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THE INVISIBLE HAND

Determining the Economic Effects of Gasoline Price Controls

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Learn Through Experience

About the Buck Institute for Education

The Buck Institute for Education (BIE) is dedicated to improving 21st-century teaching and learning by creating and disseminating products, practices, and knowledge for effective Project Based Learning. Founded in 1987, BIE is a not-for-profit 501(c)3 organization that receives operational funding from the Leonard and Beryl Buck Trust, and funding from other education organizations, foundations, schools and school districts, state educational agencies, and national governments for product development, professional development, and research.

Project Based Economics

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Table of Contents

Table of Contents

Foreword

Students learn more when they care about what they are learning. Students understand concepts better if they see how these concepts apply to the world outside of school. Students retain information longer if they are actively engaged in discussion and demonstration of what they are learning.

These are hardly new ideas, but too much of what happens in American classrooms does not meet this ideal. *Project Based Economics (PBE)* is built upon these principles. It addresses the concepts and content defined by the *Voluntary National Content Standards in Economics*, but does it in such a way that this material becomes meaningful and involving to students. *PBE* reverses the traditional method of "teach the concepts first, then give students the opportunity to apply them." Instead, *PBE* places students in an interesting scenario with an open-ended problem to solve and asks them to arrive at a justifiable solution using economic concepts. The project thus "pulls" students through the content. The teacher's role is to clarify, facilitate, and guide, rather than "push" unmotivated students toward the learning objectives.

Additionally, the *PBE* methodology helps teachers build valuable interdisciplinary "21st-century skills" including collaboration, critical thinking/problem solving, and making a presentation. We have found that *PBE* works well for diverse students in a variety of school settings. Research comparing students' economic knowledge gained from *PBE* versus that gained by students who received traditional instruction has demonstrated that the *PBE* students learn more, and that this difference is statistically significant.

These units were developed collaboratively by the Buck Institute for Education, and the HIRE Center, California State University–East Bay. They have been pilot-tested and critiqued by a group of energetic and insightful teachers throughout California. Although too many teachers have been involved in the development of these units to thank each teacher by name, we are extremely grateful for their time, insight, and contributions to making these units successful. In addition, there have been a number of university professors, staff developers, and school district staff who have contributed to unit development. We have benefited from their observations and suggestions, and offer a collective "Thank you!"

Please visit the Interact website (www.teachinteract.com) to find out about professional development offerings and conference presentations.

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Introduction

Chapter One

What is Project Based Learning?

Project Based Learning (PBL) is an instructional method in which students:

- Engage in a rigorous, extended process of inquiry focused on complex, authentic questions and problems
- Work as independently from the teacher as possible, and have some degree of "voice and choice"
- Demonstrate in-depth understanding of academic knowledge and skills
- Build 21st-century skills such as collaboration, presentation, and critical thinking/problem solving
- Create high-quality products and performances which are presented to a public audience

PBL is often cited as a valuable method by educators promoting differentiated instruction, multiple intelligences theory, learning-styles theory, 21st-century skills, and the "new 3 Rs" of rigor, relevance, and relationships.

In PBL, the project *drives* the curriculum—it provides the structure for teaching and learning. A project is not just an "applied learning activity" that follows a traditionally taught unit of instruction. Nor is it like discovery learning in its most basic form, in which students are provided with tools and activities that allow them to "discover" knowledge and skills with minimal guidance from a teacher. Instead, PBL challenges students to solve a problem through the application of content knowledge and collaborative resource-gathering, investigation, discussion, and decision-making.

Each project in *Project Based Economics* is a complete unit of instruction centered on a scenario that presents students with an engaging, realistic problem with more than one possible reasonable solution. To resolve the problem successfully, students realize they need to understand economics. This increases their motivation to learn the curriculum. Coaching students to resolve the problem posed in each unit requires a teacher to weave together a number of instructional components while remaining focused on the economic concepts around which the project is organized.

Phases of a Project Based Economics unit: how learning unfolds

Although structured flexibly enough to allow for student discovery and

independent learning, all *PBE* projects follow a series of steps or phases. These phases may sometimes overlap, but can generally be defined as follows:

Project launch—the Entry Event

At the start of each *PBE* project, students either receive some type of authentic correspondence or have an authentic experience intended to engage them in the project scenario. The "Entry Event" provokes interest and generates curiosity, leading naturally to the next phase.

Framing the inquiry—Driving Question and Knowledge Inventory

To begin the inquiry and problem-solving process, students as a class analyze their task and write a "Driving Question" that guides the project. The teacher coaches students in the construction of a Driving Question that summarizes the problem to be resolved, which in *PBE* is written according to the model:

"How can we, as_____?, (do)_____?, so that_____?"

The teacher also leads the class through a discussion and recording of knowledge that the students already have (know) and information that they still require (need to know) in order to arrive at a solution to the problem. This process is repeated periodically throughout the lesson.

Problem-solving and learning activities

The project scenario unfolds as students receive additional information about the problem to be solved. Students work in teams to conduct independent investigation and complete project tasks, while the teacher provides resources and lessons, guided by the students' "Need-to-Know List." A Project Log is used to check for student understanding of key economic terms and concepts. The class revises the knowledge inventory periodically and revisits the Driving Question to help stay on track toward a reasonable resolution to the scenario. The teacher monitors students' progress and watches for "teachable moments" when students recognize their need to know more about economics.

Presentation, assessment, and debrief

The project culminates as students finalize their solution to the problem posed in the scenario. Students prepare authentic products and present them to an audience and/or publicly discuss each group's work. The teacher uses a rubric to evaluate the students' work, and may also choose to administer a test to assess learning. The last step is to debrief the project with students, discussing both economics content and the process by which it was learned.

Teaching in the PBL environment

Although Project Based Learning is designed to foster active, engaged learning, students do not work completely on their own or exclusively with their peers when addressing the problem presented in a scenario. PBL is most effective when accompanied by *project based teaching*.

In PBL, the teacher guides students through the process of collaborative problem-solving and the creation of high-quality products and performances. Teachers are an important provider of subject-area knowledge and remain responsible for monitoring and assessing student learning, clarifying content-related concepts and misconceptions, assigning students to work groups, and managing what goes on in the classroom. Although traditional tools such as lectures, homework, and quizzes still have a place in this setting, they are used in the meaningful context of solving a problem. The role of the teacher using PBL is one of making learning "inevitable" by carefully managing the learning process and promoting a spirit of inquiry.

Make it a collaborative effort

Timing and extent of a teacher's instructional interventions differ from those used in traditional approaches. Effective teachers in PBL wait for teachable moments when students are interested and ready to learn before intervening or providing the necessary content explanations; they present or clarify concepts once students realize they need to understand subject-area content in order to solve the problem. Project Based Learning is most effective when it is a collaborative effort between the teacher and students, with the teacher as the senior partner.

This collaboration begins by engaging students in the problem to be solved. As you launch the unit, it is important not to reveal too much about the problem that students are about to encounter, and not to pre-teach the content and take away the motivation to learn that comes after students are "hooked" by the Entry Event. Take the problem seriously. While acknowledging that it is a scenario, point out that the problem is closely modeled on what happens in the real world. Heighten student interest and motivation by emphasizing the important effects their decisions will have (summarized in the "so that" part of the Driving Question written by the class). Model genuine interest and enthusiasm for the challenge of exploring several possible solutions.

The "teacher-as-coach" metaphor applies as students go about the tasks of conducting research, understanding the problem's complexities, and preparing to present their solutions. Like a good coach watching athletes practice, the teacher needs to observe, diagnose, and guide

without doing students' work for them. Anticipate some needs before they arise, be prepared to meet them, and watch for new needs as they emerge—but wait until they emerge.

One of the biggest challenges for many teachers is to step back and wait for the "need to know" to arise in students. Instead of answering all questions right away, ask, "How could you find that out?" and offer suggestions and resources for further inquiry. If students get stuck at a certain point, act as a "cognitive coach" by modeling thinking strategies. Offer process-oriented comments such as, "How would I approach that issue/task? Well, I might break it down into steps, or I might want to talk with my group about _____, or make sure I understood _____. Or maybe I'd go back to my Need-to-Know List…"

Build classroom culture

Establishing the classroom culture is also important for successful PBL. Students must know that it is all right to take intellectual risks and offer creative solutions for critique by their classmates and teacher without fear of ridicule. A healthy spirit of give-and-take needs to be in evidence in a PBL classroom, as does the habit of reflection. Students and the teacher need to constantly ask, "What are we learning?", "How are we learning?", and, "What does it mean?"

Another vital part of classroom culture is collaboration. Students work in small groups in PBL, and key to their success is the ability to work together comfortably and productively. If students are not used to group work, these skills must be taught. If students are not working well together, the teacher needs to know how to intervene and smooth things out. And when students share ideas, ask questions, and present their work, whether it is to their own classmates or a public audience, a serious and respectful tone should be the norm.

Invest in planning

A teacher using PBL should be skilled in planning and organization. Before beginning a unit, make sure to read all instructions and prepare materials carefully. But, do not overplan and feel bound by a predetermined timetable. It is hard to predict exactly how each class will approach a project and what needs will arise. A certain amount of flexibility is required, as is the willingness to let go of some expectations and control. Students may propose solutions that you had not considered, or they may want to explore issues in greater depth and breadth.

A teacher also needs skill in the use of performance-based assessment. This means knowing how to assess skills such as collaboration, communication, and time and task management. You can enhance

student development of these skills by providing exemplars, well-written rubrics, and chances to practice with helpful feedback.

Teaching in a PBL environment differs from many traditional classrooms in two other ways. First, it can be noisy. That means a teacher (and his or her school neighbors and administrators) must be willing to accept occasional apparent disorder as being the inquiry process at work. Second, a teacher must be willing to personally engage with students in ways other than standing in front of the room, delivering content knowledge as the "sage on the stage." A degree of intellectual and sometimes emotional connection with individual students is often needed to meet the challenges of PBL.

Teaching Economics With Project Based Learning

Chapter Two

Economics is the study of the allocation of scarce resources. Because resources are scarce, individuals, firms, and society must make choices about how to allocate resources and where to make tradeoffs. If a company decides to hire more workers, for example, it must reduce capital costs. If government spends more on defense, it must reduce spending on education or other areas (or else increase debt).

When students learn about economics through projects, they apply economic theories and principles to solve authentic problems. The PBL process also challenges them to think critically, to understand complex systems, and to explain and defend their decisions.

To help students gain a better understanding of how our economy allocates scarce resources, units included in *Project Based Economics* focus on teaching different aspects of scarcity and the related concepts of opportunity costs and tradeoffs. By integrating each of these PBL units into a high school economics course, students will have a better understanding of how the allocation of scarce resources forces individuals, firms, and society to make choices among competing goods and why those choices determine how resources are used. Taken together, the units demonstrate how our economy responds to each of the four basic economic questions:

- What is produced and in what quantities?
- How are goods produced?
- For whom are goods produced?
- Who makes economic decisions and by what process?

Preparing students for PBL

Before launching the the *PBE* unit, we recommend introducing students to the concept of Project Based Learning. This can be accomplished with a 45-minute activity, **Make More Money?** (see Chapter Three). In this activity, students encounter an economics-related situation. As they set about solving the problem, they learn the process for how PBL works. In one class period, they gain experience analyzing an Entry Document, writing a Driving Question, conducting a Knowledge Inventory—and learning how to think and act in different ways than they might be used to in more traditional forms of learning.

What is provided in this unit

- A **Unit Overview**, including the time required, a summary of the problem to be resolved in a scenario, the economic concepts to be learned, the placement in the curriculum of a typical high school economics course, and the NCEE Content Standards addressed
- A section on how to teach each unit, which contains:
  - **Sequence of the Unit**, a quickly referenced list of each step
  - **Step-by-Step Teaching Guide**, with detailed instructions about how to manage each step, plus sample **Driving Questions** and **Know/Need-to-Know Lists, Economics Content Notes**, prompts for **Project Log** entries, and **Potential Hurdles**
- A section of **Student Materials** with all student handout masters
- A section of **Teacher Materials** with a detailed review of the economic concepts and terminology within the unit, which may be used to guide the preparation of lessons for students, plus a glossary of concept definitions, answer keys for unit assignments, and rubrics for major unit products
- A multiple-choice test with an answer key

At various points within each unit, you will see two types of special **Notes to the Teacher** on effective implementation:

- **Economics Content Notes** point out key concepts students should be learning, and provide guidance on how to ensure that they do.
- **Potential Hurdles** indicate certain points during the unit when students might become confused or sidetracked, and explain how to help them.

Teaching Strategies for *Project Based Economics*

Scaffold learning activities

Students are supported in a variety of ways in the *PBE* units. In addition to "soft scaffolds" such as conversations with a teacher, "hard scaffolds" are provided in each unit such as charts, tables, or worksheets, to help students learn concepts and organize their ideas. Students may practice using economic concepts through oral or written exercises that build knowledge and skills necessary for the culminating task in the unit.

Efficient project-based teaching generally involves selecting content resources for students to use before they embark on solving the problems presented and creating products. These can include economic textbooks, specially prepared handouts, newspaper articles, videos, and online resources. Students should be encouraged to grapple on their own or in small groups with economic concepts, and find their own answers to content-related questions as much as possible. Consequently, it is generally best not to assign specific resources but rather to tell students what they can easily access to find the information they need to complete project tasks. It is then up to students and their groups to decide what content resources they are going to pursue.

Provide clarifying lessons at "teachable moments"

PBL is most effective with continual dialogue between the teacher (as a coach) and students. Effective project-based teachers must actively direct students toward the curriculum goals by asking probing questions in class discussions, circulating and listening to discussions in group work, and taking advantage of teachable moments when students are ready to learn. When these moments arise, the teacher has a key role to play in explaining content-related concepts and clarifying misconceptions. The teacher may offer a quick explanation to individuals or small groups, or recognize when all or most of the class needs to be taught something as a whole via direct instruction.

When lectures are given, they should be short (hence the term used in these materials, "*mini-lecture*") and organized. Limit lectures to the information students need at that point in the problem-solving process. A mini-lecture should be introduced by talking about it as part of the teacher's role as "coach" for the students' problem-solving process. It is a good idea to refer to the "Need-to-Know" list and say something like, "Many of you said yesterday that you had questions about _____, so I have some information that will answer those questions." And, as in all cases when lectures are used, you should use the techniques of good lecturing; engage students by speaking in an interesting style, asking questions, giving examples, using visual aids, and pausing to have students think, talk, or do some activity.

Use formative assessments

A key part of your job in project based teaching is to monitor whether students are learning the concepts the project is designed to teach. A variety of formative assessments will help with monitoring, including individual questioning, pop quizzes, checks for understanding with peers, and project logs. Here are strategies for using formative assessment tools:

- Listen to student discussions in small groups or as a whole class, and ask questions to provide a window into students' thinking and reveal confusion or misunderstandings.
- Administer a short pop quiz requiring students to demonstrate their understanding of an economic concept.
- Arrange for peers to check each other's understanding by pairing up to explain an economic concept to another student. Follow this by asking students for a show of hands to report how well they thought they explained, and how well they (honestly) thought their partner explained the concept. If this check reveals a knowledge gap or misunderstanding, conduct a short whole-class discussion or mini-lecture to consolidate understanding of the idea or concept.

Project Logs provide a structured way of assessing student understanding and are included in *PBE* units at significant points during the project. You may have students record many things in a Project Log or journal, including notes on the process of learning, comments on how well they or their groups are working, or reflections on content-related topics. Project Logs provide for individual accountability for learning the material, and allow you to assess the understanding of each student when students work in groups.

Project Log entries *must be checked soon after they are written* if they are to be used effectively as a diagnostic tool. You need to find out what students do and do not know in order to plan the next day's instruction. Apart from skimming them all, one way to do this quickly is to select a small number of representative samples from a range of students in the class. Or, students could be asked to raise their hands according to how well their entries—or their peer's, if they have swapped and read each other's logs—matched the criteria provided.

Once Project Log entries have been reviewed to assess the degree to which individual students understand the conceptual material being addressed, you can plan further instructional actions such as:

- talking with the class about the concepts in question by giving another mini-lecture
- talking with certain students or groups to address their misconceptions and misunderstandings

- giving additional textbook reading assignments, and/or directing students to online resources and explanations
- arranging peer teaching between students who are confused about the concept and those who have a solid understanding of it

Manage small-group work

Although the problems posed in project scenarios can be resolved entirely by individuals or entirely through whole-class effort, Project Based Learning is most effective when students are required to work in small groups. Consequently, all *PBE* unit scenarios place students in the role of a team with three to six members. This gives students the opportunity to discuss their ideas and questions with peers and develops the skills of stating a position, listening to others' positions, respectfully disagreeing with others, and collaborating and compromising. There is no always-applicable guidance for forming groups, and you will have to think about your students and decide who works well together. Generally, we encourage teachers to include students with different interests and abilities in the group so that a range of talents and skills can be applied to the project. And, it is generally *not* a good idea for students to choose their own groups based on friendship alone.

Coaching and monitoring groups is important. Most groups will need some assistance maintaining a task focus. Groups may also need help maintaining a positive attitude or dealing with group members who are not carrying their weight. Although PBL is predicated on students taking charge of their own learning, teachers need to monitor this process continually, and pull groups into impromptu conferences when their process bogs down.

Communicate standards of excellence

Rubrics that specify the characteristics of quality work and exemplars of finished products are included in each *PBE* unit. Students should be given the rubric midway through the project, to guide them as they prepare the required major products and performances. Students should not be given the rubric at the same time they receive the Entry Document at the beginning of the project as part of a "complete packet of materials" for the whole unit. They need some time to define for themselves what they have to learn to resolve the problems posed by the scenario, and receiving the rubric or other materials too soon short-circuits that process.

Manage presentation and critique of answers to the Driving Question

All *PBE* units include the preparation of some sort of tangible product and/or performance to communicate an answer to the Driving Question—essentially, the solution a group has developed to the problem posed in the project scenario. Students will need guidance in the preparation of these

products, as well as the opportunity to practice and receive feedback on their work as much as possible from their peers and teacher. After students' solutions have been presented, the class should compare and discuss them, as explained in the debrief phase of each unit.

Oral presentations to the class or a panel are a valuable component of many *PBE* units. As teachers know well, you're often not really sure if you understand something until you explain it to others. However, managing oral presentations well presents several challenges. Student groups need time to prepare and practice. The expectations for a good oral presentation should be made very clear, including presentation techniques and proper attire, posture, attitude, and group member participation. The rubrics accompanying each unit provide guidance to students on the use of content knowledge as well as oral presentation skills.

To help ensure proper participation by all group members, experienced teachers use several strategies. One is to explain that everyone will be held responsible for understanding all parts of an oral presentation and the visual aids that accompany it—and the rubric and grading criteria will reflect this goal. In addition, groups could be informed that even if they have decided in advance who will say what during the formal part of a presentation, *anyone* may be asked a question about *any part* of the presentation. Or, a teacher could tell students they will be picked at random just before the presentation to deliver various parts of it, thereby putting all group members on notice that they all need to be prepared to fully participate.

On the day of presentations, if the number of groups is not too large, there may be time for each group to make a presentation. However, a potential problem with this approach is that groups tend to repeat themselves, and by the time the fourth or fifth group has made its presentation, there is very little new left to say or very few new questions to ask the group. Also, students in groups presenting nearer the end may have an advantage by hearing previous presentations. This can be avoided if it is possible to send the rest of the class to the library or another room, so each group can present only to the teacher or panel—or have presenting groups go to another location. If all students need to remain together, give student audience members a task. Have them listen to other presentations and make notes of good points made and good answers to questions, as well as how they might have done it differently. Some classes may be ready to assess their peers' performance, using a rubric or other set of criteria while they observe and listen.

Practice 21st-century skills

To meet the challenges of the changing economy in the United States and across the world, and become participating citizens in a democracy, students need to learn more than basic skills and acquire subject-area knowledge. Accordingly, all *PBE* units provide opportunities for students to learn and practice 21st-century skills such as collaboration (e.g., working well with others, sharing resources, arriving at consensus), critical thinking (e.g., gathering relevant information, generating and evaluating solutions to problems), and communication (e.g., discussing ideas, writing, making an oral presentation, using technology). You can discuss, teach, and even assess these skills before, during, and at the end of every project.

