a good occurs where the marginal benefit of consuming the last unit equals the marginal cost of producing that last unit, thus maximizing total economic surplus. **POL-2.A.2** The market equilibrium quantity is equal to the socially optimal quantity only when all social benefits and costs are internalized by individuals in the market. Total economic surplus is maximized at that quantity. [See also PRD-3 and POL-3.]
Explain (using graphs where appropriate) how private incentives can lead to actions by rational agents that are socially undesirable (inefficient) market outcomes.	**POL-2.B.1** Rational agents can pursue private actions to exploit or exercise market characteristics known as market power. **POL-2.B.2** Rational agents make optimal decisions by equating private marginal benefits and private marginal costs that can result in market inefficiencies.

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LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
POL-2.B Explain (using graphs where appropriate) how private incentives can lead to actions by rational agents that are socially undesirable (inefficient) market outcomes.	**POL-2.B.3** Policymakers use cost-benefit analysis to evaluate different actions to reduce or eliminate market inefficiencies. **POL-2.B.4** Market inefficiencies can be eliminated by designing policies that equate marginal social benefit with marginal social cost.
POL-2.C a. Explain equilibrium allocations in imperfect markets relative to efficient allocations (using graphs where appropriate) and why these markets are inefficient. b. Calculate (using graphs where appropriate) the deadweight loss resulting from the production of a non-efficient quantity.	**POL-2.C.1** Equilibrium allocations can deviate from efficient allocations due to situations such as monopoly; oligopoly; monopolistic competition; negative and positive externalities in production or consumption; asymmetric information; and insufficient production of public goods. **POL-2.C.2** Producing any non-efficient quantity results in deadweight loss.

SUGGESTED SKILL

Graphing and Visuals

4.B

Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.

AVAILABLE RESOURCE

- Classroom Resources > **Mastering Economic Thinking Skills—*Marginal Thinking: Key Concepts and Questions***

TOPIC 6.2
Externalities

Required Course Content

ENDURING UNDERSTANDING

POL-3

Private incentives can fail to account for all socially relevant considerations.

LEARNING OBJECTIVE

POL-3.A

a. Define externalities.

b. Explain (using graphs where appropriate) how in the presence of externalities, private markets do not take into consideration social costs or social benefits.

ESSENTIAL KNOWLEDGE

POL-3.A.1

The socially optimal quantity of a good occurs where the marginal social benefit of consuming the last unit equals the marginal social cost of producing that last unit, thus maximizing total economic surplus.

POL-3.A.2

Externalities are either positive or negative and arise from lack of well-defined property rights and/or high transaction costs.

POL-3.A.3

In the presence of externalities, rational agents respond to private costs and benefits and not to external costs and benefits.

POL-3.A.4

Rational agents have the incentive to free ride when a good is non-excludable.

POL-3.B

Explain (using graphs where appropriate) how public policies address positive or negative externalities.

POL-3.B.1

Policies that address positive or negative externalities include taxes/subsidies, environmental regulation, public provision, the assignment of property rights, and the reassignment of property rights through private transactions.

TOPIC 6.3
Public and Private Goods

SUGGESTED SKILL

Principles and Models

1.B

Identify an economic concept, principle, or model illustrated by an example.

Required Course Content

ENDURING UNDERSTANDING

POL-3

Private incentives can fail to account for all socially relevant considerations.

LEARNING OBJECTIVE

POL-3.C

a. Define whether goods are rival and/or excludable.

b. Explain how the nature of rival and/or excludable goods influences the behavior of individuals and groups.

ESSENTIAL KNOWLEDGE

POL-3.C.1

Private goods are rival and excludable, and public goods are non-rival and non-excludable.

POL-3.C.2

Due to the free rider problem, private individuals usually lack the incentive to produce public goods, leaving government as the only producer.

POL-3.C.3

Governments sometimes choose to produce private goods, such as educational services, and to allow free access to them.

POL-3.C.4

Some natural resources are, by their nature, non-excludable and rival and therefore open access. Private individuals inefficiently overconsume such resources.

SUGGESTED SKILL

Graphing and Visuals

4.C

Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.

TOPIC 6.4
The Effects of Government Intervention in Different Market Structures

Required Course Content

ENDURING UNDERSTANDING

POL-4

In imperfect markets, well-designed government policy can reduce waste.

LEARNING OBJECTIVE

POL-4.A

a. Define government policy interventions in imperfect markets.

b. Explain (using graphs where appropriate) how government policies can alter market outcomes in perfectly and imperfectly competitive markets.

c. Calculate (using data from a graph or table as appropriate) changes in market outcomes resulting from government policies in perfectly competitive and imperfectly competitive markets.

ESSENTIAL KNOWLEDGE

POL-4.A.1

Per-unit taxes and subsidies affect the total price consumers pay, net price firms receive, equilibrium quantity, consumer and producer surpluses, deadweight loss, and government revenue or cost. The impact of change depends on the price elasticity of demand and supply.

POL-4.A.2

Lump-sum taxes and lump-sum subsidies do not change either marginal cost or marginal benefit; only fixed costs will be affected.

POL-4.A.3

Binding price ceilings and floors affect prices and quantities differently depending on the market structures (perfect competition, monopoly, monopolistic competition, and monopsony) and the price elasticities of supply and demand.

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LEARNING OBJECTIVE

POL-4.A

a. Define government policy interventions in imperfect markets.
b. Explain (using graphs where appropriate) how government policies can alter market outcomes in perfectly and imperfectly competitive markets.
c. Calculate (using data from a graph or table as appropriate) changes in market outcomes resulting from government policies in perfectly competitive and imperfectly competitive markets.

ESSENTIAL KNOWLEDGE

POL-4.A.4

Government intervention in imperfect markets can increase efficiency if the policy correctly addresses the incentives that led to the market failure.

POL-4.A.5

Government can use price regulation to address inefficiency due to monopoly.

POL-4.A.6

A natural monopoly will require a lump-sum subsidy to produce at the allocatively efficient quantity.

POL-4.A.7

Governments use antitrust policy in an attempt to make markets more competitive.

Exclusion:
A graph of inefficiency and policy due to collusion is beyond the scope of the course and the AP Exam.

SUGGESTED SKILL

Principles and Models

1.A

Describe economic concepts, principles, or models.

TOPIC 6.5
Inequality

Required Course Content

ENDURING UNDERSTANDING

POL-5

Market outcomes can result in income inequality.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
POL-5.A Define measures of economic inequality in income and wealth.	POL-5.A.1 Income levels and poverty rates vary greatly both across and within groups (e.g., age, gender, race) and countries. POL-5.A.2 The Lorenz curve and Gini coefficient are used to represent the degree of inequality in distributions and to compare distributions across different countries, policies, or time periods. **X Exclusion:** Drawing the Lorenz curve and calculating Gini coefficients are beyond the scope of the course and the AP Exam.
POL-5.B Explain sources of income and wealth inequality.	POL-5.B.1 Each factor of production receives the value of its marginal product, which can contribute to income inequality. POL-5.B.2: Sources of income and wealth inequality include differences in tax structures (progressive and regressive tax structures), human capital, social capital, inheritance, effects of discrimination, access to financial markets, mobility, and bargaining power within economic and social units (firms, labor unions, and families).

AP MICROECONOMICS

Instructional Approaches

Selecting and Using Course Materials

Although a college-level textbook will cover the required course content, students should also examine alternative source materials in different and varied forms to develop the habits of thinking like an economist.

Textbooks

The AP Microeconomics course requires the use of a college-level textbook. It is unlikely that a high school-level textbook will cover the content and skills of the course in the depth necessary to succeed on the AP Exam. It is important to select a textbook that covers the content of the AP Microeconomics course as outlined in the course framework. Additionally, a textbook that emphasizes skill development will be helpful in providing students with opportunities to practice graphing, solving numerical problems, and explaining economic situations.

An **example textbook list** of college-level textbooks that meet the AP Course Audit resource requirements is provided on AP Central.

Secondary Sources

Supplementing the textbook with editorials, journal articles, news articles, and essays and books by economists can help bring course concepts to life and encourage students to think critically. Microeconomists study a wide variety of current issues; examples include price hikes during natural disasters, pollution abatement, healthcare costs, traffic jams, and minimum-wage laws. Using a variety of sources that represent different points of view will engage students while enhancing learning.

Teaching the AP Economics Courses

The AP Microeconomics course framework presents content in six units to be taught in a single semester. If teachers are offering both AP Microeconomics and AP Macroeconomics with the same students over the course of two semesters and do not want to repeat the introductory material that is covered in both courses, they can use the AP Microeconomics course framework for Units 1 and 2. Following the AP Microeconomics course framework for the first two units will ensure coverage of topics that are included in the AP Microeconomics course (e.g., consumer choice theory, elasticity) but not the AP Macroeconomics course. From there, teachers can proceed to AP Macroeconomics Unit 2 or AP Microeconomics Unit 3, depending on which course they choose to teach first.

Course Framework Progression if Teaching...

AP Macroeconomics First	AP Microeconomics First
AP Microeconomics Unit 1	*AP Microeconomics Unit 1*
AP Microeconomics Unit 2	*AP Microeconomics Unit 2*
AP Macroeconomics Unit 2	*AP Microeconomics Unit 3*
AP Macroeconomics Unit 3	*AP Microeconomics Unit 4*
AP Macroeconomics Unit 4	*AP Microeconomics Unit 5*
AP Macroeconomics Unit 5	*AP Microeconomics Unit 6*
AP Macroeconomics Unit 6	*AP Macroeconomics Unit 2*
AP Microeconomics Unit 3	*AP Macroeconomics Unit 3*
AP Microeconomics Unit 4	*AP Macroeconomics Unit 4*
AP Microeconomics Unit 5	*AP Macroeconomics Unit 5*
AP Microeconomics Unit 6	*AP Macroeconomics Unit 6*

Instructional Strategies

The AP Microeconomics course framework outlines the concepts and skills students need to master to be successful on the AP Exam. In order to address those concepts and skills effectively, it helps to incorporate a variety of instructional approaches into daily lessons and activities. The following table presents strategies that can help students apply their understanding of course concepts.

Strategy	Definition	Purpose	Example
Activating Prior Knowledge	Students recall what they already know about a concept and make connections to current studies.	To prepare students to establish content connections.	When introducing the monopoly model, ask students to recall what they previously learned about perfect competition and list how firms in monopoly markets are similar to and different from firms in perfect competition. For example, firms in both market structures face increasing marginal costs.
Authentic Tasks	Students apply economic analysis to real-world issues.	To provide students with authentic experience in how economists study current issues and problems.	When covering the concept of market failure, ask students to work alone or in groups to analyze a local economic issue, like water quality, traffic jams, or public stadium financing. Then have students use their analysis to write a letter promoting the most cost-effective solution to a local supervisory board or media outlet.
Debate	Students engage in an informal or a formal argumentation of an issue. The goal is to debate ideas without attacking the people who defend those ideas.	To provide students with an opportunity to collect and orally present evidence supporting the affirmative and negative arguments of a proposition or an issue.	Have students debate whether or not the federal government should impose a $15 minimum wage (price floor).

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Strategy	Definition	Purpose	Example
Flipped Instruction	Students watch a recorded lecture before attending class. In class, students then apply their understanding of the lecture through interactive activities with teacher support.	To provide students with the opportunity to practice skills and wrestle with problems in class, where teacher help is available.	To prepare for a lesson on labor markets, assign students to watch a video lecture explaining how MRP and MRC are derived in perfectly competitive labor markets. In class the next day, have students participate in a labor market simulation that allows them to calculate MRP based on their own performance in a series of tasks.
Graph and Switch	Students generate a graph and then switch papers or whiteboards to review each other's work.	To allow students to practice creating different representations and both give and receive immediate feedback.	Provide students with the initial scenario provided in the prompt from a released FRQ—for example, Firm X is operating as a perfectly competitive firm at long-run equilibrium—and ask students to draw a correctly labeled graph of the scenario. Have students switch papers or whiteboards and provide feedback on each other's work.
Model Questions	Students answer items from released AP Exams.	To provide rigorous practice and assess students' ability to respond to AP-level multiple-choice and free-response questions.	After teaching about positive and negative externalities, provide an opportunity for students to practice answering a previous free-response question on one of these topics.
Practice Modeling	Model techniques for the class. Students then practice using those techniques and gain feedback from their peers.	To learn from the teacher's example and then have opportunities for guided practice.	When introducing a new graph in the course, model it for students first by drawing it on the board, explaining what you are doing and why, and then provide an opportunity for students to practice generating the graph with appropriate labels themselves. Allow students to provide feedback to one another and circle the room to check for understanding.

