

4

The Market Forces of Supply and Demand

PRINCIPLES OF

MACROECONOMICS

FOURTH CANADIAN EDITION

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PowerPoint® Slides

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Canadian adaptation by Marc Prud'Homme

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In this chapter, look for the answers to these questions:

What factors affect buyers' demand for goods?

What factors affect sellers' supply of goods?

How do supply and demand determine the price of a good and the quantity sold?

How do changes in the factors that affect demand or supply affect the market price and quantity of a good?

How do markets allocate resources?

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Markets and Competition

A **market** is a group of buyers and sellers of a particular good or service.

A **competitive market** is one in which there are so many buyers and so many sellers that each has a negligible impact on the market price.

A **perfectly competitive** market:

all goods are exactly the same

buyers & sellers so numerous that no one can affect the market price – each is a “**price taker**”

In this chapter, we assume markets are perfectly competitive.

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## Demand

- Demand comes from the behaviour of buyers.
- The **quantity demanded** of any good is the amount of the good that buyers are willing and able to purchase.
- **Law of demand:** the claim that, other things equal, the quantity demanded of a good falls when the price of the good rises.

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## The Demand Schedule

- **Demand schedule:**  
A table that shows the relationship between the price of a good and the quantity demanded.
- Example:  
Helen's demand for lattes.
- Notice that Helen's preferences obey the Law of Demand.

Price of lattes	Quantity of lattes demanded
\$0.00	16
1.00	14
2.00	12
3.00	10
4.00	8
5.00	6
6.00	4

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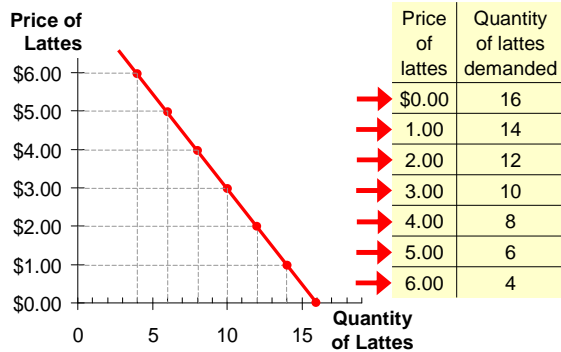
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## Helen's Demand Schedule & Curve



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### Market Demand versus Individual Demand

- The quantity demanded in the market is the sum of the quantities demanded by all buyers at each price.
- Suppose Helen and Ken are the only two buyers in the Latte market. ( $Q^d$  = quantity demanded)

Price	Helen's $Q^d$		Ken's $Q^d$		Market $Q^d$
\$0.00	16	+	8	=	24
1.00	14	+	7	=	21
2.00	12	+	6	=	18
3.00	10	+	5	=	15
4.00	8	+	4	=	12
5.00	6	+	3	=	9
6.00	4	+	2	=	6

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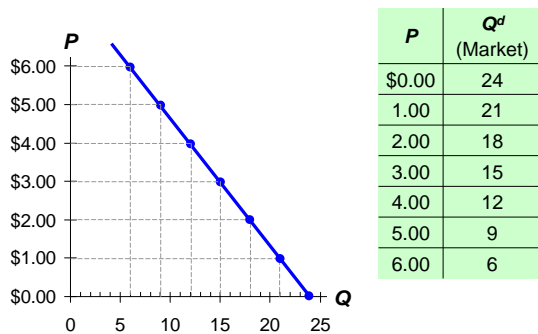
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### The Market Demand Curve for Lattes



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### Demand Curve Shifters

- The demand curve shows how price affects quantity demanded, *other things being equal*.
- These "other things" are non-price determinants of demand (*i.e.*, things that determine buyers' demand for a good, other than the good's price).
- Changes in them shift the **D** curve...

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### Demand Curve Shifters: Number of Buyers

- An increase in the number of buyers causes an increase in quantity demanded at each price, which shifts the demand curve to the right.

