

Fueling the Future

Introduction

Welcome to Econ Essentials. This program is designed to help students learn fundamental economic principles in an engaging, digital environment. In this digital interactive, students will be challenged to predict the future price of gasoline to help them make a profit for an imaginary shuttle business. Along the way, they will learn about the basic laws of supply and demand and how those laws apply to fluctuations in gasoline prices and ultimately affect them and the world around them. Finally, they will apply all they have learned to set a ticket price that will help them make a profit for their shuttle business.

While seat time for individual students will vary, the interactive is designed to take 35–45 minutes for students to complete.

This educator guide includes background information about the topics covered and guidance on how to use the tools and assessments in a one-to-one or one-to-many environment. Related standards from the Voluntary National Content Standards in Economics (2nd edition), developed by the Council for Economic Education, can be found at the end of the guide.

Overview

This module in the Econ Essentials program focuses on the price of gasoline. It is taught as a self-paced module with interactive features that enhance the experience for visual, auditory, and kinaesthetic learners. The content is divided into four topics:

- **Supply, Demand, and a Pair of Sneakers:** An introduction to supply and demand
- **What's Behind Prices at the Pump?:** How supply and demand factor into the production of gasoline
- **The Rise and Fall of Gas Prices Through History:** How events affect the price of gasoline and how the price of gasoline affects events
- **Name Your Price:** A simulation applying the module information to a student-run business

Students can view the module using a web browser on a workstation, laptop, or tablet computer. Content is presented as “screens” that students will navigate. Interactive elements and graphics are included throughout. The text, videos, and graphics are accompanied by audio narration that reinforces the content and supports learners at different reading levels.

At the end of the interactive, students will complete a summative assessment that includes a series of multiple select and drag-and-drop questions.

Instant Expert

The price of gasoline stands as a great example of the global economy at work. The basic economic principles of supply and demand are operating as the price of gasoline fluctuates over time. Students may be aware that these fluctuations occur, but they may not know why or how these fluctuations affect them and the world in which they live.

This digital interactive will show students how the price of gasoline is determined and how this price relates to them, their country, and the world. The module is divided into several topics.

THE SETUP

In the setup, students will learn that they are starting a small business to shuttle students home from after-school activities. They are given an incomplete expense report for the business. The report includes maintenance, insurance, and other costs but is missing the cost of the gasoline for their trips. Students are then challenged to set the price for a shuttle ticket but, in order to do so, they must be able to predict the future price of gasoline. Since the price of gasoline fluctuates constantly, and often by a great deal, choosing the wrong price could mean that their business loses money.

TOPIC 1: SUPPLY AND DEMAND

The first topic covers supply and demand. The price of a product is controlled mainly by levels of supply and demand.

Supply is the quantity of the product available for sale. This can change according to factors such as:

- The cost of goods needed to make the product (inputs).
- Technological improvements in the production of the product.
- The expectations of the producer.
- The number of suppliers.

Demand is the level of need for the product by consumers. Demand can increase or decrease according to factors such as:

- The price of a competitive (substitute) product.
- The price of a complementary product.
- The preferences of consumers.

Graphs of supply and demand curves represent these relationships. Supply and demand curves intersect to form a balance point called the equilibrium point. This represents the optimal price. The optimal price is the highest amount the producer can charge and still have consumers want to buy the product. The factors listed above that change the supply and demand shift the curves, causing a change in the equilibrium point.

TOPIC 2: INTEREST RATES

The price of gasoline, like the price of all products, is affected by its production costs. This topic explains various ways the price of gasoline can be affected through the creation process.

Crude oil goes through the following steps before it is sold as gasoline at the pumps:

- Extraction
- Transportation
- Refinement
- Sale to gasoline stations

The cost of these processes is increased or decreased by different factors, such as demand levels, environmental policies, war, transportation expansions, refining costs, and taxes.

Oil and gasoline businesses reduce risk from price fluctuations by using the futures markets. To continue the learnings from Econ Essentials visit www.futuresfundamentals.org.

TOPIC 3: THE RISE AND FALL OF GAS PRICES THROUGH HISTORY

The price of gasoline has historically been affected by both major and minor world events. These events can greatly change the supply of gasoline available. Examples include geopolitical conflicts like the Yom Kippur war in 1973 and natural disasters such as Hurricane Katrina in 2005.

The opposite is also true. Rising or falling gasoline prices can have large effects on individuals, nations, and the entire planet. For example, rising gasoline prices can inspire individuals to conserve energy, reduce consumer spending power, and create wealth within oil-producing nations. On the other hand, dropping gasoline prices can allow consumers to buy more oil-based products or, in the extreme, cause the economic collapse of an oil-producing nation.

TOPIC 4: NAME YOUR PRICE

To complete their expense reports, students will predict the future price of gasoline to help set the ticket price for their shuttle business. As they begin to set their prices, they will learn about an event that will affect gasoline prices. Once they set the predicted price of gasoline based on the given event, students will see the estimated expenses per ticket automatically calculated (based on a predicted number of tickets sold). They then will decide what to charge for each ticket. Students are encouraged to apply the laws of supply and demand: if they charge too much, no one will want to buy their service. But, if they charge too little, their business will fail. Finally, they can run the simulation to see how much profit, if any, their business will make over the course of the semester.

Fueling the Future

Resources

GETTING STARTED

OBJECTIVES

Students will learn:

- The basics of supply and demand, including graphs of supply and demand curves, shifts of supply and demand curves, and the equilibrium point.
- How supply and demand apply to various stages in the production of gasoline from oil.
- How the price of gasoline has been affected historically by world events.
- How the price of gasoline has affected individuals, nations, and the world.
- How to apply information about supply and demand to set pricing for an imaginary business.

MATERIALS

To help students navigate the interactive, you will need:

- A computer or other device with internet access and a web browser
- A projection device to display the web pages

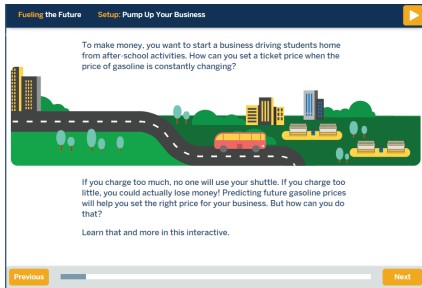
PROCEDURE

This module is designed to be used by individual students in a self-paced setting or, if technology is limited, in a one-to-many environment. If using the module as a presentation in a one-to-many environment, the instructor can use the navigation features of the module to present the content to students and to set the pace of the lesson. By eliciting group responses, the instructor can facilitate interaction between students above their experiences and ideas, and initiate small group discussions.