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Strategy	Definition	Purpose	Example
QHT	Students expand their prior knowledge of vocabulary words by marking words with a Q, an H, or a T (Q signals words students have a question about; H signals words students have heard and might be able to identify; T signals words students know well enough to teach to their peers).	To allow students to build on their prior knowledge of words and to provide a forum for peer teaching and learning of new words.	When introducing game theory, provide students with a list of terms specific to game theory (e.g., players, strategies, payoffs, dominant strategy). Have students mark their list with Q for words they have questions about, H for words they have heard and might be able to identify, and T for words they know well enough to teach. Discuss their markings as a class and ask students who have marked any words with a T to describe the terms to their classmates. Keep in mind that students may know the words in different contexts, where they have slightly different meanings.
Real-World Examples	Teacher and students relate personal stories, examples, or anecdotes to illustrate key content.	To create relevance and personal meaning of economic terms and models, which can otherwise be very abstract for students.	When introducing fixed and variable costs, ask students to recall experiences they've had with starting small businesses. Then ask students to identify the fixed and variable costs of these enterprises.
Response Groups	Students work in small groups with thought-provoking questions to develop solutions. A presenter shares each group's findings with the class.	To allow students to collaborate, practice, and build content understanding with each other.	Once students have learned the basic model of a perfectly competitive labor market, give them graphing and analysis problems to work on with partners. Students construct their responses on whiteboards, discussing questions and ideas with their partners, and then share their findings with the class.
Simplify the Problem	Students use simpler numbers or examples to help solve a problem.	To provide insight into the strategies needed to solve the problem.	When explaining to students why a firm will continue to operate in the short run despite earning economic losses, use dollar figures to represent a coffee shop's fixed and variable costs, showing why the shop would continue to operate if its monthly revenue is above variable costs but below total costs.

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Strategy	Definition	Purpose	Example
Simulation and Debriefing	Students assume the role of characters or economic agents in a simulation or case study. Students then discuss and reflect on the activity to clarify its purpose.	To help students better grasp a concept by participating in short, memorable experiences.	Involve students in a factory simulation in order to introduce the concepts of total product, marginal product of labor, and diminishing marginal productivity. Debrief as a class to reflect on the purpose and meaning of the activity.
Socratic Seminar	This is a focused discussion in which students engage with open-ended questions tied to a specific topic or text. The discussion continues with student responses and, when needed, additional open-ended questions that allow students to express their ideas and engage in complex thinking.	To help students arrive at a new understanding by asking questions that clarify; challenge assumptions; question facts, reasons, and evidence; or examine implications and outcomes.	Following instruction on negative externalities, assign students several readings relating to a local externality problem—for example, light pollution caused by stadium lights—and encourage students to discuss and evaluate market and governmental solutions to the problem.
Systematic and Explicit Instruction	Instruction that involves a teacher demonstrating a specific plan for solving problem types and students using this plan to think their way through a solution.	To provide students with procedures and questions to ask when solving problems.	Demonstrate a specific series of steps for students to systematically calculate opportunity costs and identify comparative advantage in both input and output problems.
Think-Pair-Share	Students think through a problem alone, pair with a partner to share ideas, and then share results with the class.	To construct meaning about a topic or question by first developing ideas individually that are then tested and revised with a partner and the class.	After Systematic and Explicit Instruction or Flipped Instruction on solving game theory problems, present a game matrix and ask students to work through it and identify any dominant strategies on their own. Then ask students to share responses and questions with a partner and then share their results with the class.
Vocabulary Notebook	Using a designated format such as a notebook, journal, or personal list to maintain an ongoing list of vocabulary words, definitions, and connections to academic study.	To facilitate and sustain a systematic process of vocabulary development.	Scarcity is the first topic of the course, and students will immediately be introduced to important economic terms that will come up throughout the course. Have students start a vocabulary notebook with definitions of key terms (e.g., scarcity, economics, land, labor, capital) and continue to add to their notebook with each new topic.

Developing Course Skills

Throughout the course, students will develop skills that are fundamental to the discipline of economics. Students will benefit from multiple opportunities to develop these skills in a scaffolded manner since they represent the complex skills that adept economists demonstrate.

The AP Microeconomics course framework provides a suggested skill for each course topic. However, the suggested skill provided should not be the *only* one used to teach any given topic. One skill is provided as a starting point for thinking about how to approach teaching that topic, but it is important in the discipline of economics that students are able to use all the skills. For example, "Topic 2.1: Demand" suggests skill "4.A: Draw an accurately labeled graph or visual to represent an economic model or market." When approaching the topic of demand, students will need to be able to draw a demand curve (Skill Category 4), but within that given topic, students will also need to do things like describe the law of demand (Skill Category 1), explain what might have caused a shift in the demand curve (Skill Category 2), and predict and explain the result of a change in a determinant of demand (Skill Category 3).

The tables on the pages that follow look at each of the skill categories and provide examples of questions that frame instruction for each skill, along with sample activities and strategies for incorporating that skill into the course.

Skill Category 1: Principles and Models—Define economic principles and models

Economics is grounded in a study of principles and models. Students must first be able to define economic concepts, principles, and models in order to apply them in context throughout the course.

Skill Category 1: *Principles and Models*

Skill	Key Questions	Sample Activities	Sample Instructional Strategies
1.A *Describe economic concepts, principles, or models.*	▪ What are the key assumptions behind an economic concept, principle, or model? ▪ What are the characteristics and traits of this economic concept, principle, or model?	Have students take part in a classroom auction that demonstrates the law of demand.	▪ Simulation and Debriefing ▪ Practice Modeling
1.B *Identify an economic concept, principle, or model illustrated by an example.*	▪ What economic concept, principle, or model is illustrated by this example?	Provide students with a series of market-failure scenarios and have them identify the type of market failure described in each.	▪ Response Groups ▪ Think-Pair-Share ▪ Model Questions
1.C *Identify an economic concept, principle, or model using quantitative data or calculations.*	▪ What economic concept, principle, or model does this quantitative data represent?	Work through example problems that ask students to identify who has an absolute advantage from given tables of data.	▪ Model Questions ▪ Simplify the Problem
1.D *Describe the similarities, differences, and limitations of economic concepts, principles, or models.*	▪ What do these economic concepts, principles, or models have in common? ▪ In what ways do these economic concepts, principles, or models differ? ▪ What are the limitations of these economic concepts, principles, or models?	Have students describe the similarities and differences between different market structures.	▪ Think-Pair-Share ▪ Model Questions

Skill Category 2: Interpretation—Explain given economic outcomes

Economists use their understanding of economic concepts, principles, and models to interpret economic situations. Students should be able to do the same in this course, inferring the cause of a given economic outcome by applying their understanding of course concepts.

Skill Category 2: *Interpretation*

Skill	Key Questions	Sample Activities	Sample Instructional Strategies
2.A *Using economic concepts, principles, or models, explain how a specific economic outcome occurs or what action should be taken in order to achieve a specific economic outcome.*	▪ What contributed to this outcome? ▪ What action should be taken to achieve this outcome?	After teaching students about positive and negative externalities and the resulting inefficiencies, provide students with a series of externality scenarios and ask them to provide appropriate policy solutions for each scenario.	▪ Flipped Instruction ▪ Response Groups ▪ Graph and Switch
2.B *Using economic concepts, principles, or models, explain how a specific economic outcome occurs when there are multiple contributing variables or what multiple actions should be taken in order to achieve a specific economic outcome.*	▪ What combination of variables contributed to this outcome? ▪ What actions should be taken to achieve this outcome?	Provide students with complex scenarios involving multiple market imperfections; for example, a monopoly with a negative externality (e.g., **2017 AP Exam Free-Response Question #3**) or a labor market that has both a monopsony and a union. Ask students to predict outcomes for price, quantity, and social efficiency in the market.	▪ Model Questions ▪ Response Groups
2.C *Interpret a specific economic outcome using quantitative data or calculations.*	▪ What quantitative change will result in this outcome? ▪ What can you infer from this given quantitative data?	Provide students with data on a sample firm's fixed and variable costs at varied levels of output as well as marginal revenues. Ask students to calculate profit-maximizing output for the firm.	▪ Simplify the Problem ▪ Graph and Switch

Skill Category 3: Manipulation—Determine outcomes of specific economic situations

Economists are frequently asked to predict and explain what will happen as the result of policy actions or changes in economic situations. Teachers can help students learn how to determine hypothetical outcomes through an application of the economic concepts, principles, and models covered in the course.

Skill Category 3: *Manipulation*

Skill	Key Questions	Sample Activities	Sample Instructional Strategies
3.A *Determine the outcome of an economic situation using economic concepts, principles, or models.*	▪ What will happen in this situation? ▪ What will be the effect of this change or policy action?	Provide students with a reading or video explaining a real-world economic problem. Ask students to analyze various policy choices using economic models and predict the outcome of each.	▪ Authentic Tasks ▪ Debate
3.B *Determine the effect(s) of one or more changes on other economic markets.*	▪ How will this change affect this other market?	Model in class how to explain the steps in a chain of events. Stress that when asked to determine effects in other markets (e.g., when asked how a change in the price of corn will affect ethanol markets and wheat markets), students should take care to include each step along the way and explain it in enough detail to clarify the reason for the subsequent change.	▪ Systematic and Explicit Instruction ▪ Real-World Examples ▪ Model Questions
3.C *Determine the effect(s) of a change in an economic situation using quantitative data or calculations.*	▪ What is the quantitative effect of this change or policy action?	Ask students to predict firm behavior in a game theory scenario and then ask students to revise the provided matrix to include a tax or subsidy that affects some of the payoffs. Ask students to predict the impact on firm behavior using data from the new matrix.	▪ Model Questions ▪ Simplify the Problem ▪ Response Groups

Skill Category 4: Graphing and Visuals—Model economic situations using graphs or visual representations

Graphs are important tools that economists use to represent economic situations and help predict and explain economic outcomes. Students should have ample practice throughout the course using graphs to represent economic models and markets. They should learn that even when a graph is not asked for, drawing one can be an effective strategy for answering questions and reasoning through economic scenarios.

Skill Category 4: *Graphing and Visuals*

Skill	Key Questions	Sample Activities	Sample Instructional Strategies
4.A *Draw an accurately labeled graph or visual to represent an economic model or market.*	▪ How do you graphically represent this economic model or market?	Participate in a market simulation (wheat market, cocoa market, etc.) to demonstrate the interaction of buyers and sellers. Following the simulation, ask students to graph the data from the individual buyer and seller cards to derive supply and demand curves.	▪ Simulation and Debriefing ▪ Practice Modeling
4.B *Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual.*	▪ How do you represent this specific economic situation on your graph?	Ask students to draw a graph representing a retail clothing firm earning short-run profits in monopolistic competition.	▪ Graph and Switch ▪ Model Questions ▪ Practice Modeling
4.C *Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual.*	▪ How do you represent the effect of this change on your graph?	Ask students to work in groups to answer a past free-response question that asks students to show the effect of a price floor or ceiling in a perfectly competitive market.	▪ Response Groups ▪ Think-Pair-Share

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AP MICROECONOMICS

Exam Information

Exam Overview

The AP Microeconomics Exam assesses student understanding of the skills and learning objectives outlined in the course framework. The exam is 2 hours and 10 minutes long and includes 60 multiple-choice questions and 3 free-response questions. ***Starting with the 2022–23 school year (spring 2023 exam), a four-function calculator is allowed on both sections the exam.*** *The details of the exam, including exam weighting and timing, can be found below:*

Section	Question Type	Number of Questions	Exam Weighting	Timing
I	**Multiple-choice questions**	**60**	**66.65%**	**70 minutes**
II	**Free-response questions**	**3**	**33.35%**	**60 minutes** (includes a 10-minute reading period)
	Question 1: Long (10 points)			
	Question 2: Short (5 points)			
	Question 3: Short (5 points)			

The exam assesses content from the four big ideas for the course:
Big Idea 1: Scarcity and Markets
Big Idea 2: Costs, Benefits, and Marginal Analysis
Big Idea 3: Production Choices and Behavior
Big Idea 4: Market Inefficiency and Public Policy

The exam also assesses the six units with the following exam weighting on the multiple-choice section:

Units	Exam Weighting
Unit 1: Basic Economic Concepts	**12–15%**
Unit 2: Supply and Demand	**20–25%**
Unit 3: Production, Cost, and the Perfect Competition Model	**22–25%**
Unit 4: Imperfect Competition	**15–22%**
Unit 5: Factor Markets	**10–13%**
Unit 6: Market Failure and the Role of Government	**8–13%**

How Student Learning Is Assessed on the AP Exam

The AP Economics skills are assessed on the AP Exam as detailed below.

Section I: Multiple-Choice

Skill Categories	Multiple-Choice Questions	
1: Principles and Models	30–42% of the multiple-choice questions assess students' ability to define economic principles or models. Students will need to describe and compare economic concepts, principles, and models. Additionally, students will need to identify economic concepts, principles, or models illustrated by an example.	**Numerical Analysis** Skill Categories 1, 2, and 3 all include skills that require analyzing numbers or performing calculations to identify economic concepts, principles, or models (Skill 1.C), to explain given outcomes (Skill 2.C), and to determine the effects of changes (Skill 3.C). 20–30% of total multiple-choice questions will include analyzing numbers or performing calculations.
2: Interpretation	37–47% of the multiple-choice questions assess students' ability to explain given economic outcomes. Students will need to explain how a specific economic outcome occurs, given one or more contributing variables, or what action(s) should be taken in order to achieve a specific economic outcome.	
3: Manipulation	16–25% of the multiple-choice questions assess students' ability to determine outcomes of specific economic situations. Students will need to use economic concepts, principles, or models to determine the outcome of an economic situation or determine the effects of one or more changes on other economic markets.	
4: Graphing and Visuals	Skill Category 4 is not assessed in multiple-choice questions since it requires students to draw a graph or visual representation, which can only be assessed on the free-response section of the exam. However, students will be expected to answer multiple-choice questions in which a graph or visual representation is provided.	