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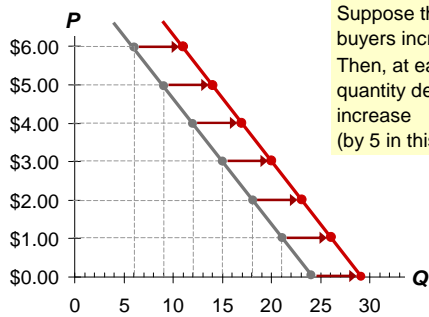
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### Demand Curve Shifters: Number of Buyers



Suppose the number of buyers increases. Then, at each price, quantity demanded will increase (by 5 in this example).

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### Demand Curve Shifters: Income

- Demand for a **normal good** is positively related to income.
  - An increase in income causes increase in quantity demanded at each price, shifting the **D** curve to the right.

(Demand for an **inferior good** is negatively related to income. An increase in income shifts **D** curves for inferior goods to the left.)

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### Demand Curve Shifters: Prices of Related Goods

- Two goods are **substitutes** if an increase in the price of one causes an increase in demand for the other.
- Example: pizza and hamburgers.  
An increase in the price of pizza increases demand for hamburgers, shifting the hamburger demand curve to the right.
- Other examples: Coke and Pepsi, laptops and desktop computers, compact discs and music downloads

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### Demand Curve Shifters: Prices of Related Goods

- Two goods are **complements** if an increase in the price of one leads to a fall in demand for the other.
- Example: computers and software.  
If price of computers rises, people buy fewer computers, and therefore less software.  
Software demand curve shifts left.
- Other examples: college tuition and textbooks, bagels and cream cheese, eggs and bacon

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### Demand Curve Shifters: Tastes

- Anything that causes a shift in tastes *toward* a good will increase demand for that good and shift its **D** curve to the right.
- Example:  
The Atkins diet became popular in the '90s, caused an increase in demand for eggs, shifted the egg demand curve to the right.

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### Demand Curve Shifters: Expectations

- Expectations affect consumers' buying decisions.
- Examples:
  - If people expect their incomes to rise, their demand for meals at expensive restaurants may increase now.
  - If the economy turns bad and people worry about their future job security, demand for new autos may fall now.

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### Summary: Variables That Affect Demand

Variable	A change in this variable...
Price	...causes a movement along the <b>D</b> curve
No. of buyers	...shifts the <b>D</b> curve
Income	...shifts the <b>D</b> curve
Price of related goods	...shifts the <b>D</b> curve
Tastes	...shifts the <b>D</b> curve
Expectations	...shifts the <b>D</b> curve

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### ACTIVE LEARNING 1: Demand curve

Draw a demand curve for music downloads. What happens to it in each of the following scenarios? Why?

- A. The price of iPods falls
- B. The price of music downloads falls
- C. The price of compact discs falls



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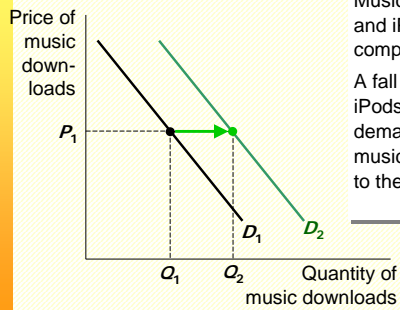
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**ACTIVE LEARNING 1:**  
**A. price of iPods falls**



Music downloads and iPods are complements. A fall in price of iPods shifts the demand curve for music downloads to the right.

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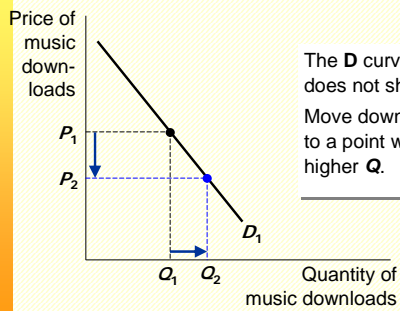
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**ACTIVE LEARNING 1:**  
**B. price of music downloads falls**



The  $D$  curve does not shift. Move down along curve to a point with lower  $P$ , higher  $Q$ .