Topics

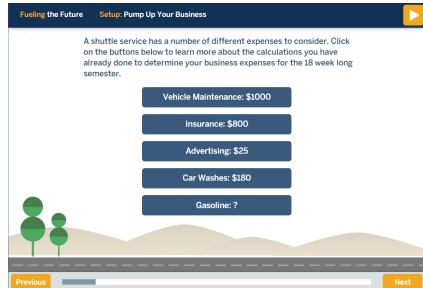
SETUP

Estimated time to complete: 2–5 minutes



Section 1—Screen 1

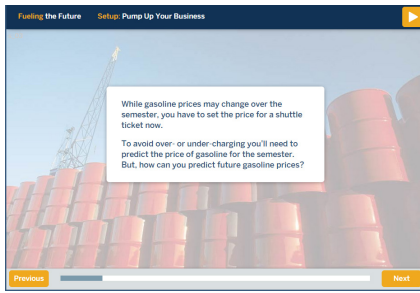
In the first screen of the setup, students will be introduced to the following challenge: They have decided to start a shuttle business to earn extra money. To set a ticket price for their shuttle service, they must anticipate their expenses, including the price of gasoline. The biggest challenge is that gasoline prices fluctuate based on many factors. How can they predict the price of gasoline so they can set a ticket price that will earn a profit for their business?



Section 1—Screen 2

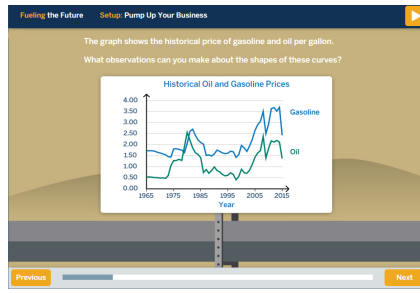
In the next screen, students will learn that they need to estimate future gasoline prices to complete the list of their business expenses and set a ticket price for the semester.

Expense Name	Expense per Semester	Explanation of Expenses
Vehicle Maintenance	\$1,000	An estimated cost of \$2,000 per year for vehicle upkeep, which is \$2,000 and \$1,000 respectively per semester.
Insurance	\$800	Insurance on the van is quoted at \$1,600 per year, which is \$800 per semester.
Advertising	\$25	It costs \$0.25 per flier copy. 100 copies of a flier at \$0.25 per flier works out to \$25 per semester.
Car Washes	\$180	The van will be washed twice a week. This will cost \$10 per week, or \$180 per semester.
Gasoline	?	?



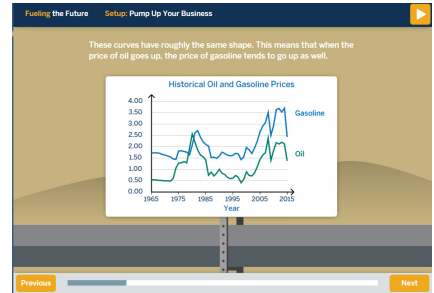
Setup—Screen 3

In this screen, students will learn the importance of setting the right price. If they set their price too low, they could lose money. However, they don't want to set their price too high, or they may not get many customers.



Setup—Screen 4

In this screen, students will be introduced to the connection between gasoline and oil.



Setup—Screen 5

Since gasoline is refined from oil, the prices of gasoline and oil have historically fluctuated similarly. Note that they move similarly, but not exactly the same, because more goes into the price of gasoline than just the cost of the oil to make it. Topic 2 provides more information on this relationship.



Setup—Screen 6

In this screen, students consider what questions they will need to answer to be able to predict the cost of gas for their business. Throughout the module the students will find the answers to these questions. In the final topic, students will apply this knowledge by running a simulation of their business costs for a semester.

Topic 1: Supply, Demand, and a Pair of Sneakers

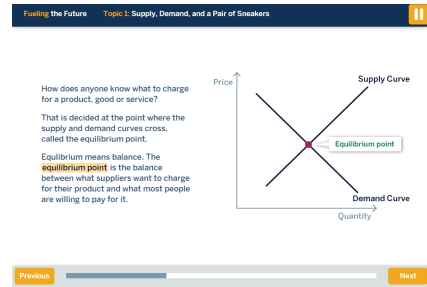
Estimated time to complete: 3–5 minutes

In Topic 1, students will learn about the basics of supply and demand.



Topic 1—Screen 1

Students will watch a video that explains supply and demand and shows how they are both graphed, depending on the level of each.



Topic 1—Screen 2

They will then explore how the graphs of supply and demand interact to determine the price of a product.

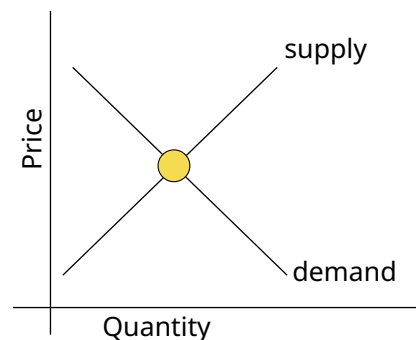
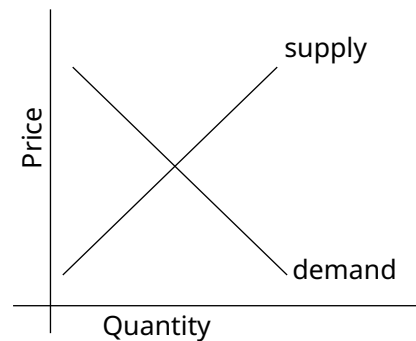
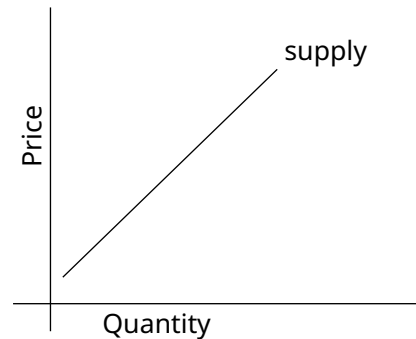
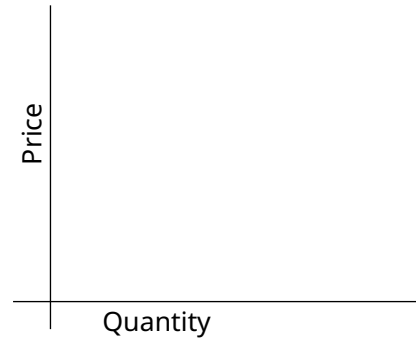
The supply and demand curves are graphs of quantity versus price.

In the supply curve, the more the producer can charge, the higher the quantity they'll produce. So the supply curve increases from left to right.

In the demand curve, the higher the price, the less quantity consumers will buy. So the demand curve decreases from left to right.

The point where these two curves meet is called the equilibrium point, or balance point.

This is the optimal price. It is the price where the demand for the product exactly matches the supply. If this is out of balance (for example, if there is more demand than supply), the producer will increase the price until the demand for the product is in balance with the available supply.



Students will then learn how the price of a product is set.

Fueling the Future Topic 1: Supply, Demand, and a Pair of Sneakers

The supply of the comic book has now increased. A change in supply causes the supply curve to move, it's called a "shift in the supply curve."