Section II: Free-Response

All four skill categories will be assessed in the three free-response questions, through four distinct types of tasks:

Make assertions about economic concepts, principles, models, outcomes, and/or effects: This task assesses skills in categories 1, 2, and 3 and accounts for 10–20% of total points in the free-response section.

Explain economic concepts, principles, models, outcomes and/or effects: This task assesses skills in categories 1, 2, and 3 and accounts for 25–35% of total points in the free-response section.

Perform numerical analysis: This task assesses student ability to make assertions that require numerical analysis or to perform calculations. This task assesses skills in categories 1, 2, or 3 and accounts for 15–30% of total points in the free-response section.

Create graphs or visual representations: This task assesses Skill Category 4 (Graphing and Visuals) and accounts for 30–50% of the total points in the free-response section. This task requires students to do the following:

- Draw an accurately labeled graph or visual to represent an economic model or market (Skill 4.A)
- Demonstrate your understanding of a specific economic situation on an accurately labeled graph or visual (Skill 4.B)
- Demonstrate the effect of a change in an economic situation on an accurately labeled graph or visual (Skill 4.C)

Task Verbs Used in Free-Response Questions

The following task verbs are commonly used in the free-response questions.

Identify. What? Which? Will? and other interrogatory words: Identify or provide information about a specified topic, without elaboration or explanation.

Explain: Provide information about how or why a relationship, pattern, position, situation, or outcome occurs using evidence and/or reasoning. Graphs and symbols are acceptable as part of the explanation.

Calculate: Perform mathematical steps to arrive at a final answer. Showing work is required.

Draw a correctly labeled: Create a graph or visual representation that illustrates or explains relationships or phenomena. Labels are required.

Show/Label/Plot/Indicate: Show, label, plot, or indicate an economic scenario on a graph or visual representation created by the student. Clearly labeling all axes and curves and showing directional changes where relevant is required.

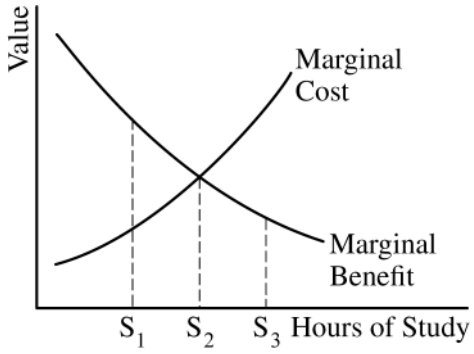
Sample Exam Questions

The sample exam questions that follow illustrate the relationship between the course framework and the AP Microeconomics Exam and serve as examples of the types of questions that appear on the exam. After the sample questions are tables that show which skill, learning objective(s), and unit each question relates to. The answers to the multiple-choice questions are also provided.

Section I: Multiple-Choice

The following are examples of the kinds of multiple-choice questions found on the exam.

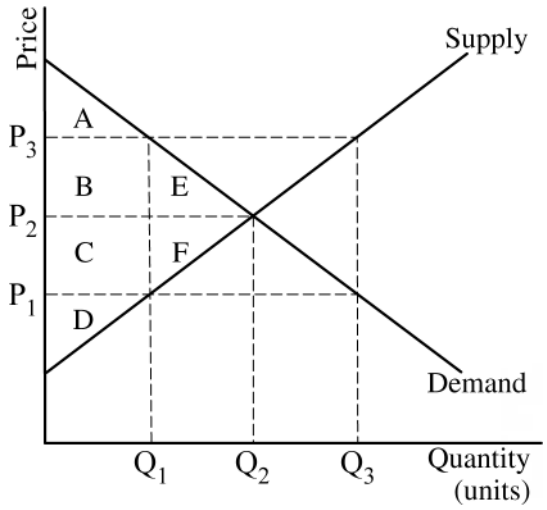
1. Individuals and societies must make choices regarding which goods and services will be produced and consumed because
   (A) unlimited wants can only be satisfied by allocating resources efficiently
   (B) resources are insufficient to satisfy the unlimited wants of people
   (C) allocating scarce resources efficiently reduces the equitable distribution of goods
   (D) income is not equally distributed to ensure that everyone can participate in the market
   (E) a country cannot have a comparative advantage in the production of all goods



2. The graph above shows the marginal benefit that a student receives and the marginal cost the student incurs from additional hours of study. Which of the following is true?
   (A) Beyond S_2 hours of study, there is no further benefit from devoting additional hours to study.
   (B) At S_1 hours of study, the extra marginal cost of study time exceeds the extra marginal benefit of study time.
   (C) The optimal number of hours that the student should study is S_2 hours.
   (D) The rational individual should study S_3 hours.
   (E) The marginal cost of studying decreases as more time is spent studying.

3. Which of the following occurs if the price of oranges is below the equilibrium price?
   (A) There is a surplus of oranges.
   (B) The quantity supplied of oranges is greater than the quantity demanded.
   (C) The quantity supplied of oranges is greater than the quantity sold.
   (D) The quantity purchased of oranges is greater than the quantity sold.
   (E) The quantity demanded of oranges is greater than the quantity supplied.

Questions 4 and 5 refer to the graph below.



4. Total economic surplus will be maximized at which of the following price and quantity combinations?

   (A) P_3 and Q_3
   (B) P_3 and Q_1
   (C) P_2 and Q_2
   (D) P_1 and Q_1
   (E) P_1 and Q_3

5. Suppose the government sets a price floor at P_3 in the market. The resulting consumer surplus, producer surplus, and deadweight loss will be which of the following?

(A)

Consumer Surplus	Producer Surplus	Deadweight Loss
B + E	C + F	A + B

(B)

Consumer Surplus	Producer Surplus	Deadweight Loss
A + B	C + D	E + F

(C)

Consumer Surplus	Producer Surplus	Deadweight Loss
A	C + D + F	E

(D)

Consumer Surplus	Producer Surplus	Deadweight Loss
A + B + E	C + D + F	0

(E)

Consumer Surplus	Producer Surplus	Deadweight Loss
A	B + C + D	E + F

6. Assume that a 2 percent increase in the price of bologna causes a 5 percent decrease in the quantity demanded of cheese. What is the cross-price elasticity of demand between these goods, and how are these goods related?
   (A) Cross-price elasticity of demand equals −0.4, and these goods are complements.
   (B) Cross-price elasticity of demand equals +0.4, and these goods are substitutes.
   (C) Cross-price elasticity of demand equals −2.5, and these goods are complements.
   (D) Cross-price elasticity of demand equals +2.5, and these goods are substitutes.
   (E) Cross-price elasticity of demand equals −0.4, and these goods are substitutes.

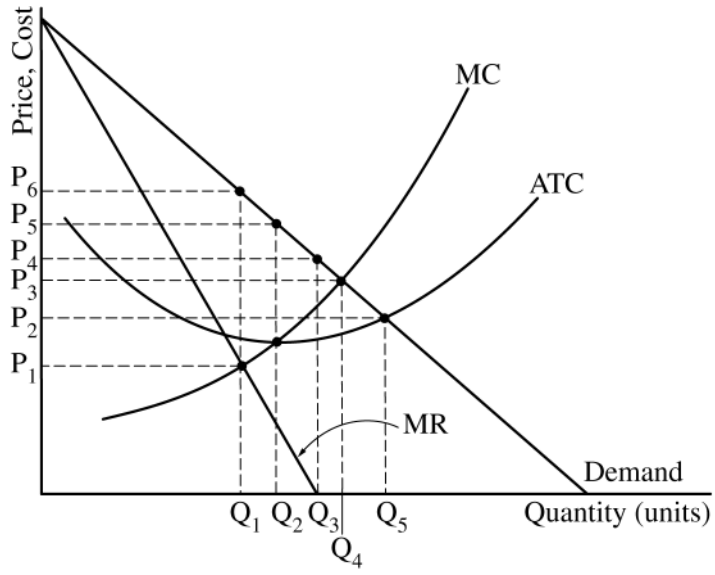
7. For a firm where labor is the only variable input, which of the following happens when diminishing returns set in?
   (A) Average variable cost begins to increase.
   (B) Average product of labor begins to decline.
   (C) Total product begins to decline.
   (D) Marginal cost begins to increase.
   (E) Average total cost begins to increase.

8. Which of the following indicates the presence of economies of scale as the quantity of output increases?
   (A) Short-run average variable cost decreases.
   (B) Long-run average total cost decreases.
   (C) Marginal cost decreases.
   (D) Average fixed cost decreases.
   (E) Marginal cost exceeds average total cost.

9. For a perfectly competitive firm, assume the price equals a rising marginal cost at 200 units of output. At this output, average total cost is $8 and average variable cost is $5. If the price is $4, by how much can this firm reduce its losses by shutting down?
   (A) $800
   (B) $600
   (C) $400
   (D) $200
   (E) $100

10. Which of the following is true for a perfectly competitive firm?
   (A) The firm is a price taker.
   (B) The firm chooses its profit-maximizing quantity by equating price to average total cost.
   (C) The firm faces a downward-sloping demand curve for its product.
   (D) The firm's short-run supply curve is the same as its average variable cost curve above the minimum of the marginal cost curve.
   (E) The firm can expect to earn positive economic profit in long-run equilibrium.

11. Which of the following is more likely to occur when there are high barriers to entry in an industry?
   (A) The firm(s) in the industry earn economic profits in the long run.
   (B) The industry will be characterized by diseconomies of scale.
   (C) The firm(s) in the industry are price takers.
   (D) The firm(s) in the industry will charge a price equal to average total cost.
   (E) The firm(s) will charge a price on the inelastic portion of the demand curve.



12. What are the profit- and revenue-maximizing quantities for the monopolist whose revenue and cost conditions are described by the graph above?

(A)

Profit-Maximizing	Revenue-Maximizing
Q_5	Q_2

(B)

Profit-Maximizing	Revenue-Maximizing
Q_4	Q_3

(C)

Profit-Maximizing	Revenue-Maximizing
Q_3	Q_3

(D)

Profit-Maximizing	Revenue-Maximizing
Q_1	Q_4

(E)

Profit-Maximizing	Revenue-Maximizing
Q_1	Q_3

13. In long-run equilibrium, at which of the following output levels will a monopolistically competitive firm operate?
    (A) Where long-run average total cost is at a minimum
    (B) Where price equals marginal revenue
    (C) Where price equals average total cost
    (D) Where marginal revenue equals average total cost
    (E) Where marginal revenue equals average revenue

14. The equilibrium quantity of labor used in the production of a good will be the largest under which of the following conditions?
    (A) When the labor market is monopsonistic and the output market is perfectly competitive
    (B) When the labor market is monopsonistic and the output market is a pure monopoly
    (C) When the labor market is perfectly competitive and the output market is a pure monopoly
    (D) When both the labor and output markets are perfectly competitive
    (E) When laborers are allowed to collude in setting a price

15. Which of the following is true if the production of a good imposes external costs?
    (A) The market supply curve lies above the marginal social cost curve.
    (B) An appropriate government policy would be to subsidize production of the good.
    (C) A competitive market would not provide the good at all.
    (D) A competitive market would produce more than the socially optimal amount.
    (E) A persistent market surplus would occur.

Section II: Free-Response

The following are examples of the kinds of free-response questions found on the exam. Note that on the actual AP Exam, there will be one long free-response question worth 10 points and two short free-response questions, each worth 5 points.

1. On the island of Gratin, potatoes are produced in a perfectly competitive constant cost industry. The market for potatoes is currently in long-run equilibrium at the market price of $5 per sack.
   (a) Draw correctly labeled side-by-side graphs for the potato market and for farmer Lamo and show each of the following.
      (i) The market equilibrium quantity and price, labeled Q_M and $5, respectively
      (ii) The quantity produced and the price for farmer Lamo, labeled Q_L and $5, respectively
   (b) Believing that the incomes of potato farmers are unfairly low, the government of Gratin imposes a binding price floor at $7 per sack. The government will purchase any surpluses of potatoes. On your graph in part (a), show each of the following.
      (i) The market quantity of potatoes that would be supplied at the price floor, labeled Q_F
      (ii) The profit farmer Lamo earns, shaded completely
   (c) If the absolute value of the price elasticity of demand is 0.92, would consumer spending on potatoes increase, decrease, or stay the same as a result of the price floor? Explain.
   (d) How would the price floor affect the demand for labor by potato farmers?
   (e) Potatoes, corn, and rice are all produced on the island of Gratin in perfectly competitive markets.
      (i) Assume corn is a substitute in production (an alternate output) for potatoes. How would setting the price floor on potatoes affect the equilibrium price and quantity of corn?
      (ii) As a result of an increase in the price of rice, the demand for potatoes increased. Are rice and potatoes substitutes or complements in consumption?

2. Two discount stores, Discount Delight and Bargain Floor, sell a popular brand of athletic shoes. They are considering including these shoes in their upcoming sale. The relevant payoff matrix appears below, with the first entry in each cell indicating Discount Delight's profit from shoe sales and the second entry in each cell indicating Bargain Floor's profit. The two firms know all the information in the payoff matrix and do not cooperate.

		Bargain Floor: Includes	Bargain Floor: Does Not Include
Discount Delight: Includes		$150, $180	$200, $100
Discount Delight: Does Not Include		$100, $250	$240, $220

(a) If Discount Delight does not include the shoes in its sale but Bargain Floor includes them, what will Bargain Floor's profit be?