Establish group and individually based grading procedures

As students usually work together to create the products and/or performance that culminate a project, you may need to assign a single grade for that product, given to all students working in the group. Of course, however, some students—like some adults—will become freeloaders and allow others to do their work for them. Self-reports, combined with group self-evaluation and group leader reports, can provide some information on how much each student may have worked, but not how much each has learned. Students will take more responsibility for their learning, and learn more, if they know their economics content understanding will be assessed individually, so let them know the group product is not the only component of their grade. Instead of relying on one speaker to make a presentation, they should be asked to divide up the task—and be ready for questions about *any* part of it, not just the part they did. But since time is usually short, questioning students during oral presentations can only be a partial assessment strategy. Consequently, multiple-choice tests that can be used to assess individual student understanding appear at the conclusion each *PBE* unit. Additionally or alternatively, you could require students to turn in individual written assignments or take a short-answer/short-essay test. You will have to work out what is most appropriate for your own grading system, but the fundamental idea holds: Make sure to assess students individually on their content knowledge, in addition to any group assessment you conduct.

Allow for several possible "right answers"

Part of what engages students in Project Based Learning is knowing that they can make choices and are not simply "doing what the teacher wants." All *PBE* unit scenarios are built around problems for which there can be multiple reasonable solutions. There are also solutions which are clearly wrong; not *every* solution will work. Guidance on evaluating reasonable and unreasonable solutions for each unit is offered in the **Step-by-Step Teaching Guide**.

Stay within the project scenario

Since the scenarios are hypothetical, students often want to add details, modify what is known, or otherwise *change* the scenario so that it is easier to resolve the problem presented. Such creativity will sabotage the core purpose of the project—it has been carefully developed as a vehicle to teach specific economics content. All *PBE* units have been developed in close consultation with U.S. high school teachers, tested in their classrooms, and revised based on their feedback to ensure that the project, although enjoyed by most students, does not become merely a "fun activity." The project has been created to achieve a serious instructional purpose, and deviating from the project scenario's storyline tends to focus students' attention on irrelevant or less important learning objectives.

Consider needs of English language learners

Students who are learning to speak, read, and write English can benefit greatly from Project Based Learning, but special scaffolding may be necessary. They may need more time to complete tasks, more vocabulary-building, and more peer-to-peer support. Some of the authentic-sounding documents presented in *PBE* scenarios may contain jargon, slang, or cultural references that will need to be explained. When forming small groups, care should be taken to assign students learning English to teams with supportive and skilled members. Finally, oral presentations may present special challenges—ELL students may be allowed to participate to a lesser extent than other group members, and/or be given questions to be answered later in writing, rather than "on the spot."

Make More Money?

Chapter Three

An Activity to Introduce Students to the Project Based Learning Methodology

Overview

In this activity, students are presented with a problem-solving task focused on a fictitious high school senior who wants to drop some classes in order to work more hours. In the role of a counseling team at the school, students investigate the facts of the situation, consider the personal and economic choices involved, and recommend a reasonable solution.

Although this activity touches on some basic economic concepts, it is primarily designed for another purpose—to demonstrate the instructional methodology of Project Based Learning (PBL). It may be used with two groups of participants: high school students in the classroom, or their teachers in professional development workshops. The Buck Institute for Education (BIE) has field-tested this activity successfully with both groups. With students, we recommend using it prior to teaching the units from the *Project Based Economics* series. The instructions below are written with this use in mind. (If the activity is being used with an audience of teachers, they should experience it much as students will, which is the best way to learn how to implement it.)

Project Based Learning may be an unfamiliar process for many students and teachers. In this activity, which requires less than a typical class period to complete, students will become familiar with many of the key elements of the methodology as designed by BIE for its economics units. Like the *PBE* units, the **Make More Money?** activity begins with a problem-solving scenario (not all projects in PBL begin this way, but it is an effective option). PBL is an inquiry-based process that springs from what students identify they need to know in order to solve the problem presented in the scenario. Accordingly, it is important not to "frontload" any information before starting the activity. Do not conduct a discussion, assign reading, or give a lecture in advance about the value of going to college vs. going to work, nor tell students all about PBL. It is sufficient to simply say, "Now we're going to do an activity that will introduce you to one of the ways we're going to learn about economics in this course." The first thing students should see is the Entry Document, the note that launches the scenario. After the scenario has run its course, the debriefing time is when the principles and features of PBL should be discussed, along with any content-related issues or further work on the topic that the teacher would like to do.

Project Based Learning has proven effective in teaching content knowledge as well or better than a traditional lecture/textbook approach, improves

retention of knowledge, and contributes to the acquisition of 21st-century skills such as collaboration, presentation, and critical thinking. Moreover, it increases student engagement and interest in the subject of economics, which is important in their lives as workers and citizens.

Content standards addressed

Voluntary National Standards in Economics:

Standard 1: Productive resources are limited. Therefore, people cannot have all the goods and services they want; as a result, they must choose some things and give up others.

Content keywords: scarcity, tradeoffs, opportunity cost

Materials needed

- One copy for each student or pair of students of the Entry Document, the note from a student, "AJ," with the additional context for it
- To have on hand in case students request it: copies or a displayed version of the handout, "Earnings by Education Level"
- Chart paper, whiteboard/chalkboard, overhead transparency, or computer and LCD projector

Procedure (40–50 minutes)

1. Read the **Entry Document** aloud as a whole class (page 22, note from "AJ" with added context)
2. Write an **initial "Driving Question"** as a whole class (recorded on a projector, chart paper or board)

   Sample:

   How can we, as the counseling team, find out what's going on with AJ, so we can help him/her make a good decision?

3. Write a list of **"What Do We Know?"** as a whole class (recorded on a projector, chart paper or board)

   Sample:

   - We're a high school teacher who got a note from a student
   - It is September
   - AJ is an 18-year-old high school senior
   - AJ wants to drop classes

- AJ isn't sure about going to college right away
- AJ has seemed withdrawn and distracted lately
- AJ's grades have slipped
- We are on AJ's counseling team
- AJ won't graduate on time if s/he drops classes
- AJ wants to work more and make more money
- AJ doesn't want his/her parents involved

4. Write a **list of "What Do We Need to Know?"** as a whole class (recorded on a projector, chart paper or board)

Sample:

- Is AJ male or female?
- What classes does AJ want to drop?
- Why has AJ been distracted and withdrawn?
- What college was AJ planning to go to?
- Why doesn't AJ want his/her parents involved?
- Do AJ's parents agree with this decision?
- What job does AJ have?
- How much money does AJ make?
- What does AJ need more money for? Is it urgent right now?
- Has AJ thought through the consequences of not going to college?
- How much more money could AJ make in the long run by going to college?

5. Discuss what **resources** could provide answers to our "need-to-know" questions.

For example, some answers could be found through research—such as a comparison of earnings in jobs requiring college degrees vs. jobs that only require a high school diploma—and some might need to come from actually talking to people. Students should recognize, or be coached to see, that the best way to get more information at this point is to talk to AJ—so tell them AJ will be here in a minute for a meeting.

6. Students take 2–3 minutes, working in pairs or small groups, to plan **questions to ask AJ**.

7. *If they ask for it*, students receive the handout **found on page 24, which shows earnings by educational attainment.** This information may give students ideas for what to discuss with AJ, and should be very briefly discussed as a class. If students do not request this information, the handout may be held for the debrief as an optional discussion piece if you want to use it.

8. Students ask questions during a **"live" meeting** with someone playing the role of AJ.

   - AJ is reluctant to talk, but eventually reveals details about the decision to drop classes.
   - For suggested responses to questions, see "Guidelines for Conducting the Interview and Playing the Role of AJ" below.
   - After AJ reveals the "secret"—that he/she needs more money to help support the family since the father was laid off—the interview ends.

9. Revisit the **Know/Need-to-Know Lists** and revise the **Driving Question** as a whole class.

   Point out that students now have answers to some of their "need to know" questions—and that the list of "what we know" has lengthened. To save time, you do not actually have to write new items on the lists. However, do ask students if they think the Driving Question still fits or if they want to change it, and do so. A new Driving Question might be:

   How can we, as the counseling team, talk more with AJ and his/her parents, so we can help him/her graduate on time and go to college?

10. **Wrap-up:** Explain that although they may not have all the answers to their "need to know" questions, it is now time to propose solutions, or at least say what they would do next. Allow 2–3 minutes for students working in pairs or small groups to brainstorm possible solutions, and then share them aloud and evaluate them.

    Sample of possible solutions:

    - Try to rearrange AJ's class schedule so he/she can complete courses required for graduation and still work the required hours.
    - Talk with AJ's parents to try to find a way to keep AJ on track for graduation and attending college.
    - Go ahead and do what AJ wants.
    - Recommend independent study or the Graduate Equivalency Diploma (GED).

11. **Debrief** with the whole class by leading a brief discussion about both the economics content and the process of learning in PBL.

Economics Content Note

Discuss the economic concepts of *scarcity, tradeoffs,* and *opportunity cost.*

Economics Content Notes: Discuss the economic concepts of *scarcity, tradeoffs*, and *opportunity cost:*

- Since the time available for work is a limited, or scarce resource, AJ must consider the trade-offs between work and further education.
- Point out that the cost of AJ's decision can be thought of in terms of what he/she gives up—the opportunity cost—by working more hours to make more money now, versus going to college and earning more later. If you wish, introduce the data comparing earnings of college graduates vs. high school–only graduates.

Potential Hurdle

Discuss what this activity demonstrates about Project Based Learning.

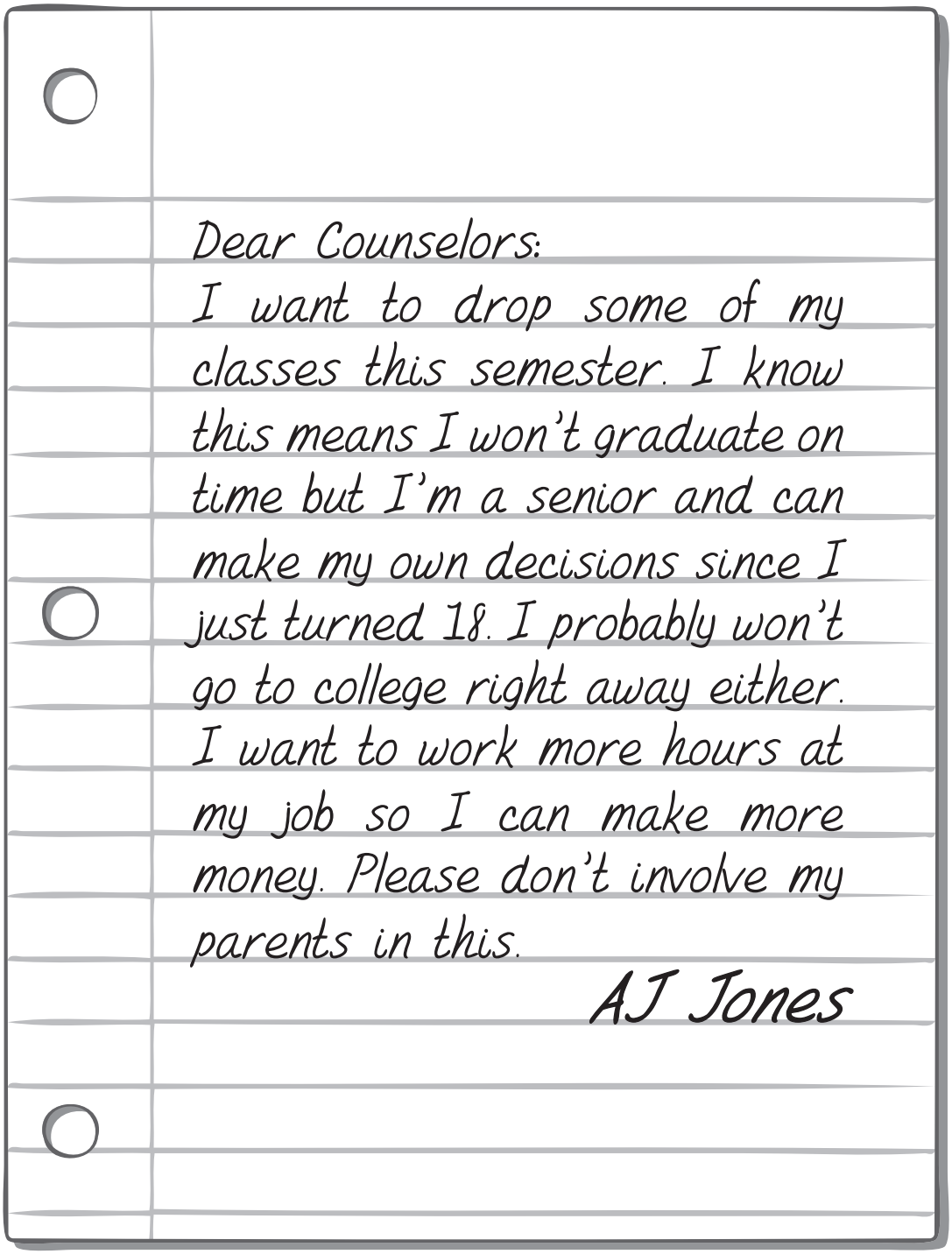
Potential Hurdle: Discuss what this activity demonstrates about Project Based Learning:

- There is no *single* ***right*** answer to the problem in the scenario—it is "open-ended"—but there are ***wrong*** answers. For example, denying AJ's request without further discussion or contact with his/her family would probably be a mistake.
- ***It is important to be persistent.*** During the "live" interview, encourage students to find different ways to ask AJ the same question. During the debriefing, point out that persistence is an important "habit of mind" for PBL.
- ***Frustration is OK—it is an important part of PBL.*** Ask students if they were frustrated at any time during the process. This often leads to a discussion of how students become frustrated during research or other inquiry-based assignments when they cannot find the answers easily. You should allow for some frustration but also offer coaching if students are getting too far off track. Focus students back on the Need-to-Know List when they are having difficulty thinking of questions to ask AJ.
- ***The Driving Question and the Know/Need-to-Know Lists are important tools*** for keeping on task and focused on the problem to be solved as it evolves.
- ***Good PBL gets students to ask questions about content.*** Asking questions demonstrates that students are open to learning, which can lead to "teachable moments." Rather than give students the answers too quickly, record questions as they come up and have students investigate. In this activity, the information on average earnings by level of education was handed out, but it could have been easily researched by students if there was more time.

- ***New information leads to shifts in perspective—and new questions***. For example, learning that AJ needs more money to support his/her family, not for frivolous expenses, creates a major shift in the way students think about the problem, and new "need to knows" could be identified.
- ***Decisions are often made under conditions of uncertainty.*** Just like people in the real world, students do not always have complete information on which to base decisions. Some of the items on the Need-to-Know List in the **Make More Money?** activity may not be answered, but that doesn't mean reasonable solutions to the problem can't be proposed.

Letter From AJ

You are a high school teacher who is also on a counseling team, and one day in September you received this note from a student your team counsels:



Dear Counselors:
I want to drop some of my classes this semester. I know this means I won't graduate on time but I'm a senior and can make my own decisions since I just turned 18. I probably won't go to college right away either. I want to work more hours at my job so I can make more money. Please don't involve my parents in this.

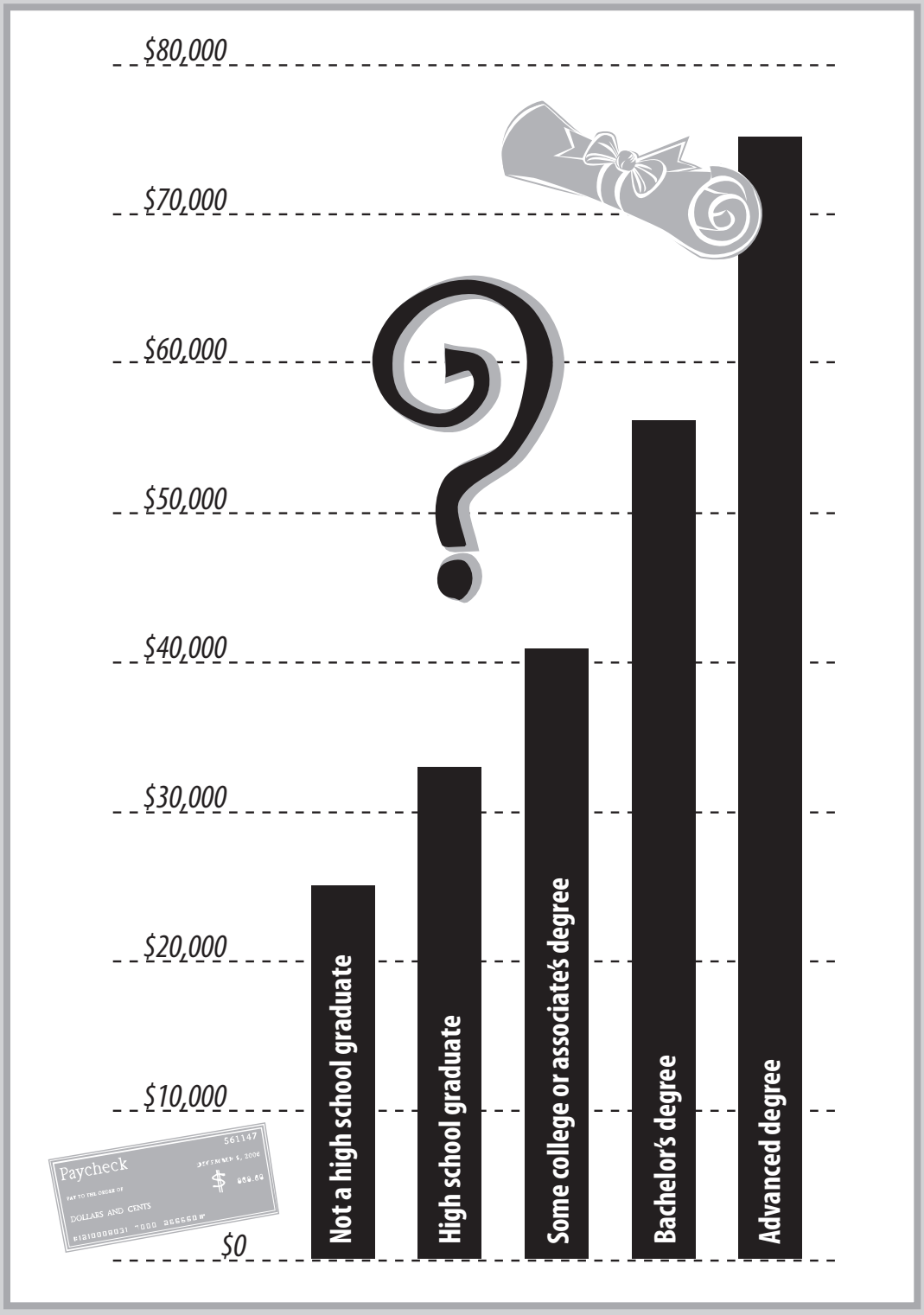
AJ Jones

You have always thought AJ was doing just fine in school—but then you remember hearing that AJ's grades have been slipping lately and that AJ has seemed somewhat distracted and withdrawn. You've decided to take this to the counseling team for action.

