

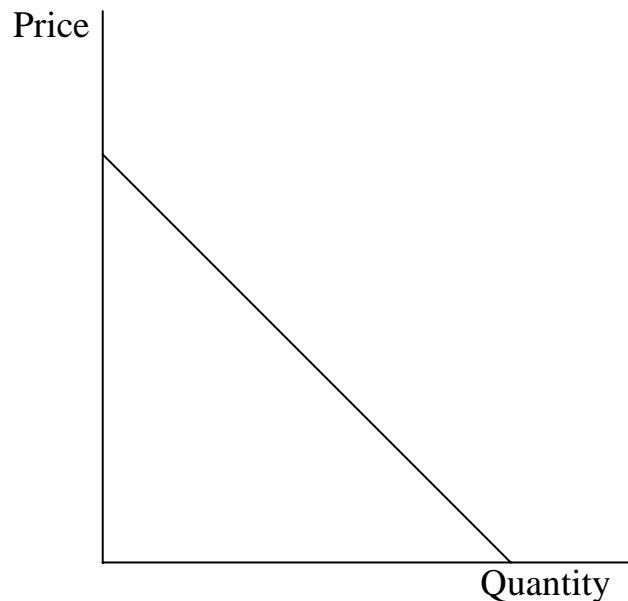
Chapter 3 outline, Principles of Microeconomics  
Supply and Demand

Demand – there is an inverse relationship between the price of a good and the amount that people are willing to purchase

The demand schedule (demand curve) is a table (graph) that shows the relationship between price and quantity of a good. (Technically, the schedule is a table and the curve is a graph, but the technical detail is not important as long as you remember the main result.)

Price	Quantity
5	0
4	1
3	2
2	3
1	4

Demand Schedule



Demand curve

The demand curve is just a graphical representation (picture) of the demand schedule.

We can read the demand curve 2 ways:

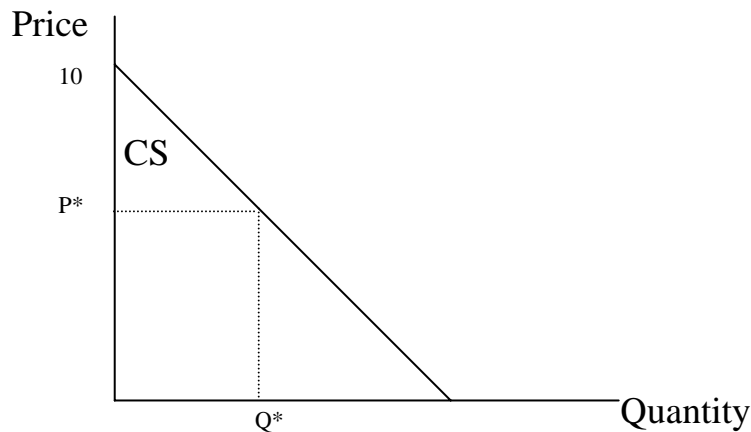
1. Horizontally: How much a person (or people if we have a market demand curve) will purchase at a given price
2. Vertically: The height of the market demand schedule is the price that a consumer is willing to pay for an additional unit.

## Market demand

It is easy to create a market demand curve (well, in theory and in this particular course it's easy; in reality, it's a little more difficult). All we need to do is look at the quantity each consumer will buy at a given price and then add up those quantities.

Consumer surplus – the net gain to consumers; mathematically, it is the area below the demand curve but above the actual price paid

The underlying principle to consumer surplus is that people are generally willing to pay more for the first unit of a good than they are for later units of the same good. Thus, when you purchase 10 boxes of macaroni and cheese for 34 cents each, you gain a surplus because you would be willing to purchase the 1<sup>st</sup> box for 65 cents. Graphically, consumer surplus looks like:



In order to calculate consumer surplus in this small example, we need to find the area of the consumer surplus triangle. That area is given by the basic formula for a triangle, which is  $\frac{1}{2} * \text{Base} * \text{Height}$ . In this example, the base is equal to  $Q^*$  and the height is equal to  $10 - P^*$ . So consumer surplus would be  $\frac{1}{2} * Q^* * (10 - P^*)$ .

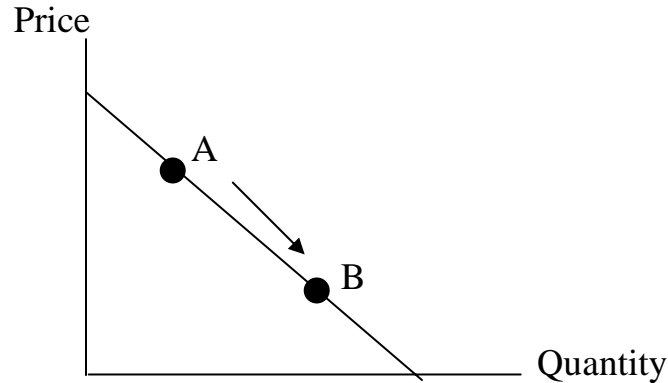
Changes in demand versus quantity demanded  
(This is a weak area for many students)

Changes in quantity demanded cause a shift along one demand curve.  
Changes in demand cause the entire demand curve to shift.