(b) Does either player have a dominant strategy? If so, identify the player and the strategy.

(c) Using numbers from the table, explain why both stores choosing not to include the shoes in their respective sales does **not** correspond to a Nash equilibrium.

(d) Identify the Nash equilibrium strategy for each store.

(e) If the two stores could cooperate in choosing their strategies, would the outcome change? Explain.

Answer Key and Question Alignment to Course Framework

Multiple-Choice Question	Answer	Skill	Learning Objective	Unit
1	B	1.A	MKT-1.A	1
2	C	2.A	CBA-2.B	1
3	E	2.A	MKT-4.B	2
4	C	2.A	MKT-4.A	2
5	E	3.A	POL-1.A	2
6	C	2.C	MKT-3.E	2
7	D	2.A	PRD-1.A	3
8	B	1.A	PRD-1.A	3
9	D	3.C	PRD-2.A, CBA-2.C	3
10	A	1.A	PRD-3.A	3
11	A	1.A	PRD-3.B	4
12	E	2.A	PRD-3.B	4
13	C	2.A	PRD-3.B	4
14	D	2.A	PRD-3.A, PRD-4.C	5
15	D	2.A	POL-3.A	6

Free-Response Question	Question Type	Learning Objectives	Unit
1	Long	MKT-3.B, MKT-3.D, MKT-3.E, POL-4.A, PRD-3.A, PRD-4.B	2, 3, 5, 6
2	Short	PRD-3.C	4

The scoring information for the questions within this course and exam description, along with further exam resources, can be found on the **AP Microeconomics Exam Page** on AP Central.

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AP MICROECONOMICS

Scoring Guidelines

Question 1: Long

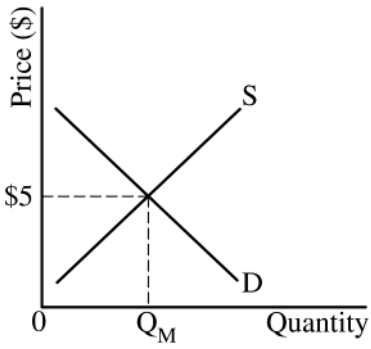
1. On the island of Gratin, potatoes are produced in a perfectly competitive constant cost industry. The market for potatoes is currently in long-run equilibrium at the market price of $5 per sack.
   (a) Draw correctly labeled side-by-side graphs for the potato market and for farmer Lamo and show each of the following.
      (i) The market equilibrium quantity and price, labeled Q_M and $5, respectively
      (ii) The quantity produced and the price for farmer Lamo, labeled Q_L and $5, respectively
   (b) Believing that the incomes of potato farmers are unfairly low, the government of Gratin imposes a binding price floor at $7 per sack. The government will purchase any surpluses of potatoes. On your graph in part (a), show each of the following.
      (i) The market quantity of potatoes that would be supplied at the price floor, labeled Q_F
      (ii) The profit farmer Lamo earns, shaded completely
   (c) If the absolute value of the price elasticity of demand is 0.92, would consumer spending on potatoes increase, decrease, or stay the same as a result of the price floor? Explain.
   (d) How would the price floor affect the demand for labor by potato farmers?
   (e) Potatoes, corn, and rice are all produced on the island of Gratin in perfectly competitive markets.
      (i) Assume corn is a substitute in production (an alternate output) for potatoes. How would setting the price floor on potatoes affect the equilibrium price and quantity of corn?
      (ii) As a result of an increase in the price of rice, the demand for potatoes increased. Are rice and potatoes substitutes or complements in consumption?

Scoring Guidelines for Question 1: Long — 10 points

Learning Objectives: MKT-3.B | MKT-3.D | MKT-3.E | POL-4.A | PRD-3.A | PRD-4.B

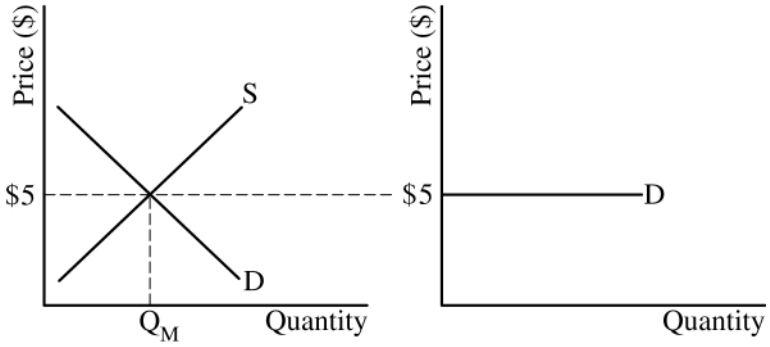
(a) Draw a correctly labeled graph of the potato market that shows the market equilibrium quantity and price labeled Q_M and \$5, respectively. **1 point** 4.A

Task type: Create graphs or visual representations



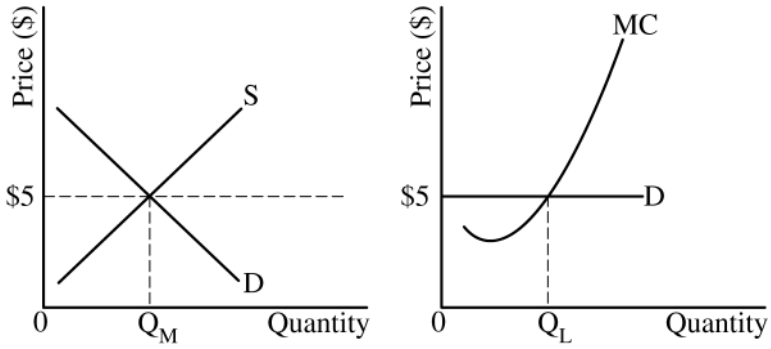
Draw a correctly labeled graph for farmer Lamo next to the graph of the potato market that shows a horizontal demand curve for Lamo coming from the market equilibrium price of \$5. **1 point** 4.A

Task type: Create graphs or visual representations



Show the profit-maximizing quantity Q_L, where P = MC. **1 point** 4.B

Task type: Create graphs or visual representations

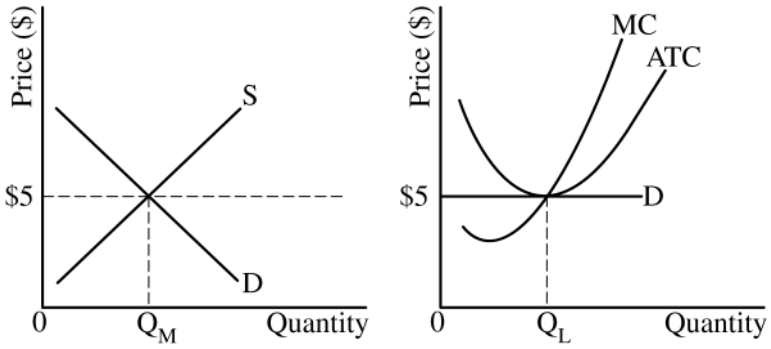


Show the ATC curve tangent to Lamo's demand curve at Q_L.

1 point

4.B

Task type: Create graphs or visual representations



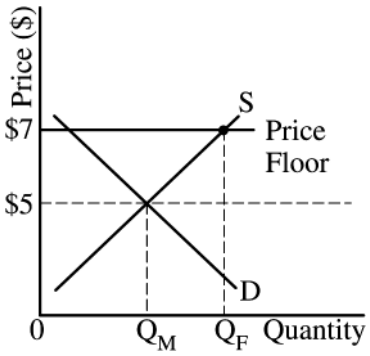
Total for part (a) **4 points**

(b) **(i)** On the graph from part (a), show the market quantity of potatoes that would be supplied at the price floor, labeled Q_F.

1 point

4.C

Task type: Create graphs or visual representations

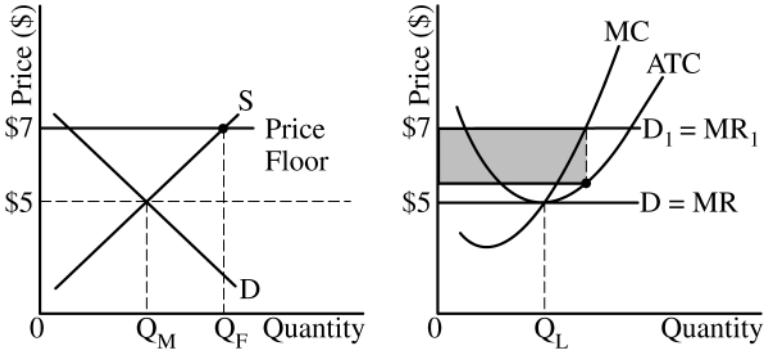


(ii) On the graph from part (a), show the profit farmer Lamo earns with the price floor, shaded completely.

1 point

4.C

Task type: Create graphs or visual representations



Total for part (b) **2 points**

(c) State that consumer spending on potatoes will increase and explain that because the demand for potatoes is inelastic, the price increase will result in an increase in total spending. (It is also acceptable to explain that because demand is inelastic, the percentage increase in price outweighs the percentage decrease in the quantity demanded of potatoes, resulting in an increase in total spending on potatoes.)

1 point

3.C

Task type: Explain

(d)	State that the demand for labor will increase and/or the demand curve will shift to the right. *Task type: Make an assertion*	**1 point** 3.B
(e)	**(i)** State that the equilibrium price of corn will increase and the equilibrium quantity of corn will decrease. *Task type: Make an assertion*	**1 point** 3.B
	(ii) State that potatoes and rice are substitutes in consumption. *Task type: Make an assertion*	**1 point** 2.A
	Total for part (e)	**2 points**
	Total for question 1	**10 points**

Question 2: Short

2. Two discount stores, Discount Delight and Bargain Floor, sell a popular brand of athletic shoes. They are considering including these shoes in their upcoming sale. The relevant payoff matrix appears below, with the first entry in each cell indicating Discount Delight's profit from shoe sales and the second entry in each cell indicating Bargain Floor's profit. The two firms know all the information in the payoff matrix and do not cooperate.

		Bargain Floor	
		Includes	Does Not Include
Discount Delight	Includes	\$150, \$180	\$200, \$100
	Does Not Include	\$100, \$250	\$240, \$220

(a) If Discount Delight does not include the shoes in its sale but Bargain Floor includes them, what will Bargain Floor's profit be?

(b) Does either player have a dominant strategy? If so, identify the player and the strategy.

(c) Using numbers from the table, explain why both stores choosing not to include the shoes in their respective sales does **not** correspond to a Nash equilibrium.

(d) Identify the Nash equilibrium strategy for each store.

(e) If the two stores could cooperate in choosing their strategies, would the outcome change? Explain.

Scoring Guidelines for Question 2: Short — 5 points

Learning Objectives: PRD-3.C

(a)	State that Bargain Floor's profit will be $250. *Task type: Perform numerical analysis*	**1 point** 1.C
(b)	State yes and identify that including the shoes in its sale is the dominant strategy for Bargain Floor. *Task type: Perform numerical analysis*	**1 point** 1.C
(c)	Explain that it is not a Nash equilibrium because Bargain Floor has an incentive to move to including the shoes in its sale, earning $30 more ($250>$220). *Task type: Explain*	**1 point** 2.C
(d)	Identify the Nash equilibrium strategy for each store as choosing to include the shoes in the sale. *Task type: Perform numerical analysis*	**1 point** 2.C
(e)	State yes and explain that by both agreeing to not include the shoes in their sales, they would both increase their profits. *Task type: Explain*	**1 point** 3.C
	Total for question 2	**5 points**

AP MICROECONOMICS

Appendix

Appendix: AP Microeconomics Conceptual Framework

Big Idea 1: Scarcity and Markets (MKT)

Limited resources and unlimited wants result in the need to make choices. In a market economy, the choices of buyers and sellers determine market prices and the allocation of scarce resources.

Enduring Understanding	Learning Objective	Essential Knowledge
MKT-1 *Most resources are scarce, and in most cases use of resources involves constraints and trade-offs.*	**MKT-1.A** Define resources and the cause(s) of their scarcity.	**MKT-1.A.1** Economic trade-offs arise from the lack of sufficient resources (scarcity) to meet society's wants and needs.
		MKT-1.A.2 Most factors of production (such as land, labor, and capital) are scarce, but some factors of production (such as established knowledge) may not be scarce due to their non-rival nature.
	MKT-1.B Define how resource allocation is influenced by the economic system adopted by society.	**MKT-1.B.1** Resource allocation involves answering three basic questions—What goods and services to produce? How to produce those goods and services? And who consumes those goods and services?
		MKT-1.B.2 Resource allocation is significantly influenced by the economic system adopted by society, such as command economy, market economy, or mixed economy. Each system involves a particular set of institutional arrangements and a coordinating mechanism for allocating scarce resources and distributing output.
	MKT-1.C a. Define (using graphs as appropriate) the production possibilities curve (PPC) and related terms. b. Explain (using graphs as appropriate) how the production possibilities curve (PPC) illustrates opportunity costs, trade-offs, inefficiency, efficiency, and economic growth or contraction under various conditions. c. Calculate (using data from PPCs or tables as appropriate) opportunity cost.	**MKT-1.C.1** The PPC is a model used to show the trade-offs associated with allocating resources.
		MKT-1.C.2 The PPC can be used to illustrate the concepts of scarcity, opportunity cost, efficiency, underutilized resources, and economic growth or contraction.
		MKT-1.C.3 The shape of the PPC depends on whether opportunity costs are constant, increasing, or decreasing.
		MKT-1.C.4 The PPC can shift due to changes in factors of production as well as changes in productivity/technology.
		MKT-1.C.5 Economic growth results in an outward shift of the PPC.