Guidelines for Conducting the Interview and Playing the Role of "AJ"

- The role of AJ may be played by a male or female—either you, another adult, or a competent student who has been rehearsed.
- AJ should be very reluctant to talk at first. Avoid answering direct questions by saying things like, "It's a personal decision,"—"I just want to work more hours,"—"I'm 18 and can handle myself,"—"It's nothing to do with not liking school or having trouble or anything."
- Slowly reveal the following information, when asked about it:
  - Job is at a local supermarket; bagger and stocker now, but could become a checker soon
  - Hourly wage is $8
  - Now work 15 hours a week, want to increase it to 40
  - May have appeared withdrawn and distracted because of this decision, but nothing else is going on (relationships are good, no drug/alcohol abuse, no physical or mental problems, no difficulties with school, etc.)
  - Want to drop government, economics, and English classes and keep art, yearbook; not taking math or science this year but have taken three years of each
- Be evasive about what the money is needed for—"Oh, I just want to buy stuff," … "My cell phone bill is pretty big," … "I might get a car, better clothes, just spending money for going out with my friends, you know…," … "And I'll save some money too."
- Show discomfort when talking about your parents. Say you do not want to involve them because, "I'm 18 and can make my own decisions," … "I don't want them to stress about me," … "They've got my two brothers and sister to worry about."
- If asked, "Why not wait to work more until after you graduate?" AJ should respond, "I really need the money now." (This should be said in a way that begins to raise suspicions, and/or show discomfort with body language and facial expressions.)
- If the group is getting too frustrated and/or you wish to end the activity, give a clue about what question to ask to get AJ to reveal the "secret" by saying, "My family…I mean, I really need the money now."
- Upon further questioning, it should be revealed that AJ's father has suddenly been laid off from his job (you could choose something in a downsized sector of the economy—computer programming, auto-parts factory, etc.). AJ feels like s/he should work to help support the family, but they would be ashamed to admit it, and would not want AJ to do this.
- *After this last piece of information is revealed, the meeting ends and "AJ" leaves.*

Median Earnings for Full-time, Year-Round Workers Age 25 and Over by Educational Attainment (2007)



Source: www.census.gov/prod/2009pubs/p20-560.pdf

The Invisible Hand

Chapter Four

Purpose and Overview

Time required

5–6 class periods

Project scenario

In a market economy, market forces set a price at which consumers are willing and able to purchase all the goods they want and producers are able to sell all they want. When a government sets a price below the market-determined price (i.e., sets a price ceiling), shortages occur and create nonprice distributional mechanisms such as black markets and waiting in queues. To explore how benefits and costs arise with all methods of allocating goods and services, students are presented with the following problem-solving scenario in this project:

> *U.S. Department of Energy Secretary Les Singer asks his policy group for help in planning how to implement legislation on gasoline price controls that was passed by Congress. He asks the policy group to start the process by trying to decide which consumers should be given high, medium, or low priority when gasoline is allocated. The group listens to messages from consumers who are concerned that shortages may occur with price controls and explain why they need gasoline. The situation soon is complicated when a critical op-ed piece appears in a petroleum industry newsletter and reporters start asking questions about possible negative effects of price controls. Secretary Singer, realizing he doesn't know enough about economics to respond to these concerns, asks his policy group to write a memo to him explaining why price controls might cause problems in a free market system. Finally, he asks the policy group to write an op-ed piece announcing the Energy Department's plan for implementing price controls.*

Concepts to be learned

To successfully resolve the problem and complete the products required in this project, students need to understand and be able to apply the following economic concepts:

- Black market
- Demand
- Equilibrium price
- Equilibrium quantity
- Market
- Market economy
- Nonprice rationing
- Opportunity cost
- Price
- Price ceiling
- Price control
- Scarcity
- Shortage
- Supply
- Tradeoff
- Unfettered market

Although an understanding of the following economic concepts is not essential to complete project tasks, teachers can use the unit to explain additional economic concepts including:

- Command economy
- Price floor
- Surplus

NCEE content standards addressed

The Invisible Hand addresses the following *Voluntary National Content Standards in Economics* codified by The National Council on Economic Education, in partnership with the National Association of Economic Educators and the Foundation for Teaching Economics. For more information see www.ncee.net/ea/standard.

Standard #	Economic Concept
1	Scarcity
2	Opportunity cost
3	Market systems (allocation of goods and services)
4	Economic incentives
7	Market economies
8	Supply and demand

The Invisible Hand can also be used to teach the following standards:

5	Free trade and voluntary exchange
9	Effects of competition

Teaching *The Invisible Hand*

Sequence of the unit

Like the other BIE *Project Based Economics* units, students complete *The Invisible Hand* by following a standard set of activities in a proscribed order. But within these activities, there will be variation in the timing and in the way students complete them.

The sequence of instructional activities is described below. This sequence is logical, and is based upon extensive pilot testing in high school economics classrooms. It is also informed by research into effective instruction. Although changes may be necessary to meet time constraints, address the needs of specific student populations, or include additional instructional materials and learning opportunities, we strongly encourage teachers to adhere to the sequence of activities as closely as possible—at least during the first several times *The Invisible Hand* is taught. Each instructional activity is discussed in more detail in the following section, the **Step-by-Step Teaching Guide**.

Pre-project planning

0. **Prepare** for successful project implementation.

Launching the project

1. Students listen to the **voicemail from Secretary Singer**, read the transcript, and discuss it as a whole class.

Framing the inquiry

2. Students develop the **initial "Know" list** with you (whole-class discussion).
3. Students develop the **initial Driving Question** with you (whole-class discussion).
4. Students develop the **initial "Need-to-Know" list** with you (whole-class discussion).

Problem-solving and learning activities

5. Provide (optional) **Clarifying Lesson #1** on *market economies.*
6. Students individually write **first Project Log entry.**
7. **Review individual Project Log entries** to assess understanding of economic concepts.
8. Students listen to and discuss the **voicemail messages** forwarded from Secretary Singer (whole-class discussion).

9. Students **revise the Know/Need-to-Know list** with you (whole-class discussion).
10. Students use worksheet to **allocate points** to decide who should get gasoline (in pairs/threes) and discuss results as a whole class.
11. Provide **Clarifying Lesson #2** on *black markets.*
12. Students individually write **second Project Log entry**
13. **Review individual Project Log entries** to assess understanding of economic concepts.
14. Students read the **memo and Op-Ed piece** and discuss it as a whole class.
15. Students **revise the Driving Question** with you (whole-class discussion).
16. Students **revise the Know/Need-to-Know List** with you (whole-class discussion).
17. Provide **Clarifying Lesson #3** on *demand and supply.*
18. Students individually write **third Project Log entry**.
19. **Review individual Project Log entries** to assess understanding of economic concepts.
20. Students write **memo on markets**, in small groups, in pairs, or individually.
21. Use the supplied rubric to **assess memos** on markets.
22. Students listen to **final voicemail** from Secretary Singer and discuss it as a whole class.
23. Students **finalize the Driving Question** with you (whole-class discussion).
24. Students **revise the Know/Need-to-Know List** with you (whole-class discussion).
25. Provide **Clarifying Lesson #4** on *price controls and market prices.*
26. Students individually write **fourth Project Log entry.**
27. **Review individual Project Log entries** to assess understanding of economic concepts.
28. **Share supplied rubric with students** to guide their work.
29. Students review the **final Know/Need-to-Know List** with you (whole-class discussion).

Presentation, assessment, and debrief

30. Students **discuss policy on price controls** in small groups.

31. Students **write Op-Ed pieces** in small groups, pairs, or individually.

32. Students **report on and compare Op-Ed pieces** (whole-class discussion).

33. Use the supplied rubric to **assess Op-Ed pieces**.

34. Conduct a **debrief to clarify and consolidate** students' understanding of key economic concepts (as necessary).

35. Manage **student reflection** on the 21st-century skills practiced, and the process of learning in PBL.

36. Use the supplied **multiple-choice test** to assess individual students' knowledge of key economic concepts.

37. Make **notes on adjustments to the unit** to improve student learning for the next time the unit is taught.

Step-by-Step Teaching Guide

Each of the above instructional activities is discussed in more depth below, with tips for successful classroom implementation.

Pre-project planning

0. Prepare for successful project implementation.

There are a number of issues that must be considered before embarking on a project with students. These include:

- How much time will be devoted to the project?
- What economics content resources need to be prepared in advance (textbooks, articles, websites, etc.)?
- Do all students have the skills they need to tackle the project—including basic literacy skills as well as the ability to work in teams, make presentations, and conduct research? If not, is it necessary to pre-teach some of these skills, make sure students who need it have adequate support, or deal with these challenges in other ways?
- How will student groups be formed? *(See comments in Chapter Two.)*
- How will groups report on their progress and be held accountable? Do report forms or other tools need to be developed?
- Is it necessary to arrange access to the library/media center or computer lab?
- Do parents or administrators need to be informed about the process of Project Based Learning and be assured that time spent on the project is focused on standards-specific learning goals?

In addition to considering the above issues, be sure student handouts and clarifying lesson/mini-lecture materials are ready—or at least underway.

Finally, **decide if the culminating product will be done as a small group, in pairs, or individually.** This will affect how you present the task to students, use time, and assess their learning. Students are asked to write an Op-Ed piece—a relatively short persuasive essay. Although the scenario places students in the role of members of a Policy Group, you may ask them to discuss it first, then write in pairs or individually if you wish.

Important Note About Audio/Visual Materials: This unit features voicemail messages as part of the scenario. You may find these recordings on the accompanying CD-ROM. As an acceptable alternative, you and/or students may simply do a "dramatic reading" of the voicemail messages using the transcript provided in the ***Student Materials***.

Important!
Note About Audio/ Visual Materials:
This unit features voicemail messages as part of the scenario. You may find these recordings on the accompanying CD-ROM. As an acceptable alternative, you and/or students may simply do a "dramatic reading" of the voicemail messages using the transcript provided in the ***Student Materials***.

Launching the project

1. Students listen to the voicemail from Les Singer and/or read the transcript, and discuss it as a whole class.

The voicemail message is two minutes long and contains several important details. In order to more carefully analyze this message, students should also follow along with the transcript. As an alternative to playing the audio recording, you or students may do a "dramatic reading" of the transcript.

> *An audio recording of the voicemail messages is included on the accompanying CD-ROM.*
>
> *A transcript of the voicemail from Secretary Singer may be found in the* ***Student Materials.***

The transcript could be projected so it can be read by the whole class. Alternatively, copies of the transcript could be duplicated and given to students.

Potential Hurdle
It is essential that the entire class be able to read and comprehend the text. If necessary, employ regular literacy-building strategies.

Potential Hurdle: Because this memo sets up the scenario and the problem to be solved, it is essential that the entire class be able to read and comprehend the text. If necessary, employ the same literacy-building strategies you would normally use for this kind of reading material.

Synopsis of voicemail: The two-minute message identifies the students' role, tells them that price controls on gasoline have just been legislated, and requests that they rank various groups in American society according to how important it is that they receive gasoline. The message seeds the idea that setting the price of gasoline may not be easy because the controls could result in shortages. It promises students two more resources: a sampling of phone calls from consumer groups wanting gasoline, and a worksheet to help prioritize groups.

Economics Content Note
Do not at this point explain to students the meaning of the economic terms in the memo. They will do this for themselves once they begin working to solve the problem.

Economics Content Note: The voicemail message contains a number of economic terms, such as distributional concerns, price control, price ceiling, and so on. This is intentional. It is assumed that students will either not understand these terms or have misconceptions regarding their meanings. **Do not**, at this point, explain to students the meaning of these terms. Tell students they should put these terms on the list of what they "need to know" to solve the problem. Figuring out the meaning of economic terms is something students should, as much as possible, do for themselves (with your monitoring and guidance) once they begin working to solve the problem.

Framing the inquiry

2. Students develop the initial "Know" list with you (whole-class discussion).

Students must now assess what they already know about the problem posed in the Entry Document. This should be done as a whole class by creating a "What Do We Know?" list on chart paper, an overhead transparency, or a computer projector. Ask students to carefully review the Entry Document and offer items for the list, making sure to *only record what is in the text, not what might be inferred*. Students should be coached to identify all of the information that the Entry Document provides. They should conclude that this information is insufficient to solve the problem, and they need to know (learn) additional things.

Although each class generally produces a unique Know/Need-to-Know List, an example of the type of items that might appear on the list follows.

Example of initial Know List

What do we know?

- Congress passed a bill on gasoline price controls
- We are a policy group and we work for the Dept. of Energy
- Bill is head of the Policy Group and is new to DOE
- Bill worked with the Energy Committee in Congress and helped get price control legislation passed
- Les Singer heads DOE and knows nothing about gasoline prices
- DOE has to set the price of gas
- DOE also has to make sure high-priority users get all the gasoline they need
- We're going to get a worksheet to help us rank groups of consumers
- We can add groups to the list
- Price affects who gets gasoline
- People are worried that price controls will cause shortages of gas
- We will get phone call messages
- Les is giving a speech in Guadalajara and wishes he'd taken Spanish

3. Students develop the initial Driving Question with you (whole-class discussion).

After students have discussed the voicemail message from Les Singer, and you are satisfied that students understand it, lead students in drafting an initial Driving Question. This is generally done as a whole-class discussion.

A Driving Question is a succinct declaration of the general problem students are to solve. In *PBE*, it takes the following form:

> How can we, as... **[the role(s) being assumed by the students],** do... **[the specific task(s) students must complete],** so that... **[the specific result or goal(s) to be accomplished].**

The initial Driving Question may be quite different from the Driving Question that will emerge as students think about and work on the problem. This is to be expected. The Driving Question generally evolves as students gain more insight and knowledge into the problem and its underlying issues. The initial Driving Question may look something like:

> How can we, as **a policy group at DOE,** prioritize **the users of gasoline** so that **we can set the price of gasoline to make sure high-priority groups get all the gasoline they need?**

At this point, it is okay if the Driving Question is somewhat ill-defined. It is not necessary that the Driving Question contain economic terms or, if it does, use the economic terms correctly. The Driving Question will become more refined as students learn more, and as new developments in the scenario unfold.

4. Students develop the initial Need-to-Know List with you (whole-class discussion).

The next step in the problem-solving process is to coach students to identify information they need to know in order to answer the Driving Question. Again, guiding students to pay close attention to all parts of the Entry Document, create a "What Do We Need to Know?" list. If students are missing a key piece of information about the scenario, the economic content, or their tasks, ask questions to elicit items for the list. *This is critical because everything students are taught in the unit must spring from this list.*

At this point in the problem-solving process, students will probably list things that they actually do *not* need to know. Allow students to do so. The class will return to the Know/Need-to-Know List again later, having learned more about what they need to know to solve the problem, and should recognize

irrelevant concerns at that time. A core part of the process of Project Based Learning is to distinguish what information is and is not necessary to successfully answer the Driving Question. As much as possible, encourage students to identify irrelevant information on their own.

Although each class generally produces a unique Know/Need-to-Know List, an example of the type of items that might appear on the list follows.

Example of initial Need-to-Know List

What do we need to know?

- Why did gasoline prices need to be controlled?
- Why will there be shortages with price controls?
- What is the price of gas?
- What does allocate mean?
- What is Bill's last name?
- Who is the President?
- When will Les get back?
- What is a bureaucracy?
- What is a policy group?
- How do we rank groups?
- Have there been past shortages?
- Are there shortages now?
- How long will price controls be in effect?
- How much are distributors being charged for gas?
- Is this the holiday season or summer?
- What do people say in the phone calls?
- Why are gasoline prices so high?
- What groups want gasoline?
- Why do we have only 25 points to use?
- Why do we have to decide who gets gasoline?

Potential Hurdle: Students may want to know why they must have price controls, or they may want to enact policies to get more gasoline (e.g.,

Potential Hurdle

Students may want to know why they must have price controls or cannot create policy to increase the supply of gasoline, but remind them that their job as bureaucrats is to implement policy, not make it—that job is Congress's.

increase drilling or put pressure on oil-producing countries to increase the gasoline supply). Remind them that they are government bureaucrats and their assignment is not to set policy but to implement policy that has been set. This hurdle offers a good opportunity to review the role of Congress in setting policy.

Problem-solving and learning activities

5. Provide (optional) Clarifying Lesson #1 on *market economies*.

This lesson can be provided to students using a combination of mini-lectures and selections from a textbook and other print and online resources, some of which may be assigned as homework. See "Economics Review" for information to include in a mini-lecture.

Economics Content Note

This lesson emphasizes how market-determined prices answer the four economic questions, as well as how firms lower prices to compete in markets and respond to higher prices with an increase in quantity supplied.

Economics Content Note: In this lesson emphasize the following concepts:

- How prices determined in markets answer the four economic questions
- How firms will lower prices to compete for consumers in markets and respond to higher prices with an increase in quantity supplied

6. Students individually write their first Project Log entry, an answer to the following question:

How do gasoline companies answer the fundamental economic questions when price controls are not in place?

Project Log entries do not have to be long, but they do need to be completed for Project Based Learning to be most effective. They may be assigned either as in-class tasks or as homework.

7. Review individual Project Log entries to assess understanding of economic concepts.

For tips on reviewing Project Logs, see "Use Formative Assessments" in Chapter Two discussion of ***Teaching Strategies for*** *Project Based Economics.*

8. Students listen to the voicemail messages forwarded from Secretary Singer as a whole class.

The series of voicemail messages, totaling 11.5 minutes in length, are from groups and individuals hoping to be given priority in getting gasoline. As an alternative to playing the audio recording, you and students may do a "dramatic reading" of the transcript.

Introduce the voicemail messages by reminding students that Secretary Singer referred to it in his message, and asked his policy group to listen to these people's concerns before giving high, medium, and low priority to groups of gasoline users. If you wish, have students read along on the transcript with the voicemails as they are being played.

> *A transcript of the voicemail messages may be found in the* ***Student Materials****.*

Each of the people in the voicemails represents a particular need for gasoline. Students should see that most (if not all) of the needs are legitimate, and as a result, it will be difficult to make a decision about who should get gasoline. Students should also see that individuals are making the calls because they are fearful that shortages will occur when price ceilings are put in place.

To ensure that students fully understand the equity concerns that have led to price controls and the shortages that will occur with price ceilings, they should listen carefully to each person's needs. Students should be prompted to listen for information that answers the question, "Why do they need gasoline?" You could pause between each message to facilitate understanding of each individual's agenda in calling Secretary Singer.

Students should hear that:

- ***Jimmy Hoffman*** wants special assurance that truckers will be able to get gasoline. He suggests that truckers' services are essential to facilitating commerce. He also notes that trucking companies were losing money when gasoline prices were high.
- ***Joe Gannon*** is concerned that crime and fire damage will be more prevalent, and that lives and property will be lost unless public safety officers get the gasoline they need.
- ***Eve Tamar*** wants gasoline so she can take her children to afterschool activities, which make them more well-rounded people
- ***Maddy Washington*** likes price controls because she gets cheaper gasoline and does not mind standing in line. (Her opportunity cost of standing in line is low.)
- ***Arnold Ziffel*** makes the plea for farmers to have gasoline so crops can be grown and shipped to markets
- ***Christina Lopez*** commends price controls as being fair, but wants to make sure that low-income workers will get gasoline. She notes that they had difficulty buying gasoline when the price was high. She also believes that public transit is unreliable.

- ***Fiori Packart*** introduces the notion of a black market that will arise with price controls on gasoline, and she wants to make sure that businesses can get the petroleum products they need to continue production. Without gasoline, she points out, businesses will cut back production, which will mean layoffs.
- ***Henry Edsel*** wants price controls so the people not getting gasoline will buy his hybrid cars
- ***Helen Moses*** wants senior citizens to get gasoline so they can drive to the doctor's office
- ***Ted Tilton*** makes the plea for fuel for the large airlines so transport and business travel can continue
- ***Victor Tran*** wants to reduce overall gasoline consumption by giving gasoline to public transit and not to private citizens
- ***Imelda Guzman*** commutes many miles to work and needs to have gasoline so she can keep her house and job. She says she had trouble paying for gasoline when the price was high.
- ***Jamal Hayward*** needs gasoline so he can get to work and school

Economics Content Note
In class discussions, keep students focused on the distributional aspects of the voicemail messages. They should understand the problems that arise for some when gas prices are relatively high, but also the problems for others who can't get gas when prices are low.

Economics Content Note: The voicemail messages should heighten student interest in price controls. They should bring up questions such as "Why are people worried about price controls?" In class discussions, keep students focused on the distributional aspects of the messages. Make sure they understand the problems that exist for some people or groups when gasoline prices are relatively high (without price ceilings)—and also the problems that will exist for others if they cannot get gasoline when prices are low. Many of the potential problems with and consequences from price controls are seeded in the voicemails. For example, Fiori Packart suggests the idea of a black market for gasoline, which should be highlighted as a "need-to-know." Henry Edsel plants the idea that there may be secondary consequences (and tradeoffs) from allocating gasoline by means other than price. If people using hybrid cars get gasoline, for instance, the environment will be improved, and the car producers will make lots of money.

