Reading Fair 2011

From Reading to Writing in the Key Learning Areas of Science Education and Personal, Social & Humanities Education

PLK Mrs. Ma Kam Ming-Cheung Fook Sien College

Speakers

- Wong Shun Hang, Daniel (Biology)
- Law Po Yu (Economics)

EDB support program

- 2009/10 support program
- Project team:

  (Director) Mrs. Bette Li

  (Advisor) Mrs. Ida Moon

  Ms. Josephine Tao
- lesson planning and observation

Our school

- a government-aided secondary school
- 1997-2010
  - **CMI** school
  - **extended English curriculum** for junior form subjects (including cross-curricular activities)
- 2009 - present
  - **English and Chinese groups** for **NSS** selected subjects
- 2010-11
  - **English classes** for **S1**

Lesson plan (Biology)

- Topic

  " Protein as a primary food substance "

- Target
  - S.4
  - academic ability: middle to upper level
  - **Chinese used mainly as the medium of instruction in junior forms**

Before the Support Program

- **teacher-centred** and less interaction

- students'mode of learning
  - during lesson, mainly through **listening and reading**
  - after school, through homework
  - **lack confidence** in asking and answering questions, giving opinions
  - a **"quiet"** atmosphere

Objectives

- provide more **language support**
- facilitate learning of new concepts, including the **terms** (e.g. pronunciation) and their **usage** (e.g. sentence pattern)
- enable students to **produce their knowledge correctly in both verbal and written forms**

Strategies

Worksheet

(a) Left column

- for **taking notes** (diagrams, short descriptions…)
- for engaging students and facilitating the building up of concepts

(b) Right column

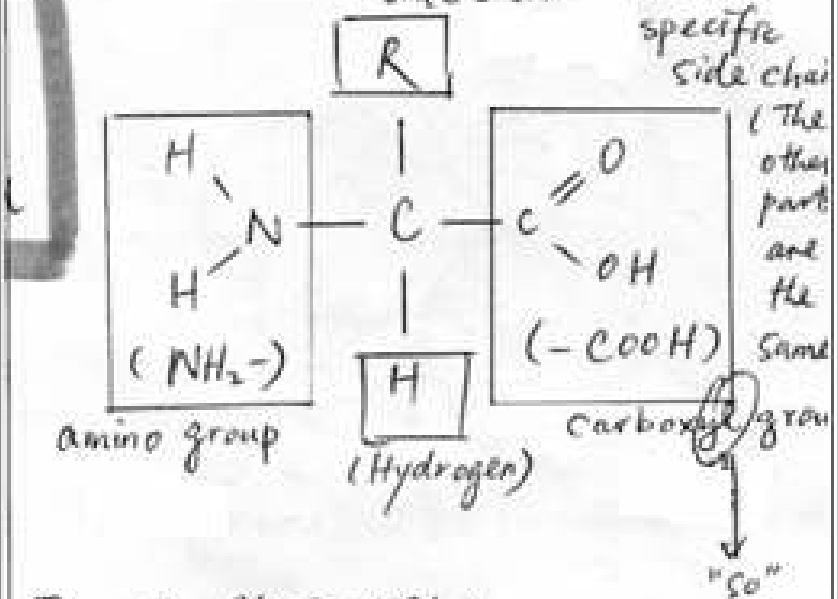
- for writing down **keywords and sample sentences**

Notes

2. The basic structure of an amino acid: Poly saccha

(1)

☆ There are 20 kinds of a.a. and each amino acid has its own specific side chai (The other part are the same



(2) e.g. Glycine (Gly)

H ← (side chain)

constant region

Cysteine (Cys)