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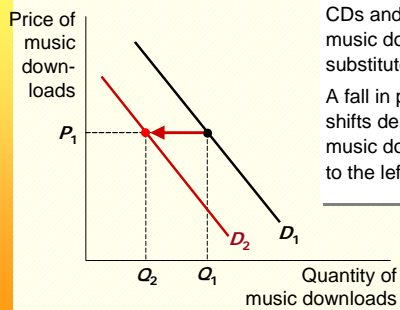
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**ACTIVE LEARNING 1:**  
**C. price of CDs falls**



CDs and music downloads are substitutes. A fall in price of CDs shifts demand for music downloads to the left.

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## Supply

- Supply comes from the behaviour of sellers.
- The **quantity supplied** of any good is the amount that sellers are willing to sell.
- Law of supply:** the claim that, other things equal, the quantity supplied of a good rises when the price of the good rises.

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## The Supply Schedule

- Supply schedule:**  
A table that shows the relationship between the price of a good and the quantity supplied.
- Example:  
Starbucks' supply of lattes.
- Notice that Starbucks' supply schedule obeys the Law of Supply.

Price of lattes	Quantity of lattes supplied
\$0.00	0
1.00	3
2.00	6
3.00	9
4.00	12
5.00	15
6.00	18

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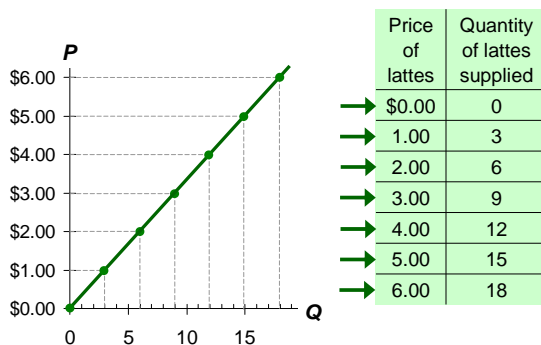
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## Starbucks' Supply Schedule & Curve



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### Market Supply versus Individual Supply

- The quantity supplied in the market is the sum of the quantities supplied by all sellers at each price.
- Suppose Starbucks and Jitters are the only two sellers in this market. ( $Q^s$  = quantity supplied)

Price	Starbucks		Jitters		Market $Q^s$
\$0.00	0	+	0	=	0
1.00	3	+	2	=	5
2.00	6	+	4	=	10
3.00	9	+	6	=	15
4.00	12	+	8	=	20
5.00	15	+	10	=	25
6.00	18	+	12	=	30

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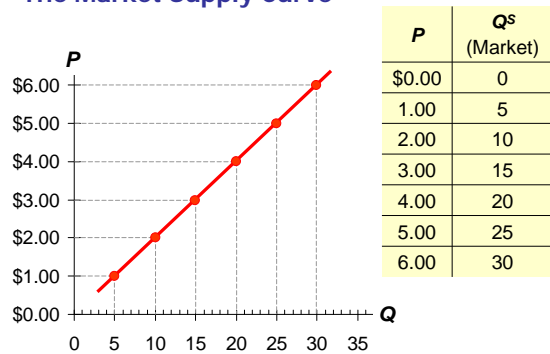
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### The Market Supply Curve



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### Supply Curve Shifters

- The supply curve shows how price affects quantity supplied, *other things being equal*.
- These "other things" are non-price determinants of supply.
- Changes in them shift the **S** curve...

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### Supply Curve Shifters: Input Prices

- Examples of input prices: wages, prices of raw materials.
- A fall in input prices makes production more profitable at each output price, so firms supply a larger quantity at each price, and the **S** curve shifts to the right.

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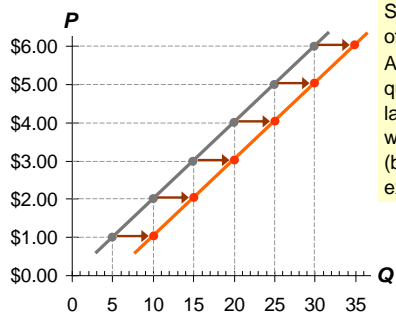
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### Supply Curve Shifters: Input Prices



Suppose the price of milk falls. At each price, the quantity of lattes supplied will increase (by 5 in this example).