9. Students revise the Know/Need-to-Know List with you (whole-class discussion).

Revisit the Know/Need-to-Know List as a whole class and move any items that are now "known" from the "Need-to-Know" to the "Know" side of the list, or mark them with a check. In addition, students should have some new items for the Need-to-Know List.

The revised Know/Need-to-Know List might include the following new items:

Sample items for revised Know/Need-to-Know List

What do we know?

- [previously listed items]
- People are afraid they will not be able to get gasoline
- Some people like price controls
- Gasoline prices were $5 a gallon
- Maddy thinks the new policy will set gasoline prices at $1.50 a gallon
- Some groups need gasoline for work
- Some groups need gasoline for fun
- Businesses need gasoline to keep running
- Gasoline is important to lots of people and to the U.S. economy

What do we need to know?

- [previously listed items]
- What is a black market?
- How much gasoline do these people need?
- Who else can we add to the list?

10. Students use worksheet to allocate points to decide who should get gasoline (in pairs/threes) and discuss results as a whole class.

After students understand the needs of different consumer groups for gasoline and recognize the problems created by shortages, they should be given the worksheet from Les Singer. The worksheet is designed to show students how difficult it can be to make decisions about who gets gasoline when there is not enough to satisfy everyone. Students should use the 25 points on the worksheet to show who they think should have priority in getting gasoline. ***Students may add groups that might need gasoline to the list, but they cannot remove groups that have made phone calls.*** Of course, they can always give a group a zero, indicating that it should have no gasoline.

Allocating the 25 points among groups is best done by having students work in pairs. Suggest that they use pencil, since they will need to erase as they try different point allocations. Or you could provide two copies of the worksheet—one to work on and one to record final decisions.

Potential Hurdle
While students might complain that 25 points aren't enough to allocate, do not increase the number of available points—the limited points reflect scarcity. Ask students to focus on the activities identified in the voicemails and award points on that basis.

Potential Hurdle: Students might complain that 25 points are not enough to allocate because some people will not get gasoline. However, ***do not*** increase the amount of available points. The exercise was designed to show students how difficult it can be to allocate gasoline when price is below equilibrium (i.e., price is not determining "who gets the goods"). The limited points reflect scarcity and for students to understand the problems of allocating resources under scarcity, they must not exceed the 25 points allocation. Each group thinks it has a real need for gasoline, and it is difficult to make decisions about who should get it. The 25 points for allocation will emphasize this important economic reality. Students also may want fuller descriptions of what each group does—"Does the parent also work? What products do the businesses make? How much gasoline do they actually use?" Ask them to focus on the *activities* identified in the voicemails and award priority points on that basis. Remind them that most of the time people have to make decisions without all information.

After each pair has allocated their points, the entire class can discuss any problems they encountered in doing the exercise. Students should realize that the challenges they faced in assigning points are the same ones that come up when allocating gasoline with a price ceiling present.

The point allocation exercise can be used to generate discussion about who should get gasoline. Discussion can be stimulated with such questions as, "How did you rank the group? Who is on top and who is on the bottom? Do you think it is fair that not everyone can get gasoline? Who do you think would be on the top and bottom if price were used to allocate gasoline? Is it fairer if price determines who gets gasoline? What happens to the economy if the people with a zero don't get gasoline?"

Economics Content Note
Use the discussion on who should get gasoline to remind students that this type of decision-making is unnecessary when markets determine price. Emphasize that the reason for price controls is because some people think that markets are unfair. However, not everyone gets gasoline with nonprice allocations either, due to scarcity.

Economics Content Note: The discussion on who should get gasoline should be used to remind students that this type of decision-making is not necessary when markets determine price. Markets need no coordination because voluntary exchange—individuals and firms trading for what they want—leads to market-efficient pricing. You should emphasize that the reason that price controls are implemented is because some people think markets are not fair. These feelings frequently arise when prices for goods like gasoline or housing are high and some people are priced out of the market. You should make sure that students see that some people that need gasoline do not get it with nonprice allocations, which is what they did when they allocated points. Scarcity means that not everyone can get the gasoline they want, and either markets or the government can be used to determine who does get it. Should students add entities to the list (e.g., military), the ranking becomes even more difficult. You can use these additional entities to illustrate how much more complicated allocating gasoline is when all members of society are considered potential consumers.

11. Provide Clarifying Lesson #2 on *black markets*.

This lesson can be provided to students using a combination of mini-lectures and selections from a textbook and other print and online resources, some of which may be assigned as homework. See "Economics Review" in the *Teacher Materials* for background information for this lesson.

Economics Content Note: In this lesson emphasize the following concepts:

- Some ways in which goods can be allocated without using price
- How black markets operate
- Why black market arise with price controls
- How black markets increase the opportunity cost of getting the good

Economics Content Note
In this lesson emphasize how goods can be allocated without using price, as well as how black markets operate, why they arise with price controls, and how they increase opportunity cost.

12. Students write their second Project Log entry, an answer to the following questions:

Why do price ceilings cause shortages? What is a black market and why might it alleviate shortages?

Project Log entries do not have to be long, but they do need to be completed for Project Based Learning to be most effective. They may be assigned either as in-class tasks or as homework.

13. Review individual Project Log entries to assess understanding of economic concepts.

For tips on reviewing Project Logs, see "Use Formative Assessments" in Chapter Two discussion of ***Teaching Strategies for Project Based Economics****.*

Economics Content Note: The Project Log entries should be reviewed to determine whether students understand that some people who don't get gasoline under the point-allocation scheme will bid up its price in an illegal market. This illegal market—called a "black market"—will reduce some of the allocation pressures on the price-controlled market. Some people who got gasoline using a point scheme would be happier if they sold gasoline at a higher price (i.e., made a profit) to people who could not get the gasoline. By trading in the black market, both parties are made better off—or they wouldn't have entered the black market.

Economics Content Note
Review the Project Log entries to determine student understanding that some who don't get gasoline under the point-allocation scheme will bid up its price on the black market, and that some who do get gasoline will sell it on the black market.

14. Students read the memo and Op-Ed piece and discuss it as a whole class.

The memo and Op-Ed piece are designed to increase and solidify students'

knowledge of free markets by examining the production side of the market. This memo asks students to write a detailed memo, immediately, explaining how free markets work and why price ceilings produce shortages.

Potential Hurdle
Distribute and discuss the memo and Op-Ed separately if students have difficulty synthesizing and internalizing all of the info together.

Potential Hurdle: Some students may find it difficult to synthesize and internalize all of the information contained in the memo and Op-Ed piece if they are distributed together. If you think this might be the case, you can distribute and discuss the documents separately.

Economics Content Note
The Op-Ed seeds the idea that price controls impede free-market operations. The motivation provided by self-interest is what drives markets; price signals where to move resources towards areas of efficiency.

Economics Content Note: The Op-Ed piece seeds the idea that price controls impede free-market operations. Its focal point is a quote from Adam Smith's *The Wealth of Nations*. This famous quote—which introduces the phrase, the "invisible hand"—succinctly summarizes how markets operate when freed of government interference. In essence, the motivation provided by self-interest—customers pursuing what they want, laborers working for pay, or firms pursuing profit—is what drives markets. Price serves as the signal to move resources toward areas of efficiency.

15. Students revise the Driving Question with you (whole-class discussion).

Students should revise their Driving Question after reading the memo from Les Singer. Their revised Driving Question may look like:

> How can we, as **a policy group**, write a detailed memo **explaining why the market sets price efficiently and price ceilings might produce shortages**, so that **Les Singer can answer the reporters' questions?**

16. Students revise the Know/Need-to-Know List with you (whole-class discussion).

Revisit the Know/Need-to-Know List as a whole class and move any items that are now "known" from the "Need-to-Know" to the "Know" side of the list, or mark them with a check. In addition, students should have some new items for the Need-to-Know List.

The revised Know/Need-to-Know List might include the following new items:

Sample items for revised Know/Need-to-Know List

What do we know?

- [previously listed items]
- Price ceilings create shortages

- Reporters are challenging Mr. Singer and he needs help
- Oil producers don't like price controls
- Drilling for oil is expensive
- There are different ways to drill for oil
- If gasoline prices are set too low, producers will not pump oil
- Now we have to write but can't use graphs

What do we need to know?

- [previously listed items]
- What is a free market?
- Who was Adam Smith?
- What is the price of gasoline now?
- What does the long quote mean?
- Why would there be less gasoline if the price was lowered?
- How would the laws of supply and demand by destroyed by price controls?
- Why doesn't Les know economics?

Potential Hurdle: By now, students might be exasperated by the fact that they don't know the price of gasoline. You might remind them that simply knowing the price of gasoline is not good enough. If the price of gasoline is to have any meaning at all, it has to be in relative terms. What if the price of gasoline was $10 a gallon, but everyone earned $100,000 a year? Or the price of public transportation was $50 a ride? The relevant dimension for policymakers is that people *believe* the price of gasoline to be too high.

Potential Hurdle
Students may be exasperated at the fact that they don't know the price of gasoline; however, the price alone is meaningless if not expressed in relative terms. What matters to policymakers is whether people *believe* the price is too high.

17. Provide Clarifying Lesson #3 on *demand and supply.*

This lesson can be provided to students using a combination of mini-lectures and selections from a textbook and other print and online resources, some of which may be assigned as homework. See "Economics Review" for information to include in a mini-lecture.

Economics Content Note
In this lesson, emphasize the law of demand/supply, how individuals/firms respond to prices, factors that determine demand/supply, equilibrium price, and shortages and price controls.

Economics Content Note: In this lesson emphasize the following concepts:

- The law of demand and how individuals respond to prices
- Factors that determine demand

- The law of supply and how firms respond to prices
- Factors that determine supply
- Equilibrium price
- Shortages and price controls

18. Students individually write third Project Log entry, an answer to the following question:

Why would price ceilings "prevent the laws of supply and demand from operating"?

19. Review individual Project Log entries to assess understanding of economic concepts.

For tips on reviewing Project Logs, see "Use Formative Assessments" in Chapter Two discussion of ***Teaching Strategies for Project Based Economics.***

Economics Content Note
Review ther Project Log entries to determine student understanding of how markets operate and why price ceillings set below equilibrium price would produce shortages.

Economics Content Note: The Project Log entries should be reviewed to determine whether students understand how markets operate and why price ceilings set below equilibrium price would produce shortages in the market. They should see that with price ceilings more individuals want gasoline (price is lower) and fewer firms want to produce it (can't cover costs). Students should also see that some people—those that get the gasoline at the lower price—benefit greatly from price controls.

20. Students write memo on markets individually.

A sample memo and rubric may be found in "Assessment Tools" in ***Teacher Materials.***

If you think students need it, show them the rubric before they write. The sample memo and rubric should be used to assess the students' memos. The sample memo can also be distributed to the class after the memos are graded to show an example of high-quality work or be used as a basis for follow-up discussion.

Economics Content Note
It is essential that students understand the basic principles of free-market operation; without a solid grounding in these, students will not fully comprehend both the good and bad ramifications of price controls.

Economics Content Note: It is essential for students to understand the basic principles of free-market operation, which is the core goal of this unit. Without a solid grounding in these principles, they will not fully comprehend the ramifications—both good and bad—of price controls. Because many students can replicate graphs depicting market operations yet not understand the underlying forces, the assignment to write a memo using "plain English" will force them to grapple with the intuitive explanation of unfettered markets.

21. Use supplied rubric to assess memos on markets.

*A sample memo on markets and the rubric for it may be found in "Assessment Tools" in the **Teacher Materials.***

As you review students' memos explaining free market operations and price controls, use the rubric to help you note any areas of weakness that reveal incomplete or incorrect understanding of key economic concepts. If many students appear to need help understanding something, consider doing a quick whole-class lesson, mini-lecture or discussion. If only a few need help, a side conversation with individuals or small groups might be sufficient.

Economics Content Note: The material contained in Clarifying Lesson #3 may be challenging for students. If the memos that students write indicate that they do not understand the functioning of markets, reintroduce the material from that lesson. Because this material lies at the heart of economics, reinforcement for clarity or increased understanding might be essential.

Economics Content Note
If student memos indicate a lack of comprehension of how markets function, reintroduce the material from that lesson.

22. Students listen to final voicemail from Secretary Singer and discuss it as a whole class.

This voicemail message, which is 2:15 minutes in length, may be found on the accompanying CD-ROM. In order to more carefully analyze this message, students should also read a transcript.

*A transcript of the voicemail from Secretary Singer may be found in the **Student Materials**.*

Synopsis of final voicemail message: Secretary Singer thanks his Policy Group for their memo on markets, noting how price controls may seem fair, but free markets are efficient. He tells students that they must quickly decide on a gasoline pricing policy and persuade the public of the wisdom of their policy through an Op-Ed piece to appear in major newspapers and wire services. The message explicitly tells the Policy Group that they can set price above or below market equilibrium. In their Op-Ed piece they need to justify their decision, outline a plan for allocating gasoline, and identify winners and losers. Finally, Les mentions that the Op-Ed piece is being sent to the President's Council of Economic Advisors for approval.

23. Students finalize the Driving Question with you (whole-class discussion).

Students should revise their Driving Question after listening to the final message from Les Singer. This is going to be the final Driving Question, or at least very close to it, so be sure students clearly understand their task. The final Driving Question should look something like:

How can we, as **the Policy Group at the DOE,** write an Op-Ed piece **explaining our policy on gasoline price controls,** so that **the public will support our decision?**

24. Students revise the Know/Need-to-Know List with you (whole-class discussion).

Revisit the Know/Need-to-Know List as a whole class and move any items that are now "known" from the "Need to Know" to the "Know" side of the list, or mark them with a check. In addition, students should have some new items for the Need-to-Know List.

The revised Know/Need-to-Know List might include the following new items:

Sample items for revised Know/Need-to-Know List

What do we know?

- [previously listed items]
- We need to write an Op-Ed piece announcing our policy on price controls
- We need to persuade the public that we've made the right decision
- We need to decide if we should set the price ceiling below or above market level
- A price ceiling set above equilibrium lets the market determine price
- We need to decide how to determine who gets gasoline
- Our Op-Ed piece needs to identify winners and losers in our policy
- Les needs our Op-Ed piece in two days
- The President knows Les doesn't know economics, so the Council of Economic Advisors has to approve our policy
- Les is threatening to "take us down with him"

What do we need to know?

- [previously listed items]
- What is an Op-Ed piece and how do we write one?
- How long does it have to be?
- What is the Council of Economic Advisors?
- What is a wire service?
- What does the "tradeoff between equity and efficiency" mean?

25. Provide Clarifying Lesson #4 on *price controls and market prices.*

This lesson can be provided to students using a combination of mini-lectures and selections from a textbook and other print and online resources, some of which may be assigned as homework. See "Economics Review" for background information for this lesson.

Economics Content Note: In this lesson emphasize the following concepts:

- The advantages (benefits) of letting market-determined prices allocate gasoline
- The disadvantages (costs) of letting market-determined prices allocate gasoline
- The advantages (benefits) of using price ceilings and nonprice means to allocate gasoline
- The disadvantages (costs) of using price ceilings and nonprice means to allocate gasoline

Economics Content Note
In this lesson, emphasize the advantages and disadvantages of letting market-determined prices allocate gasoline, and the advantages and disadvantages of using price ceilings and nonprice means to allocate gasoline.

26. Students individually write fourth Project Log entry, an answer to the following questions:

What are some of the advantages of setting prices in competitive markets? What are some of the advantages of using price controls?

27. Review individual Project Log entries to assess understanding of economic concepts.

For tips on reviewing Project Logs, see "Use Formative Assessments" in Chapter Two discussion of ***Teaching Strategies for Project Based Economics****.*

Economics Content Note: The Project Log should be reviewed to determine if students understand the costs and benefits of letting the market-determined prices allocate gasoline and the costs and benefits of using nonprice allocating mechanisms and price controls. Every policy alternative has benefits and costs, so society might be better off with the policy alternative in which benefits exceed costs by the greatest amount.

Economics Content Note
Review the Project Log to determine student understanding of the concepts in clarifying lesson #4. Since every policy alternative has benefits and costs, society might be better off with the one in which benefits exceed the costs by the greatest amount.

28. Share supplied rubric with students to guide their work.

The rubric for the Op-Ed piece may be found in"Assessment Tools" in the ***Teacher Materials****.*

Give a copy of the rubric to each group, pair, or to each student, and/or display it on an overhead or computer projector so every student can read it.

Discuss the rubric with students to be sure they understand that they will be assessed primarily on their knowledge of economics. Their writing skills, while important, are given less weight on the rubric. If you are altering the rubric's point scheme to conform to your own grading system, be sure to maintain the emphasis on knowledge of economics.

29. Students review the final Know/Need-to-Know List with you (whole-class discussion).

Conduct a final whole-class discussion of the items on the Know/Need-to-Know List. The purpose of this discussion is to identify any final questions or issues that still need to be addressed. Also note which items on both lists are, in fact, not necessary for solving the problem—even though knowing more might make for an even better solution, if time allowed.

Presentation, assessment, and debrief

30. Students discuss policy on price controls in small groups.

As noted above in Step 0 (*Pre-project Planning)*, you should have decided if students will write the Op-Ed piece in small groups or in pairs. Whichever method you choose, form students into policy groups so they can discuss the potential pros and cons of price controls together before they write. If groups are formed with some students favoring price controls and some favoring market-set prices, this will encourage debate and discussion and help stimulate thinking.

Remind students that their Op-Ed piece will be given to the Council of Economic Advisors (CEA) for review, so the focus must be on the economic aspects of their policy. If you prefer to have students make a presentation as an exit from the problem, make it a group task and have them present their Op-Ed piece to the CEA. Make sure they focus on the economics of their policy and not on visuals for their presentation.

Economics Content Note
If students have trouble with whether to set prices above or below equilibrium, you may illustrate the ineffectiveness of setting the price ceiling above equilibrium with the supplied example.

Economics Content Note: Students may have trouble with the ambiguity in their assignment to set price above or below equilibrium. Usually they can see that setting a price below equilibrium results in shortages and gasoline rationing, but they may have difficulty seeing that a price ceiling set above equilibrium is another way of saying that the market should set the price of gasoline. You may be able to illustrate the ineffectiveness of setting the price ceiling above equilibrium with an example. Ask the students what would happen if the school told soda vendors that they could not sell soda for more than $25 a can. Students will readily see that the price of soda sold at their school would not change. You can then move the example to gasoline. (What would happen if gasoline stations were told they could not sell gasoline for more than $35 a gallon?) After a short explanation reminding students that both soda and gasoline prices are currently set in the market and that they would still

be set in the market with a price ceiling of $25, they will recognize that setting a price ceiling above equilibrium is a way of saying, "Let the market set price."

31. Students write Op-Ed pieces in small groups, in pairs, or individually.

Once students clearly understand what they need to do, allow enough time for them to write well-crafted Op-Ed pieces. It may take students a whole class period to write, or a night or two of homework. Remind students that they have the final memo from Les Singer and the rubric to guide them, as well as the model of an Op-Ed piece which they saw earlier in the unit, written by J.R. Ewing in the "Oil Express."

Economics Content Note: It doesn't matter whether students favor or oppose price controls. What is important is that they understand how both unfettered markets and markets with price controls operate, and that they can assess the advantages and disadvantages of each.

Economics Content Note
It doesn't matter whether students favor or oppose price controls; what does matter is that they can assess the advantages and disadvantages of both free markets and and markets with price controls.

32. Students report on and compare Op-Ed pieces (whole-class discussion).

If you wish to conclude the unit with a more formal oral presentation, see the comments below under "Teaching Tips."

Depending on whether students wrote as a small group, in pairs, or individually, there are several ways you could have students share their solutions to the problem. If time allows, each group could be asked to report on the following:

- Where did you decide to set the price of gasoline and why?
- How are you determining who gets gasoline?
- Who are the winners and losers under your policy?

To save time, or if students wrote in pairs or individually, you could conduct an informal poll of students' responses to each of the above questions and keep track on the board or overhead projector.

Lead a discussion of the reasonableness of various solutions, and the economic reasoning used to justify them.