The graph shows an increase in supply. Because the supply curve shifted, there's a new equilibrium point. This new equilibrium point is much lower than it was before, which means price has dropped significantly.

Previous Next

Topic 1—Screen 3

Next, students will learn how the price will change due to shifts in supply and demand.

When events occur to change the level of supply, the supply curve will shift. Increased supply will shift the curve right (toward higher quantity) and decreased supply will shift it left (toward lower quantity).

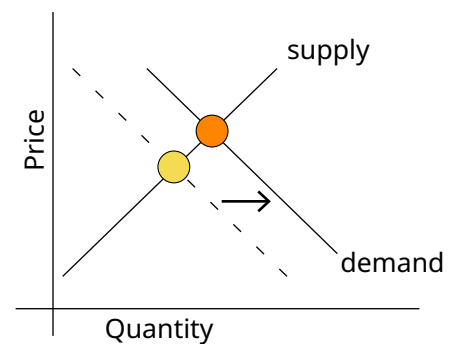
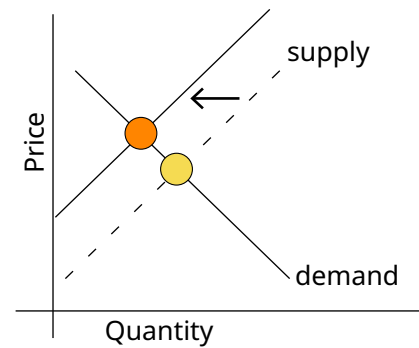
This changes the equilibrium point. In this example, the supply decreased, shifting the curve left. Now the intersection of the supply and demand curves is at a higher price.

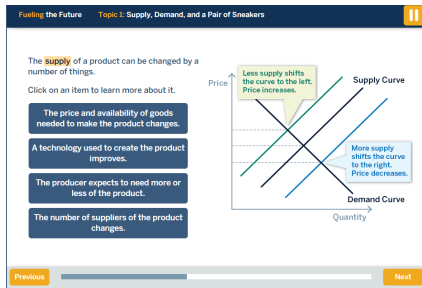
This makes sense: a reduction in the available product leads to an increase in the price of the product.

When events occur to change the level of demand, the demand curve will shift.

In this case, an event occurred to increase the demand. This shifted the demand curve to the right. The equilibrium point is higher.

This makes sense: an increase in the demand for a product means that producers can charge more for that product.





Topic 1—Screen 4

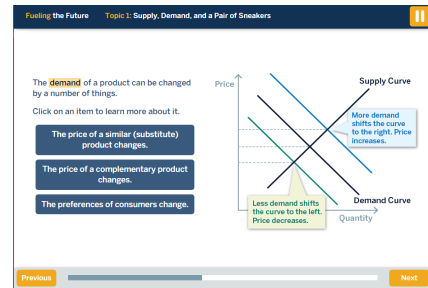
In this screen, students will study various ways that the supply curve can be shifted.

Supply is the amount of product available for sale, which can be affected by many things:

- **The cost of goods needed to make the product:** Products are usually made by changing, combining, or refining other products (called inputs). When the prices of inputs change, this will change the price of the product. Ex: Windows are made from glass. If the cost of glass goes up, the producer can make fewer windows for the same amount of money. This decreases the supply.
- **Technological improvements in the production of the product:** Technology is continuously advancing. New technology can be developed to allow producers to make goods faster, cheaper, and with less waste. Ex: Advancements in robotics have allowed many steps in the production of goods to be automated.

This means that more product can be produced in the same amount of time. This increases the supply.

- **The expectations of the producer:** Suppliers will often produce more or less of their product during certain times of the year or around certain events with the expectation of increased or decreased sales. Ex: Office supply stores anticipate an increased need in basic school supplies around September. They would increase their supply of these in anticipation of this need.
- **The number of suppliers:** The supply of a product can be greatly increased or decreased if the number of suppliers changes. Ex: The supply of bikes in the city will increase if another store opens that sells bikes.



Topic 1—Screen 5

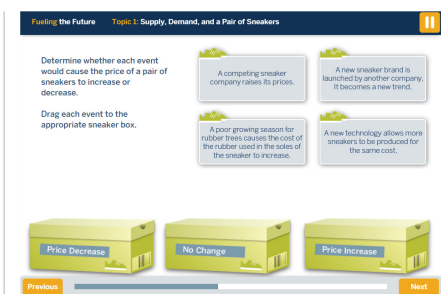
In this screen, students will study various ways that the demand curve can be shifted.

Demand is the level of need for the product by consumers. It can be affected by many things:

- **The price of a competitive (substitute) product:** If there are two very similar products for sale, the demand will be higher for the one with the lower price. Ex: A business sells two types of basketballs. The price of Ball A is dropped to be less than the price of Ball B. This will increase the demand for Ball A and decrease the demand for Ball B.
- **The price of a complementary product:** Complementary products are products that are usually sold together. If the price of one of the products changes, that changes the likelihood that consumers will also purchase the other product. Ex: Phone, cable, and internet are often sold together by providers.

If the cost of internet service increases, people are less likely to buy an Internet and cable package.

- The preferences of consumers:** Because of our socially-networked society, trends appear in consumer purchases. Sometimes products will become unpopular as part of a social or political movement or become popular after an endorsement by a public figure. Ex: As part of the movement for greener living, public transit and bike travel have become more popular.



Topic 1—Screen 6

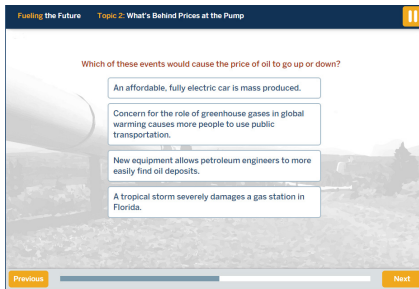
Topic 1 ends with a formative assessment. Students are given a product and a series of events. They are asked to choose whether each event will cause a price increase, a price decrease, or no price change at all. They will do this by dragging the event tiles and dropping them into the correct bin.

Tile	Correct Bucket	Answer Explanation
A competing sneaker company raises its prices	Price Increase	When prices are raised for a product, consumers are more likely to buy a cheaper, similar good. This means that demand increases. More demand shifts the demand curve to the right and increases the price.
A new sneaker brand is launched by another company and becomes a new trend	Price Decrease	A change in consumer tastes can decrease the demand for the product. This shifts the demand curve to the left, decreasing the price.
A poor growing season for rubber trees causes the cost of the rubber used in the sole of the sneaker to increase	Price Increase	Rubber is a product that is used to make sneakers. That makes it an input for sneakers. An increase in cost for an input causes the supply to decrease, shifting the supply curve to the left and increasing the price.
A new technology allows more sneakers to be produced each day for the same cost	Price Decrease	An increase in supply causes the supply curve to shift to the right, decreasing the price.

Topic 2: What's Behind Prices at the Pump?