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### Supply Curve Shifters: Technology

- Technology determines how much inputs are required to produce a unit of output.
- A cost-saving technological improvement has same effect as a fall in input prices, shifts the **S** curve to the right.

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### Supply Curve Shifters: Number of sellers

- An increase in the number of sellers increases the quantity supplied at each price, shifts the **S** curve to the right.

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### Supply Curve Shifters: Expectations

- Suppose a firm expects the price of the good it sells to rise in the future.
- The firm may reduce supply now, to save some of its inventory to sell later at the higher price.
- This would shift the **S** curve leftward.

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### Summary: Variables That Affect Supply

Variable	A change in this variable...
Price	...causes a movement along the <b>S</b> curve
Input prices	...shifts the <b>S</b> curve
Technology	...shifts the <b>S</b> curve
No. of sellers	...shifts the <b>S</b> curve
Expectations	...shifts the <b>S</b> curve

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## ACTIVE LEARNING 2: Supply curve

Draw a supply curve for tax return preparation software. What happens to it in each of the following scenarios?

- A. Retailers cut the price of the software.
- B. A technological advance allows the software to be produced at lower cost.
- C. Professional tax return preparers raise the price of the services they provide.



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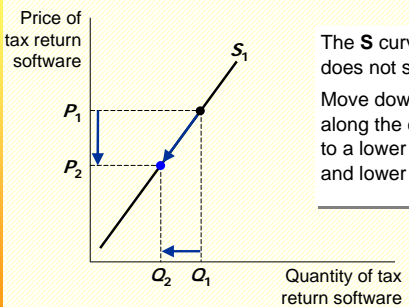
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## ACTIVE LEARNING 2: A. fall in price of tax return software



The **S** curve does not shift. Move down along the curve to a lower **P** and lower **Q**.

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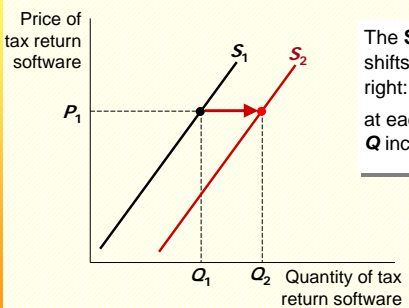
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## ACTIVE LEARNING 2: B. fall in cost of producing the software



The **S** curve shifts to the right: at each price, **Q** increases.

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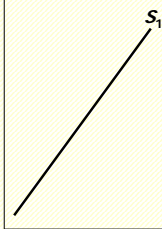
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## ACTIVE LEARNING 2:

### C. professional preparers raise their price

Price of  
tax return  
software



This shifts the  
demand curve for  
tax preparation  
software, not the  
supply curve.

Quantity of tax  
return software

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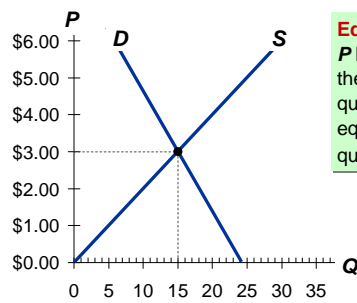
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## Supply and Demand Together



**Equilibrium:**  
**P** has reached  
the level where  
quantity supplied  
equals  
quantity demanded

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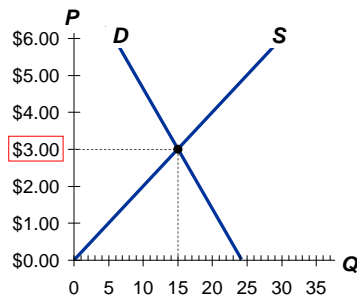
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## Equilibrium price:

The price that equates quantity supplied with quantity demanded



P	Q <sup>D</sup>	Q <sup>S</sup>
\$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30