Economics Content Note: The Op-Ed piece should outline a policy for setting the price of gasoline and describe plans for its allocation. It must justify any negative consequences or present policies for mitigating negative consequences. For example, students could justify the use of price ceilings and ration the quantity of gasoline each person receives through coupons, or they could justify the use of market-set pricing and provide vouchers to individuals

Economics Content Note
The Op-Ed should outline a policy for setting gasoline prices and allocation, as well as justify any negative consequences or present policies for mitigating negative consequences.

who cannot afford to purchase gasoline. In all cases, they must discuss the economic ramifications of their policy by identifying winners and losers.

33. Use the supplied rubric to assess Op-Ed pieces.

*The rubric for the Op-Ed piece may be found in the **Teacher Materials**, in "Assessment Tools."*

As you read students' Op-Ed pieces, use the rubric to help you note any areas of weakness that reveal incomplete or incorrect understanding of key economic concepts. Clarify these during the debrief to follow.

34. Conduct a debrief to clarify and consolidate students' understanding of key economic concepts (as necessary).

It is critical that the debrief phase of the project not be ignored. This is the time when students, as a whole class, reflect on and receive feedback on both the economic content of the project and the process of solving the problem presented in the scenario. The debrief is in two stages; the first focuses on economics content, and the second focuses on the process of learning in PBL.

Begin the economics content–focused part of the debrief by discussing how the project helped students better understand economics. The discussion could be guided by questions such as:

- After listening to other students' solutions to the problem presented in the scenario, is there anything that you think you left out or would have done differently?
- What new ideas or economic concepts did you learn in this project?
- What economic concepts do you still not understand?

The debrief is a vital opportunity for clarifying any remaining conceptual misunderstandings evident in student work, or correcting inaccurate statements made during presentations. Spend some time after students' presentations clarifying any concepts that are still unclear.

Concepts addressed by this unit include:

- Competition in markets
- Demand
- (Equilibrium) price
- Nonprice rationing
- Price ceiling and shortages
- Scarcity and opportunity cost
- Supply

Economics Content Note: Students must see how competitive markets and their equilibrium price efficiently allocate gasoline. It is consumers competing for gasoline and firms competing for consumers of gasoline that result in this efficiency. If the price of gasoline is "too high," it's because consumers bid it that high in their desire for gasoline or firms can't lower the price any further in their desire for consumers because their cost of producing it is that high. Price controls set the price outside the market, usually because the market-determined price is considered unfair. Because prices are not allowed to change under price controls, consumers cannot bid up the price of gasoline to get more of it and firms cannot produce more of it because of increased cost. A nonprice rationing scheme must be developed to determine who gets gasoline. This content is central to the unit and must be demonstrated in the Op-Ed piece. You should review this content should the Op-Ed pieces reveal that it is not mastered.

Economics Content Note
Students must see how competitive markets and their equilibrium price efficiently allocate gasoline; consumers competing for gasoline and firms competing for consumers results in this efficiency. Price controls set the price outside the market, necessitating a nonprice rationing scheme for allocation. Student Op-Ed pieces must demonstrate mastery of these concepts.

35. Manage student reflection on the 21st-century skills practiced, and the process of learning in PBL.

Students should have a chance to discuss the process of learning in PBL, and to reflect on the 21st-century skills of critical thinking, collaboration, and presentation that they used in the project. This part of the debrief could be done with a series of questions, for example:

- Did you find it to be difficult when there are several possible "right answers" to the Driving Question? Why?
- How does it feel to go through some parts of the project without specific directions, to make some of your own decisions?
- How much do you think you learned in terms of skills like working as a team and making a presentation?

Finally, ask students for feedback on how the project was structured, with questions such as:

- Did you need more resources to help you solve the problem—more lecture time, more readings, more time on the computer?
- Did you need more help in learning how to work together in your group?
- Did you have enough time for each step of the unit?
- Are there any suggestions you would make for improving how the unit is taught?

36. Use the supplied multiple-choice test to assess individual students' knowledge of key economic concepts.

*The multiple-choice test for this unit may be found in the **Teacher Materials**, in "Assessment Tools."*

37. Make notes on adjustments to the unit to improve student learning for the next time the unit is taught.

Teachers inevitably recognize how to make *The Invisible Hand* more effective after they have taught it. We encourage you to note these thoughts quickly, so you can review your ideas for improvement the next time you teach the unit.

Teaching tips

Before a *Project Based Economics* unit is published, it is taught numerous times by experienced high school economics teachers. We include their advice about avoiding potential problems in *The Invisible Hand* below.

- Avoid focusing the unit on the positives of nonprice rationing. If the emphasis changes to the negatives of market economies, curriculum standards targeted for this unit will not be met. *Students must learn that market determined prices are efficient and this lesson will be lost by changing the unit's focus.* Please see other lessons to address the topic of government allocation of goods and services in light of market inequities or failures.

Extensions to the unit

- Consider the following economics content-related extensions:
    - Command economies could be examined by contrasting them with pricing and allocation in market economies
    - The coordination wrought by the "invisible hand" can be linked to circular flow to illustrate how unfettered markets lead to an economic system
    - The discussion of price controls can easily be expanded to include price floors and surpluses
    - "eBay," the online auction website, can be used as an example of market forces working to set prices
    - Students can research economic, social, and political American history as part of their review of price controls used in the past
    - You can initiate a discussion about production and cost, in the petroleum or other industries, by focusing on the J.R. Ewing Op-Ed piece

- You could have students make an oral presentation before the Council of Economic Advisors, in addition to writing the Op-Ed piece. They could make the presentation as a culminating activity, or make it before writing their final draft of the Op-Ed piece, as a way to get feedback on their ideas. You as the teacher could play the role of members of the CEA, or other adults could be brought in to hear presentations—as long as they take their role seriously and are coached by you in how to play it.
- Since the Op-Ed piece students are asked to write is basically a persuasive essay, it would be easy to coordinate this task with English/Language Arts content standards—and find resources from teachers of that subject on how to write persuasively.
- If you want to use the unit to reinforce the graphical tools of demand, supply, equilibrium, price, and price ceilings, tell students that their Op-Ed piece must be accompanied by a graphical analysis at the request of the CEA. If you use this option, make sure that the students' earlier memo showed a solid intuitive understanding of how markets work. If students do not have this understanding, use the Op-Ed piece to reinforce their understanding of market operations.

Economics Review

Unfettered Markets: An Intuitive Approach

This introductory section provides background information and an intuitive approach to free markets. The benchmark lessons that follow offer a more graphical analysis of market operations.

Economists tend to praise competitive markets because the rational and self-interested forces that characterize economic behavior lead not to a permanent state of chaos but to a harmony of interests. Adam Smith articulated this insight in 1776 in his book, *An Inquiry Into the Nature and Causes of the Wealth of Nations*:

> Every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, as he is in this, as in many other cases, led by an invisible hand to promote an end which was not part of his intention. Nor is it always the worse for society that it was no part of it. By pursuing his own interest he frequently promotes that of society more effectively than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good. (p. 423)

Smith felt that the tendency of individuals to act in their own self-interest is a natural law and a natural right that precedes the existence of government. Exercising individual rights in a competitive market creates the greatest good for the greatest number in society. Smith's view, although regarded as a mainstream perspective on capitalism, has been amended to accommodate government provisions of goods when the market fails to provide them in sufficient quantities.

How does this work?

While nobody blames the thermostat (a measure of temperature) for a low temperature, prices (a measure of scarcity) are often blamed when people are not able to obtain a scarce resource. Scarcity is a relationship between desirability and availability—between demand and supply. In a society in which diamonds are highly desired but not available, diamonds are relatively scarce. In a society in which diamonds are not desired and also not available, they are still scarce. A good is scarce whenever people cannot obtain as much of it as they would like without being required to sacrifice something else of value.

If goods are scarce, they must be rationed. Some kind of criterion must be established for discriminating among the claimants as to who gets how much of the good. The criterion could be physical prowess, public esteem, age,

willingness to pay money, or anything else. Under capitalism and a market-based economy, willingness to pay money usually determines who gets the good…but not always:

- Harvard University has many more applicants than it can take as freshmen, so it must ration its admissions. The university discriminates on the basis of high school grades, test scores, recommendations, etc.
- Although many individuals want to be President of the United States, only one person can serve at a given time. We have developed an elaborate election process to discriminate who becomes President.
- Physically attractive women frequently have several men clamoring for their attention. They must, therefore, ration their attentions. They could use athleticism, intelligence, looks, manners, or something else to discriminate between suitors.

Competition is the result of discriminating among the individuals vying for a good. For example, once Harvard announces its criteria for discriminating among applicants, individuals compete for admission to Harvard based on these criteria. *Competition results from scarcity*, and it can be eliminated only with the elimination of scarcity. It is not confined to capitalist societies or to societies that use money.

Whenever scarcity exists, rationing allocates the good according to some criteria for discrimination. Competition is merely what occurs when people strive to meet the criteria used to ration scarce goods.

Nonetheless, the criteria matter. If a society rations on the basis of physical strength, individuals will do strength-enhancing exercises. If a society rations on the basis of *willingness to pay money, individuals will work to earn that money, and those that are able and willing to pay the price will get the good*. Poor people will get less than rich people, which many consider to be unfair. However, with nonprice rationing (distributing goods by means other than price), businesses may sell to customers on the basis of age, sexual preference, personal habits, family size, letters of reference, pet ownership, race or ethnicity, etc. These allocations also may not seem fair, and it is hard to tell who will get goods without price as the rationing device.

Let's look at price as a distributional mechanism. What happens when a good, like gasoline, becomes more scarce? In an unfettered market (i.e., one without interferences), consumers will compete for the remaining gasoline by bidding up its price. If prices are not allowed to rise, rationing criteria other than price will be used. Potential purchasers of gasoline will attempt to discover the new criteria for discriminating among buyers, and they will compete against one another in trying to satisfy the new criteria. Their competition will raise the total price—monetary plus nonmonetary—and will continue raising it until

the quantity demanded no longer exceeds the quantity supplied.

It is almost always in the interest of suppliers (i.e., producers) to raise the monetary price rather than use another rationing device. The owner of a gasoline station, for example, gains nothing if customers have to wait in line 20 minutes to buy gas. Thus, the increased costs to purchasers from nonprice rationing often are not benefits to the seller.

If suppliers cannot raise prices in the face of increasing shortages, they will look for alternative ways to turn the situation to their advantage. For example, gasoline retailers may reduce their daily hours of operation, since they can probably sell all of their supply in a shorter period of time. This may further increase the price—monetary plus nonmonetary costs—of gasoline to buyers. Gasoline retailers may also sell gasoline in an illegal (black) market, in which they can sell it at a higher price.

Price, therefore, serves as an important rationing device in market economies. This is not to say that it is the perfect means of coordinating the production and distribution of goods. Under some conditions monetary prices may not reflect people's preferences adequately. Ignorance, market power, collusive arrangements, disagreements about property rights, and inequalities in society all interfere with the "ideal" operation of the price system and can drive a wedge between price and people's preferences.

Consider other rationing mechanisms and their potential difficulties.

- **Need:** The idea of rationing according to need may be intuitively appealing, but the definition of need is vague, subjective, arbitrary, relative, uncertain, and subject to abuse
- **First come, first served:** Standing in line increases the nonmonetary price paid for the good. This rationing device is appealing to those who have a relatively low opportunity cost of time, such as low-wage workers and retirees.
- **Lottery, or equal shares for all:** While this rationing scheme takes some of the arbitrariness out of rationing, it ignores the differences in individual needs for a good. Does everyone have an equal right to gasoline—even those who do not own a car, or those who are too young to drive?
- **Merit:** Rationing can be based on providing the good to those who deserve it. The problem arises in defining who deserves it. Should a prize be awarded to the person who tries the hardest to obtain it, or to the one who has performed the best?

Nonprice rationing mechanisms also ignore the problem of supply incentives. People produce goods because they want to be rewarded for their efforts. A system for rationing scarce goods that does not provide appropriate rewards

for those who make the goods eventually will fail because most goods simply would not be produced if the producer were not compensated.

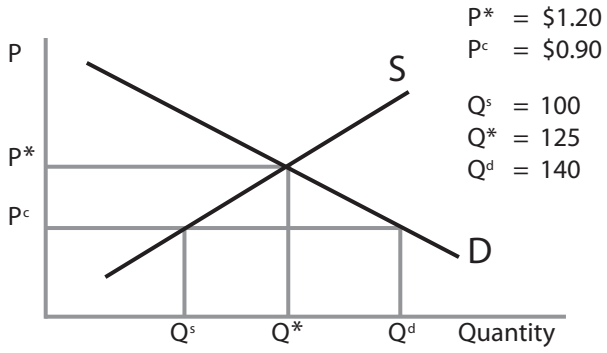
Finally, prices serve as a signal for economizing. Because people can use money to purchase a wide variety of goods and services, a rising price creates an incentive to economize on that good's consumption so other goods and services can be purchased. For example, the rising price of gasoline, in the face of increasing scarcity, signals individuals to economize. They begin looking for ways to reduce usage—through carpools, walking, public transportation, more efficient cars, etc. If the price of gasoline is kept low, say with price ceilings, individuals do not have an incentive to economize, and they will continue to use gasoline at levels consistent with less scarcity.

Price Controls: Price Ceilings and Floors

Sometimes the general public and/or governments feel that the forces of supply and demand result in prices that are either unfairly high to buyers or unfairly low to sellers. In such cases, government may intervene by legally limiting how high or low the price may go.

A Price-Controlled Market: Price Ceilings

A price ceiling is the maximum legal price a seller can charge for a good or service. The rationale for ceiling prices is that they enable consumers to obtain some "essential" good or service that they could not afford at the equilibrium price. (Examples are provided in the Case Studies benchmark lesson.) The figure at right illustrates the effect of one type of price control, price ceilings, on the market.

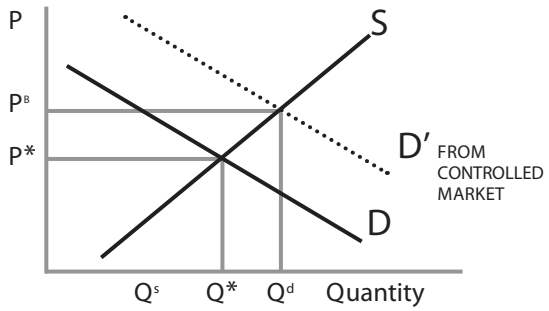


Let's say the market starts in equilibrium. P* is the equilibrium price and Q* is the equilibrium quantity. At P* ($1.20), the quantity demanded by consumers is exactly the same as that supplied by firms, and 125 units will be bought and sold. If price controls establish a ceiling below $1.20 (say $0.90), a shortage will ensue. At a price of $0.90, firms will only supply 100 units of the good, but consumers will be able and willing to pay for 140 units. The government will be faced with the problem of rationing the 100 units among 140 consumers (assuming one consumer per good). As long as price remains below P*, the shortages will continue.

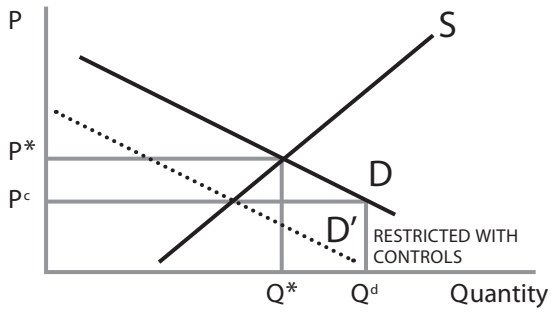
What if a black market exists in which the price of the good is allowed to rise? The consumers who are able and willing to pay a higher price for the good and do not obtain it in the legal market will move into the black market, thereby increasing demand for the good and its price in that market, as the

figure below shows. This move may exacerbate shortages in the legal market if producers can capture the price increase in the black market by moving some of the supply from the lower-price legal market to the higher-price black market. The figure illustrates the effect of a black market on demand.

Black Market



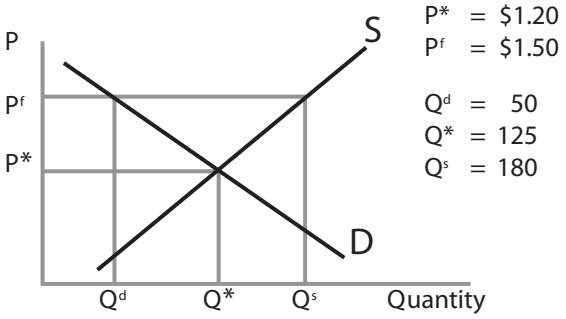
Price-Controlled Market



Once a price control sets price below P* to Pc, some consumers will not be able to obtain the good, effectively reducing demand in the price-controlled market to D′. These individuals will move into the black market (assuming no additional costs are borne with this move), increasing demand for gasoline to D′ in this market—which will increase price to PB above the originally set price of P*.

A Price-Controlled Market: Price Floors

A price floor is a minimum price established by the government that is above equilibrium price. Price floors generally have been invoked when society has felt that the free-functioning market is not providing a sufficient price for the good. Minimum wage legislation and price supports for agricultural products are examples. The figure at right illustrates the effect of price floors on the market.



Let's say the market starts in equilibrium. P* is the established price and Q* is the established quantity. At P* ($1.20), the quantity demanded by consumers is exactly the same as that supplied by firms, and 125 units will be bought and sold. If a price floor is established above $1.20 (say $1.50), a surplus will ensue. At a price of $1.50, firms will supply 180 units of the good, but consumers will only be able and willing to pay for 50 units. The government will be faced with the problem of getting rid of 130 units. As long as price remains above P*, the surpluses will continue. In the labor market, prices are wages and quantities are laborers and 130 workers would be able and willing to work, but employers would not hire them at the legally set wage.

Markets: A User-Friendly Guide

One of the main strengths of economic theory is its ability to provide a general explanation for the way in which price and output are determined, even though each industry has idiosyncrasies that underlie pricing and production.

In general, economists describe four distinct market structures, each with a pricing and output generated from the market forces:

1. Pure competition
2. Monopolistic competition
3. Oligopoly
4. Pure monopoly

The table below briefly describes the characteristics of each of the four markets. Although markets are structured along a continuum and not discrete markets, the typology allows us to illustrate the two key characteristics that underlie movement from the competitive end of the spectrum to the monopoly end: 1) ease of entry into the market, and 2) ease of substituting a firm's product with others. In pure competition, firms freely enter the market, and each firm's product is identical to all others. In pure monopoly, absolute barriers exist to entry of new firms, and the firm's product is unique and has no close substitutes. As a firm moves from a purely competitive market to a monopolistic market, its control over price and profit potential increases.

Characteristic	Pure competition	Monopolistic competition	Oligopoly	Pure monopoly
Number of firms	A very large number	Many	Few	One
Type of product	Homogeneous with other firms	Differentiated	Homogeneous or differentiated	Unique—no close substitutes
Control over price	None	Very limited	Mutual dependence between firms	Considerable
Conditions of entry	No obstacles	Relatively easy	Significant obstacles	Absolute barriers
Nonprice competition	None	Considerable (advertising)	Usually considerable, if product differentiation	Mostly public relations
Typical examples	Agriculture	Apparel	Automobiles	Local utilities

General Characteristics of Firms in Each Type of Market

Pure Competition

Firms operating in a perfectly competitive market face competition from a *large number of firms, all of which have identical products.* However, because so many firms operate in this market, each firm operates independently of the others. All firms in the industry make a standardized (homogeneous) product, and the consumer is indifferent as to which product s/he buys. These characteristics mean that all products in the market have perfect substitutes (e.g., fresh corn), nonprice competition does not exist among the firms (e.g., no advertising to differentiate products), and firms are price takers. Price-taking behavior means that firms have no influence on price and can sell all they want at the going market price. If they try to raise the price of their good, no one will buy it. Instead, consumers will purchase the identical product at a lower price from another firm. No incentive exists for a firm to lower the price, because it can sell all it wants at the going market price. Lowering price would simply decrease total revenue, since the same amount can be sold at the higher price. Firms are free to enter and leave a perfectly competitive market. No legal, technological, or financial (for example) obstacles exist for new firms to enter the market or firms currently in the market to leave.