Keywords and sentences

Notes

3. The formation of dipeptide, polypeptide and protein:

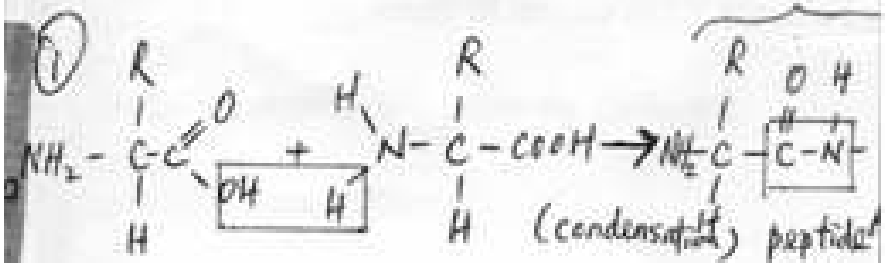


table tennis ball bamboo stick

Polypeptide

(The chain will bend and fold to form a specific

Keywords and sentences

Notes	Keywords and sentences
4. ● _____ kinds of amino acids are used to build up different proteins. Diffe proteins have different _____ _. ● Put a "✓" in the appropriate box(es):	

Source	Essential amino acids	Non - _____ Amino ac
Can be made by our body		
Must be obtained from the diet		
Not required by our body		

Note taking

e.g.

In a table format, students can organize their knowledge more systematically

Notes	Keywords and sentences
1. Can you guess the size of a protein called insulin ( ) which is used to regulate our blood glucose level? Chemical formula of insulin: C___ H___ O___ N___ S___	_____ _____

Keywords and sentences

e.g.
Amino acid

Proteins **are built up by** amino acids.

Amino acid **is the basic unit of** protein.

Notes	Keywords and sentences
1. Can you guess the size of a protein ( ) which is used to reg blood glucose level? Chemical formula of insulin: C___ H___ O___ N___ S_	

Keywords and sentences

e.g.
Amino acid

Proteins are built up by amino acids.

(Previous knowledge is applied)
Starch is built up by glucose.

Notes	Keywords and sentences
1. Can you guess the size of a protein ( ) which is used to reg blood glucose level? Chemical formula of insulin: C___ H___ O___ N___ S_	

Sample sentences

e.g.

Through condensation, …… are joined to form …….

Through condensation, amino acids **are joined to form** a polypeptide.

(Previous knowledge is applied)

Through condensation, **glucose molecules** are joined to form **a starch molecule**.

Keywords and sentences

- different kinds of **language support can be provided at any TIME** when explaining a concept

Keywords and sentences

- keywords

  - **highlighted** on the board
  - **pronounced as models** for students
  - students **practise**:

    practised in pairs, repeated by whole class, row by row and **by individuals**
  - written down on worksheet

(***Read aloud first, and then write***)

Keywords and sentences

- keywords

  - **asking questions** to enable students to **recycle the use of keywords**

Keywords and sentences

e.g. *amino acid*

Q: **What is the basic unit of a protein?**

A: The basic unit of a protein is an

amino acid. / It is an *amino acid*.

Q: **What is the basic unit of an insulin?**

A: The basic unit of an insulin is an

amino acid. / It is an *amino acid*.

Keywords and sentences

Q: In our model, what do the table tennis balls represent?

A: They represent *amino acids*.

Q: What kind of molecules are joined to form a dipeptide through condensation?

A: *Two amino acids* are joined to form a dipeptide through condensation.

Keywords and sentences

- keywords

  - it is suggested **not** to resort to using the **Chinese translation of the key words**

  - sometimes good for understanding,

    BUT

    it is not beneficial for usage

Key words and sentences

- sample sentences
  - write on the board
  - help students **understand** the meaning and the usage of the key words
  - ask students to **repeat** them
  - ask students to **spell the word and write out the sentence** without looking at the board

Keywords and sentences

- sample sentences

  another way:

  - **learn suitable expressions from**

    reading scientific articles

    (find out target sample sentences)

Article 3

BBC News | Sport | Weather | Travel | TV

Health

It's vital our diets contain protein, either from animal or plant sources.

Why is protein important?

From hair to fingernails, protein is a major functional and structural component of all our cells. Protein provides the body with roughly 10 to 15 per cent of its dietary energy, and is needed for growth and repair.

