SPHERE Teaching Civic Culture Together

REAL WORLD ECONOMICS

ECONOMICS IN ONE VIRUS: CHAPTER 10

Why was there no hand sanitizer in my pharmacy for months?

GRADE LEVEL: 9-12 (ADVANCED)
TIME ESTIMATE: 100-120 MINUTES (MAY BE BROKEN UP INTO TWO CLASS PERIODS)

Lesson Overview

Students will examine determinants of supply and demand in creating price signals during an emergency. Students will apply these determinants to products affected during the early months of the coronavirus pandemic.

Objectives

- Students will be able to apply determinants of supply and demand to market situations.
- Students will be able to explain how determinants of supply and demand affect market equilibrium prices. Students will evaluate the impact of price-gouging rules on markets in emergency situations.

Vocabulary

- Demand
- Law of demand
- Law of supply
- Market equilibrium
- Price
- Price gouging
- Quantity
- Shortage
- Supply

Materials

- AP photo of sanitizer shortage
- Four corner posters: Contest; Personal Characteristics; First Come, First Served; Auction
- Distribution Methods Graphic Organizer or poster paper/large Post-it notes and markers
- Vocabulary preview sheet
- Sanitizer excerpt reading
- Determinants of Demand worksheet
- Demand Practice worksheet
- Determinants of Supply worksheet
- Supply Practice worksheet
- Price-gouging excerpt
- Exit ticket

Prework (if applicable)

The teacher should label the four corners of the room with the four corners posters in advance if possible. It may be helpful for students to conceptually understand supply, demand, and how market equilibrium price and quantity are determined.

Warm-Up

- Students will view AP photograph of sanitizer shortage
- Students will complete graphic organizer in which they identify what they notice, think, and wonder
- Students and teacher will discuss photo using guiding questions:
  - What is happening in the picture?
  - Why might there be a shortage of hand sanitizer?
  - Is there any reason the hand sanitizer might have been particularly important in 2020?

- Are there other things people could have used instead of hand sanitizer?

Lesson Activities

- **Hand sanitizer four corners activity**
  - With the photo of the hand sanitizer still displayed, ask students to brainstorm how they might distribute the hand sanitizer.
  - Categorize student responses into four general areas that you have posted in the room:
    - Contest
    - Personal Characteristics
    - First Come, First Served
    - Auction
  - Have students stand in the corner that best reflects the method they believe is most fair.
  - Have students sit in groups based on the corners they chose. Give students three to five minutes to determine three pros and three cons of their distribution method.
  - Have each group report the pros and cons of the distribution method they have chosen.
  - If there is time, allow students to change groups/corners based on new information.
- **Vocabulary preview**
  - Explain that the free market is most like an auction. It works through the laws of supply and demand.
  - Have students complete the vocabulary preview worksheet:
    - Demand
      1. These are the goods and services buyers are willing and able to purchase in markets.
      2. Use “demand” in a sentence.
    - Law of demand
      1. As the price of a product increases, the quantity of that product demanded will decrease.
      2. Draw a demand curve on the price and quantity graph. (Students may need guidance here, but if they understand the concept, it should be relatively straightforward.)
    - Law of supply
      1. As the price of a product increases, the quantity of that product supplied will also increase.

    ii. Draw a supply curve on the price and quantity graph. (Students may need guidance here, but if they understand the concept, it should be relatively straightforward.)

  - Market equilibrium
    i. This is the point at which producers and consumers agree on a price and a quantity.
    ii. Draw a supply curve and demand curve on the same graph. Where they cross is market equilibrium. X marks the spot! Draw a big dot on market equilibrium.
  - Price
    i. Price is the amount of money exchanged by buyers and sellers.
    ii. Draw a supply curve and a demand curve on the same graph. Where they cross is market equilibrium. Draw a dotted line from there to the Y axis. That is equilibrium price!
  - Price gouging
    i. This is when the seller increases the price of a good or service to a level higher than what is considered reasonable or fair.
    ii. What does price gouging look like? Draw a picture.
  - Quantity
    i. Quantity is the amount of a good or service.
    ii. Draw a supply curve and a demand curve on the same graph. Where they cross is market equilibrium. Draw a dotted line from there to the X axis. That is equilibrium quantity.
  - Shortage
    i. This is when the quantity demanded is greater than the quantity supplied at a given price level.
    ii. Give an example of a shortage.
  - Supply
    i. Supply is the goods and services producers are willing and able to take to market.
    ii. Use “supply” in a sentence.
- Have students use all the vocabulary words to write a paragraph that makes sense.