**Quantity demanded** changes because of **1** reason:

1. a change in the price of the good in question (if we are talking about the market for apples, then a change in the price of apples will cause a change in the quantity demanded of apples)

A graphical representation of a quantity demanded change is shown below.



This particular graph shows how quantity demanded increases when price decreases.

The **demand** for a good changes because of these reasons:

1. a change in consumer income (demand increases when income increases)
2. a change in the number of consumers in the market (demand increases when the number of consumers increases)
3. a change in the price of a substitute good (demand increases when the price of a substitute increases)
4. a change in the price of a complementary good (demand increases when the price of a complement decreases)
5. a change in the expected future price of the good (demand increases when people expect the price to rise)
6. demographic changes: population changes in age groups with strong demand for a good
7. preferences: consumer desires for the goods change

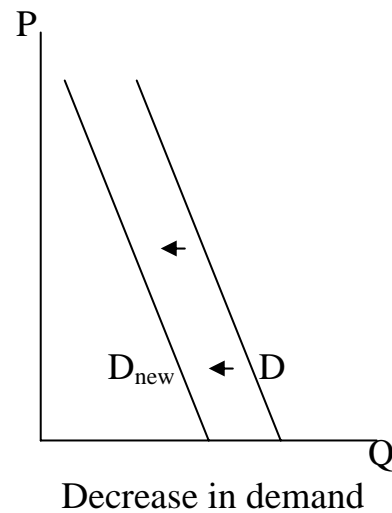
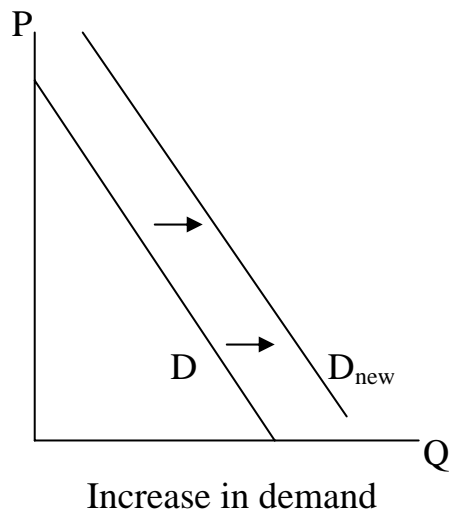
\*note that demand decreases when an opposite change occurs, such as less consumers in the market

## Substitutes and complements

1. substitutes are goods that can be seen as having a similar function; you choose one good or the other
  - a. margarine or butter
  - b. hot dogs or hamburgers
  - c. going to the gym or going to a moviesubstitutes do not mean that you should not consume or purchase both; it just means that there are other options available for consumers if the price of one good becomes too high
2. Complements are goods that are consumed together
  - a. ham and eggs
  - b. coffee and cream
  - c. ice cream and hot fudge and whip cream and cherries and colored sprinkles, etc.

complements do not mean that these goods cannot be consumed independent of each other; it just means that demand for one good may be affected by a price increase in a good that it is normally consumed with

The pictures below show an increase in demand (shift to the right of the entire demand curve) and a decrease in demand (shift to the left of the entire demand curve).



## Supply

Profits and losses play an important part in supply.

They are the driving forces behind why producers choose how much to produce.

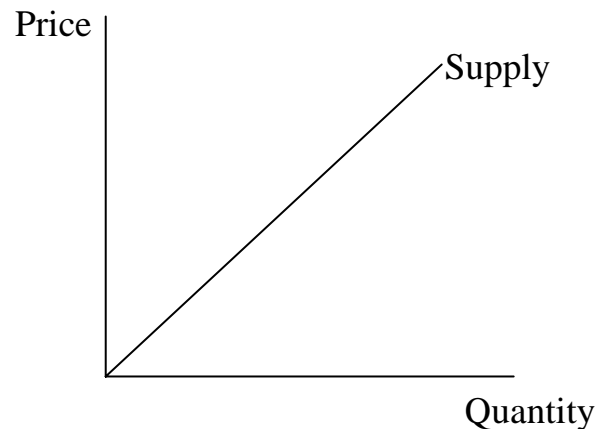
### Law of supply

Supply – there is a direct relationship between the price of a good and the amount which producers are willing to produce; i.e. if the price of a good goes up producers will be willing to produce more

The supply curve is graphed on the same type of graph as the demand curve (price is on the vertical or Y-axis and quantity is on the horizontal or X-axis). We can also have a supply schedule and a supply curve. The supply schedule and supply curve look as follows.

Price	Quantity
0	0
1	1
2	2
3	3
4	4

Supply schedule



Supply curve

The supply curve can be read two ways:

- A. Horizontally: the quantity a producer will produce at a given price
- B. Vertically:
  - a. the minimum price necessary to induce producers to supply that additional unit
  - b. the opportunity cost of producing that additional unit

### Changes in quantity supplied versus changes in supply

A change in quantity supplied causes a change along the same supply curve.

A change in supply causes a shift in the entire supply curve.