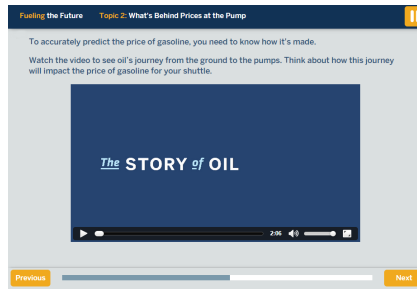
Estimated time to complete: 5–10 minutes

Now that the students have learned the basics of supply and demand, in this topic they will focus on factors that can influence the supply and demand of gasoline, from its extraction as oil to its sale at a gasoline station.



Topic 2—Screen 1

In this screen, students will choose which events they think would affect the price of gasoline. Students will not be told which of these are correct now, but will be given the opportunity to change their answers at the end of the topic. This way, students will see how their thinking changed after learning the material in the topic.

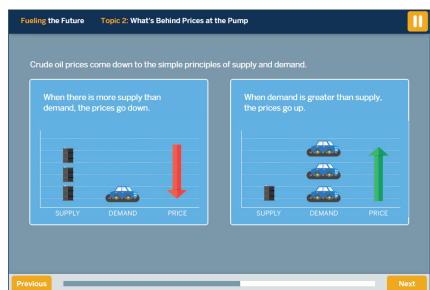


Topic 2—Screen 2

In the next screen, students will watch a video on the journey from oil to the pump. It explains and illustrates how oil is found by geologists, how facilities are built on the area, and how oil is extracted. Once extracted, the oil is transported to holding facilities and distribution centers via pipeline, railway, or ship.

Each stage of this process can affect the price of gasoline. The details of each stage will be discussed later in the topic.

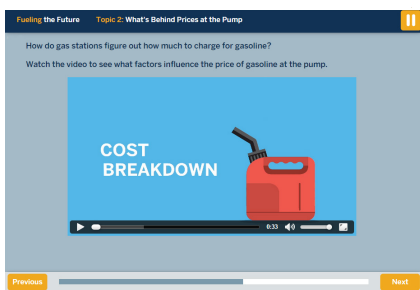
Multiple Select Option	Answer
An affordable, fully electric car is mass produced.	Yes
Concern for the role of greenhouse gases in global warming causes more people to use public transportation.	Yes
New equipment allows petroleum engineers to more easily find oil deposits.	Yes
A tropical storm severely damages a gasoline station in Florida.	No



Topic 2—Screen 3

This screen links supply and demand to the price of oil. If the supply of oil is above the demand, the price of oil will go down. If the demand for oil is above the supply, the price of oil will go up.

This happens because the system tries to find the equilibrium point. For example, when the demand is higher than the supply, the supplier will increase the price until the demand decreases to exactly meet the supply. If the supply is higher than the demand, suppliers will decrease the price in order to bring the demand up to the level of supply.



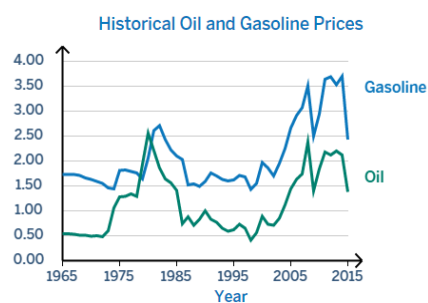
Topic 2—Screen 4

In this screen, students will watch a video to see how a gasoline station determines what to charge for its gasoline. They have to set a price that allows them to make enough profit to purchase more gasoline, while remaining competitive with other gasoline stations in town.

Gasoline prices can break down as follows:

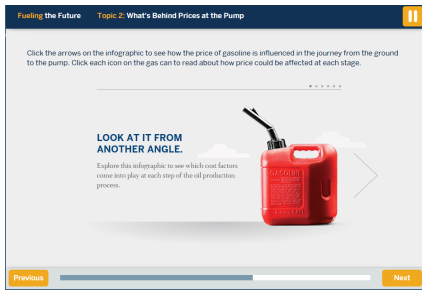
- Crude oil costs: 65%
- Refinement costs: 13%
- Storage and marketing: 10%
- Taxes and fees: 12%

This is how the price of gasoline and oil are connected. Since the cost of oil makes up most of the cost of selling gasoline, fluctuations in the price of oil cause fluctuations in the price of gasoline.



However, since there are other factors in play (refinement and taxes, for example), these do not always change the same amount or at exactly the same time. This is why the lines on the graph of oil and gasoline prices on the setup screen did not move exactly in sync.

The futures market is used to lock in a price for commodities and reduce price fluctuations. This helps businesses, like oil related businesses, manage risk. To continue the learnings from Econ Essentials and for more information on futures, visit www.futuresfundamentals.org.



Topic 2—Screen 5

In this screen, students explore a clickable infographic on factors that can affect the cost of gasoline during each stage of its creation and sale.

Below is the information contained in the infographic.

Stage of gasoline Creation	Stage Information	Factor Information
Extraction	<p>Oil first needs to be found and extracted.</p> <p>The oil company starts by hiring geologists to go on the hunt. Once it's found, they need to get permission to dig at that site. Would you let them dig in your backyard?</p> <p>After getting the green light, the company has to build the necessary facilities, gather some manpower, and get to work!</p>	<p>Global Demand Oil is shipped all over the world. Because of this, the global demand for oil is a big factor in the price.</p> <p>For example: China uses a lot of oil. If China suddenly used less oil, there would be a decrease in demand. This could cause the prices to go down.</p> <p>Environmental Policies Environmental policies are put into place to keep the planet safer.</p> <p>Sometimes these policies can restrict the production of oil ("sorry, you can't drill here!") or slow its transport ("that pipeline plan goes through protected areas"). This can affect the price.</p> <p>Change in Supply Oil that comes from closer to home is cheaper. The more oil that refineries get locally, the lower the price can be. New drilling technology has allowed the U.S. to dramatically increase its production of oil. In 2014, the U.S. was the third-largest oil-producing country in the world, close behind Russia and Saudi Arabia!</p>

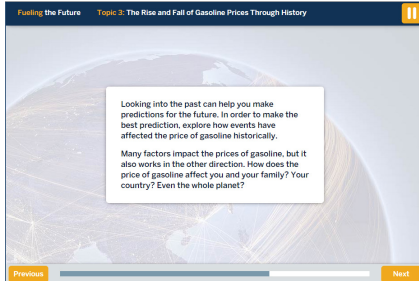
Below is the information contained in the infographic.