- **Sanitizer excerpt reading and application**
  - Have students read the sanitizer excerpt and answer questions.
  - Review questions and the graph:
    - How was the demand for hand sanitizer affected by the coronavirus pandemic? Why?
      i. *Consumers demanded more hand sanitizer at all price levels.*

    ii. *This can be reflected on a graph by shifting demand to the right. Demonstrate this shift on the board or PowerPoint.*
  - What happened to the price of hand sanitizer as a result? Why?
    i. *The price of hand sanitizer increased, especially for resellers.*
    ii. *Demonstrate this with the graph you drew for question 1. Show that the equilibrium price of hand sanitizer should have increased.*
  - What should have happened to the supply for hand sanitizer? Why?
    i. *Producers should have responded to the increase in price by producing more hand sanitizer.*
    ii. *Show students how price would have actually recovered by graphing a shift in supply on top of your original graph.*
  - What should have happened to the quantity of hand sanitizer demanded? Why?
    i. *The quantity of hand sanitizer demanded should have decreased as consumers would have reduced their consumption or switched to soap.*
    ii. *This might be a good time to share the concept of substitute goods and graph the increased demand for soap.*

- **Check for understanding**
  - Take a poll: Producers should be able to charge higher prices for essential products when there is a shortage.
  - This is a pulse check. You can do this with a raise of hands, but if you have time, have students put themselves in a gradient based on how much they agree or disagree with the statement. This allows them to talk to each other to think more deeply about the issue.

IF YOU HAVE SHORTER CLASS PERIODS, THIS IS A GOOD PLACE TO CONCLUDE.

- **Determinants of demand**
  - Have students brainstorm responses to the question: Other than price, what might make you want more or less of a product?
  - Share with students the list of determinants of demand:
    - Income
      i. *If consumers have more money, they will demand more services. If consumers have less money, they will demand fewer goods and services.*
      ii. *Jin got a raise, so he started taking the family out to dinner on Tuesdays.*

- Expectations
  i. *If consumers expect a future shortage or price increase, they will demand more in the short run. If consumers expect a future surplus or a drop in price, they will demand less in the short run.*
  ii. *Hassan does not buy candy before Valentine's Day, because he knows it will go on sale after Valentine's Day.*
- Price of a substitute
  i. *If the price of a substitute is high, consumers will demand more of a good or service. If the price of a substitute is low, consumers will demand less of a good or service. Availability of the substitute might also cause demand effects.*
  ii. *Jimena bought chicken instead of turkey for Thanksgiving dinner because turkey was too expensive.*
- Price of a complement
  i. *If the price of a complement is low, consumers will demand more of a good or service. If the price of a complement is high, consumers will demand less of a good or service.*
  ii. *Margot bought more cookies because milk was on sale.*
- Tastes and preferences
  i. *If something is popular, consumers will demand more of it. If something becomes unpopular, consumers will demand less of it.*
  ii. *Bailey bought Crocs in every color because everyone is wearing them these days.*
- Discuss and give examples.
- Show students that increases in demand shift the curve to the right and decreases shift the curve to the left.
- Show students how to determine the changes in equilibrium price and quantity.
- Review the hand sanitizer example.
- Expectations and tastes and preferences caused an increase in demand, which should have caused an increase in price and quantity.