Proteins are large molecules made up of long chains of amino acid subunits. Some of these amino acids are nutritionally

6. Functions of proteins:

After reading the article, use the following terms to form complete sentences to show the functions of proteins:

growth, repair, energy, used up, carbohydrates, lipids, enzymes, proteins, cell membrane, antibody, form, use for

Through reading activity,

- **students can learn more scientific knowledge from the articles**
- **find out different ways to express a concept**

Sentence pattern learned :

- Proteins ***are used for*** growth.
- Proteins ***are used to form*** enzymes.
- Proteins ***can act as*** enzymes.

Revision Exercise

- **questions** are selected from past papers / designed in the pattern similar to the questions asked in the lesson
- **familiarize** students with **different question formats**
- **recycle words and sentences** that they have learnt from the lesson later on

(a) Compare the basic units of a maltose, a lipid and a protein molecule. (3 marks)

it contains hydrogen atom.

Maltose is formed by two glucose molecules, alanine is formed by a carboxyl group, amino group, hydrogen atom and a side chain. Maltose and alanine have the same hydrogen atom.

(b) What is the specific name used to describe the part of the alanine molecule which is marked by a circle? (1 mark)

The specific name is carboxyl group.

(c) Which *two* substances are formed when two alanine molecules join together? (1 mark)

Water, dipeptide molecules are formed

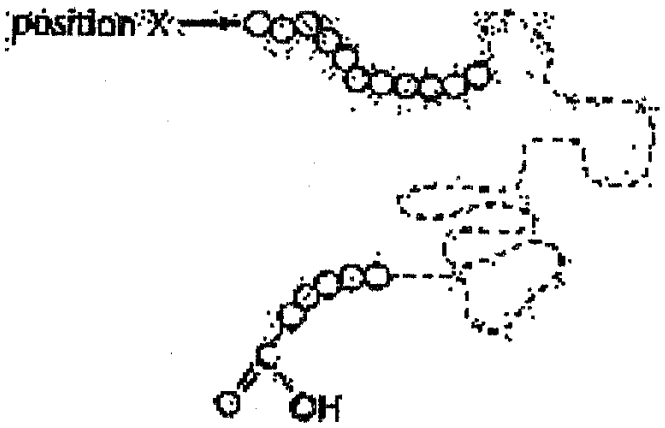
(d) State which type of bond would form between the joined pair of alanine molecules. (1 mark)

Peptide bond would form.

(e) Explain how a polypeptide chain is formed? (2 marks)

A dipeptide is formed because of the joined pair of alanine molecules, then the dipeptide joined another alanine. A polypeptide chain is formed. Through condensation, many amino acids are joined to form a polypeptide

0.5



Written output of the knowledge

(a) Name the basic units which make up this molecule. (1 mark)

The basic unit is amino acid (1) / They are amino acids.

(b) Name ONE chemical element which would be found in this molecule but not in a polysaccharide molecule. (1 mark)

Nitrogen / sulphur (1) would be found in this molecule but not in a polysaccharide molecule.

(c) Give the formula of the chemical group that would be found at position X on the molecule. (1 mark)

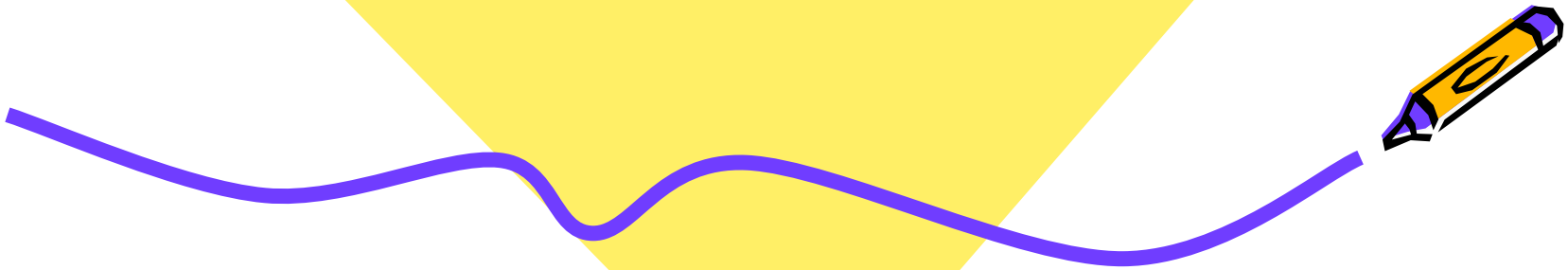
$-NH_2$ (1)

Conclusion

- Through more language support in the lesson , students have **confidence** and find an effective way to **produce their knowledge in suitable verbal and written forms**.