Monopolistic Competition

Firms operating in a monopolistically competitive market face competition from a *large number of firms, all of which offer a similar but not identical product.* While the "large number of firms" might not be as large as the number in the competitive market, each firm has a small percent of the market (defined as firms producing similar products). With a relatively small market share, firms have relatively little control over market price and cannot collude with other firms on pricing or quantity produced. As a result, firms are not mutually interdependent, and each firm determines its policies without considering or knowing the possible reactions of rival firms.

Oligopoly

Firms operating in an oligopolistic industry face *market domination by only a few firms.* "Few" means that the firms are mutually interdependent, as each firm considers the possible reactions of its rivals to its price, advertising, and production activities. Firms in an oligopolistic market may produce either a homogeneous (e.g., steel) or differentiated (e.g., automobile) product. The critical element is the mutual dependence among firms in the industry, not the nature of the product.

Pure Monopoly

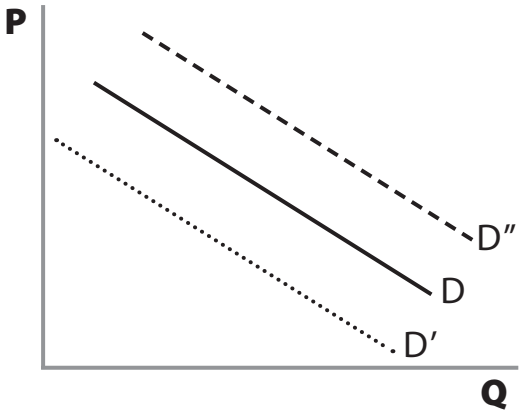
The firm operating in a pure monopoly market is the *only firm in that industry, producing a specific product with no close substitutes*. The firm and the industry are synonymous. Because the monopolist's product is unique, the buyer sees no alternative to purchasing the good and must buy the good from the monopolist or go without it. This uniqueness gives the firm a great deal of control over price. As the only firm operating in the market, the monopolist is responsible for setting the total quantity of the good supplied and then setting the selling price so all of the quantity produced is sold (i.e., it is a price maker). It can change the product's price by manipulating the quantity of product supplied, but it is constrained in setting a price by the downsloping demand curve for its product. Economies of scale and technological or legal barriers (for example) must completely block entry into the industry for monopoly power to exist. Although a monopolist faces no competition from other firms, it still could have an interest in advertising to stimulate demand for its product (e.g., diamonds).

Pricing and Output in Markets

General principles of market operation apply in determining equilibrium price and quantity in all markets. In developing these general principles, we assume that firms maximize profits and that entry into and exit from a market is relatively easy.

A market is an institution or mechanism that brings together "buyers" (those who want the good) and "sellers" (those who make the good). Markets come in all forms. A farmer's roadside stand, retail stores, and the New York Stock Exchange are all examples of firms operating in different markets. In fact, any situation that links potential buyers and sellers constitutes a market. Markets can be local, national, or international. Some markets are highly personal while others are highly impersonal.

One of the most important activities in markets is setting the price of goods. To understand the determination of prices, we must understand the mechanics underlying the decisions of consumers (demand) and producers (supply).



Demand

A demand schedule shows the various amounts of a product that consumers are *willing and able* to purchase at each price (in a series of possible prices) during a specified period of time. We usually look at demand from the vantage point of price because we are interested in how much individuals are able and willing to purchase at a given price. Remember that a

demand schedule does not tell us which price will actually exist. For that, we must combine information from the demand schedule with information from the supply schedule.

The fundamental characteristic of demand is summarized in the law of demand: All else equal, as price falls, the quantity demanded rises (or all else equal, as the price rises, the quantity demanded falls). This law is shown in the demand curve (D) illustrated on the graph at right, in which Price (P) is plotted with Quantity (Q).

What "all else" must be "equal" in order to graph the demand curve plotted here? Basically, there are five determinants of demand, or factors that can shift the demand curve plotted here (i.e., the "equals"). Notice that when demand is shifted outward by one of these factors (D"), more will be sold at each price. When demand is shifted inward (D'), less will be sold at each price. Factors that determine demand are:

1. **Change in buyer tastes:** A favorable change in how buyers perceive the product will increase demand (i.e., shift curve out). A negative change will reduce demand (i.e., shift curve inward).
2. **Change in number of buyers:** An increase in the number of buyers in the market (say people move into an area) will increase demand, while a decrease in the number of buyers will decrease demand.
3. **Change in income:** The impact of income on demand is not straightforward. If a positive relationship between income and demand exists, income increases lead to demand increases. Goods exhibiting these characteristics are called normal goods, and we buy more of them when our income goes up and less of them when our income goes down. Some goods have an inverse relationship between income and demand. These are called inferior goods. As income goes up, demand goes down—and as income goes down, demand goes up. Examples include such things as used clothing, which people often buy only when their income is low.
4. **Change in prices of related goods:** Whether a change in the price of another good increases or decreases a product's demand depends on whether the related good is a substitute or complement. A substitute good is used in place of another good, and a complement good is used in conjunction with it. When goods are substitutes, as the price of one good rises (falls), demand for the other good rises (falls) because people switch from the good with the higher price to the one with the lower price. Air travel on different airlines, and things like butter and margarine, are often viewed as substitutes. Conversely, when goods are complements, as the price of one good rises (falls), demand for the other good falls (rises) because people cut back on consumption of

both (complementary) goods with price changes. Peanut butter and jelly, tennis balls and tennis racquets, and CD players and CDs are often viewed as complementary goods.

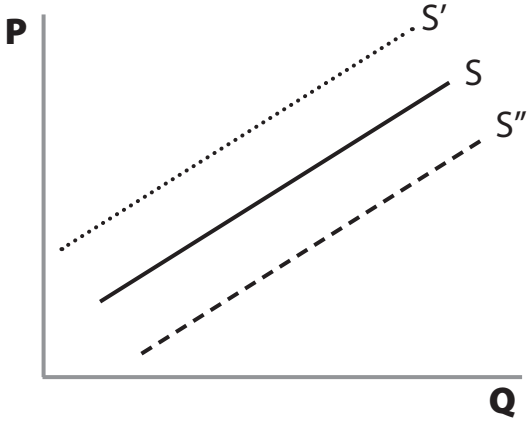
5. **Change in expectations:** Consumer expectations about future prices, product availability, and future income can shift demand. Expectations of higher prices may prompt them to buy now to "beat" the anticipated price increases, or an expected rise of income may induce consumers to be freer in their current spending. Conversely, expectations of lower prices or income may cause consumers to curtail spending in the current period.

Supply

A supply schedule shows the amount firms are *able and willing* to produce (in a series of possible prices) during a specified period of time. We usually look at supply from the vantage point of price because we are interested in how much firms are able and willing to produce at a given price. A positive relationship between price and quantity produced arises because firms are willing to produce more at higher prices than lower prices. They must receive higher prices to produce more because marginal costs generally increase with more produced. (Note: This contrasts to the behavior of consumers, for which price serves as a deterrent to purchasing the good.) All else equal, a firm will make more of a good at a higher price because profits will be greater as the price rises.

Remember, a supply schedule does not tell us which price will actually exist. For that we must combine information from the supply schedule with information from the demand schedule.

A fundamental characteristic of supply can be summarized in the law of supply: All else equal, as price rises, the quantity supplied rises (or all else equal, as the price falls, the quantity supplied falls). This law is illustrated in the supply curve (S) illustrated on the graph at right, in which Price (P) is plotted with Quantity (Q).



What "all else" must be "equal" in order to graph the supply curve plotted above? Basically, there are six determinants of supply, or factors that can shift the supply curve plotted above (i.e., the "equals"). Notice that when supply is shifted outward by one of these factors (S″), more will be produced at each price. When supply is shifted inward (S′), less will be produced at each price. Factors that determine supply are:

1. **Resource prices:** A firm's supply curve is based on its production costs. It follows that a fall in resource prices will lower production costs

and increase supply, and that a rise in resource prices will increase production costs and decrease supply.

2. **Technology:** A technological improvement generally means that fewer resources are needed to produce a given quantity. As a result, production costs decrease and supply increases with technological advances.

3. **Taxes and subsidies:** Firms treat most taxes as costs and most subsidies as revenues. An increase in taxes, therefore, will increase production costs and lower supply, and conversely. An increase in subsidies will lower production costs and increase supply, and conversely.

4. **Prices of other goods:** Changes in the price of other goods can also shift the supply curve if the two products are related in production. For example, if the price of wheat increases, farmers may plant wheat instead of corn. In this case, the products are production substitutes.

5. **Expectations:** The future price of a product can affect a firm's current willingness to supply that product. If price is expected to rise in the future, firms may withhold some of the product to take advantage of expected higher prices, and conversely.

6. **Number of sellers:** The larger the number of suppliers, the greater the amount of the good supplied in the market

Equilibrium

By bringing together supply and demand, we can see how the buying decisions of consumers and the selling decisions of producers determine the price of a product and the quantity bought and sold in the market. Let's examine the market for gasoline in a given time period. The table below gives the schedule of quantity demanded and quantity supplied.

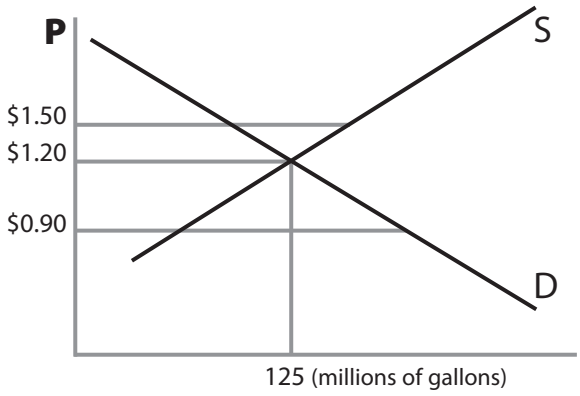
Price	Quantity demanded *(in millions)*	Quantity supplied *(in millions)*	Shortage (-) or surplus (+)	Pressure on price
$ 2.00	40	200	+160	↓
$1.50	100	160	+60	↓
$1.20	125	125	0	0
$1.00	135	110	-25	↑
$ .90	140	100	-40	↑
$ .60	200	25	-175	↑

Of the six possible prices at which gasoline might sell, equilibrium will be reached when 125 million gallons sell for $1.20 per gallon. How did we arrive

at this price? Let's assume that for some reason the price started at $1.50. What happens? SIxty million gallons cannot be sold, and a surplus of gasoline exists. To sell the gas, as opposed to having to dispose of it, the firm will lower the price, knowing that a decrease in price will lead to an increase in quantity demanded. At any price above the market clearing price of $1.20, an excess supply of gasoline (i.e., a surplus) exists and, as a result, firms will lower the price.

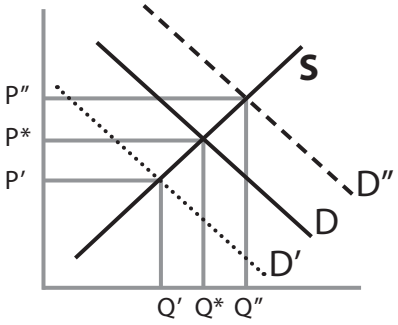
What if price falls below $1.20? At prices below $1.20, shortages exist—more people want gasoline than is being produced. As a result, upward pressure on price occurs as people bid up the price of gas. More simply, some individuals are able and willing to pay a higher price for gasoline (as the quantity demanded column indicates) and will offer to pay more than the price to obtain it. As price rises, fewer people are able and willing to buy gasoline and the shortage lessens.

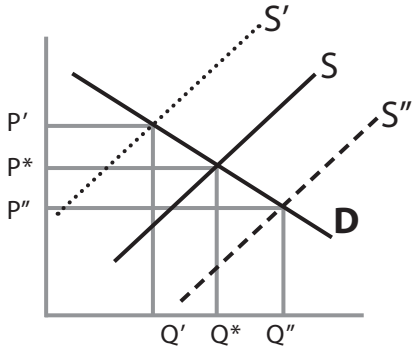
Neither shortages nor surpluses exist at the market clearing price of $1.20. Price has served as the equilibrating mechanism to clear the market. This market is graphically illustrated at right.



Of course, this graph can be used to illustrate only changes in quantity demanded or quantity supplied—movements along the demand or supply curve in response to changes in the price of gas. In the graph, everything but price and quantity is held constant. The equilibrium price will change with changes in either demand or supply—that is, when either the demand or supply curve shifts. When this occurs, it is easy to predict how price and quantity will change.

1. **Demand increase:** Price and quantity will both increase (from P*Q* to P″Q″), as illustrated at right (in D″).
2. **Demand decrease:** Price and quantity will both decrease (from P*Q* to P′Q′), as illustrated at right (in D′).





3. **Supply increase:** Price will decrease and quantity will increase (from P*Q* to P″Q″), as illustrated at right (in S″).
4. **Supply decrease:** Price will increase and quantity will decrease (from P*Q* to P′Q′), as illustrated at right (in S′).

Competition and Free Markets

Remember the characteristics of a competitive market:

1. Very large number of firms in the industry
2. Homogeneous product
3. Price taker
4. Free entry and exit

Because each firm in a competitive market produces a negligible fraction of total industry supply, a firm cannot influence the market price, and supply and demand forces set the equilibrium price. The firm in a competitive market adjusts its output to the market price. It takes this market price as a piece of information and uses it to establish levels of production. This means that the demand curve facing a firm in a competitive market is perfectly elastic at market price, signifying that the firm can sell all it wants at the going market price.

How much will the firm produce? The firm sets its output levels where profits are maximized, which is where total revenue exceeds total cost by the largest amount. At this point, the amount of revenue brought in from the last unit sold (marginal revenue) equals the cost of its production (marginal cost). Should profits exist, more firms will enter the industry and market supply will increase, which will lower price. The lowering of price will decrease a firm's profits. Firms will continue to enter and drive down price as long as profit exists. The entry of firms into the market and reduction of price will eventually eliminate all profits.

What if the price dictated by the market does not cover costs? That is, total revenue never exceeds total cost and losses ensue. In this case, firms will leave the market. As firms exit the market and market supply decreases, price will rise and increase the total revenue for the remaining firms. As firms continue to exit and price continues to rise, losses will be reduced for firms remaining in the market. The exit of firms and increase of price will eventually eliminate all losses.

The entry and exit of firms from the market will eliminate all profits and losses in the long run. As a consequence, firms in a competitive market will not have profits or losses in the long run, although in the short run either could exist. Note that when we say no profit exists, we mean no economic profit exists. Normal profit (i.e., on-the-books profit) exists because economic profit includes a normal return on investment as part of its costs.

Bottom Line on Competition

Advantages

- In the long run, each firm operates at optimum efficiency (i.e., lowest per-unit cost). Resources could not possibly be arranged more efficiently.

- The consumer gets the product at the *lowest possible price*, since competition eliminates all economic profit
- Resources could not be rearranged to produce goods and services that would give consumers more satisfaction

Disadvantages

- Competition may be most efficient at a point in time but not over time. Since profits are eliminated, the competitive firm may not undertake research and development, and therefore a slower rate of technical process will ensue.
- Perfect competition is most efficient only without social costs, social benefits, or economies of scale in the relevant range of production

Competition may produce too much inequality. Too much, of course, is in the eye of the beholder.

Markets With Price Controls: Case Studies

Rent Control in New York City: A Price Ceiling

Since 1943, New York City (NYC) has had a system of rent controls that impose ceilings on rents. The purpose was to establish a rent (the price of an apartment for a month) below the equilibrium level so the poor could better afford a place to live.

In the short run, rent control is likely to transfer income from landlords to tenants. However, rent control can have some very undesirable effects. Shortages result because the quantity of apartments demanded exceeds the quantity supplied. Estimates suggest that NYC now has about a $3 billion shortage of new rental housing, despite a population loss in past decades and the nation's largest government-assisted, middle-income and low-rent public housing programs. It can take a year or more to obtain an apartment in NYC today.

Because the quantity demanded exceeds the quantity supplied for NYC apartments, some device other than price must ration the available apartments. This allows landlords to discriminate in choosing tenants, accept side payments or bribes from those looking for housing, and curtail maintenance. Renters are willing to pay bribes, accept poorer service, and handle maintenance themselves because of the housing shortage. In addition, landlords often try to subdivide apartments, since the rent ceiling on the subdivisions may exceed that of the original apartment.

Studies show that rent controls do keep the cost of housing down for renters **who are able to keep or obtain rent-controlled apartments**. For housing

units built before 1943, the average increase in rents was about 2% per year, and the average increase in landlords' costs was about 6% a year. Not surprisingly, relatively little new housing has been built since rent controls were enacted, and existing housing is often poorly maintained.

Rent Control in California Mobile-Home Parks: A Price Ceiling

Rent-control laws covering mobile-home parks are common in California. A mobile-home park is a tract of land on which pads are rented to residents who live in mobile homes that they own. Once placed on a pad, very few mobile homes are ever moved. The rent-control laws prevent the owners of mobile-home parks from raising rents in accord with increases in their costs. In a case involving the city of Santa Barbara, the U.S. Court of Appeals expressed its concern that these laws have "eviscerated" the property rights of the park owners and given "a windfall to current park tenants at the expense of current mobile-park owners."

Studies have shown that these laws increase the price of mobile homes in communities with price ceilings. In fact, the price of a mobile home tends to be about 32% higher in communities with rent-controlled mobile home parks than in communities without them. (The demand curve for mobile homes is pushed outward, as demand for the homes increases with the reduction in price of a complementary good, the rental of the land, which thereby raises the price of a home.) Once rent-control laws are enacted, mobile-home owners in areas with price ceilings see the value of their mobile homes rise, while the rent paid to park owners falls.

Office of Price Administration and WWII: Price Ceilings

During World War II, the market price of many civilian goods was driven upward as war production created shortages. Tires, gasoline, and many consumer products were exceedingly scarce, and some products disappeared altogether during the war (e.g., new car production ceased after April 1942). The result was that some sellers who possessed products in short supply could and did charge a "high" price—one that the market would bear. Often the selling price was many times over the actual cost. Charges of price gouging were rampant, and many goods went only to those who could and would pay the high prices.

In response, President Franklin D. Roosevelt established a system of price controls to maintain some "equitable" price structure under war-generated shortages. He also established the U.S. Office of Price Administration (OPA) to regulate the price controls. In April 1942, the OPA issued a general maximum-price regulation, making prices charged in March 1942 the ceiling price for most commodities. As real prices continued to rise, the OPA implemented drives to secure compliance. The drives included giving each consumer a small share of a commodity in an effort to reduce the scramble for supply that would produce black markets.

Goods were rationed using unit and point systems. Under the unit system, a ration ticket permitted the consumer to purchase a specified quantity of a rationed good at the fixed monetary price. The coupon was used for most products other than processed foods, meats, and fats, which were rationed under another system. Sometimes shares of the goods were equal, but other times shares were rationed through a complex formula designed to tailor the shares to a consumer's needs (e.g., gasoline).

The point system was used to ration processed foods (the "blue" point system) and meats and fats (the "red" point system). Under point rationing, the consumer received a certain number of points, which could be used to purchase a specified range of rationed commodities that sold at varying point prices. The consumer had to pay controlled money prices for other food products. This gave consumers some choice while also receiving a fair share of the controlled commodity.

Problems with the price controls and rationing abounded. The ration tickets were like currency and were frequently referred to as ration currency. Consequently, ration coupons were counterfeited and sometimes currency was overissued, which led to point inflation or bare shelves. Markets were inefficient. Because prices could not adjust between commodities and regional price variations could not occur, markets could not reallocate supplies and locational shortages developed. Shortages of fluid milk existed in southern and western cities. The northeast was plagued by gasoline shortages, and the west and rural areas witnessed shortages of clothing.

Evasion of the rationing controls became widespread. To suppress evasion, the OPA increased control over the marketplace through injunctions, license suspensions, treble damage suits, and criminal proceedings. The treble damage suit was the most used sanction. However, evasion techniques evolved for commodities, including:

- **Food:** Evasion existed in the form of overcharging of food prices and tie-in sales. Wholesalers complained that meat packers forced them to take a variety of unwanted products along with the more desirable cuts. Quality deterioration or "adulteration" became a serious problem—adding fat to hamburger, reducing the butterfat content of milk, adding cornstarch to spices, stretching coffee with fillers. Upgrading (selling lower quality merchandise as if it were a higher quality) and short-weighting were common.
- **Clothing:** Evasion generally took two forms: quality deterioration and forced upgrading. This was a difficult area to control because clothing is a highly diversified commodity and seasonal changes made it hard to specify prices. In addition, clothing relied heavily on the cotton industry, which had powerful friends in Congress.