Stage of gasoline Creation	Stage Information	Factor Information
		<p>Geopolitical Conflicts Conflicts between and within countries can slow the production and transport of oil. This can increase the price.</p> <p>For example, ongoing conflict in the Middle East could potentially disrupt supply and cause prices to increase.</p> <p>Some global conflicts can result in government sanctions (restrictions) that further impact supplies and affect energy prices.</p>
Transportation	<p>Once it is out of the ground, crude oil is loaded up and delivered to be refined or stored.</p> <p>Depending on where the oil came from, this oil may be transported by sea, rail, or pipeline.</p>	<p>Rail and Pipeline Expansions In North America, pipelines and railways have expanded, meaning they carry more oil more quickly.</p> <p>This makes it quicker and cheaper to move crude oil supplies from within the country to the refineries on the Gulf and East coasts.</p> <p>OPEC OPEC decides how much oil it wants to produce. Since it controls a large share of the oil that is extracted, it can affect the price by deciding the level of supply.</p>

Stage of gasoline Creation	Stage Information	Factor Information
Refinement	<p>After the oil is extracted and transported, it is refined—made into gasoline, diesel fuel, jet fuel, and many other products.</p>	<p>Logistics and Infrastructure With the increase in U.S. oil production, the U.S. can now export many more products that are refined from oil.</p> <p>However, government policy does not allow crude oil from the U.S. to be exported to other countries.</p> <p>Refining Costs Some types of crude oil need more work to refine. Additionally, different places require special gasoline formulations. Have you ever seen an advertisement by a gasoline station for a special type of gasoline?</p> <p>These factors, combined with a refinery’s capabilities and facilities, can impact pump prices.</p>
Gasoline Station	<p>The gasoline station has now purchased and stocked the gasoline that you’ll put into your vehicle.</p> <p>The final price it charges per gallon takes into account local competition, state laws, and a profit margin for the business.</p>	<p>State Taxes and Fees In North America, each state or province has its own laws that gasoline stations must follow. These rates can cause gasoline prices to be higher or lower depending on where you live.</p> <p>Retail Margin The gasoline station will use the money it makes today to buy its next supply of gasoline. Station owners set a price per gallon that will compete with other gasoline stations in town and will earn them a profit to keep the business up and running.</p>

Topic 3: The Rise and Fall of Gas Prices Through History

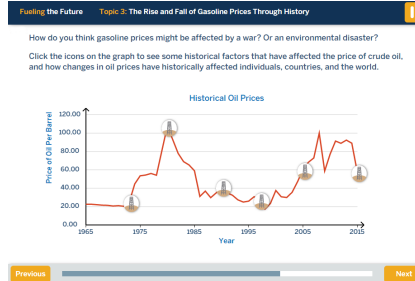
Estimated time to complete: 5–10 minutes



Topic 3—Screen 1

In this topic, students will look at two sides of a cause and effect cycle:

- how people and events have affected the price of gasoline
- how the price of gasoline affects people and events



Topic 3—Screen 2

On this screen, students will use an interactive graph of gasoline prices through history. Students will see that, over the course of history, there have been many major fluctuations in the price of gasoline. On top of many of these fluctuations there will be clickable data points. Clicking on these points will reveal more information on the events surrounding each major price change.

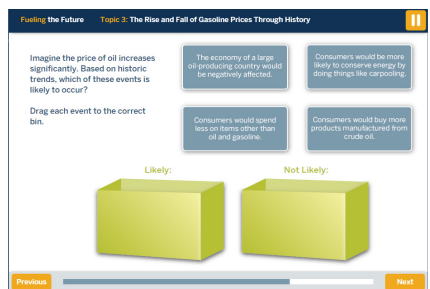
Below is information related to each event.

Year	Event	Event Description
1973	Yom Kippur War	In October of 1973, a coalition of Arab states waged war against Israel. Saudi Arabia refused to export oil to the U.S. and other countries that supported Israel. This cut oil production, causing the energy crisis in the 1970s when oil shortages caused the price of oil and gasoline to increase significantly.
1980	1980s Oil Glut	The cost of oil during the 1970s energy crisis caused people to think more about conserving energy. Demand for oil and gasoline decreased, leading to a global oil surplus. As a result, the price of oil dropped significantly.
1990	Gulf War	<p>OPEC gave oil-producing countries an oil quota, or amount they were allowed to produce in a given time. Iraq accused Kuwait of producing more than they were allowed, causing an oil surplus and the resulting decrease in price.</p> <p>Since Iraq's economy was mostly based on oil, its government lost several billion dollars per year and did not have enough money to cover basic costs.</p> <p>In 1990, Iraq invaded Kuwait in retaliation, and a coalition of forces led by the United States responded by invading Iraq. These conflicts caused large changes in the price of oil throughout the world.</p>
1997	Asian Financial Crisis	In 1997, the economies of several Asian countries collapsed, causing them to import less oil. This significantly lowered global demand, triggering the price of oil to decrease and hurting the economies of oil-producing countries. This economic ripple effect slowed the growth of the global economy.

Below is information related to each event.

Year	Event	Event Description
2005	Hurricane Katrina	In 2005, Hurricane Katrina interrupted oil production and distribution in the Gulf of Mexico. Many offshore oil sites in the region were damaged and pipelines were unable to transport oil due to power outages. This greatly reduced the supply of oil in the U.S., and caused the price of oil and gasoline to increase.
2015	Competition Between OPEC Countries	<p>A significant oil price drop occurred between mid-2014 and early 2015. Worsening European economies and slowing growth in China both contributed to a decrease in the global demand for oil. The large decrease in demand led to a sharp drop in price.</p> <p>When a decrease in demand causes low prices, OPEC usually cuts their supply to balance the market and send oil prices climbing again. However, OPEC countries failed to agree on supply cuts and instead competed against each other at low prices in order to gain more of the Asian oil market</p>

Students will then be presented with two formative assessments. Both of these assessments include a set of four tiles that students will drag into one of two bins. As soon as a tile is dropped into a bin, it will either be marked as correct or they will receive feedback telling them why that choice was incorrect.

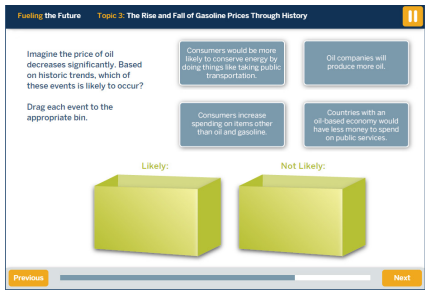


Topic 3—Screen 3

During the first assessment, students will be asked to consider the possible consequences of a drastically increased price of oil. The consequences may be for individuals, for a nation, or for the world at large.

Assessment 1 asks students to consider consequences of a drastically increased price of oil.

Option	Correct Answer	Explanation
The economy of a large oil-producing country would suffer.	Not Likely	When oil prices are high, countries with an oil-based economy make a lot of money. This strengthens their economy as more people in the country make more money and have extra disposable income to spend. This means that non-oil-related businesses in the country also make more money and are able to produce more goods and hire additional staff, further strengthening the country's economy.
Consumers would be more likely to conserve energy by doing things like carpooling.	Likely	When oil prices are high, consumers try to conserve energy in order to save money. Carpooling is a way for a group of people to share the cost of gasoline for trips like daily commutes.
Consumers would spend less on items other than oil and gasoline.	Likely	Gasoline for transportation and oil for heating is a necessity for many people. After spending more money on gasoline and heating oil, people will have less money left to spend on other items.
Consumers would buy more products manufactured from crude oil.	Not Likely	When oil prices are high, consumers typically buy fewer oil-based products, since the price of those products has risen.