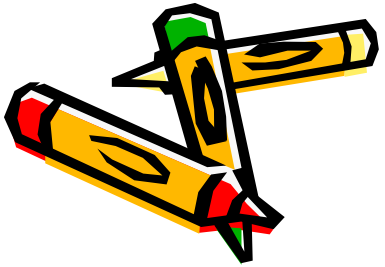
~ The End ~

Students' Background



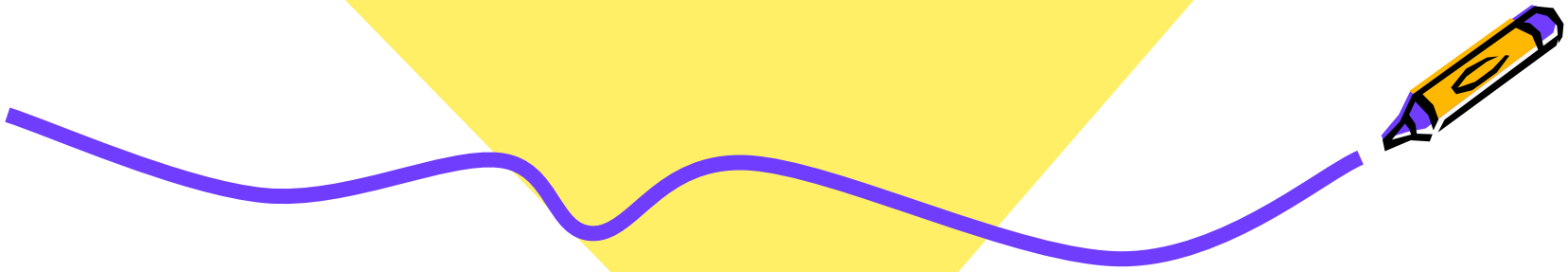
Students' background

- Class: S.4, from 5 different classes
- No. of students: 39 (10 boys and 29 girls)
- Subject taken as an elective, depending on their English results when they were in S.3
- Have never studied any subject in English when they were in lower forms
- This topic was taught in the second term