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Big Idea 1: Scarcity and Markets (MKT) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
MKT-2 *The consequences of scarcity can be mitigated through specialization in production and by exchange.*	**MKT-2.A** a. Define absolute advantage and comparative advantage. b. Determine (using data from PPCs or tables as appropriate) absolute and comparative advantage.	**MKT-2.A.1** Absolute advantage describes a situation in which an individual, business, or country can produce more of a good or service than any other producer with the same quantity of resources. **MKT-2.A.2** Comparative advantage describes a situation in which an individual, business, or country can produce a good or service at a lower opportunity cost than another producer.
	MKT-2.B a. Explain (using data from PPCs or tables as appropriate) how specialization according to comparative advantage with appropriate terms of trade can lead to gains from trade. b. Calculate (using data from PPCs or tables as appropriate) mutually beneficial terms of trade.	**MKT-2.B.1** Production specialization according to comparative advantage, not absolute advantage, results in exchange opportunities that lead to consumption possibilities beyond the PPC. **MKT-2.B.2** Comparative advantage and opportunity costs determine the terms of trade for exchange under which mutually beneficial trade can occur.
MKT-3 *Individuals and firms respond to incentives and face constraints.*	**MKT-3.A** a. Define (using graphs as appropriate) key terms and factors related to consumer decision making and the law of demand. b. Explain (using graphs as appropriate) the relationship between price and quantity demanded and how buyers respond to incentives and constraints.	**MKT-3.A.1** A well-defined system of property rights is necessary for the market system to function well. **MKT-3.A.2** Economic agents respond to incentives. **MKT-3.A.3** Individuals often respond to incentives, such as those presented by prices, but also face constraints, such as income, time, and legal and regulatory frameworks. **MKT-3.A.4** The law of demand suggests that a change in the own-price causes a change in quantity demanded in the opposite direction and a movement along a demand (marginal benefit) curve. **MKT-3.A.5** The conceptual relationship between price and quantity stated by the law of demand leads to downward-sloping demand curves explained by the income effect and substitution effect and/or by diminishing marginal utility. **MKT-3.A.6** The market demand curve (schedule) is derived from the summation of individual demand curves (schedules).
	MKT-3.B Explain (using graphs as appropriate) buyers' responses to changes in incentives and constraints.	**MKT-3.B.1** Changes in the determinants of consumer demand can cause the demand curve to shift.

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Big Idea 1: Scarcity and Markets (MKT) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
MKT-3 *Individuals and firms respond to incentives and face constraints.*	**MKT-3.C** a. Define (using graphs as appropriate) the law of supply. b. Explain (using graphs as appropriate) the relationship between price and quantity supplied.	**MKT-3.C.1** A change in own-price causes a change in quantity supplied in the same direction and a movement along a supply curve. **MKT-3.C.2** The market supply curve (schedule) is derived from the summation of individual supply curves (schedules). The market supply curve is upward-sloping.
	MKT-3.D Explain (using graphs as appropriate) producers' (sellers') responses to changes in incentives and technology.	**MKT-3.D.1** Changes in the determinants of supply can cause the supply curve to shift.
	MKT-3.E a. Define measures of elasticity. b. Explain (using graphs where appropriate) measures of elasticity and the impact of a given price change on total revenue or total expenditure. c. Calculate (using data from a graph or a table as appropriate) measures of elasticity.	**MKT-3.E.1** Economists use the concept of elasticity to measure the magnitude of percentage changes in quantity owing to any given changes in the own-price, income, and prices of related goods. **MKT-3.E.2** Price elasticity of demand is measured by the percentage change in quantity demanded divided by the percentage change in price or the responsiveness of the quantity demanded to changes in price. Elasticity varies along a linear demand curve, meaning slope is not elasticity. **MKT-3.E.3** Ranges of values of elasticity of demand are described as elastic or inelastic with the separating benchmark being a magnitude of 1, where the change in the price and the change in the quantity demanded are proportional. a. When the magnitude of the value of elasticity is greater than 1, the demand is described as being elastic with respect to that price in the range of the given change. b. When the magnitude of the value of elasticity is less than 1, the demand is described as being inelastic with respect to that price in the range of the given change. c. When the magnitude of the value of elasticity is equal to 1, the demand is described as being unit elastic with respect to that price in the range of the given change. **MKT-3.E.4** The price elasticity of demand depends on certain factors such as the availability of substitutes. **MKT-3.E.5** The impact of a given price change on total revenue or total expenditure will depend on whether demand is elastic, inelastic, or unit elastic.

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Enduring Understanding	Learning Objective	Essential Knowledge
MKT-3 *Individuals and firms respond to incentives and face constraints.*	**MKT-3.E** a. Define measures of elasticity. b. Explain (using graphs where appropriate) measures of elasticity and the impact of a given price change on total revenue or total expenditure. c. Calculate (using data from a graph or a table as appropriate) measures of elasticity.	**MKT-3.E.6** Price elasticity of supply is measured by the percentage change in quantity supplied divided by the percentage change in price, or the responsiveness of the quantity supplied to changes in price. **MKT-3.E.7** Ranges of values of elasticity of supply are described as elastic or inelastic with the separating benchmark being a magnitude of 1, where the change in the price and the change in the quantity supplied are proportional. a. When the magnitude of the value of elasticity is greater than 1, the supply is described as being elastic with respect to that price in the range of the given change. b. When the magnitude of the value of elasticity is less than 1, the supply is described as being inelastic with respect to that price in the range of the given change. c. When the magnitude of the value of elasticity is equal to 1, the supply is described as being unit elastic with respect to that price in the range of the given change. **MKT-3.E.8** The price elasticity of supply depends on certain factors such as the price of alternative inputs. **MKT-3.E.9** Elasticity can be measured for any determinant of demand or supply, not just the price. **MKT-3.E.10** Income elasticity of demand is measured by the percentage change in the quantity demanded divided by the percentage change in consumers' income. Economists use the income elasticity of demand to determine whether a good is normal or inferior. **MKT-3.E.11** Cross-price elasticity of demand is measured by the percentage change in the quantity demanded of one good divided by the percentage change in the price of another good. Economists use the cross-price elasticity of demand to determine whether goods are substitutes, complements, or not related.

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Big Idea 1: Scarcity and Markets (MKT) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
MKT-4 *Although equilibria are stable, an economy can move from one equilibrium to another if market conditions change.*	**MKT-4.A** a. Define (using graphs as appropriate) market equilibrium, consumer surplus, and producer surplus. b. Explain (using graphs as appropriate) how equilibrium price, quantity, consumer surplus, and producer surplus for a good or service are determined. c. Calculate (using data from a graph or table as appropriate) areas of consumer surplus and producer surplus at equilibrium.	**MKT-4.A.1** The supply-demand model is a tool for understanding what factors influence prices and quantities and why prices and quantities might differ across markets or change over time. **MKT-4.A.2** In a perfectly competitive market, equilibrium is achieved (and markets clear with no shortages or surpluses) when the price of a good or service brings quantity supplied and quantity demanded into balance, in the sense that buyers wish to purchase the same quantity that sellers wish to provide. **MKT-4.A.3** Equilibrium price provides information to economic decision-makers to guide resource allocation. **MKT-4.A.4** Economists use consumer surplus and producer surplus to measure the benefits markets create to buyers and sellers and understand market efficiency. **MKT-4.A.5** Market equilibrium maximizes total economic surplus in the absence of market failures, meaning that perfectly competitive markets are efficient.
	MKT-4.B a. Define a surplus and shortage. b. Explain (using graphs where appropriate) how changes in underlying conditions and shocks to a competitive market can alter price, quantity, consumer surplus, and producer surplus. c. Calculate (using data from a graph or table as appropriate) changes in price, quantity, consumer surplus, and producer surplus in response to changes in market conditions or market disequilibrium.	**MKT-4.B.1** Whenever markets experience imbalances—creating disequilibrium prices and quantities, surpluses, and shortages—market forces drive price and quantity toward equilibrium. **MKT-4.B.2** Factors that shift the market demand and market supply curves cause price, quantity, consumer surplus, producer surplus, and total economic surplus (within that market) to change. The impact of the change depends on the price elasticities of demand and supply.

Big Idea 2: Costs, Benefits, and Marginal Analysis (CBA)

There are trade-offs associated with any decision. Making optimal decisions requires evaluating the additional costs and benefits of possible actions.

Enduring Understanding	Learning Objective	Essential Knowledge
CBA-1 *Rational economic decisions require evaluation of costs and benefits.*	**CBA-1.A** a. Define opportunity cost. b. Explain the opportunity costs associated with choices. c. Calculate the opportunity costs associated with choices.	**CBA-1.A.1** Rational agents consider opportunity costs, whether implicit or explicit, when calculating the total economic costs of any decision. **CBA-1.A.2** Total benefits form the metric "utility" for consumers and total revenue for firms.
	CBA-1.B a. Explain a decision by comparing total benefits and total costs (using a table or a graph when appropriate). b. Calculate total benefits and total costs (using a table or graph when appropriate).	**CBA-1.B.1** Total net benefits, the difference between total benefits and total costs, are maximized at the optimal choice. **CBA-1.B.2** Some decisions permit rational agents to look at only marginal benefit and marginal cost. Other decisions cannot be broken down into increments in this way and must be evaluated by looking at total benefits and total costs.
CBA-2 *To determine the optimal level at which to pursue an activity whose total benefits exceed total cost, rational economic agents compare marginal benefits and marginal costs.*	**CBA-2.A** a. Define the key assumptions of consumer choice theory. b. Explain (using a table or graph as appropriate) how a rational consumer's decision making involves the use of marginal benefits and marginal costs. c. Calculate (using a table or a graph when appropriate) how a rational consumer's decision making involves the use of marginal benefits and marginal costs.	**CBA-2.A.1** Consumers face constraints and have to make optimal decisions accounting for these constraints. **CBA-2.A.2** In a model of rational consumer choice, consumers are assumed to make choices so as to maximize their total utility. **CBA-2.A.3** Consumers experience diminishing marginal utility in the consumption of goods and services. **CBA-2.A.4** Consumers allocate their limited income to purchase the combination of goods that maximizes their utility by equating/comparing the marginal utility of the last dollar spent on each good. **X Exclusion:** Indifference curves are beyond the scope of the course and the AP Exam, but equating the ratios of marginal utility to price is within the scope.

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Big Idea 2: Costs, Benefits, and Marginal Analysis (CBA) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
CBA-2 *To determine the optimal level at which to pursue an activity whose total benefits exceed total cost, rational economic agents compare marginal benefits and marginal costs.*	**CBA-2.B** a. Define marginal analysis and related terms. b. Explain a decision using marginal analysis (using a table or a graph when appropriate).	**CBA-2.B.1** Marginal analysis involves comparing the additional benefit of increasing a given activity with the additional cost. Comparing marginal benefit (MB) with marginal cost (MC) helps individuals (firms) decide whether to increase, decrease, or maintain their consumption (production) levels.
		CBA-2.B.2 The optimal quantity at any point in time does not depend on fixed costs (sunk costs) or fixed benefits that have already been determined by past choices.
		CBA-2.B.3 The optimal quantity is achieved when marginal benefit is equal to marginal cost or where total benefit is maximized.
	CBA-2.C a. Define the different types of profit. b. Explain how firms respond to profit opportunities. c. Calculate a firm's profit or loss.	**CBA-2.C.1** Firms respond to economic profit (loss) rather than accounting profit..
		CBA-2.C.2 Accounting profit fails to account for implicit costs (such as cost of financial capital, compensation for risk, or an entrepreneur's time) which if fully compensated result in normal profit.
	CBA-2.D a. Define (using graphs or data as appropriate) the profit-maximizing rule. b. Explain (using a graph or data as appropriate) the profit-maximizing level of production.	**CBA-2.D.1** Firms are assumed to produce output to maximize their profits by comparing marginal revenue and marginal cost.

Big Idea 3: Production Choices and Behavior (PRD)

Firms seek to minimize costs and maximize profits, which influences their production decisions in the short run and long run.

Enduring Understanding	Learning Objective	Essential Knowledge
PRD-1 *Firms' production and cost constraints over different input and output levels shape optimal decisions in the short run and long run.*	**PRD-1.A** a. Define (using graphs where appropriate) key terms and concepts relating to production and cost. b. Explain (using graphs where appropriate) how production and cost are related in the short run and long run. c. Calculate (using data from a graph or table as appropriate) the various measures of productivity and short-run and long-run costs.	**PRD-1.A.1** The production function explains the relationship between inputs and outputs both in the short run and the long run. **PRD-1.A.2** Marginal product and average product change as input usage changes, and hence, total product changes. **PRD-1.A.3** Diminishing marginal returns occur as the firm employs more of one input, holding other inputs constant, to produce a product (output) in the short run. **PRD-1.A.4** Fixed costs and variable costs determine the total cost. **PRD-1.A.5** Marginal cost, average (fixed, variable, and total) cost, total cost, and total variable cost change as total output changes, but total fixed cost remains constant at all output levels, including zero output. **PRD-1.A.6** Production functions with diminishing marginal returns yield an upward-sloping marginal cost curve. **PRD-1.A.7** Specialization and the division of labor reduce marginal costs for firms. **PRD-1.A.8** Cost curves can shift in response to changes in input costs and productivity. **PRD-1.A.9** In the long run, firms can adjust all their inputs, and as a result, all costs become variable. **PRD-1.A.10** The relationship between inputs and outputs in the long run is described by the scale of production—increasing, decreasing, or constant returns to scale. **PRD-1.A.11** The long-run average total cost is characterized by economies of scale, diseconomies of scale, or constant returns to scale (efficient scale). **PRD-1.A.12** The minimum efficient scale plays a role in determining the concentration of firms in a market and the market structure.