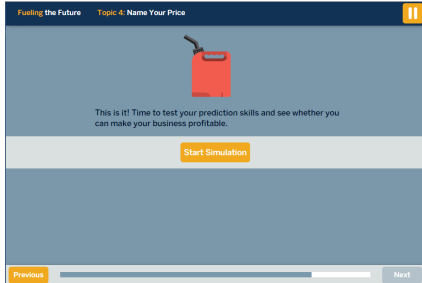
Topic 3—Screen 4

Assessment 2 asks students to consider consequences of a drastically decreased price of oil.

Option	Correct Answer	Explanation
Consumers would be more likely to conserve energy by doing things like taking public transportation.	Not Likely	When oil prices are low, consumers aren't as concerned with conserving energy because it doesn't cost as much.
Oil companies will produce more oil.	Not Likely	When oil prices are low, it is usually caused by the supply of oil being higher than the demand. Because of this, producers are unlikely to increase extraction of oil as this will only cause a further discrepancy between supply and demand and further lower the price.
Consumers would increase.	Likely	When oil prices are low, consumers do not have to spend as much money on necessary fuel items for heating and transportation. This allows them to have more money to spend on other items.
Countries with oil-based economies would have less money to spend on public services.	Likely	When oil prices are low, countries with an oil-based economy lose a lot of money. This is because oil companies lose money and have to reduce production and staffing. When the economy falls, the country receives less money in taxes. This means that the country has less money to spend on public services, such as upkeep of roads, police, and health care.

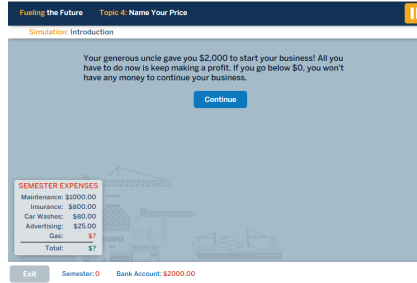
Topic 4: Name Your Price

Estimated time to complete: 5–10 minutes



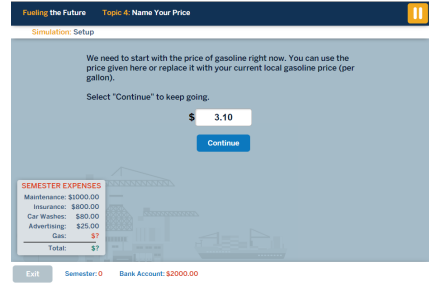
Topic 4—Screen 1

In the final topic of the module, students will run a simulation to run their business for a semester. Once they enter the simulation, they can run it through as many semesters as they want and see their progress across all rounds. In this screen, students will press “Start Simulation” to begin.



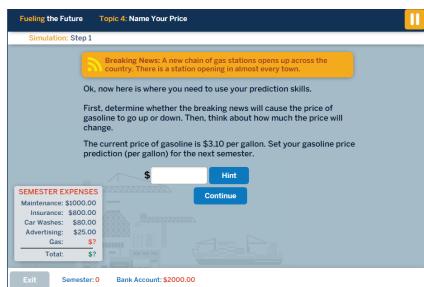
Topic 4—Screen 2

On the first screen, students are shown their expenses (maintenance, insurance, car washes, and advertising) and their start-up budget of \$2,000. Gasoline is shown as an unknown in the expenses list, and students are reminded that they need to figure out the cost of gasoline in order to solve the problem for their businesses. They can click “Next” to move onto the main part of the simulation.



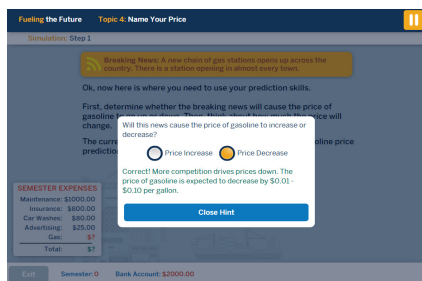
Topic 4—Screen 3

In the Setup screen inside the simulation, students set the current price of gasoline in their neighborhoods. Students who do not drive or know the price can either get help from a friend or simply leave the default price. Their success in the simulation is gauged relative to the initial price, whatever it may be.



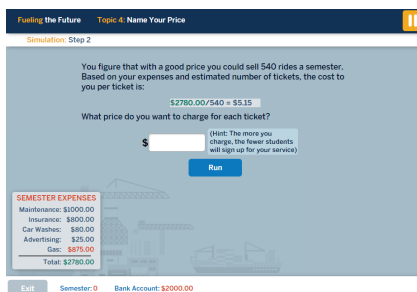
Topic 4—Screen 4

In the Step 1 simulation screen, students are directed to look at the given “Breaking News” event and choose what gasoline price to use for their budget. Some of these events will increase or decrease the price of gasoline by small or large amounts and for different periods of time, leading to different average gasoline prices over the 18-week semester.



Topic 4—Screen 4 Hint pop-up

Next to the gasoline price input is a hint button. Clicking on this button gives students a hint. When the hint is opened, it first asks them to choose whether they think the event will cause an increase or decrease.



Topic 4—Screen 5

After answering that, they will move on to the Step 2 screen where they will receive some information on how the gasoline price might be affected (within a range) over the course of a semester. Students will use that information to estimate a price change.

Below is a list of possible breaking news events and how they affect gasoline prices.

Event	Gasoline Price Increase or Decrease?	How the Price of Gasoline is Affected
New technology is making it cheaper to produce cars. New cars cost less as a result.	Price Increase	A decrease in the price of cars will lead to an increase in the purchasing of cars. More cars mean that fuel will be higher in demand. Increased demand allows the price of gasoline to increase. However, it will not increase substantially in the short term, so the simulation will show an increase in the average price of gasoline by \$0.09 per month for the entire semester.
Car companies are investing a lot of money in new safety features. New cars cost more as a result.	Price Decrease	An increase in the price of cars will result in a decrease in the demand for cars. This will cause a decrease in the demand for gasoline. However, it will not decrease substantially in the short term, so the simulation will decrease the average price of gasoline by \$0.05 per month for the entire semester.
A hurricane devastates the Gulf of Mexico, damaging many offshore drilling sites. Power is expected to be out for days, shutting down several pipelines in the region.	Price Increase	Hurricanes and other natural disasters can cause massive spikes in the price of gasoline in the short term, with the price stabilizing as infrastructure is restored and supply is able to return to normal levels. For example, during Hurricane Katrina, the average US price of gasoline jumped from \$2.29 to \$3.07 in the first month, then returned back to the original price within two months. The simulation will show an increase in the price of gasoline by \$0.86 in the first month, then a decrease in the price by \$0.22 per month for the rest of the semester.
A large oil deposit has been found off the coast of Newfoundland, Canada. Drilling will begin immediately.	Price Decrease	This would increase the amount of oil available close to U.S. refineries. The simulation will decrease the price of gasoline by \$0.04 per month for the semester.