- **Practicing with determinants of demand**
  - Have students work in groups to complete the Determinants of Demand Worksheet based on the excerpt.
  - Review responses
    - *Facemasks: demand increase based on expectations, tastes, and preferences; increase in price and quantity*
    - *Groceries: demand increase based on tastes and preferences; increase in price and quantity*

    - *Delivered food: demand increase based on tastes and preferences; increase in price and quantity*
    - *Dine-in restaurants: decrease in demand based on tastes and preferences; decrease in price and quantity*
    - *Travel: decrease in demand based on tastes and preferences; decrease in price and quantity*
    - *Movie theaters: decrease in demand based on tastes and preferences; decrease in price and quantity*
    - *Home streaming services: increase in demand as a substitute, but this is really shifting tastes and preferences; increase in price and quantity*
    - *Toilet paper: increase in demand based on expectations; increase in price and quantity*
  - Teachers may extend this by asking students to brainstorm other effects like the loss of a job, the increase in outdoor gatherings, etc.

- **Determinants of supply**
  - Have students brainstorm responses to the following question: Other than price or quantity, what might make a producer willing and able to provide more of a product at every price level?
  - Share with students the list of determinants of supply
    - Technology
      i. *Producers may use technology to improve production techniques or lower production costs, supplying more. Similarly, technological failures may slow production or increase production costs, supplying less at every price level.*
      ii. *Sneaker companies will now 3D print rubber soles, speeding the shoe production process and driving down costs.*
    - Expectations
      i. *Producers might delay supply if they expect prices to rise in the future. Producers supply more in the short run if they expect prices to fall in the future.*
      ii. *Expectations of falling prices in the future pushed Samsung to provide more Android phones now.*
    - Costs of inputs
      i. *Producers will supply less at every price level if input prices are high. Conversely, if input prices drop, producers will supply more at every price level.*
      ii. *When the cost of corn rises, Frito-Lay will supply fewer corn chips at every price level.*
    - Number of producers
      i. *If there are more producers, supply will increase. If there are fewer producers, supply will decrease.*

        ii. *One of the donut shops on Main Street closed, so there is a decreased supply of donuts on Main Street.*
    - Government policies
        i. *Taxes, regulations, and restrictions decrease the supply of a product. Subsidies will increase supplies of a product.*
        ii. *Food and Drug Administration inspection rules reduce the supply of beef.*
  - Discuss and give examples.
  - Show students that increases in supply shift the curve to the right and that decreases in the curve shift supply to the left.
  - Review the sanitizer example with a shift in supply from alcohol manufacturers.
- **Determinants of supply practice**
  - Respond as a class to the example in the excerpt.
    - *Meat: decrease in supply; increase in price and decrease in quantity*
  - Have students in pairs generate at least one additional supply example.
  - Pairs should share their examples and graphs with the class.
  - Examples that are possible:
    - *Essential workers demand better pay: increase in input costs decreases supply of essential services, increasing price and decreasing the quantity of these services available.*
    - *People open Etsy shops for homemade masks: increase in the number of producers increases supply, decreases price, and increases quantity.*
    - *People who have lost their jobs start driving for DoorDash: increase in the number of suppliers increases supply, driving a decrease in price and an increase in quantity.*
    - *Government gives grants to airlines to remain in operation: government subsidies lead to increase in supply, decrease in prices, and increase in quantity.*
    - *People working from home decide to sell their vehicles: increase in suppliers willing to sell vehicles leads to increase in supply of used vehicles, leading to a decrease in price and an increase in quantity.*
    - *Government shuts down hair salons: Government embargo leads to reduced supply of haircuts given by people willing to perform these services in a client's home. This leads to a decrease in supply, increased prices, and decreased quantity.*
- **Price-gouging excerpt**
  - Have students read the price-gouging excerpt.
  - Have students answer the following questions:

- How would an economist expect producers to respond to a hand sanitizer shortage? Why did producers fail to respond this way?
  i. *We should expect producers to respond to price increases by producing more hand sanitizer.*
  ii. *Company reputation and government policy kept prices low, which prevented producers from responding to the price signals.*
- Should government policies prevent price gouging in an emergency? Why or why not?
  i. *Students may answer this either way with a valid response.*
  ii. *Price controls reinforce and prolong shortages of essential items.*
  iii. *Price controls may keep the limited quantities accessible to others via different means of allocation, such as first come, first served, rather than concentrating essential products in the hands of the wealthiest.*