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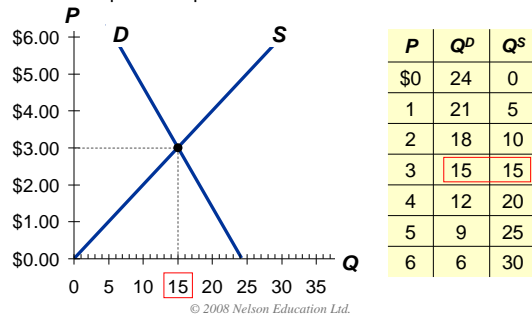
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### Equilibrium quantity:

The quantity supplied and quantity demanded at the equilibrium price



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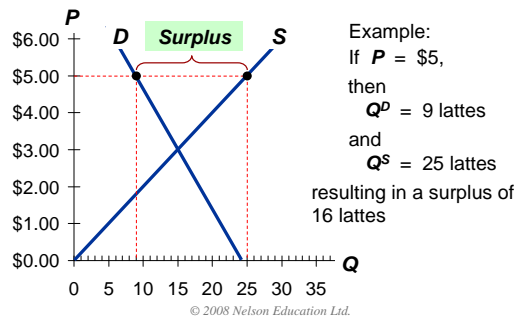
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### Surplus:

when quantity supplied is greater than quantity demanded



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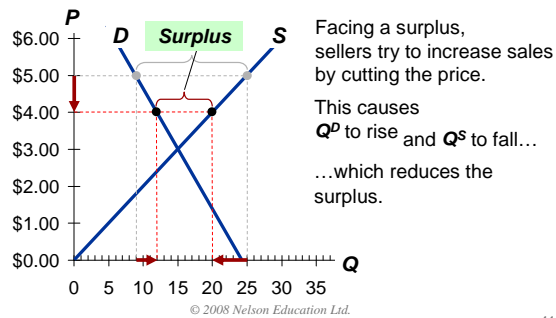
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### Surplus:

when quantity supplied is greater than quantity demanded



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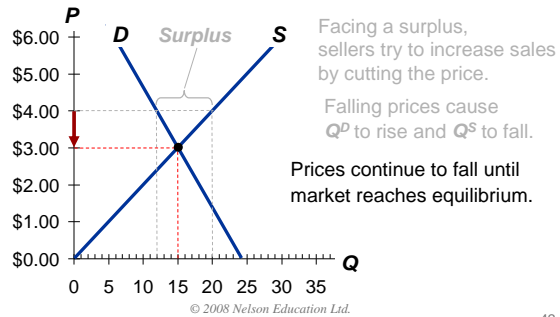
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### Surplus:

when quantity supplied is greater than quantity demanded



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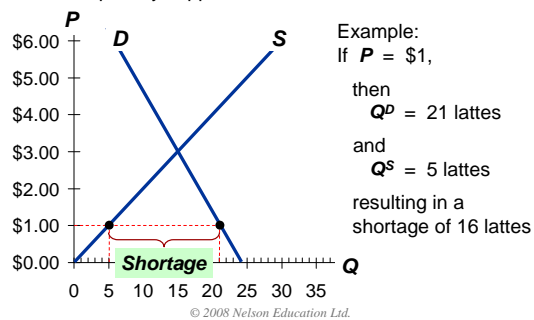
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### Shortage:

when quantity demanded is greater than quantity supplied



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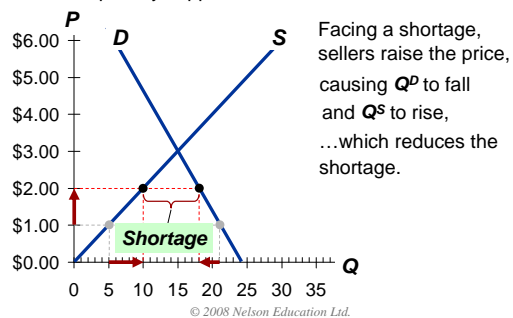
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### Shortage:

when quantity demanded is greater than quantity supplied



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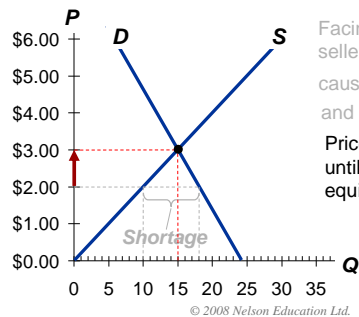
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### Shortage:

when quantity demanded is greater than quantity supplied



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Facing a shortage, sellers raise the price, causing  $Q^D$  to fall and  $Q^S$  to rise. Prices continue to rise until market reaches equilibrium.