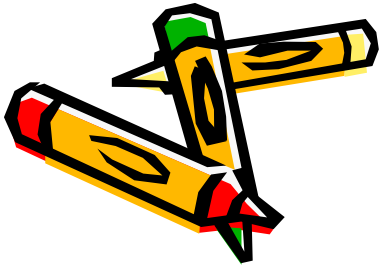
Change in Market condition

Worksheet 1

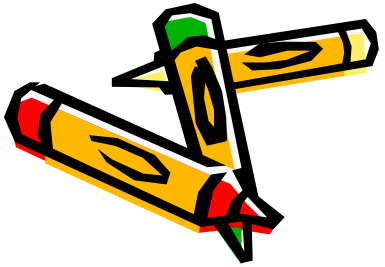


Q 1

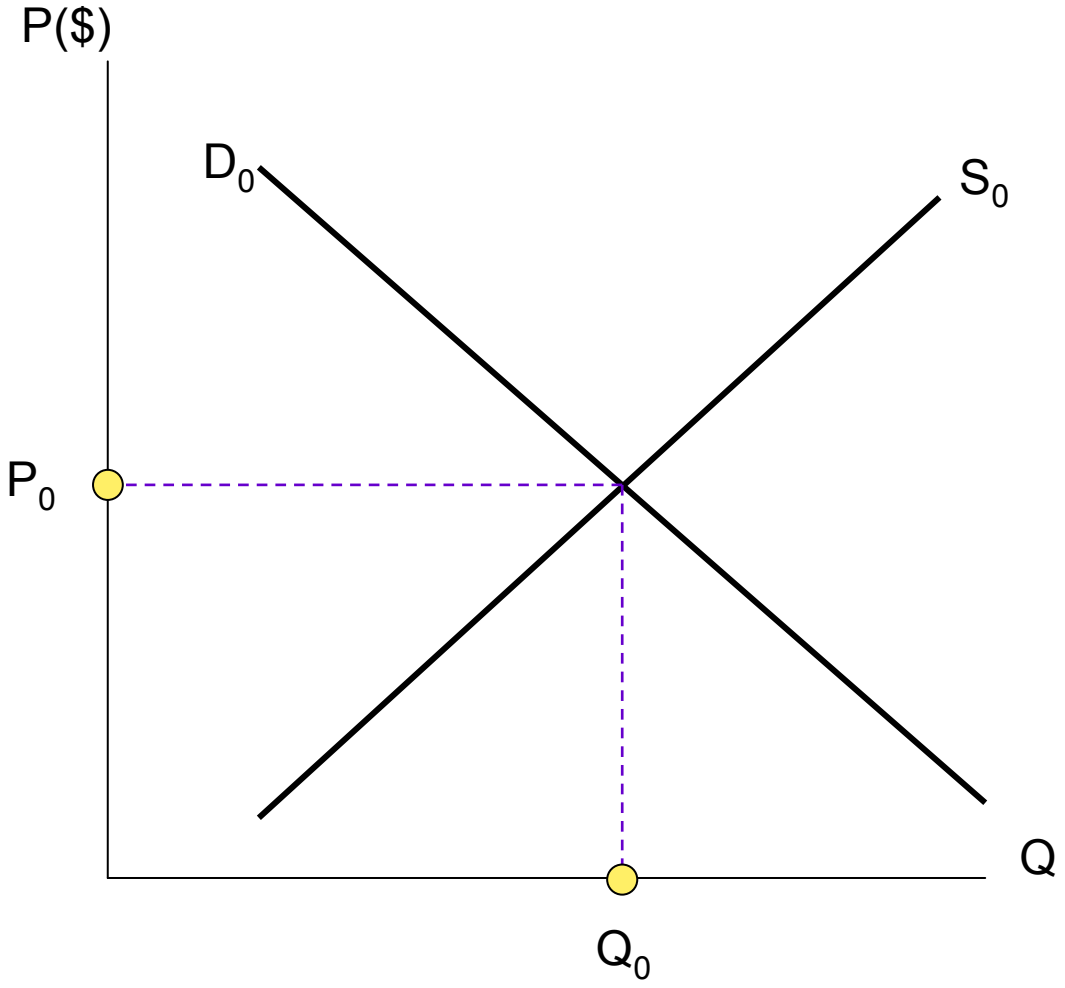
- The temperature was getting higher. What were the effects on the market equilibrium of air conditioners?



- Before we explain the change in market equilibrium, we can try to answer the following questions.

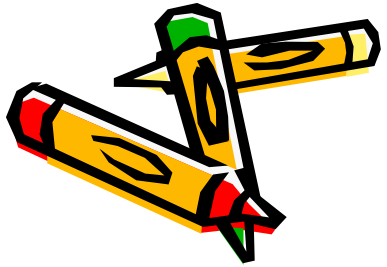


1. Before the temperature was getting higher, what was the market equilibrium price and quantity?



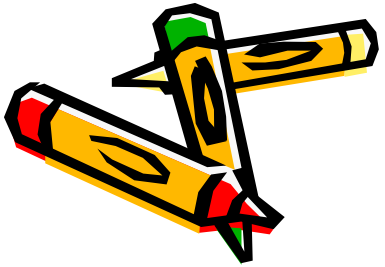
1. Before the temperature was getting higher, what was the market equilibrium price and quantity?

- **The market equilibrium price was P_0 and the market equilibrium quantity was Q_0.**



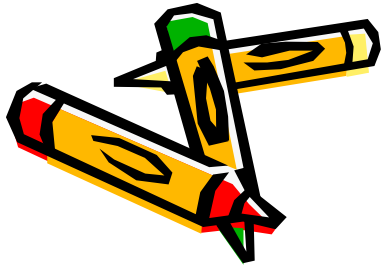
2. When the temperature was getting higher, did the consumers plan to buy more or fewer air-conditioners at each price level?