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Big Idea 3: Production Choices and Behavior (PRD) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
PRD-2 *Firms' short-run decisions to produce output, and long-run decisions to enter or exit a market, are based on profitability.*	**PRD-2.A** Explain (using graphs or data where appropriate) firms' short-run decisions to produce positive output levels, or long-run decisions to enter or exit a market in response to profit-making opportunities.	**PRD-2.A.1** In the short run, firms decide to operate (i.e., produce positive output) or shut down (i.e., produce zero output) by comparing total revenue to total variable cost or price to average variable cost (AVC). **PRD-2.A.2** In the absence of barriers to entry or exit, in the long run (i.e., once factors that are fixed in the short run become variable), firms enter a market in which there are profit-making opportunities and exit a market when they anticipate economic losses.
PRD-3 *Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.*	**PRD-3.A** a. Define (using graphs as appropriate) the characteristics of perfectly competitive markets and efficiency. b. Explain (using graphs where appropriate) equilibrium and firm decision making in perfectly competitive markets and how prices in perfectly competitive markets lead to efficient outcomes. c. Calculate (using data from a graph or table as appropriate) economic profit (loss) in perfectly competitive markets.	**PRD-3.A.1** A perfectly competitive market is efficient. Firms in perfectly competitive markets face no barriers to entry and have no market power. **PRD-3.A.2** In perfectly competitive markets, prices communicate to consumers and producers the magnitude of others' marginal costs of production and marginal benefits of consumption and provide incentives to act on that information (i.e., price equals marginal cost in an efficient market). **PRD-3.A.3** In perfectly competitive markets, firms can sell all their outputs at a constant price determined by the market. **PRD-3.A.4** At a competitive market equilibrium, firms are price takers and select output to maximize profit by producing the level of output where the marginal cost equals marginal revenue (at the price). **PRD-3.A.5** At a competitive market equilibrium, the price of a product equals both the private marginal benefit received by the last unit consumed and the private marginal cost incurred to produce the last unit, thus achieving allocative efficiency. **PRD-3.A.6** In a short-run competitive equilibrium, price can either be above or below its long-run competitive level resulting in profits or losses, motivating entry or exit of firms and moving prices and quantities toward long-run equilibrium. **PRD-3.A.7** In a long-run perfectly competitive equilibrium, productive efficiency implies all operating firms produce at efficient scale, price equals marginal cost and minimum average total cost, and firms earn zero economic profit. **PRD-3.A.8** Firms may be in a constant cost, increasing cost, or decreasing cost industry. Long-run prices depend on the portion of the long-run cost curves on which firms operate. **PRD-3.A.9** A perfectly competitive market in long-run equilibrium is allocatively and productively efficient.

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Big Idea 3: Production Choices and Behavior (PRD) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
PRD-3 *Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.*	**PRD-3.B** a. Define (using graphs where appropriate) the characteristics of imperfectly competitive markets and inefficiency. b. Explain (using graphs where appropriate) equilibrium, firm decision making, consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets and why prices in imperfectly competitive markets cannot be relied on to coordinate the actions of all possible market participants and can lead to inefficient outputs. c. Calculate (using data from a graph or table as appropriate) areas of consumer surplus, producer surplus, profit (loss), and deadweight loss in imperfectly competitive markets.	**PRD-3.B.1** Imperfectly competitive markets include monopoly, oligopoly, and monopolistic competition in product markets and monopsony in factor markets. **PRD-3.B.2** In imperfectly competitive output markets and assuming all else is constant, a firm must lower price to sell additional units. **PRD-3.B.3** In imperfectly competitive markets, consumers and producers respond to prices that are above the marginal costs of production and/or marginal benefits of consumption (i.e., price is greater than marginal cost in an inefficient market). **PRD-3.B.4** Incentives to enter an industry may be mitigated by barriers to entry. Barriers to entry—such as high fixed/start-up costs, legal barriers to entry, and exclusive ownership of key resources—can sustain imperfectly competitive market structures. **PRD-3.B.5** A monopoly exists because of barriers to entry. **PRD-3.B.6** In a monopoly, equilibrium (profit-maximizing) quantity is determined by equating marginal revenue (MR) to marginal cost (MC). The price charged is greater than the marginal cost. **PRD-3.B.7** In a natural monopoly, long-run economies of scale for a single firm exist throughout the entire effective demand of its product. **PRD-3.B.8** A firm with market power can engage in price discrimination to increase its profits or capture additional consumer surplus under certain conditions. **PRD-3.B.9** With perfect price discrimination, a monopolist produces the quantity where price equals marginal cost (just as a competitive market would) but extracts all economic surplus associated with its product and eliminates all deadweight loss. **PRD-3.B.10** In a market with monopolistic competition, firms producing differentiated products may earn positive, negative, or zero economic profit in the short run. Firms typically use advertising as a means of differentiating their product. Free entry and exit drive profits to zero in the long run. The output level, however, is smaller than the output level needed to minimize average total costs, creating excess capacity. The price is greater than marginal cost, creating allocative inefficiency.

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Big Idea 3: Production Choices and Behavior (PRD) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
PRD-3 *Even with a common goal of profit-maximization, market structure constrains and influences prices, output, and efficiency.*	**PRD-3.C** a. Define (using tables as appropriate) key terms, strategies, and concepts relating to oligopolies and simple games. b. Explain (using tables as appropriate) strategies and equilibria in simple games and the connections to theoretical behaviors in various oligopoly market and non-market settings. c. Calculate (using tables as appropriate) the incentive sufficient to alter a player's dominant strategy.	**PRD-3.C.1** An oligopoly is an inefficient market structure with high barriers to entry, where there are few firms acting interdependently. **PRD-3.C.2** Firms in an oligopoly have an incentive to collude and form cartels. **PRD-3.C.3** A game is a situation in which a number of individuals take actions, and the payoff for each individual depends directly on both the individual's own choice and the choices of others. **PRD-3.C.4** A strategy is a complete plan of actions for playing a game; the normal form model of a game shows the payoffs that result from each collection of strategies (one for each player). **PRD-3.C.5** A player has a dominant strategy when the payoff to a particular action is always higher independent of the action taken by the other player. Dominant strategies can be eliminated from each player's action set and can sometimes lead to an equilibrium outcome (see Nash equilibrium below). **PRD-3.C.6** A Nash equilibrium is a condition describing the set of actions in which no player can increase his or her payoff by unilaterally taking another action, given the other players' actions. **Exclusions:** Dominant strategies and Nash equilibrium with more than two players or more than two actions per player, mixed-strategy equilibria, extensive form games, and normal form games with more than two players or more than two actions per player are beyond the scope of the course and the AP Exam. **PRD-3.C.7** Oligopolists have difficulty achieving the monopoly outcome for reasons similar to those that prevent players from achieving a cooperative outcome in the Prisoner's Dilemma; nevertheless, prices are generally higher and quantities lower with oligopoly (or duopoly) than with perfect competition.

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Big Idea 3: Production Choices and Behavior (PRD) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
PRD-4 *Factor prices provide incentives and convey information to firms and factors of production.*	**PRD-4.A** a. Define (using graphs where appropriate) key terms and concepts relating to factor markets. b. Explain (using graphs where appropriate) the relationship between factors of production, firms, and factor prices. c. Calculate (using data from a graph or table where appropriate) the marginal revenue product and marginal resource cost.	**PRD-4.A.1** Factors of production (labor, capital, and land) respond to factor prices (wages, interest, and rent), and employers' (firms') decision to hire is based on the productivity of the factors, output price, and cost of the factor. **PRD-4.A.2** The quantity of labor demanded is negatively related to the wage rate, while the quantity of labor supplied is positively related to the wage rate in a given labor market, other things constant.
	PRD-4.B Explain (using graphs where appropriate) firms' and factors' responses to changes in incentives and constraints.	**PRD-4.B.1** Changes in the determinants of labor demand, such as the output price and the productivity of the worker, cause the labor demand curve to shift. **PRD-4.B.2** Changes in the determinants of labor supply (such as immigration, education, working conditions, age distribution, availability of alternative options, preferences for leisure, and cultural expectations) cause the labor supply curve to shift.
	PRD-4.C a. Define (using graphs as appropriate) the characteristics of perfectly competitive factor markets. b. Explain (using graphs where appropriate) the profit-maximizing behavior of firms buying labor (with other inputs fixed) in perfectly competitive markets. c. Calculate (using data from a graph or table where appropriate) measures representing the profit-maximizing behavior of firms buying labor (with other inputs fixed) in perfectly competitive markets.	**PRD-4.C.1** In a perfectly competitive labor market, the wage is set by the market and each firm hires the quantity of workers, where the marginal factor (resource) cost (wage) equals the marginal revenue product of labor. A typical firm may be a perfect competitor in the labor market even if it is an imperfect competitor in its output markets. **PRD-4.C.2** A typical firm hires labor in a perfectly competitive labor market as long as the marginal revenue product of labor is greater than the market wage. **PRD-4.C.3** To minimize costs or maximize profits, firms allocate inputs such that the last dollar spent on each input yields the same amount of marginal product. **PRD-4.C.4** Marginal revenue product of a factor of production is the change in total revenue divided by the change in that factor of production, which is also equal to the marginal physical product of that factor multiplied by the marginal revenue ($MRP = MP \times MR$). Firms in a perfectly competitive output market will have marginal revenue product of labor that is equal to the value of the marginal product of labor ($VMPL = MPL \times P$) because marginal revenue for each unit of output is equal to price.

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Big Idea 3: Production Choices and Behavior (PRD) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
PRD-4 *Factor prices provide incentives and convey information to firms and factors of production.*	**PRD-4.D** a. Define (using graphs as appropriate) the characteristics of monopsonistic markets. b. Explain (using graphs where appropriate) the profit-maximizing behavior of firms buying labor (with other inputs fixed) in monopsonistic markets. c. Calculate (using data from a graph or table where appropriate) measures representing the profit-maximizing behavior of firms buying labor (with other inputs fixed) in monopsonistic markets.	**PRD-4.D.1** In a monopsonistic labor market, a typical firm hires additional labor as long as the marginal revenue product is greater than the marginal factor (resource) cost (the wage of a new unit of labor plus the wage increase given to all existing labor). **PRD-4.D.2** When a typical firm hires additional workers in a monopsonistic labor market, the marginal factor (resource) cost is greater than the supply price of labor.

Big Idea 4: Market Inefficiency and Public Policy (POL)

Private markets can fail to allocate resources efficiently, and well-designed public policy can endeavor to promote greater efficiency and equity in the economy.

Enduring Understanding	Learning Objective	Essential Knowledge
POL-1 *Government policies influence consumer and producer behavior and therefore affect market outcomes.*	**POL-1.A** a. Define forms of government price and quantity intervention. b. Explain (using graphs where appropriate) how government policies alter consumer and producer behaviors that influence incentives and therefore affect outcomes. c. Calculate (using data from a graph or table where appropriate) changes in market outcomes resulting from government policies.	**POL-1.A.1** Some government policies, such as price floors, price ceilings, and other forms of price and quantity regulation, affect incentives and outcomes in all market structures. **POL-1.A.2** Governments use taxes and subsidies to change incentives in ways that influence consumer and producer behavior, shifting the supply and demand curves accordingly. **POL-1.A.3** Taxes and subsidies affect government revenues or costs. **POL-1.A.4** Government intervention in a market producing the efficient quantity through taxes, subsidies, price controls, or quantity controls can only decrease allocative efficiency. **POL-1.A.5** Deadweight loss represents the losses to buyers and sellers as a result of government intervention in an efficient market. **POL-1.A.6** The incidence of taxes and subsidies imposed on goods traded in perfectly competitive markets depends on the elasticity of supply and demand.
	POL-1.B a. Define tariffs and quotas. b. Explain (using graphs where appropriate) how markets are affected by public policy related to international trade. c. Calculate (using data from a graph or table as appropriate) changes in market outcomes resulting from public policy related to international trade.	**POL-1.B.1** Equilibria in competitive markets may be altered by the decision to open an economy to trade with other countries; equilibrium price can be higher or lower than under autarky, and the gap between domestic supply and demand is filled by trade. Opening an economy to trade with other countries affects consumer surplus, producer surplus, and total economic surplus. **POL-1.B.2** Tariffs, which governments sometimes use to influence international trade, affect domestic price, quantity, government revenue, and consumer surplus and total economic surplus. **POL-1.B.3** Quotas can be used to alter quantities produced and therefore affect price, consumer surplus, and total economic surplus. **Exclusion:** The graphing of quotas is beyond the scope of the course and the AP Exam, but understanding how quotas affect quantities produced is within the scope.