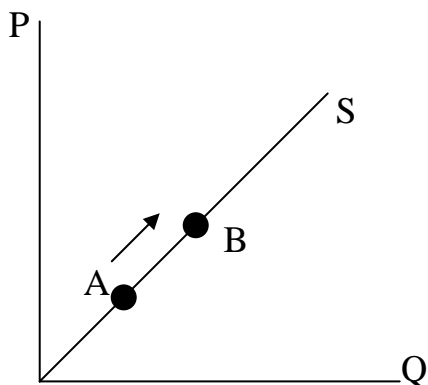
There is one reason for a change in **quantity supplied**

1. a change in the price of the good in question (if we are talking about the market for apples, then a change in the price of apples will cause a change in the quantity demanded of apples)

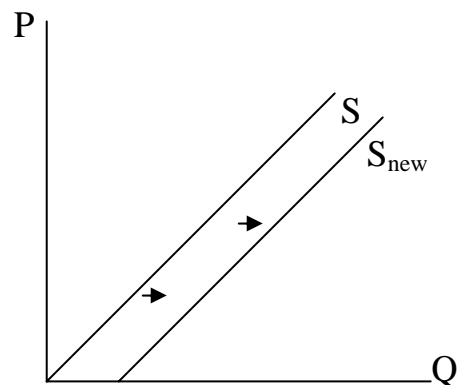
Reasons for a change in supply

1. a change in the price of a resource used in producing the good
2. a technological change allowing cheaper production of the good
3. bad weather or other uncontrollable acts such as war
4. a change in the taxes imposed on the producers of the good
5. an increase in the number of firms in the market

The graphs below show the difference between an increase in quantity supplied and an increase in supply.

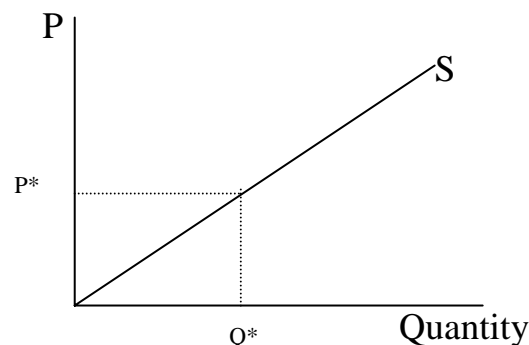


Increase in quantity supplied



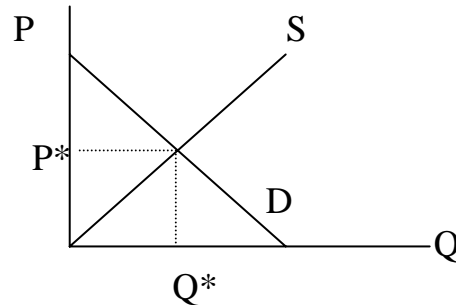
Increase in supply

A concept related to consumer surplus is producer surplus. Producer surplus is the net gain to producers. Mathematically, producer surplus is the area beneath the price paid and above the supply curve (it is equal to  $\frac{1}{2} * P^* * Q^*$  in the example below).



How are market prices determined?

The market equilibrium is found by plotting the supply curve and the demand curve on the same graph and locating the point of intersection (where do the lines cross).

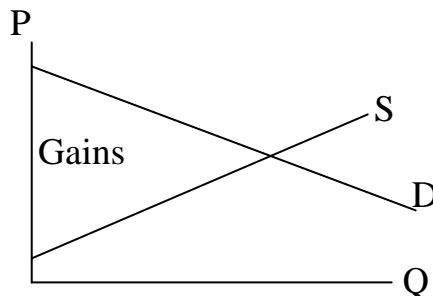


I will generally denote the equilibrium price as  $P^*$  and the equilibrium quantity as  $Q^*$ .

You should know what happens to equilibrium price and quantity when there is:

1. A demand change
2. A supply change
3. A demand and a supply change

Economic efficiency results when the equilibrium is reached. All the gains from trade have now been fully realized. The picture below shows the gains from trade. The gains from trade can be defined as the sum of consumer and producer surplus. If a market is economically efficient, all of the gains from trade have been realized. In the next chapter, we will see how all of the gains from trade may not be realized.



How markets respond to changes in supply and demand:

In a market economy, when the demand for a good increases, its price will rise. This leads to:

1. Consumers now have more incentive to search for substitutes and to moderate their additional purchases of the good whose price has risen
2. Producers now have more of an incentive to produce the good as the price is higher

In a market economy, when the supply of a good increases, its price will decrease. This leads to:

1. Producers now have less incentive to produce the good as they are realizing less profit with the lower price
2. Consumers, now facing a lower price, are more willing to purchase the good

Time and the adjustment process

When demand or supply change, consumers and producers usually cannot act instantly. They need time to weigh the costs and benefits associated with the change in price of a good. They may also need time to seek out alternative goods and services to purchase in place of the good whose price increased.

The invisible hand

The invisible hand is one of Adam Smith's contributions to economics. Basically, people will work in their own best interests (which is what most people do anyway) to make a profit. But if everyone works in his or her own best interest then he or she should be working at the job that makes him or her the most productive. Therefore, society will be better off because people are working at the places where they are the most productive.