- **Shelter:** Despite widespread support for rent controls, evasion was widespread. Owner-occupied housing was not controlled, so rental owners could evict their tenants, sell the property at market price, and have the buyer pay in monthly installments with an extremely slow accumulation of equity. Other forms of evasion included bribes and cash on the side. In 1946, rents in Portland, Oregon, ranged from $38 to $60 a month, plus black market bribes ranging from $5 to $500 to get the apartment and monthly side payments of $10 to $15.
- **Fuel:** Stations frequently would sell gasoline without receiving ration coupons, and counterfeiting of gasoline coupons was common. Quality deterioration, upgrading, short-weighting, tie-in sales, and cash on the side were also common. By January 1945, an estimated one in 16 stations had been sanctioned by the OPA.

At the end of the war, price controls and rationing were gradually abolished. The OPA was finally disbanded in 1947.

Nixon and Wage/Price Controls: Price Ceilings

Rampant inflation in the late 1960s created a need to curb rising prices without economic contraction. Bill Burns, Federal Reserve Chair, believed that wage and price controls could augment monetary policy to achieve this goal. Early in 1970, Congress passed the Economic Stabilization Act, which gave President Richard Nixon the authority to impose price controls. On August 15, 1971, the first phase of wage and price controls began. Wages, prices, and rents were frozen for 90 days, and contradictory fiscal policy measures were implemented. In Phase II, a mandatory system of wage and price controls was developed to allow for controlled adjustments through 1972. Phase III moved toward voluntary controls and a greater reliance on market adjustments, but prices rose rapidly. In June 1973, the administration imposed a 60-day freeze on many wages and prices. Shortages resulted, especially in food products. Phase IV began the decontrol of prices in August 1973; and on April 30, 1974, all wage and price controls were terminated.

Nixon's wage and price controls created supply uncertainties and resource misallocation. They reduced production, which caused even higher prices. For the most part, instead of restraining wages and prices, they reduced the profit margins of businesses. This meant that once controls were removed, catch-up price inflation occurred.

Concept Definitions

The curriculum is designed to teach the following concepts:

Black market: A market in which sellers illegally sell to buyers at higher than legal prices

Demand: Purchases of a good or service that consumers are able and willing to make, given its price and the choices available to them. The law of demand states that a negative (or inverse) relationship exists between price and quantity demanded. That is, as price increases (decreases) the amount of a good purchased decreases (increases). Demand is determined by consumer tastes and income and by the price of other goods. The demand schedule is a table showing the quantities of a good that will be purchased at various prices. The demand curve relates the price of a good and the quantity of the good that individuals are able and willing to purchase. Aggregate demand is the total demand for goods and services in the economy, including households (for consumer goods), firms and government (for investment gods), and other countries (for exports).

Equilibrium price: The price where the quantity demanded and the quantity supplied are equal. The price where neither shortages nor surpluses exist and no incentive exists for prices to rise or fall.

Equilibrium quantity: The quantity at which the amount that buyers are able and willing to purchase exactly equals the amount of the product that sellers will sell. This occurs at equilibrium price.

Market: An arrangement that allows buyers and sellers to exchange things. A buyer exchanges money for a product, while a seller exchanges a product for money.

Market economy: An economic system (method of organization) in which only the private decisions of consumers, resource suppliers, and producers determine how resources are allocated

Nonprice rationing: Controlled distribution of scarce resources, goods, and services by means other than price. Examples include resources or goods being distributed on a particular day or at a particular time through queues (standing in line; coupons; first come, first served; lottery, etc.). Nonprice rationing stands in contrast to price rationing, which means that those with the most money or assets and who want the good the most get it.

Opportunity costs: The real sacrifice involved in achieving something. The value of the next best opportunity that would have to be foregone in order to achieve a particular thing.

Price: The quantity of money (or other goods and services) paid and received for a unit of a good or service. The nominal price of a good is its dollar or other unit) value. The real price of a good is how many other goods must be foregone for its purchase.

Price ceiling: A legally established maximum price for a good or service

Price control: Any legally set price for a good or service

Scarcity: A condition where less of something exists than people would like if the good had no cost. Scarcity arises because resources are limited and cannot accommodate all of our unlimited wants.

Shortage: The amount by which the quantity demanded of a good or service exceeds the quantity supplied at a given (below equilibrium) price

Supply: The amount of a good or service that a firm is prepared to sell at a given price. The firm determines how to supply using its marginal cost curve. Industry supply is a generally the summation of an individual firm's marginal cost curves (in a constant cost industry). The supply schedule is a table showing the amount of a good that will be produced at a given price. The supply curve relates the quantity of a good supplied by a firm (or market) at each price. The law of supply dictates that the curve is upsloping, indicating the more will be produced as the price of the good increases. Aggregate supply is the total amount of the good available for consumption, consisting of both domestically produced goods and services and imports.

Tradeoff: An exchange relationship denoting how much of one good (or resource) is needed to get another good (or resource)

Unfettered market: A market in which buyers and sellers are permitted to carry out transactions based solely on mutual agreement, without intervention from government, except for the simple protection of property rights and enforcement of contracts.

Teachers can also demonstrate the following concepts using this lesson:

Command economy: An economic system (method of organization) in which property resources are publicly owned and central economic planning is used to direct and coordinate economic activities.

Price floor: A legally determined price that is above equilibrium price

Surplus: The amount by which the quantity supplied exceeds the quantity demanded at a given (above equilibrium) price

Assessment Tools

Rubrics

We have provided a rubric for each major product or performance required in this unit. All rubrics may be used as written, or adapted by the teacher to fit particular needs. Rubrics serve two major purposes. First, they provide guidance to students, describing the characteristics of good quality work—and because of this, rubrics should be shared with students while they are preparing how to demonstrate what they have learned. Second, rubrics provide teachers and others with a framework for assessment and feedback.

We have divided our rubrics into three levels of quality. If teachers wish to express these levels on a numeric point scale, we suggest that "Exceeds Standards" equals a 4 or 5, "Meets Standards" equals a 3, and "Does Not Meet Standards" equals a 1 or 2. We intentionally did not include a scoring system based on percentages or letter grades, since evaluation and reporting methods vary greatly among teachers. However, we have suggested what we believe to be the proper weight given to each category, with the emphasis on the application of content knowledge.

The rubrics for each unit do not include extensive detail about the qualities of a good oral presentation, or of good writing and other products such as electronic media. Rubrics for writing and other media products may be found in various print resources and websites, or developed by teachers, schools, and districts.

Sample memo on market operations

MEMO

DATE: *(Month, Day, Year)*
TO: Secretary Singer
FROM: Policy Group
RE: Markets and price ceilings

The price of goods determines how much will be produced by suppliers and how much will be bought by individuals. Producers do the simple calculation: how much will it cost me to make the product, and how much money will it bring in? If the good brings in more money than it costs to make, the firm will make it. If not, the firm will not. Consumers assess the happiness they will get from buying the good against its price. If consumers get more happiness from that good than its price, they will buy it. If not, they will not.

A market is all of these individual decisions put together. If consumers get a lot of happiness from a good, they may be willing to pay more than the price to get it. If there isn't enough of the good, they will pay more than its price to get it. As consumers pay more for the good, firms will make more of it because they can get a higher price. Higher prices indicate that people want more of the good, and firms respond by producing more of it. Lower prices mean that people want less of a good, and firms respond by making less. Because governments cannot know how much people like the good or how much it really costs to produce it, governments cannot know how much of a good should be produced. Only a market-determined price reflects this information.

The bottom line is that a free market works because people and firms agree to a price through a bidding process. People are happy with the price because they can get as much of the good as they want. Firms are happy with the price because they can cover their costs and sell all they produce.

There are no shortages or surpluses in a free market, but the solution may not seem fair to people who cannot afford to pay the price. Setting a price ceiling so more people can afford a good will create shortages, and as a result, something will have to be done to determine who will get the good. People who don't get it at the lower price will not be happy, will think the price is not fair, and will bid up the price in a black market.

The Invisible Hand: Rubric for Memo on Free Markets

Component and the Recommended Value	Exceeds Standards (score 4–5)	Meets Standards (score 3)	Does Not Meet Standards (score 1–2)
Understanding of economics (80%) ***Key points:*** • How free markets allocate scarce goods and services by rationing by price • How price ceilings affect supply and demand • How price ceilings may cause shortages and hurt some consumers	All of the key points are clearly, accurately and completely discussed using sound economic thinking and vocabulary	All of the key points are clearly and accurately discussed while attempting to use economic thinking and vocabulary	The information used is unclear and/or economic thinking may be incorrect; any or all of the key points may be missing or inaccurately discussed
Quality of writing (20%)	Writing is in the proper memo form; uses non-technical language and contains no graphs; tone is entirely appropriate to the audience.	Writing is in the proper memo form; it contains no graphs and for the most part uses non-technical language; tone is for the most part appropriate to the audience.	Writing is not in the proper memo form; it may use technical language and contain graphs; tone is not appropriate to the audience.
	Writing is free of significant errors in mechanics and grammar; ideas are well organized and clearly understandable. Describes the problem clearly, accurately.	Writing has few significant errors in mechanics and grammar; ideas are for the most part organized and understandable.	Writing has several significant errors in mechanics and grammar; ideas are not clearly organized and/or understandable.

The Invisible Hand: Rubric for Op-Ed Piece on Gasoline Price Control Policy

Component and the Recommended Value	Exceeds Standards (score 4–5)	Meets Standards (score 3)	Does Not Meet Standards (score 1–2)
Understanding of the problem (10%) ***Key aspects:*** • The need to create a policy on price controls and allocating gasoline in response to Congressional action • The need to write a persuasive op-ed piece to convince the public of the wisdom of the policy	Describes the problem clearly, accurately and completely in terms of all key points.	Describes the problem clearly and accurately in terms of all key points.	Does not describe the problem clearly or accurately in terms of some or all key points
	Solution to the problem is completely consistent with the scenario as presented; the parameters of the problem have not been altered and/or facts "made up" to avoid grappling with key aspects of economics.	Solution to the problem is generally consistent with the scenario as presented; the parameters of the problem have not been altered significantly and/or facts "made up" to avoid grappling with key aspects of economics.	Solution to the problem is not consistent with the scenario as presented; the parameters of the problem may have been altered and/or facts "made up" to avoid grappling with key aspects of economics
Understanding of economics (70%) ***Key points:*** • The negatives that arise for the market if price controls are set • The costs and benefits of price controls and of prices set in the free market • How a price ceiling set above equilibrium lets the market determine price • Identification of winners and losers under the proposed policy	Clear and accurate economic thinking and vocabulary are used to demonstrate an understanding of how prices are determined; all of the key points are discussed in detail	Clear and accurate economic thinking and vocabulary are used to demonstrate an understanding of how prices are determined; most of the key points are discussed in some detail	Economic thinking and vocabulary, if used, are unclear and/or inaccurate; most or all key points are not discussed
Quality of writing (20%)	Writing is highly persuasive; it defends the policy with precise and relevant evidence	Writing is generally persuasive; it defends the policy with relevant evidence	Writing is not persuasive; it does not defend the policy with relevant evidence
	Writing is in the proper Op-Ed piece style; uses non-technical language; tone is entirely appropriate to the audience	Writing is in the proper Op-Ed piece style; uses non-technical language; tone is generally appropriate to the audience	Writing is not in the proper Op-Ed piece style; may use technical language; tone is not appropriate to the audience
	Writing is free of significant errors in mechanics and grammar; ideas are well organized and clearly understandable	Writing has few significant errors in mechanics and grammar; ideas are for the most part organized and understandable	Writing has several significant errors in mechanics and grammar; ideas are not clearly organized and/or understandable

Test for *The Invisible Hand*

Answer Key

The following questions are taken from William B. Walstad and Ken Rebek, *Test of Economic Literacy* (3rd edition) 1987. NY: National Council of Economics Education.

1. Business firms wish to sell their products at high prices. Households wish to buy products at low prices. In a market economy this conflict of interest is resolved by:
   - A lawsuits
   - B government
   - (C) competition
   - D collective bargaining

2. A newspaper reports that the price of gasoline increased and the quantity sold decreased. In a competitive market, this situation would most likely be the result of:
   - A an increase in demand
   - B an increase in supply
   - C a decrease in demand
   - (D) a decrease in supply

3. Why do medical doctors generally earn more than farmers?
   - A Medical doctors are more efficient than farmers.
   - B Medical doctors provide a service rather than make a product.
   - C There are fewer medical doctors than farmers in our economy.
   - (D) Medical doctors are scarcer, given the demand for their services.

4. In a competitive market, the price of a product is $5.00. If the government passes a law that sets a minimum price of the product at $6.00, this change will result in:
   - (A) a surplus of the product
   - B a shortage of the product
   - C a decrease in the supply of the product
   - D an increase in the demand for the product

5. Which would most likely increase the quantity of gasoline sold in a competitive market?
   - A an increase in the price of crude oil
   - (B) a decrease in the price of automobiles
   - C a decrease in the income of consumers
   - D an increase in taxes on gasoline products

6. In a competitive market, the price of shoes is likely to be increased by:
   - (A) a decrease in the supply of shoes
   - B a decrease in the demand for shoes
   - C more capital investment in shoe factories
   - D new machines reducing the cost of shoe production

The following questions are are from Matthew Martin, Turley Mings and Diane Swanson, *Teaching and Testing from the Study of Economics: Principles, Concepts and Applications* (5th edition) 1995. Guilford, Connecticut: Dushkin Publishing Group/Brown and Benchmark Publishers.

7. What is meant by the statement, "Resources are scarce"?

   A Resources are hard to find.
   (B) Resources are limited relative to human wants.
   C Nobody owns resources.
   D Resources must be produced.

8. When economists say, "There is no such thing as a free lunch," they are referring to the fact that:

   A costs increase instead of remaining constant
   (B) everything has a cost
   C efficiency today might lead to reduced growth in the future
   D tradeoffs are necessary in order to eliminate scarcity

9. Some people in the United States are very wealthy, while some people are very poor. This statement reflects the way in which the U.S. economy has answered which of the following basic economic questions?

   (A) for whom to produce
   B how to produce
   C how much to produce
   D what to produce

10. Which of the following is a ***true*** statement about economic and socioeconomic goals?

    (A) There is less agreement about which socioeconomic goals are desirable.
    B There is more agreement about which socioeconomic goals are desirable.
    C Socioeconomic goals are easier to attain.
    D Socioeconomic goals are more difficult to attain.

11. Which types of economic systems must contend with the three basic economic problems of what, how, and for whom to produce?

    A market economies
    B centrally directed economies
    C traditional economies
    (D) all of the above

12. An economic system primarily dependent upon the actions of independent buyers and sellers is called a:

    A market economy
    B free enterprise economy
    C capitalist economy
    (D) all of the above

13. When goods that people want are in short supply, market economies ration the available goods by _____ and command economies ration them by _____.
    - A "first come, first served"; government orders
    - B adjusting prices; adjusting prices
    - (C) adjusting prices; making people wait in lines
    - D making people wait in lines; government orders

14. A centrally directed economy differs from a market economy:
    - A in the types of economic decisions that must be made
    - B in the degree of interdependence in the economy
    - (C) in the way that economic decisions are made
    - D all of the above

15. What do capitalistic economies depend upon for the allocation of resources and finished products?
    - A central agencies
    - (B) the price system
    - C tradition
    - D state and local governments

16. A market economy uses the price system to answer which of the basic economic questions?
    - A for whom to produce
    - B what to produce
    - C how to produce
    - (D) all of the above

17. Which of the following must exist in order for a market economy to work?
    - A People must follow their self interest.
    - B People must be motivated to make a profit.
    - C People must be free to buy and sell as they choose.
    - (D) all of the above

18. Which is a ***false*** statement about a market economy?
    - A A decrease in price generally results in a decrease in production.
    - B A rise in price is generally an incentive to produce more.
    - (C) Goods and services in short supply are rationed on the equitable basis of "first come, first served."
    - D Different sellers must compete with one another to sell their goods to consumers.

19. One socioeconomic goal that must be achieved in order for a market economy to work well is:
    - A an equitable distribution of income
    - B job security for workers
    - (C) economic freedom for people to choose what they want to buy and sell
    - D full employment

20. Why are butchers motivated to produce hamburger in a market economy?
    - A because consumers like hamburgers
    - B because butchers have always produced hamburgers
    - (C) because butchers can make profits by selling hamburger
    - D because government regulations require a certain amount of hamburger to be made

21. In what way does a market economy provide answers to the three basic economic questions?
    - A through collective decision making by buyers and sellers
    - B through government directives to buyers and sellers
    - C through the actions of individual buyers and sellers motivated to do what is best for society
    - (D) through the actions of individual buyers and sellers motivated to do what is best for themselves

22. The lure of profits determines what gets produced in which kind of economic system?
    - (A) a market economy
    - B a traditional economy
    - C a command economy
    - D all of the above

23. Why are goods and services produced in a market economy?
    - A because people need goods and services
    - B because people have unlimited wants for goods and services
    - (C) because people want to make profits for themselves
    - D because of tradition and institutions

24. In a market economy, the opportunity to make a profit for providing a good or service is called
    - A an inducement
    - B a reinforcement
    - (C) an incentive
    - D a motive

25. How does a market system resolve the problem of shortages?
    - (A) Shortages will result in higher prices, which will provide an incentive for more production.
    - B Shortages will result in lower prices, which provide an incentive for consumers to buy other goods not in short supply.
    - C Shortages of one good will always be balanced by surplus supplies of other goods.
    - D Goods are rationed equitably by "first come, first served."

26. The price at which buyers are just willing to buy the same amount that sellers are willing to sell is called
    - A the just price
    - B the balanced price
    - (C) the equilibrium price
    - D the going price

27. If the price of oranges is below the equilibrium price, then which of the following is a ***true*** statement?

    A There will be a surplus of oranges, and the price of oranges will fall.
    B There will be a surplus of oranges, and the price of oranges will increase.
    C There will be a shortage of oranges, and the price of oranges will fall.
    (D) There will be a shortage of oranges, and the price of oranges will increase.

28. If the price of beef is above the equilibrium price, then which of the following is a ***true*** statement?

    (A) There will be a surplus of beef, and the price of beef will fall.
    B There will be a surplus of beef, and the price of beef will increase.
    C There will be a shortage of beef, and the price of beef will fall.
    D There will be a shortage of beef, and the price of beef will increase.

29. Which of the following is a ***true*** statement?

    A A freely competitive market will result in either surpluses or shortages unless government price controls are used.
    (B) In a freely competitive market, prices will adjust to remove surpluses or shortages.
    C When the price of a product is too high, shortages will result.
    D The only way to eliminate surpluses is to allow prices to increase to equilibrium.

30. Many city governments impose rent controls on apartment owners, keeping the price of an apartment below the equilibrium price. Which of the following will result from the policy of rent control?

    A a surplus of apartments
    (B) a shortage of apartments
    C a decrease in the demand for apartments
    D an increase in the supply of apartments

31. An important characteristic of an equilibrium price is that it:

    A maximizes profits
    B increases surpluses
    (C) clears the market
    D does not depend on supply or demand

32. Which of the following causes competitive markets to move toward an equilibrium price?

    A supply changing to meet demand
    B consumers switching to complements and substitutes in reaction to price changes
    C government price controls
    (D) buyers and sellers reacting to shortages and surpluses

33. The author of *The Wealth of Nations* was:

    A Milton Friedman
    (B) Adam Smith
    C Karl Marx
    D Alexander Hamilton

Transcript of Voicemail From Les Singer

(Total running time: two minutes)

Voice of Les Singer, Secretary, Department of Energy:

Hi, Bill. Les Singer here. I'm really pleased to have you on board as head of my Policy Group. I know you just finished an assignment working for Congress, spearheading the Energy Committee's gas price control legislation—and several members of Congress have told me that your work was critical in getting that bill passed. While the legislation is supposed to help ease the strain of high gas prices, the Department of Energy now needs to figure out the details. I'm counting on your group in a big way. As head of the Department I know how to run a large bureaucracy, but I really don't know much about setting the price of gas. I know how important gas is to our economy, but not much else. So here's where I need your help.