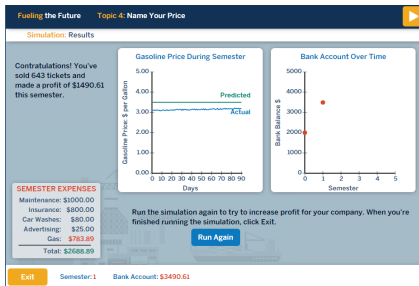
Event	Gasoline Price Increase or Decrease?	How the Price of Gasoline is Affected
A popular celebrity endorses a new kind of energy-efficient car. The car becomes extremely popular.	Price Decrease	With an increased number of fuel-efficient cars on the road, there is a small decrease in the demand for gasoline. This will lead to a small decrease in the price of gasoline while producers adjust the available supply. The simulation will decrease the price of gasoline by \$0.05 per month for the semester.
A long-standing chain of gasoline stations is closing. Some people will need to drive a long way to fill their gasoline tanks.	Price Increase	Since this will decrease the number of suppliers, the available supply of gasoline locally will decrease. With a small decrease in supply, the simulation will increase the price of gasoline by \$0.02 per month for the semester.
A new chain of gasoline stations opens up across the country. There is a station opening in almost every town.	Price Decrease	Since this will increase the number of suppliers, the available supply of gasoline locally will increase. The simulation will decrease the price of gasoline by \$0.02 per month for the semester.

As students change the price of gasoline, they will see several things update:

- Their expense report will finish filling in. This will be filled in with the estimated amount of gasoline students will use for their business for the semester, which is calculated using the following assumptions:
 - The number of school days in the semester is, on average, 90.
 - This number of days is multiplied by the number of miles a student could drive back and forth each day. Fifty miles was chosen for this, as it is at the upper end of reasonable driving times and distances. A higher number of miles results in a larger difference in profit.
 - The total number of miles, 4,500, is then divided by the gasoline mileage of the average shuttle van (18 mpg). This division gives the total number of gallons of gasoline used by the business per month.
 - The number of gallons is then multiplied by the gasoline price that the student sets, which gives the gasoline expenses for the business.

- The average expenses per ticket will populate. Students are given the estimated number of tickets that they will sell if they set a reasonable price.
 - They will be shown the total expenses divided by the estimated number of tickets, which equals the costs per ticket.
 - Students will use this cost to determine how much profit they want to build into each ticket price. They will need to use their knowledge about supply and demand to help. If they set the price too high, demand will go down. If they set the price too low, supply will go down. These will mean less money in the bank.

Students will then click to run the simulation based on their estimates.



Topic 4—Screen 4

Once students choose to run the simulation, they will be taken to this screen to see how many tickets they sold and how much money, if any, they made.

There are two graphs. The first graph shows the price of gasoline over the course of the semester. There will be a straight line representing the price of gasoline that the students estimate. Contrasting that will be the fluctuating line of the actual gasoline price across the semester. The students will be able to compare their estimate with the actual average price of gasoline.

The second graph will show their profit to date. It will have a section for each semester that the students have run. They can see how their decisions alter the amount of profit they earn each semester.

Profit is calculated based on the number of tickets sold at the set price, minus the student's expenses.

The number of tickets sold will be calculated based on how high the students set the ticket price: the higher the price, the fewer tickets will be sold. The lower the price, the more tickets will be sold, up to a given maximum (there are only so many seats in the van, after all!) Students will see that they can balance the price by finding the profit level where they'll sell a lot of tickets but also make a good amount of profit from each ticket. Their profit or loss is also reflected in the amount of money in their bank accounts.

The example below illustrates the possible differences two students might see while running the simulation.

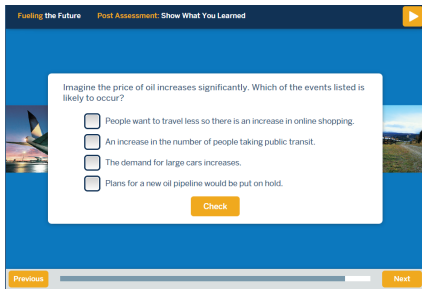
- The base cost of gasoline is set to \$3.00.
- The students receive the hurricane event.
- Student A sets the price to \$3.70. Student B sets the price to \$3.10.
- Student A chooses to sell tickets for \$5.50 each. Running the simulation, they sell 590 tickets. Their gross income is \$3,245. With the average gasoline price at \$3.74 per semester, the total expenses are \$2,212.94. They made \$1,032.06.
- Student B chooses to sell tickets for \$7.00 each.

Running the simulation, they sell 275 tickets. Their gross income is \$1,925. With the average gasoline price at \$3.74 per semester, the total expenses are \$2,212.94. They lost \$287.94.

Students can choose to run the simulation until they decide to stop or they run out of money. The charts and bank account balances update at the end of each semester that they run.

Post-Assessment

The students will finish the digital interactive by completing a set of four final assessments. Their performance will be totalled and shown to the students at the end of the assessment.

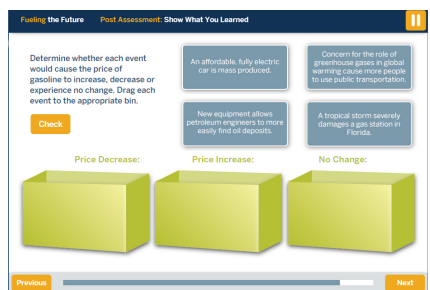


Post-Assessment—Screen 1

Screen 1 of the assessment is a multiple choice problem. Students will look at all the possible answers and pick the ones they believe are correct. They then click the Check button to check their answer. Correct answers will be highlighted green. Incorrect answers they selected will be highlighted red. If there are any incorrect answers, feedback will appear to direct students towards the correct answers. Students will then have one more chance to answer before they are shown the correct answers.

Question: “Select each situation that would affect the supply or demand of gasoline.”

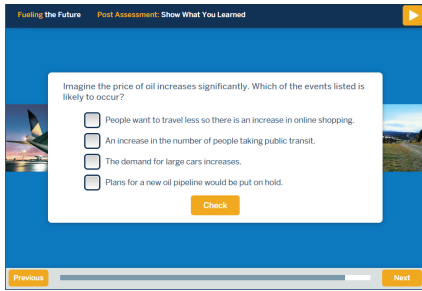
Multiple Choice Option	Yes/No	Explanation of Answer
An affordable, fully electric car is mass produced.	Yes	The increase in popularity of electric cars could decrease the demand for gasoline, decreasing the price.
Concern for the role of greenhouse gases in global warming causes more people to use public transportation.	Yes	Increased use of public transportation would decrease the amount of gasoline that would be used for individual vehicles. This decreased demand could lead to a decrease in the price.
New equipment allows petroleum engineers to more easily find oil deposits.	Yes	When new oil can be more easily found, this increases the available oil supply. Increased supply means that the price of gasoline could go down.
A tropical storm severely damages a gas station in Florida.	No	Damage to one gas station would not lead to an increased price at other stations.