- **Exit ticket**
  - Have students read the final excerpt.
  - Have students respond to two questions:
    - How do laws against price gouging negatively affect consumers?
      i. *These laws cause persistent shortages as well as cheating in the marketplace.*
      ii. *You may graph this as a price ceiling for students and demonstrate the shortage on the graph.*
    - Describe what happens in the market for essential products if price-gouging laws do not restrict buyers and sellers during an emergency.
  - As demand increases, so do equilibrium price and quantity. Some people choose to buy substitutes or not to buy at all. Producers increase supply levels, and more producers enter the market to bring prices back into balance.
      i. *Encourage students to graph this with one supply shift and one demand shift if they can.*

ECONOMICS IN ONE VIRUS: CHAPTER 10

Why was there no hand sanitizer in my pharmacy for months?

Warm-Up

I noticed:	I think:	I wonder:

- How should we decide who gets the hand sanitizer?

Contest

Personal Characteristics

First Come, First Served

Auction

Why was there no hand sanitizer in my pharmacy for months?

Distribution Methods Graphic Organizer

Contest

Pros	Cons

Personal Characteristics

Pros	Cons

Why was there no hand sanitizer in my pharmacy for months?

Distribution Methods Graphic Organizer

First Come, First Served

Pros	Cons

Auction

Pros	Cons

Why was there no hand sanitizer in my pharmacy for months?

Vocabulary Preview Sheet

Demand This is the goods and services buyers are willing and able to purchase in markets.	**Law of Demand** As the price of a product increases, the quantity of that product demanded will decrease.	**Law of Supply** As the price of a product increases, the quantity of that product supplied will also increase.
Use "demand" in a sentence:	Use the blank graph below to draw a demand curve:  	Use the blank graph below to draw a supply curve: 

Market Equilibrium	Price	Price Gouging
This is the point at which producers and consumers agree on a price and a quantity.	This is the amount of money exchanged by buyers and sellers.	This is when the seller increases the price of a good or service to a level higher than what is considered reasonable or fair.
Draw a supply curve and demand curve on the same graph. Where they cross is market equilibrium. X marks the spot! Draw a big dot on market equilibrium. 	Draw a supply curve and a demand curve on the same graph. Where they cross is market equilibrium. Draw a dotted line from there to the Y axis. That is equilibrium price! 	What does price gouging look like? Draw a picture.

Quantity This is the amount of a good or service.	**Shortage** This is when the quantity demanded is greater than the quantity supplied at a given price level.	**Supply** Supply is the goods and services producers are willing and able to take to market.
Draw a supply curve and a demand curve on the same graph. Where they cross is market equilibrium. Draw a dotted line from there to the X axis. That is equilibrium quantity. 	Give an example of a shortage.	Use "supply" in a sentence.

- Use all nine words to write a paragraph!

Why was there no hand sanitizer in my pharmacy for months?

Excerpt #1

What can economics tell us about these phenomena? What we were observing could be explained by Econ 101—it is a story of *supply* and *demand*. Or, at least, it represents our societal attempts to deny how these forces ordinarily determine prices in a market economy.

Most people don't usually use much hand sanitizer. Yet after public health officials talked of the importance of keeping our hands clean throughout the day, the want and need for it soared. Not just for individuals but for use in business settings too.

People rushed to buy up whatever they could, emptying the shelves over and over again as soon as they were refilled. There was a huge, unexpected expansion in demand. With stores out of the goods and customers' willingness to pay rising sharply, this near-term shortage was leading to sales at higher and higher prices in a smaller market online. People who really want something badly are often willing to pay vast amounts for it.

Now, ordinarily, with more buyers competing to obtain the normal supply of products, prices would start to rise for sanitizer across the economy. These rising prices would be a message, screaming that there is relative scarcity in the market—of supply not satisfying the now higher level of demand. It's the same sort of message that we get in years with sharply rising rents in cities such as New York, or when flight prices spike when a destination becomes more fashionable and desirable during holiday seasons.