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### Three Steps to Analyzing Changes in Eq'm

To determine the effects of any event,

1. Decide whether the event shifts **S** curve, **D** curve, or both.
2. Decide in which direction the curve shifts.
3. Use supply-demand diagram to see how the shift changes eq'm **P** and **Q**.

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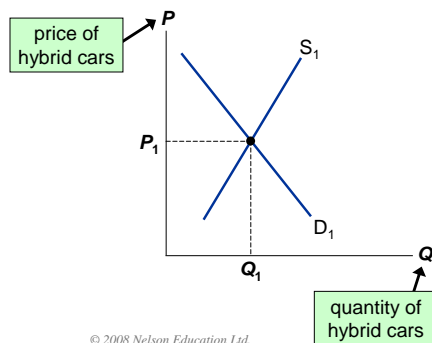
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### EXAMPLE: The Market for Hybrid Cars



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### EXAMPLE 1: A Change in Demand

#### EVENT TO BE

#### ANALYZED:

Increase in price of gas.

#### STEP 1:

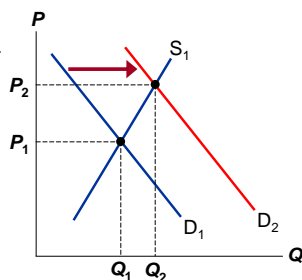
D curve shifts

#### STEP 2:

D shifts right

#### STEP 3:

The shift causes an increase in price and quantity of hybrid cars.



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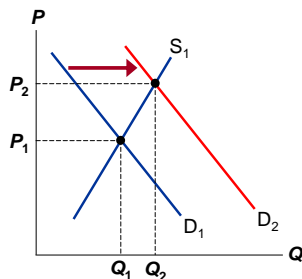
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### EXAMPLE 1: A Change in Demand

Notice:

When **P** rises, producers supply a larger quantity of hybrids, even though the **S** curve has not shifted.

*Always be careful to distinguish b/w a shift in a curve and a movement along the curve.*



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### Shift in Curves vs. Movement along Curves

- **Change in supply:** a shift in the **S** curve
  - occurs when a non-price determinant of supply changes (like technology or costs)
- **Change in the quantity supplied:** a movement along a fixed **S** curve
  - occurs when **P** changes
- **Change in demand:** a shift in the **D** curve
  - occurs when a non-price determinant of demand changes (like income or # of buyers)
- **Change in the quantity demanded:** a movement along a fixed **D** curve
  - occurs when **P** changes

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### EXAMPLE 2: A Change in Supply

**EVENT:** New technology reduces cost of producing hybrid cars.

**STEP 1:**

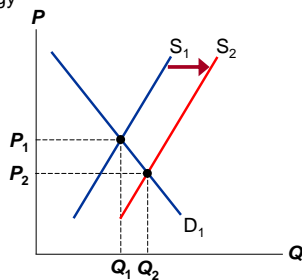
**S** curve shifts

**STEP 2:**

**S** shifts right

**STEP 3:**

The shift causes price to fall and quantity to rise.



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### EXAMPLE 3: A Change in Both Supply and Demand

**EVENTS:**

price of gas rises AND new technology reduces production costs

**STEP 1:**

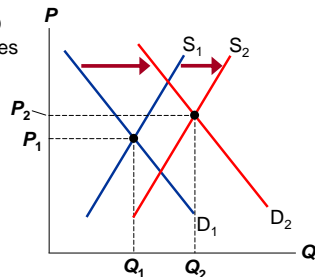
Both curves shift.

**STEP 2:**

Both shift to the right.