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Big Idea 4: Market Inefficiency and Public Policy (POL) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
POL-2 *Perfectly competitive markets allocate resources efficiently, but imperfect competition often results in market inefficiencies.*	**POL-2.A** a. Define social efficiency. b. Explain (using graphs where appropriate) why resource allocation in perfectly competitive markets is socially efficient.	**POL-2.A.1** The optimal quantity of a good occurs where the marginal benefit of consuming the last unit equals the marginal cost of producing that last unit, thus maximizing total economic surplus.
		POL-2.A.2 The market equilibrium quantity is equal to the socially optimal quantity only when all social benefits and costs are internalized by individuals in the market. Total economic surplus is maximized at that quantity. [See also PRD-3 and POL-3.]
	POL-2.B Explain (using graphs where appropriate) how private incentives can lead to actions by rational agents that are socially undesirable (inefficient) market outcomes.	**POL-2.B.1** Rational agents can pursue private actions to exploit or exercise market characteristics known as market power.
		POL-2.B.2 Rational agents make optimal decisions by equating private marginal benefits and private marginal costs that can result in market inefficiencies.
		POL-2.B.3 Policymakers use cost-benefit analysis to evaluate different actions to reduce or eliminate market inefficiencies.
		POL-2.B.4 Market inefficiencies can be eliminated by designing policies that equate marginal social benefit with marginal social cost.
	POL-2.C a. Explain equilibrium allocations in imperfect markets relative to efficient allocations (using graphs where appropriate), and why these markets are inefficient. b. Calculate (using graphs where appropriate) the deadweight loss resulting from the production of a non-efficient quantity.	**POL-2.C.1** Equilibrium allocations can deviate from efficient allocations due to situations such as monopoly; oligopoly; monopolistic competition; negative and positive externalities in production or consumption; asymmetric information; and insufficient production of public goods.
		POL-2.C.2 Producing any non-efficient quantity results in deadweight loss.

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Big Idea 4: Market Inefficiency and Public Policy (POL) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
POL-3 *Private incentives can fail to account for all socially relevant considerations.*	**POL-3.A** a. Define externalities. b. Explain (using graphs where appropriate) how in the presence of externalities, private markets do not take into consideration social costs or social benefits.	**POL-3.A.1** The socially optimal quantity of a good occurs where the marginal social benefit of consuming the last unit equals the marginal social cost of producing that last unit, thus maximizing total economic surplus.
		POL-3.A.2 Externalities are either positive or negative and arise from lack of well-defined property rights and/or high transaction costs.
		POL-3.A.3 In the presence of externalities, rational agents respond to private costs and benefits and not to external costs and benefits.
		POL-3.A.4 Rational agents have the incentive to free ride when a good is non-excludable.
	POL-3.B Explain (using graphs where appropriate) how public policies address positive or negative externalities.	**POL-3.B.1** Policies that address positive or negative externalities include taxes/subsidies, environmental regulation, public provision, the assignment of property rights, and the reassignment of property rights through private transactions.
	POL-3.C a. Define whether goods are rival and/or excludable. b. Explain how the nature of rival and/or excludable goods influences the behavior of individuals and groups.	**POL-3.C.1** Private goods are rival and excludable, and public goods are non-rival and non-excludable.
		POL-3.C.2 Due to the free rider problem, private individuals usually lack the incentive to produce public goods, leaving government as the only producer.
		POL-3.C.3 Governments sometimes choose to produce private goods, such as educational services, and to allow free access to them.
		POL-3.C.4 Some natural resources are, by their nature, non-excludable and rival and therefore open access. Private individuals inefficiently overconsume such resources.

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Big Idea 4: Market Inefficiency and Public Policy (POL) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
POL-4 *In imperfect markets, well-designed government policy can reduce waste.*	**POL-4.A** a. Define government policy interventions in imperfect markets. b. Explain (using graphs where appropriate) how government policies can alter market outcomes in perfectly and imperfectly competitive markets. c. Calculate (using data from a graph or table as appropriate) changes in market outcomes resulting from government policies in perfectly competitive and imperfectly competitive markets.	**POL-4.A.1** Per-unit taxes and subsidies affect the total price consumers pay, net price firms receive, equilibrium quantity, consumer and producer surpluses, deadweight loss, and government revenue or cost. The impact of change depends on the price elasticity of demand and supply. **POL-4.A.2** Lump-sum taxes and lump-sum subsidies do not change either marginal cost or marginal benefit; only fixed costs will be affected. **POL-4.A.3** Binding price ceilings and floors affect prices and quantities differently depending on the market structures (perfect competition, monopoly, monopolistic competition, and monopsony) and the price elasticities of supply and demand. **POL-4.A.4** Government intervention in imperfect markets can increase efficiency if the policy correctly addresses the incentives that led to the market failure. **POL-4.A.5** Government can use price regulation to address inefficiency due to monopoly. **POL-4.A.6** A natural monopoly will require a lump-sum subsidy to produce at the allocatively efficient quantity. **POL-4.A.7** Governments use antitrust policy in an attempt to make markets more competitive. **Exclusion:** A graph of inefficiency and policy due to collusion is beyond the scope of the course and the AP Exam.

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Big Idea 4: Market Inefficiency and Public Policy (POL) *cont'd*

Enduring Understanding	Learning Objective	Essential Knowledge
POL-5 *Market outcomes can result in income inequality.*	**POL-5.A** Define measures of economic inequality in income and wealth.	**POL-5.A.1** Income levels and poverty rates vary greatly both across and within groups (e.g., age, gender, race) and countries.
		POL-5.A.2 The Lorenz curve and Gini coefficient are used to represent the degree of inequality in distributions and to compare distributions across different countries, policies, or time periods. **Exclusion:** Drawing the Lorenz curve and calculating Gini coefficients are beyond the scope of the course and the AP Exam.
	POL-5.B Explain sources of income and wealth inequality.	**POL-5.B.1** Each factor of production receives the value of its marginal product, which can contribute to income inequality.
		POL-5.B.2 Sources of income and wealth inequality include differences in tax structures (progressive and regressive tax structures), human capital, social capital, inheritance, effects of discrimination, access to financial markets, mobility, and bargaining power within economic and social units (firms, labor unions, and families).

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Appendix: AP Microeconomics Graphs and Visuals

AP Microeconomics Graphing and Visuals

Students are expected to model economic situations using graphs or visual representations throughout the AP Microeconomics course. The pages that follow identify the graphs and visuals that are required on the AP Microeconomics Exam along with the associated learning objectives. One illustrative example of the set-up of each graph or visual is provided for reference; however, it is only one example and students are expected to do more than simply set up a graph or visual on the AP Microeconomics Exam. As the AP Economics Skills outline, students must be able to demonstrate their understanding of specific economic situations on accurately labeled graphs (e.g., via properly labeled and placed points, curves, and shaded areas) and demonstrate the effect of changes on accurately labeled graphs or visuals (e.g., via properly labeled shifts in curves, new quantities and/or prices, arrows indicating the direction of change, and shaded areas). Students must also be able to interpret and manipulate provided graphs and visuals representing different economic situations. To access past AP Exam questions and formative practice questions that use graphs or visual representations, teachers can visit the AP Question Bank on **AP Classroom** and filter questions by stimulus, skill, topic, and other criteria.

Draw and Analyze Provided Graphs and Visuals

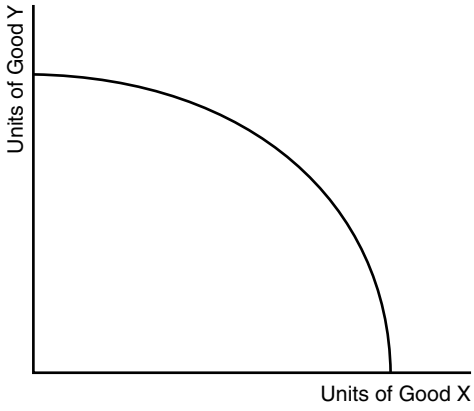
Students should be able to answer questions about a provided graph or visual of each of the following models in the multiple-choice or free-response sections of the AP Microeconomics Exam and be able to draw a graph or visual themselves on the free-response section of the exam using each of the following models.

THE PRODUCTION POSSIBILITIES CURVE MODEL

Associated Learning Objectives

MKT-1.C **MKT-2.A** **MKT-2.B**

Example

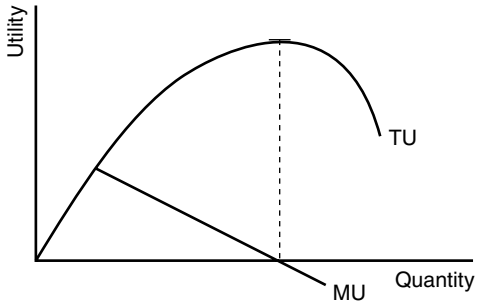


UTILITY

Associated Learning Objectives

CBA-1.B **CBA-2.A** **CBA-2.B**

Example



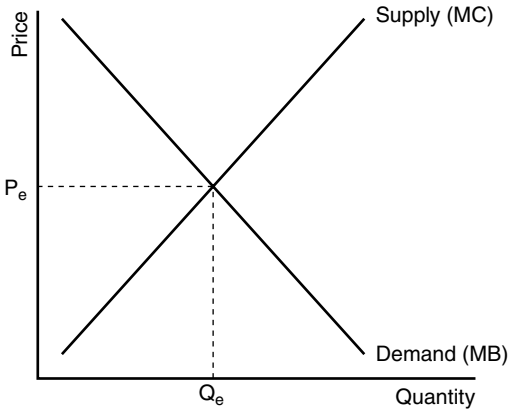
Exclusion:
Indifference curves are beyond the scope of the course and the AP Exam, but equating the ratios of marginal utility to price is within the scope.

DEMAND AND SUPPLY

Associated Learning Objectives

CBA-2.A CBA-2.B MKT-3.A MKT-3.B MKT-3.C MKT-3.D MKT-3.E MKT-4.A MKT-4.B POL-1.A POL-1.B

Example

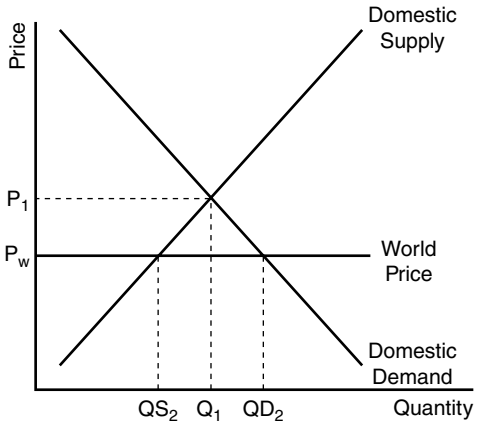


DEMAND AND SUPPLY FOR THE DOMESTIC MARKET IN THE CONTEXT OF INTERNATIONAL TRADE

Associated Learning Objectives

POL-1.B

Example



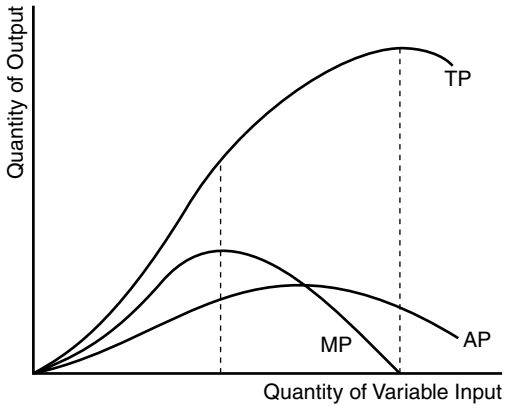
Exclusion:
The graphing of quotas is beyond the scope of the course and the AP Exam, but understanding how quotas affect quantities produced is within the scope.