The legislation says that we have to set the price of gas and make sure high-priority users get the gas they need. I'm not sure exactly how this all works, but I'm told there could be distributional concerns that come with a ceiling on the price of gas, and this sure looks likely. I'm already getting phone calls from people who are worried that a price ceiling will produce shortages and not everyone who wants gas will be able to get it.

Here's what I'm thinking. If price controls will produce gas shortages, then we might want to set prices based on who we think should get gas. Let's set the price of gas so that high-priority groups can get all the gas they want, medium-priority groups can get most of the gas they want, and low-priority groups will get any gas that is left. Of course, this means we will have to do some ranking to see who should have priority.

I'll forward a sampling of phone calls we've been getting from groups of consumers who want gas. I'll also fax over a worksheet I designed to help with the ranking. The worksheet has 25 points to allocate among groups who have expressed their concerns. If there is anyone else who you think should be included, please add them to the list. With this point scheme we'll be able to see at a glance who should get gas, and who might not get it. Let's discuss your rankings when I get back.

I'm sorry I can't be there to welcome you aboard in person, but the President needed me to give a speech in Guadalajara—sure wish I'd taken Spanish in high school!

Transcripts of Voicemail Messages

(Total running time: 11:25)

Les Singer, Secretary, U.S. Department of Energy

Bill. Les here. I'm forwarding the voicemails I promised your group. I guess these people heard all the scare stories during the debate over the gas price-control legislation. They all seem very concerned about rationing with price controls. If they're right that price ceilings will cause gas shortages, then we need to figure out a priority ranking for who should get gas. I'll fax over the worksheet to help us decide this. Would you listen to why these folks think they should get gas, and see if you agree?

Jimmy Hoffman, President, Meadowlands Trucking

Yes, Secretary Singer. I'm Jimmy Hoffman, president of the Meadowlands Trucking Company. Truckers are really happy about having price controls on gas. We were operating at huge losses when gas topped $5 a gallon. But I'm a little worried that the price ceilings my congressman talked about might cause shortages of diesel fuel. I hope you will make sure that truckers get all the fuel they need—otherwise we won't be able to move consumer goods across the country. Trucking will diminish—maybe even disappear—if we can't get gas cheaply. And, if trucks don't roll, the world won't spin.

Joe Gannon, Police Sergeant, LAPD

Hello, this is Sergeant Joe Gannon of the Los Angeles Police Department. I'm calling to remind you that public safety will become a critical concern when price ceilings result in gas shortages for our police cars, fire trucks, and ambulances. Cities will become unmanageable. Crime will increase if police don't have gas to patrol neighborhoods and get to crime scenes quickly. Lives and property will be lost if fire trucks can't get to a fire. And people will die if ambulances can't be driven to the hospital. It's obvious—public safety vehicles require the highest priority for gasoline.

Eve Tamar, parent

Hello, Secretary Singer. I'm Eve Tamar and I've never called a Cabinet member in my life, but the thought of price controls on gas has me quite concerned. I have a son who plays sports and a daughter who does a lot of community service. These activities make them well-rounded high school students and good citizens. I cannot tell you how important it is to have the gas to drive them around so they can continue these activities. I appeal to you, as a parent, Secretary Singer, to give parents the gas we need to drive our children to and from school and after-school activities.

Maddy Washington, teen

Hi. I'm Maddy Washington and I go to Fairmont High School and work at Bennie's Burgers after school and during the summer. I think the new policy to have gas sell for $1.50 a gallon is wonderful. I'd love to go on road trips with my friends, but I can't afford to go until you

make gas cheap. My Economics teacher tells me that lots of people are against price controls because they think they will not be able to get gas or they may have to stand in line to get it. But who cares? I think standing in line for gas is a good way to meet people. After all, we have to stand in line to get groceries, don't we?

Arnold Ziffel, farmer

Howdy Secretary Singer. This is Arnold Ziffel and I own a 500-acre farm in Minert, Missouri. I'm really worried about being able to get gas with price controls. Our tractors, combines, and balers all need gas so we can plant and harvest our crops, and our trucks need gas for hauling. If you thought people complained when food prices were high because gas cost $5 a gallon, wait until you hear what happens when they can't get food because farmers can't get gas!

Christina Lopez, Director, local community-based organization

Hello, this is Christina Lopez and I run a community-based organization that provides services to the working poor. I am happy to see the price ceiling being placed on gasoline. It will allow many of my clients to afford gas to get to job interviews, buy groceries, and do all the other things that driving a car allows people to do. We finally have a fair price for gas. Now let's make a fair decision about who gets the gas, and relieve low- income people from the burden of having to rely on public transit.

Fiori Packart, Chief Executive Officer, Hew Production

Hi Les. Fiori Packart of Hew Production. Are we really getting price controls on gasoline? Amazing. I hope you realize what problems a nonprice rationing system would create for business. If we can't get gas and other petroleum products we will not be able to maintain current production levels. And if we have to pay the high prices for gas that will be available in the black market, we will still have to cut back production because our costs will increase. As you know, production cutbacks will mean downsizing our workforce. Layoffs are NOT something the economy can afford right now. Remember, "the business of America is America's business," and corporate America must be a top priority when it comes to gasoline-related products.

Henry Edsel, hybrid car producer

Les, Henry Edsel here. Great news about the price controls. You may remember that I produce hybrid cars, so I think price controls are an excellent way to make people see the need for cars that use less gas. If you set the price of gas ***real*** low, there will be a ***huge*** shortage. Then give drivers of hybrid cars all the gas they want, and people will start buying hybrid cars! Sure, my company benefits—but so will the environment!

Helen Moses, senior citizen

Good afternoon Secretary Singer. My name is Helen Moses. I am 84-years-old and remember when your grandfather was our congressman and our gas was cheap. Those were the glory days. We small town residents could easily drive to the big city to get things like medical care. Now I don't know what to think about price controls on gas. I had to cancel my last doctor's

visit because I couldn't afford the gas, but my son says that I won't even be able to get gas once there are price controls. Ever since Valley Care Medical Center closed, it has been really hard for seniors out here to get to the doctor. Secretary Singer, please give senior citizens some gas.

Ted Tilton, Chief Operating Officer, Amalgamated Airlines

Les, Ted Tilton, Amalgamated Airlines. As you know, U.S. airlines are a $110 billion industry that can be grounded in a nanosecond without gasoline. Price controls could easily destroy our ability to get the gas we need to fly our planes. And without major airlines providing transportation, business travel will come to a halt and families will not be reunited at holidays. Ground small planes if you wish, but grounding the major airlines will stifle the country's economy.

Victor Tran, Director, Manhattan Transit Authority

Hi, this is Victor Tran at the Manhattan Transit Authority. I'd like to say, public transit brings hundreds of thousands of people to work, school, and leisure activities across the nation in a fuel-efficient way. It allows people to reduce their gas consumption and helps make the air cleaner. Public transit is a necessity for many people who cannot afford other means of transportation. Please put price-controlled allocations to good use. Give public transit agencies all the gas they want—and force people to curtail their use of private automobiles.

Imelda Guzman, long-distance commuter

Hello, my name is Imelda Guzman, and I'm president of the Highland Homeowners Association in Bellingham, Washington. I strongly supported price controls to lower the price of gasoline, because I commute 85 miles a day to get to and from work. My family and I were struggling to pay our monthly bills when gasoline was $5 a gallon. But of course, if I can't get gas with price controls, I'll lose my job because I can't get to work. If I can't work we'll lose our home. Workers need gas and you need to make sure we can get it.

Jamal Hayward, 23-year-old worker

Hello, I'm Jamal Hayward and I graduated from high school about five years ago. I'm currently working on my bachelor's degree at night, and I work at the Federal Reserve Bank during the day. I like my job and I'll be able to advance in my career once I have my bachelor's degree. I need my car to get to work and then school. Please make sure I can get gas. My career is ahead of me. Please don't take it away.

Name: _____ Date: _____

Point Allocation Chart

Bill and Group,

Please allocate 25 points among these consumers. More points means they should get more gas. Zero points means no gas. Feel free to add others to the list, but don't take anyone away. We can discuss when I get back. — Les

Group	Why They Need Gas	Points	Reason for Priority
Truckers			
Public safety			
Parents			
Teens			
Farmers			
Low-income workers			
Businesses			
Hybrid-car drivers			
Senior citizens			
Airlines			
Public transit			
Long-distance commuters			
Workers/students			
Other 1:			
Other 2:			
Other 3:			
Total		**25**	

Memo From Les Singer and Op-Ed Piece

United States Department of Energy

Office of the Secretary

Telephone: 202.555.1212

Fax: 202.555.1213

MEMORANDUM

To: Policy Group
Office of Secretary Les Singer
From: Les Singer, Secretary, DOE
Subject: Price Control Problems?

There seems to be a lot of concern about price controls. A group of reporters stopped me today to ask about J.R.'s Op-Ed piece in the oil industry's rag. They asked me if I knew how markets operated and if DOE would intentionally set prices so low that it would cause shortages in the gasoline market. I was able to make light of their questioning with a joke, but I must be prepared immediately for answering their questions.

I need a detailed memo that explains why J.R. would say that price ceilings "prevent the laws of supply and demand from operating." I need to understand what is so efficient about letting the market set the price of gasoline and why price ceilings might produce shortages and hurt some people.

Feel free to use some of those graphs you like if you want, but I also need you to explain the effects of markets and price controls in plain English.

I can't leave the building until I am armed with this information. Actually, you can't leave either, seeing as there are six reporters sitting in our lobby. Please get the memo to me by the end of the day.

Attachment

OIL EXPRESS

A TRADE PAPER OF THE OIL, GAS, AND PETROLEUM INDUSTRY

OPINION

The U.S. Department of Energy—headed by none other than that puppet-of-the-President, Les Singer — is now deciding how to implement price control legislation just passed by Congress and signed by the President. Implementing this legislation in the wrong way will destroy the capitalistic spirit in this country by preventing the laws of supply and demand from operating.

It is true that price controls would lower the price of gasoline. But they would also eliminate production of 90 percent of the world's gasoline. Consider how they resulted in rationing of goods during World War II and gas shortages in the 1970s.

What Mr. Singer may not realize is that price reflects the cost of getting gas to consumers. If oil producers do not get paid enough to cover their costs of production, they will not pump oil and no one will have gas.

Mr. Singer has talked about setting the price of gas at the alarmingly low rate of $1.50 a gallon. At this price, oil producers will not engage in horizontal drilling or inject carbon dioxide into the subsurface for additional oil production.

Although these techniques can cost twice as much as traditional wells, they produce far more oil. Without the use of these newer technologies, oil production will be cut back by about 35 percent.

Our economy works because prices tell us what to buy and produce. In 1776, Adam Smith described how this mechanism produced *The Wealth of Nations*:

> *It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest... (Man is) led by an invisible hand to promote an end which was no part of his intention.*

Smith is saying that if you want to have gas in your car, you have to pay a price that will compensate the producer's efforts.

Only free markets can determine that price. Government bureaucrats cannot.

J.R. Ewing is President and CEO of Ewing Oil and Gas.

Transcript of Final Voicemail From Les Singer

(Total running time: 2:15)

Voice of Secretary Les Singer

Bill, Les Singer again. Thanks for your group's background work on markets. That really helped me sort through some issues about free markets and price-controlled markets. I guess price controls may be fair, but free markets are efficient. The old tradeoff between equity and efficiency is a real dilemma.

Anyway, we've got to announce, quickly, our policy on price controls and allocating gas. I suggest that your group make this your number-one priority. We plan on explaining our policy to the general public in an Op-Ed piece, which will appear in several major newspapers and wire services next week, so please write it in that form.

Since the legislation only says that we must set a price ceiling on gas and determine the rules for its allocation, we have some leeway in what we can do. So you will need to decide whether we will have a policy that sets the price ceiling below market or above market level—and then decide how to determine who gets gas. That was sharp thinking when you pointed out to me that a price ceiling set above equilibrium lets the market determine price. I wouldn't have thought of that.

Once the public sees the Op-Ed piece and accepts our decision, the DOE Implementation Group will determine the exact price and set the allocation plan into motion. Remember, we must gain public support with our Op-Ed piece, and this can only be done by showing that our policy is grounded in a clear understanding of how both unfettered and price-controlled markets work.

So, to sum things up, your job is to use the Op-Ed piece to persuade the public of the wisdom of our policy—regardless of whether we set the price of gasoline above or below equilibrium. You'll need to justify our policy decision, outline the plans for allocating gas, and identify winners and losers.

Because the President knows that I do not have a strong background in economics, he has requested that the Council of Economic Advisors approve the piece before it goes to print. Given this extra step in getting our policy out to the public, I will need to see your piece in two days. Just so you know, my head is on the block here, and if the Op-Ed piece does not convince the Council of our price-control policy, I will have to take some of my staff down with me.

Name: _____ Date: _____

Test for *The Invisible Hand*

Please circle the letter of your answer.

1. Business firms wish to sell their products at high prices. Households wish to buy products at low prices. In a market economy this conflict of interest is resolved by:

   A lawsuits
   B government
   C competition
   D collective bargaining

2. A newspaper reports that the price of gasoline increased and the quantity sold decreased. In a competitive market, this situation would most likely be the result of:

   A an increase in demand
   B an increase in supply
   C a decrease in demand
   D a decrease in supply

3. Why do medical doctors generally earn more than farmers?

   A Medical doctors are more efficient than farmers.
   B Medical doctors provide a service rather than make a product.
   C There are fewer medical doctors than farmers in our economy.
   D Medical doctors are scarcer, given the demand for their services.

4. In a competitive market, the price of a product is $5.00. If the government passes a law that sets a minimum price of the product at $6.00, this change will result in:

   A a surplus of the product
   B a shortage of the product
   C a decrease in the supply of the product
   D an increase in the demand for the product

5. Which would most likely increase the quantity of gasoline sold in a competitive market?

   A an increase in the price of crude oil
   B a decrease in the price of automobiles
   C a decrease in the income of consumers
   D an increase in taxes on gasoline products

6. In a competitive market, the price of shoes is likely to be increased by:

   A a decrease in the supply of shoes
   B a decrease in the demand for shoes
   C more capital investment in shoe factories
   D new machines reducing the cost of shoe production

7. What is meant by the statement, "Resources are scarce"?

   A Resources are hard to find.
   B Resources are limited relative to human wants.
   C Nobody owns resources.
   D Resources must be produced.

8. When economists say, "There is no such thing as a free lunch," they are referring to the fact that:

   A costs increase instead of remaining constant
   B everything has a cost
   C efficiency today might lead to reduced growth in the future
   D tradeoffs are necessary in order to eliminate scarcity

9. Some people in the United States are very wealthy, while some people are very poor. This statement reflects the way in which the U.S. economy has answered which of the following basic economic questions?

   A for whom to produce
   B how to produce
   C how much to produce
   D what to produce

10. Which of the following is a ***true*** statement about economic and socioeconomic goals?

    A There is less agreement about which socioeconomic goals are desirable.
    B There is more agreement about which socioeconomic goals are desirable.
    C Socioeconomic goals are easier to attain.
    D Socioeconomic goals are more difficult to attain.

11. Which types of economic systems must contend with the three basic economic problems of what, how, and for whom to produce?

    A market economies
    B centrally directed economies
    C traditional economies
    D all of the above

12. An economic system primarily dependent upon the actions of independent buyers and sellers is called a:

    A market economy
    B free enterprise economy
    C capitalist economy
    D all of the above

13. When goods that people want are in short supply, market economies ration the available goods by _____ and command economies ration them by _____.

    A "first come, first served"; government orders
    B adjusting prices; adjusting prices
    C adjusting prices; making people wait in lines
    D making people wait in lines; government orders

14. A centrally directed economy differs from a market economy:

    A in the types of economic decisions that must be made
    B in the degree of interdependence in the economy
    C in the way that economic decisions are made
    D all of the above

15. What do capitalistic economies depend upon for the allocation of resources and finished products?

    A central agencies
    B the price system
    C tradition
    D state and local governments

16. A market economy uses the price system to answer which of the basic economic questions?

    A for whom to produce
    B what to produce
    C how to produce
    D all of the above

17. Which of the following must exist in order for a market economy to work?

    A People must follow their self interest.
    B People must be motivated to make a profit.
    C People must be free to buy and sell as they choose.
    D all of the above

18. Which is a ***false*** statement about a market economy?

    A A decrease in price generally results in a decrease in production.
    B A rise in price is generally an incentive to produce more.
    C Goods and services in short supply are rationed on the equitable basis of "first come, first served."
    D Different sellers must compete with one another to sell their goods to consumers.

19. One socioeconomic goal that must be achieved in order for a market economy to work well is:

    A an equitable distribution of income
    B job security for workers
    C economic freedom for people to choose what they want to buy and sell
    D full employment

20. Why are butchers motivated to produce hamburger in a market economy?

A because consumers like hamburgers
B because butchers have always produced hamburgers
C because butchers can make profits by selling hamburger
D because government regulations require a certain amount of hamburger to be made

21. In what way does a market economy provide answers to the three basic economic questions?

A through collective decision making by buyers and sellers
B through government directives to buyers and sellers
C through the actions of individual buyers and sellers motivated to do what is best for society
D through the actions of individual buyers and sellers motivated to do what is best for themselves

22. The lure of profits determines what gets produced in which kind of economic system?

A a market economy
B a traditional economy
C a command economy
D all of the above

23. Why are goods and services produced in a market economy?

A because people need goods and services
B because people have unlimited wants for goods and services
C because people want to make profits for themselves
D because of tradition and institutions

24. In a market economy, the opportunity to make a profit for providing a good or service is called

A an inducement
B a reinforcement
C an incentive
D a motive

25. How does a market system resolve the problem of shortages?

A Shortages will result in higher prices, which will provide an incentive for more production.
B Shortages will result in lower prices, which provide an incentive for consumers to buy other goods not in short supply.
C Shortages of one good will always be balanced by surplus supplies of other goods.
D Goods are rationed equitably by "first come, first served."

26. The price at which buyers are just willing to buy the same amount that sellers are willing to sell is called

    A the just price
    B the balanced price
    C the equilibrium price
    D the going price

27. If the price of oranges is below the equilibrium price, then which of the following is a ***true*** statement?

    A There will be a surplus of oranges, and the price of oranges will fall.
    B There will be a surplus of oranges, and the price of oranges will increase.
    C There will be a shortage of oranges, and the price of oranges will fall.
    D There will be a shortage of oranges, and the price of oranges will increase.

28. If the price of beef is above the equilibrium price, then which of the following is a ***true*** statement?

    A There will be a surplus of beef, and the price of beef will fall.
    B There will be a surplus of beef, and the price of beef will increase.
    C There will be a shortage of beef, and the price of beef will fall.
    D There will be a shortage of beef, and the price of beef will increase.

29. Which of the following is a ***true*** statement?

    A A freely competitive market will result in either surpluses or shortages unless government price controls are used.
    B In a freely competitive market, prices will adjust to remove surpluses or shortages.
    C When the price of a product is too high, shortages will result.
    D The only way to eliminate surpluses is to allow prices to increase to equilibrium.

30. Many city governments impose rent controls on apartment owners, keeping the price of an apartment below the equilibrium price. Which of the following will result from the policy of rent control?

    A a surplus of apartments
    B a shortage of apartments
    C a decrease in the demand for apartments
    D an increase in the supply of apartments

31. An important characteristic of an equilibrium price is that it:

    A maximizes profits
    B increases surpluses
    C clears the market
    D does not depend on supply or demand

32. Which of the following causes competitive markets to move toward an equilibrium price?

A supply changing to meet demand
B consumers switching to complements and substitutes in reaction to price changes
C government price controls
D buyers and sellers reacting to shortages and surpluses

33. The author of *The Wealth of Nations* was:

A Milton Friedman
B Adam Smith
C Karl Marx
D Alexander Hamilton

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