That very price rise ordinarily spurs a reaction from companies. With it becoming more profitable for may producers to supply more of a good to the market, they might hire some more workers or offer more overtime to ramp up production to meet demand. . . .

At the same time, as the price rises from that initial demand shock, consumers would start questioning whether they really need a second sanitizer bottle enough to justify paying a higher price. The price rise would serve as an effective rationing device, partially reducing the quantity of sanitizer that would have been demanded had the price remained fixed. Those that placed higher value on obtaining sanitizer, such as businesses where having hand sanitizer is important to assure consumers that they are lowering their risks from the virus, would continue to pay for the amounts they needed. Others who might have picked up a bottle or two might now instead opt for soap.

As these two incentive effects play out, gradually the market would converge to a position where the supply of sanitizer was able to meet a higher demand at a new, higher price. Consumers would be paying higher prices, yes, but more sanitizer would be available than it was before. Pretty soon, there would be no shortages on the shelves.

—*Economics in One Virus,* pp. 150–151

- How was the demand for hand sanitizer affected by the coronavirus pandemic? Why?
- What happened to the price of hand sanitizer as a result? Why?
- What should have happened to the supply for hand sanitizer? Why?
- What should have happened to the quantity of hand sanitizer demanded? Why?

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Determinants of Demand

Income

If consumers have more money, they will demand more services. If consumers have less money, they will demand fewer goods and services.

Expectations

If consumers expect a future shortage or price increase, they will demand more in the short run. If consumers expect a future surplus or a drop in price, they will demand less in the short run.

Price or Availability of a Substitute

If the price of a substitute is high, consumers will demand more of a good or service. If the price of a substitute is low, consumers will demand less of a good or service. Availability of the substitute might also cause demand effects.

Price of a Complement

If the price of a complement is low, consumers will demand more of a good or service. If the price of a complement is high, consumers will demand less of a good or service.

Tastes and Preferences

If something is popular, consumers will demand more of it. If something becomes unpopular, consumers will demand less of it.

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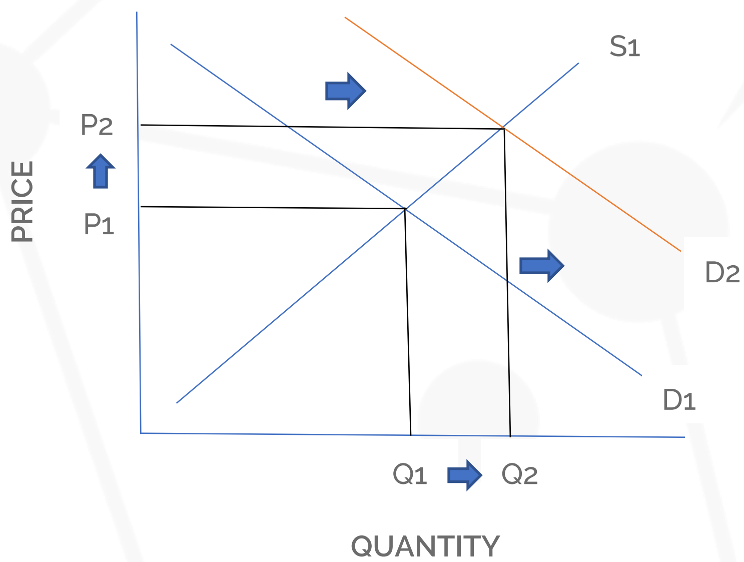
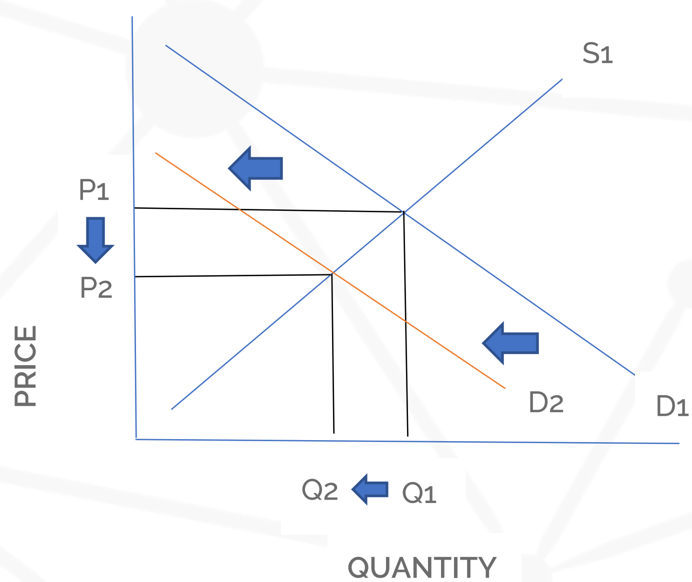
Shifts in Demand