**STEP 3:**

**Q** rises, but effect on **P** is ambiguous: If demand increases more than supply, **P** rises.



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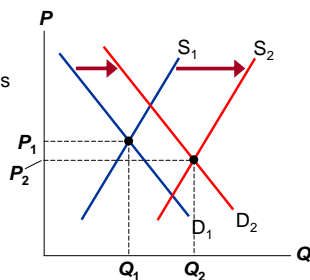
### EXAMPLE 3: A Change in Both Supply and Demand

**EVENTS:**

price of gas rises AND new technology reduces production costs

**STEP 3, cont.**

But if supply increases more than demand, **P** falls.



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### ACTIVE LEARNING 3: Changes in supply and demand

Use the three-step method to analyze the effects of each event on the equilibrium price and quantity of music downloads.

- Event A: A fall in the price of compact discs
- Event B: Sellers of music downloads negotiate a reduction in the royalties they must pay for each song they sell.
- Event C: Events A and B both occur.

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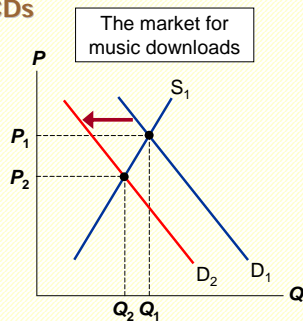
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### ACTIVE LEARNING 3: A. fall in price of CDs

#### STEPS

1. **D** curve shifts
2. **D** shifts left
3. **P** and **Q** both fall.



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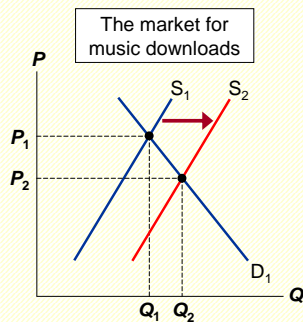
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### ACTIVE LEARNING 3: B. fall in cost of royalties

#### STEPS

1. **S** curve shifts  
(royalties are part of sellers' costs)
2. **S** shifts right
3. **P** falls,  
**Q** rises.



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### ACTIVE LEARNING 3:

#### C. fall in price of CDs AND fall in cost of royalties

##### STEPS

1. Both curves shift (see parts A & B).
2. **D** shifts left, **S** shifts right.
3. **P** unambiguously falls.  
Effect on **Q** is ambiguous:  
The fall in demand reduces **Q**,  
the increase in supply increases **Q**.

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#### CONCLUSION: How Prices Allocate Resources

- One of the Ten Principles from Chapter 1: *Markets are usually a good way to organize economic activity.*
- In market economies, prices adjust to balance supply and demand. These equilibrium prices are the signals that guide economic decisions and thereby allocate scarce resources.



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#### CHAPTER SUMMARY

- A competitive market has many buyers and sellers, each of whom has little or no influence on the market price.
- Economists use the supply and demand model to analyze competitive markets.
- The downward-sloping demand curve reflects the Law of Demand, which states that the quantity buyers demand of a good depends negatively on the good's price.

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## CHAPTER SUMMARY

- Besides price, demand depends on buyers' incomes, tastes, expectations, the prices of substitutes and complements, and # of buyers. If one of these factors changes, the **D** curve shifts.
- The upward-sloping supply curve reflects the Law of Supply, which states that the quantity sellers supply depends positively on the good's price.
- Other determinants of supply include input prices, technology, expectations, and the # of sellers. Changes in these factors shift the **S** curve.

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## CHAPTER SUMMARY

- The intersection of **S** and **D** curves determine the market equilibrium. At the equilibrium price, quantity supplied equals quantity demanded.
- If the market price is above equilibrium, a surplus results, which causes the price to fall. If the market price is below equilibrium, a shortage results, causing the price to rise.

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## CHAPTER SUMMARY

- We can use the supply-demand diagram to analyze the effects of any event on a market: First, determine whether the event shifts one or both curves. Second, determine the direction of the shifts. Third, compare the new equilibrium to the initial one.
- In market economies, prices are the signals that guide economic decisions and allocate scarce resources.

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# End: Chapter 4

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