THE PRODUCTION FUNCTION

Associated Learning Objectives

PRD-1.A

Example

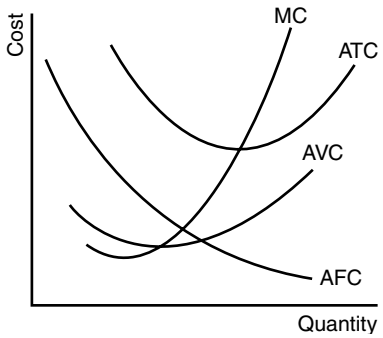


PER-UNIT COSTS IN THE SHORT RUN

Associated Learning Objectives

PRD-1.A **PRD-2.A**

Example

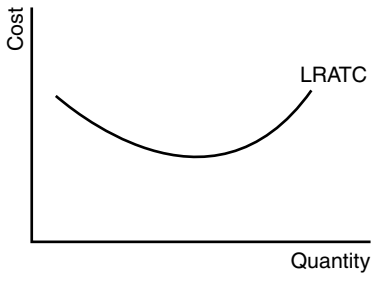


COSTS IN THE LONG RUN

Associated Learning Objectives

PRD-1.A **PRD-2.A**

Example

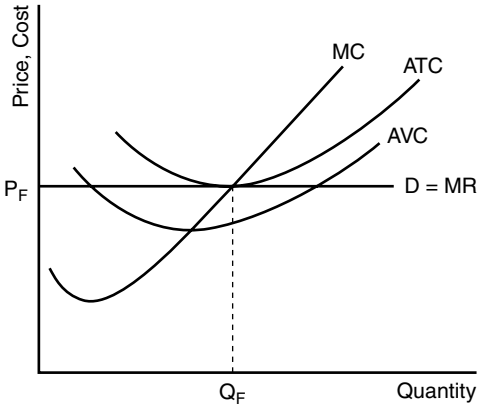


PERFECT COMPETITION

Associated Learning Objectives

CBA-2.D PRD-2.A PRD-3.A POL-2.A POL-4.A

Example

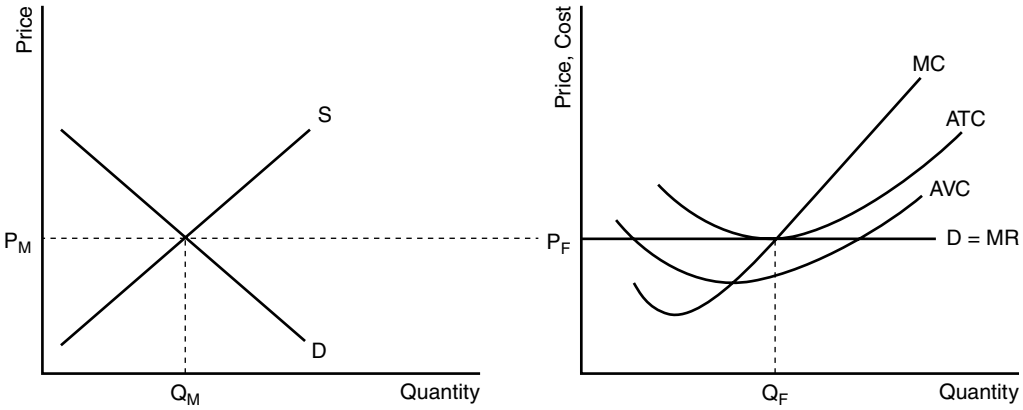


PERFECTLY COMPETITIVE MARKET AND A FIRM IN THAT MARKET

Associated Learning Objectives

CBA-2.D PRD-2.A PRD-3.A POL-2.A POL-4.A

Example

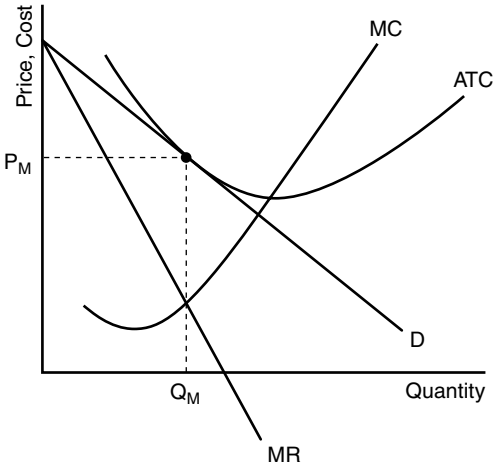


MONOPOLY AND MONOPOLISTIC COMPETITION

Associated Learning Objectives

CBA-2.D PRD-2.A PRD-3.B POL-2.B POL-2.C POL-4.A

Example

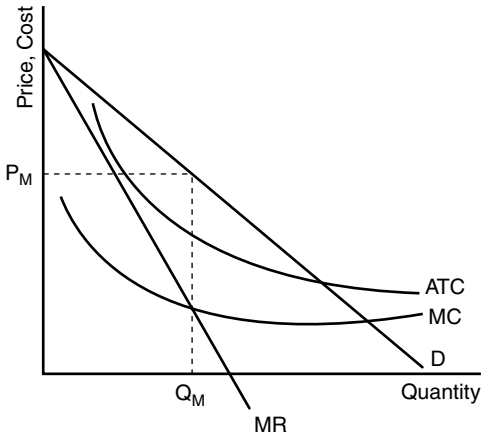


NATURAL MONOPOLY

Associated Learning Objectives

CBA-2.D PRD-2.A PRD-3.B POL-2.B POL-2.C POL-4.A

Example



GAME THEORY MATRIX

Associated Learning Objectives

PRD-3.C

Example

		Company A	
		Keep Price the Same	Raise Price
Company B	Advertise	$50, –$2	$175, $0
	Not Advertise	$150, $15	$100, $0

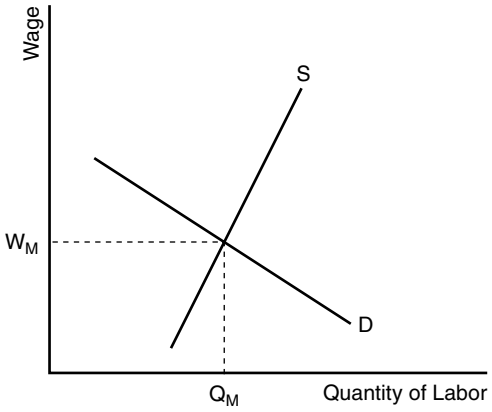
Exclusion:
Dominant strategies and Nash equilibrium with more than two players or more than two actions per player, mixed-strategy equilibria, extensive form games, and normal form games with more than two players or more than two actions per player are beyond the scope of the course and the AP Exam.

FACTOR MARKETS

Associated Learning Objectives

PRD-4.A PRD-4.B PRD-4.C POL-4.A

Example

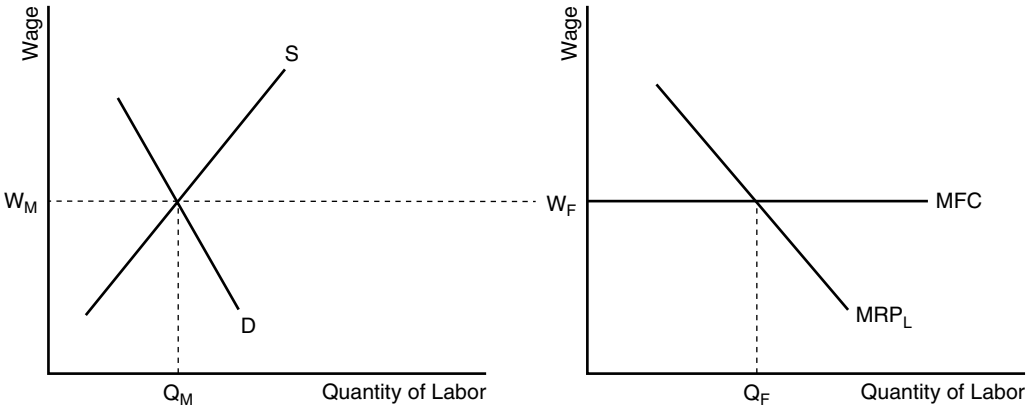


FIRM IN A PERFECTLY COMPETITIVE FACTOR MARKET

Associated Learning Objectives

CBA-2.D **PRD-2.A** **PRD-4.A** **PRD-4.B** **PRD-4.C** **POL-2.A** **POL-4.A**

Example

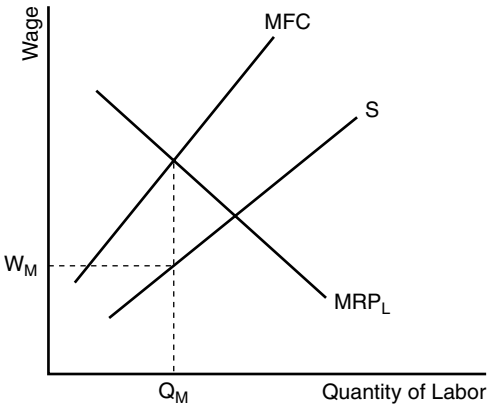


MONOPSONY

Associated Learning Objectives

CBA-2.D **PRD-2.A** **PRD-3.B** **PRD-4.A** **PRD-4.B** **PRD-4.D** **POL-2.B** **POL-2.C** **POL-4.A**

Example



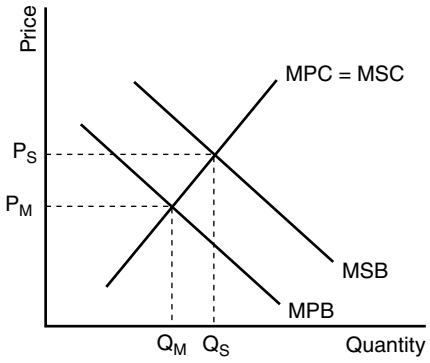
EXTERNALITIES IN PERFECTLY COMPETITIVE MARKETS

Associated Learning Objectives

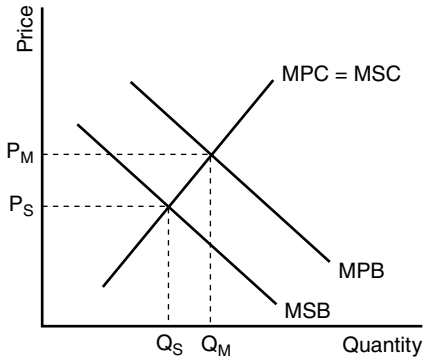
POL-2.A **POL-2.B** **POL-2.C** **POL-3.A** **POL-3.B** **POL-4.A**

Examples

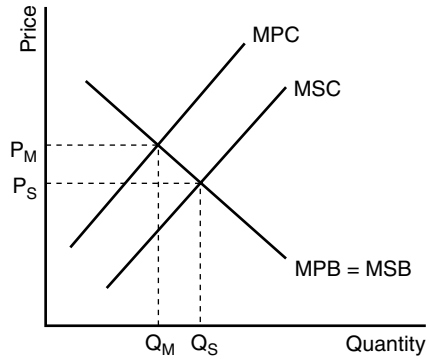
Example–Positive Consumption Externality



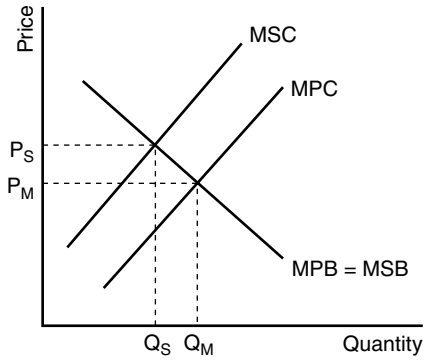
Example–Negative Consumption Externality



Example–Positive Production Externality



Example–Negative Production Externality



Analyze Provided Graphs and Visuals

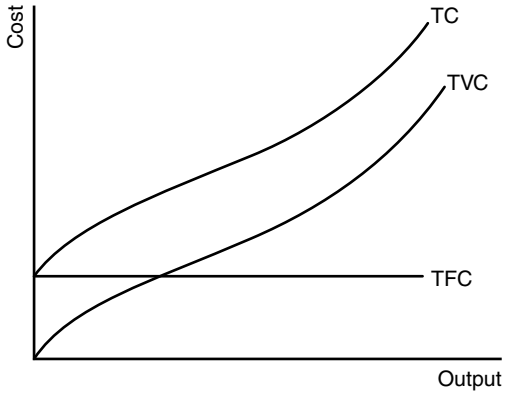
Students will not be expected to draw the following graphs and visuals themselves on the free-response section of the AP Microeconomics Exam, but students should be prepared to answer multiple-choice or free-response questions in which the following graphs and visuals are provided or referenced.

TOTAL COSTS IN THE SHORT RUN

Associated Learning Objectives

PRD-1.A **PRD-2.A**

Example

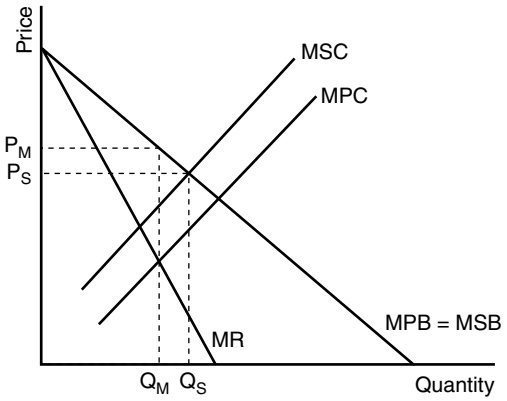


EXTERNALITIES IN IMPERFECTLY COMPETITIVE MARKETS

Associated Learning Objectives

POL-2.A **POL-2.B** **POL-2.C** **POL-3.A** **POL-3.B** **POL-4.A**

Example

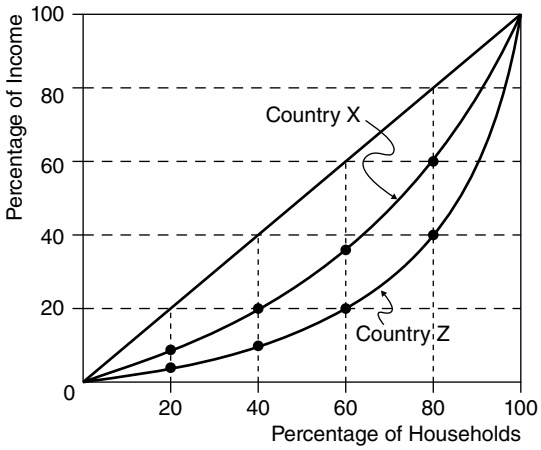


LORENZ CURVE

Associated Learning Objectives

POL-5.A

Example



Exclusion:
Drawing the Lorenz curve and calculating Gini coefficients are beyond the scope of the course and the AP Exam.

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