Demand increases shift the curve to the **RIGHT**. Price increases, and quantity increases.



Demand decreases shift the curve to the **LEFT**. Price decreases, and quantity decreases.



Why was there no hand sanitizer in my pharmacy for months?

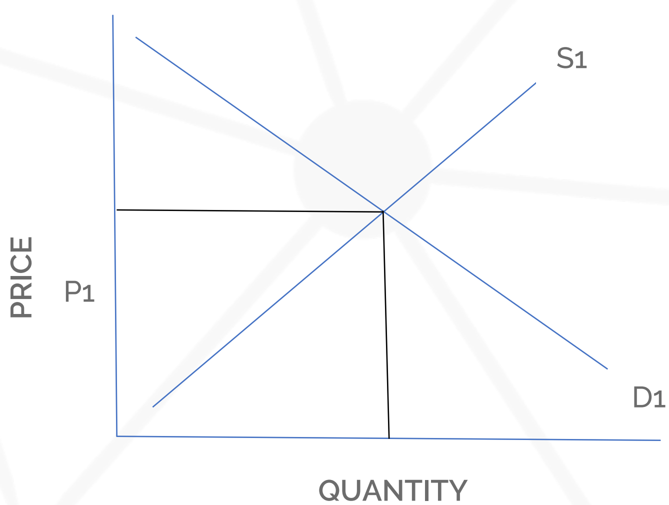
Practicing with Demand

Think of all the ways the pandemic severely disrupted supply and demand in product markets. On the demand side, we got the unexpected and sudden demand increases for goods perceived as "needed" for COVID-19 (such as facemasks and hand sanitizer). But there was also a demand surge and then ongoing elevated spending at grocery stores and for delivered food, because sit-in restaurants were first closed and then perceived as less safe to dine in. All that was mirrored by the opposite effect of collapsing demand on travel, recreation, and entertainment—industries with higher perceived risk of infection.

Consumers stocked up on some products, such as home toilet paper, out of precaution because they expected shortages. Then, in other sectors, we saw a big demand substitution, such as from movie theatres to home streaming.

—*Economics in One Virus*, p. 153

- Directions: Graph the correct demand shift for one of the markets identified in the excerpt.



- Circle the label for the market you have graphed:
  - Facemasks
  - Groceries
  - Delivered food
  - Dine-in restaurants
  - Travel
  - Movie theaters
  - Streaming services

- Circle the correct effect:
  - Demand
  - Price
  - Quantity

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Determinants of Supply

Technology

Producers may use technology to improve production techniques or lower production costs, supplying more. Similarly, technological failures may slow down production or increase production costs, supplying less at every price level.

Expectations

Producers might delay supply if they expect prices to rise in the future. Producers supply more in the short run if they expect prices to fall in the future.

Costs of Inputs

Producers will supply less at every price level if input prices are high. Conversely, if input prices drop, producers will supply more at every price level.

Number of Producers

If there are more producers, supply will increase. If there are fewer producers, supply will decrease.

Government Policies

Taxes, regulations, and restrictions decrease the supply of a product. Subsidies will increase supplies of a product.