Post-Assessment—Screen 2

Screen 2 of the assessment is a drag and drop activity. Students will be given a set of tiles to drag into a series of bins. The tiles will each contain an event. The students will look at each event and choose whether the event would cause an increase, decrease, or no change in the price of gasoline. Students will then click the Check button. Any incorrect tiles will pop out of the bins and land back where they started.

Tile	Change	Explanation of Answer
An affordable, fully electric car is mass produced.	Price Decrease	The increase in popularity of electric cars could decrease the demand for gasoline, decreasing the price.
Concern for the role of greenhouse gases in global warming causes more people to use public transportation.	Price Decrease	Increased use of public transportation would decrease the amount of gasoline that would be used for individual vehicles. This decreased demand could lead to a decrease in the price.
New equipment allows petroleum engineers to more easily find oil deposits.	Price Decrease	When new oil can be more easily found, this increases the available oil supply. Increased supply means that the price of gasoline could go down.
A tropical storm severely damages a gas station in Florida.	No Change	Damage to one gas station would not lead to increased prices at other stations.

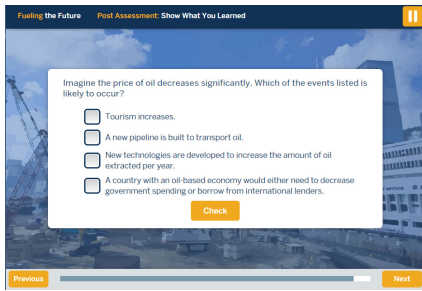


Post-Assessment—Screen 3

Screen 3 of the assessment is a multiple choice problem. Students will look at all the possible answers and pick the ones they believe are correct. They then click the Check button to check their answer. Correct answers will be highlighted green. Incorrect answers they selected will be highlighted red. If there are any incorrect answers, feedback will appear to direct students towards the correct answers. Students will then have one more chance to answer before they are shown the correct answers.

Question: "Imagine the price of oil increases significantly. Which of the events listed is likely to occur?"

Multiple Choice Option	Yes/No	Answer Explanation
People want to travel less so there is an increase in online shopping.	Yes	When the price of oil increases, so does the price of gasoline. An increase in the price of gasoline means that people want to spend less time driving. This increases the likelihood of people choosing to shop online rather than travel to stores.
An increase in the number of people taking public transit.	Yes	When the price of oil increases, so does the price of gasoline. An increase in the price of gasoline means that people try to save money by taking public transit rather than driving a personal vehicle.
The demand for large cars increases.	No	When the price of oil increases, so does the price of gasoline. An increase in the price of gasoline means that people try to buy smaller and more fuel-efficient cars to save money. The demand for large cars goes down.
Plans for a new oil pipeline would be put on hold.	No	When the price of oil increases, it is usually because the demand for oil is higher than the supply. Producers try to increase the supply of oil. One way to do this would be to build a new pipeline to make transportation easier.

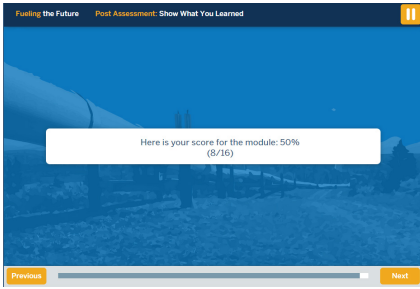


Post-Assessment—Screen 4

Screen 4 of the assessment is a multiple choice problem. Students will look at all the possible answers and pick the ones they believe are correct. They then click the Check button to check their answer. Correct answers will be highlighted green. Incorrect answers they selected will be highlighted red. If there are any incorrect answers, feedback will appear to direct students towards the correct answers. Students will then have one more chance to answer before they are shown the correct answers.

Question: “Imagine the price of oil is decreases significantly. Which of the events listed is likely to occur?”

Multiple Choice Option	Yes/No	Answer Explanation
Tourism increases.	Yes	When the price of oil decreases significantly, so does the price of gasoline. This means that people can travel farther for the same amount of money. This increases tourism.
A new pipeline is built to transport oil.	No	When the price of oil decreases, it is usually caused by more supply available than demand for oil. Producers would not build a new pipeline because doing so would further increase the supply of oil and cause the price to drop even more.
New technologies are developed to increase the amount of oil extracted per year.	No	When the price of oil decreases, it is usually caused by more supply available than demand for oil. Producers would not develop new technologies because doing so would further increase the supply of oil and cause the price to drop even more.
A country with an oil-based economy would either need to decrease government spending or borrow from international lenders.	Yes	Countries with oil-based economies make a high percentage of their revenue from oil. This comes from taxes on the oil companies and employees, and even from the spending of those employees at non-oil businesses. When oil prices fall, the revenues for the country fall. This means that there is less money for the government to spend on the needs of the company. They will either have to cut spending or borrow the amount they need from international lenders.



Post-Assessment—Screen 5

In the final screen of the assessment (and the interactive), students will receive their score for the post assessment. They will be scored out of 18—one point for every draggable tile and every correct multiple choice answer, shown as a percent.

Students, at any point, can go back to any slide in the interactive and review the content or complete the simulation again.

Educational Standards

The module aligns with the Voluntary National Content Standards in Economics (2nd edition), developed by the Council for Economic Education. Specific 12th-grade standards and benchmarks covered by this module include:

SPECIALIZATION

- **Standard 4:** The goods or services that an individual, region, or nation can produce at lowest opportunity cost depend on many factors (which may vary over time), including available resources, technology, and political and economic institutions.

MARKETS AND PRICES

- **Standard 1:** Market outcomes depend on the resources available to buyers and sellers, and on government policies.
- **Standard 2:** A shortage occurs when buyers want to purchase more than producers want to sell at the prevailing price.
- **Standard 3:** A surplus occurs when producers want to sell more than buyers want to purchase at the prevailing price.
- **Standard 4:** In a market economy, shortages of a product usually result in price increases; surpluses usually result in price decreases.

ROLE OF PRICES

- **Standard 1:** Demand for a product changes when there is a change in consumers' incomes, consumer preferences, the prices of related products, or the number of consumers in a market.
- **Standard 2:** Supply of a product changes when there are changes in the prices of the productive resources used to make the product, the technology used to make the product, the profit opportunities available to producers from selling other products, or the number of sellers in a market.
- **Standard 3:** Changes in supply or demand cause relative processes to change; in turn, buyers and sellers adjust their purchase and sales decisions.