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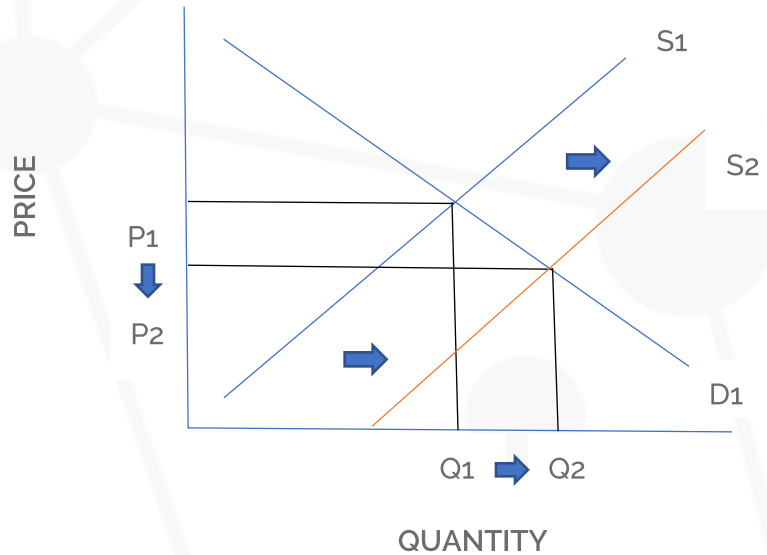
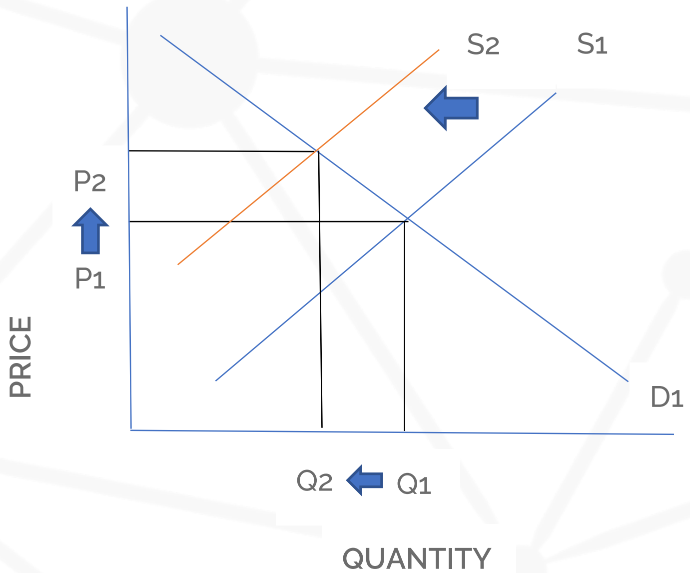
Shifts in Supply

Supply increases shift the curve to the **RIGHT**. Price decreases, and quantity increases.



Supply decreases shift the curve to the **LEFT**. Price increases, and quantity decreases.



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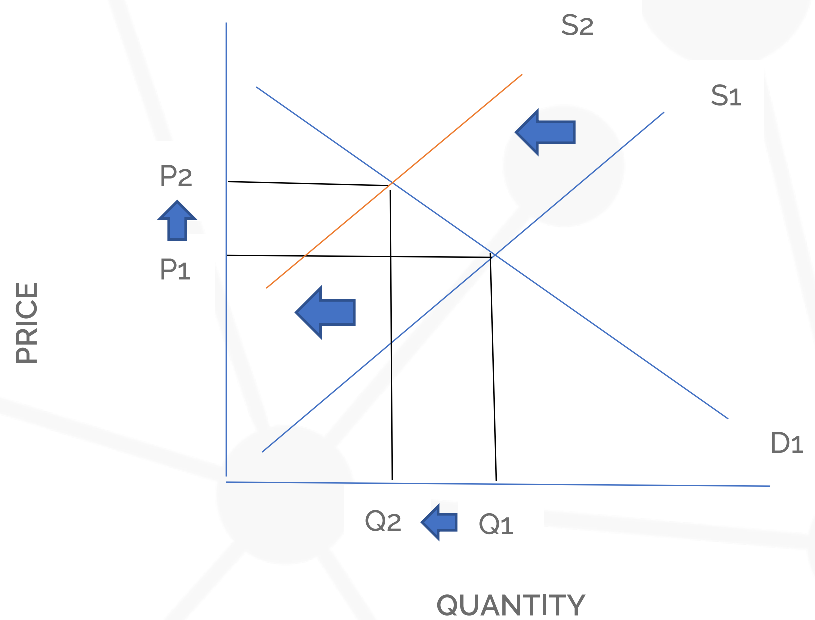
Practice with Supply

But it's not just the demand side. Travel and work restrictions, as well as the virus itself, disrupted supply chains. We saw meat shortages, for example, when meatpacking plants were closed after being found to be prolific virus transmission sites.

—*Economics in One Virus*, p. 153

Example:



Packaged Meats

- Directions:
  - Generate an example of the way that COVID-19 may have affected the supply of a specific product in the market. Describe what happened and how supply was affected. Draw a graph that reflects the shift in supply. Describe the effect of the shift in supply on price and quantity of the product.

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Price-Gouging Excerpt

Businesses might not want to adjust prices much when supply and demand varies within expected ranges. After all, it is costly to adjust prices, and they have to take into account how consumers will react to fluctuating prices in terms of willingness to search for alternative sellers. But these COVID-19 disruptions were so drastic that major price changes might be more likely to occur. What's more, these price changes would be desirable. Price increases in markets with surging demand, for example, would actively incentivize wholesalers to take time to redesign their products and build new relationships to fulfill our new needs. Rising prices would make us think twice as consumers about overbuying and hoarding toilet paper. Elevated prices for scarce goods would encourage those with big stocks of the products to bring them to market. And a bigger payoff for existing manufacturers would incentivize entrepreneurs to reengineer their businesses to the new realities, paying overtime or ramping up production to meet demand.

Yes, these effects would not be instantaneous. Yes, it is regrettable that consumers would have to pay more. Yes, no economist pretends this is good for everyone. But, as a society, we want resources to shift to producing things that consumers want and need.

Yet when such large-scale changes to supply and demand occur as the result of an emergency, such as a pandemic or hurricane, many of us seemingly reject or ignore the underlying economics. Instead, we blame the companies raising prices as being greedy rather than acknowledging the supply-and-demand realities they face.

Whereas market prices before an emergency are deemed good, fair, and reasonable, market prices that rise significantly during an emergency are dubbed bad, unfair, and unreasonable. Firms are accused of profiteering. Where once we understood that supply and demand determines what we pay for things, now we imply that companies have complete discretion to set prices at whatever level they like, irrespective of consumers' willingness to pay or the risk of being undercut by competitors. Hence the charge of price gouging.

—*Economics in One Virus,* pp. 154–155

- How would an economist expect producers to respond to a hand sanitizer shortage? Why did producers fail to respond this way?

- Should government policies prevent price gouging in an emergency? Why or why not?

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Exit Ticket

But the unwillingness by policymakers to allow the price mechanism to ration the goods means that those who need it most (and are willing to pay more for it) will often not be able to find the sanitizer, while the financial incentive to produce more, particularly for existing suppliers, gets smothered—resulting in empty shelves, at least until demand subsides somewhat. Although we might expect national brands to avoid raising prices out of concern for their reputations, anti-price-gouging laws also prohibit smaller convenience stores and existing online merchants from raising their prices to ensure supply meets demand. This eliminates the market safety valve of sellers who are less concerned with their reputations from providing the more expensive goods to those who really value them highly.

Price controls like this, in fact, have very negative short-, medium-, and long-term consequences. In the near term they encourage buyers to overpurchase and hoard. Those fortunate enough to be in the store when shelves are replenished buy more than they would have if prices reflected the reality of the situation. Meanwhile, these just-in-case purchases worsen shortages for others, who see their demands unmet, given the gap between the amount of the product available and the amount they want to consume at the regulated price.

—*Economics in One Virus*, p. 159

- How do laws against price gouging negatively affect consumers?

- Describe what happens in the market for essential products if price-gouging laws do not restrict buyers and sellers during an emergency.