- **The consumers planned to buy more air-conditioners at each price level.**

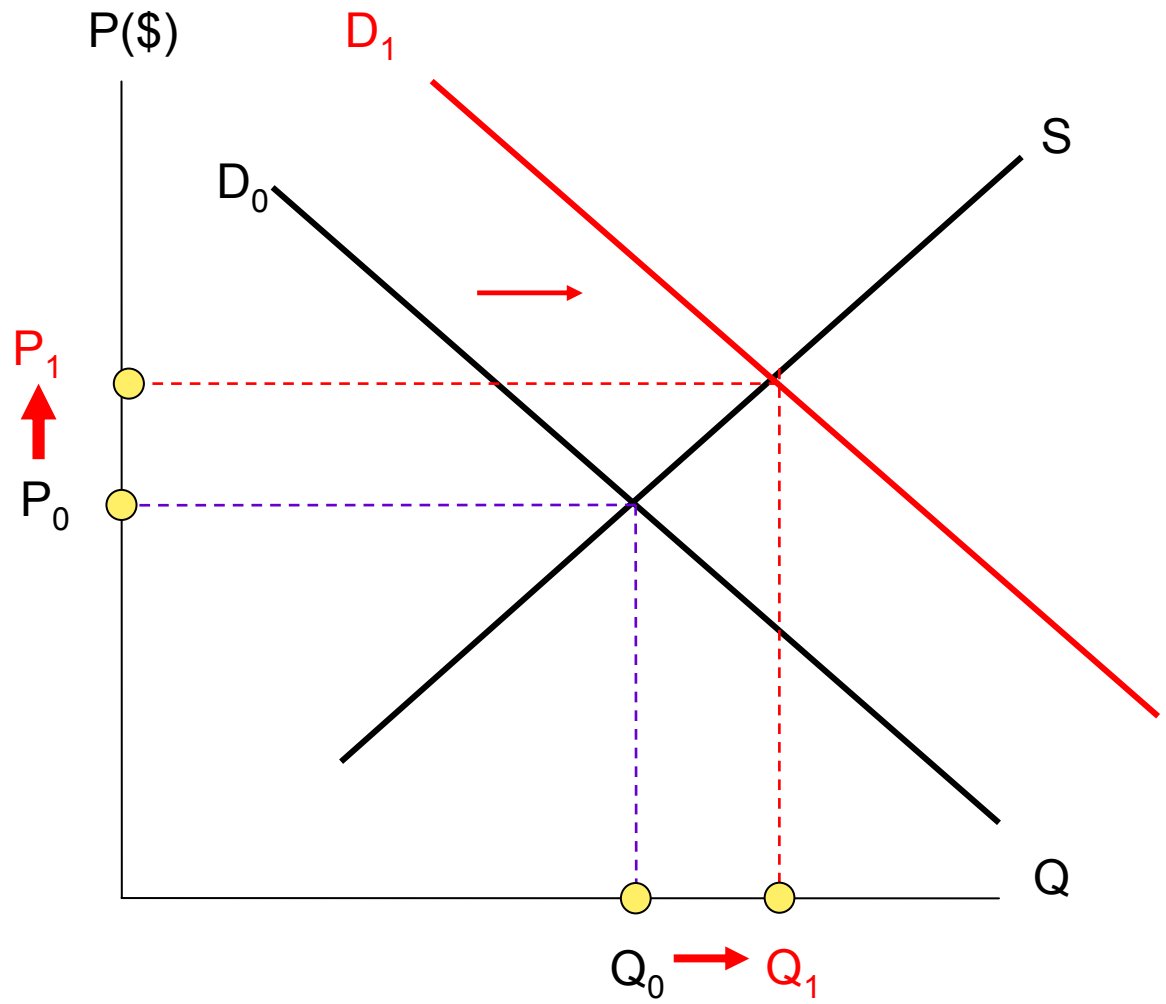


3. How did the market demand for air-conditioners change?

- **The market demand for air-conditioners increased.**

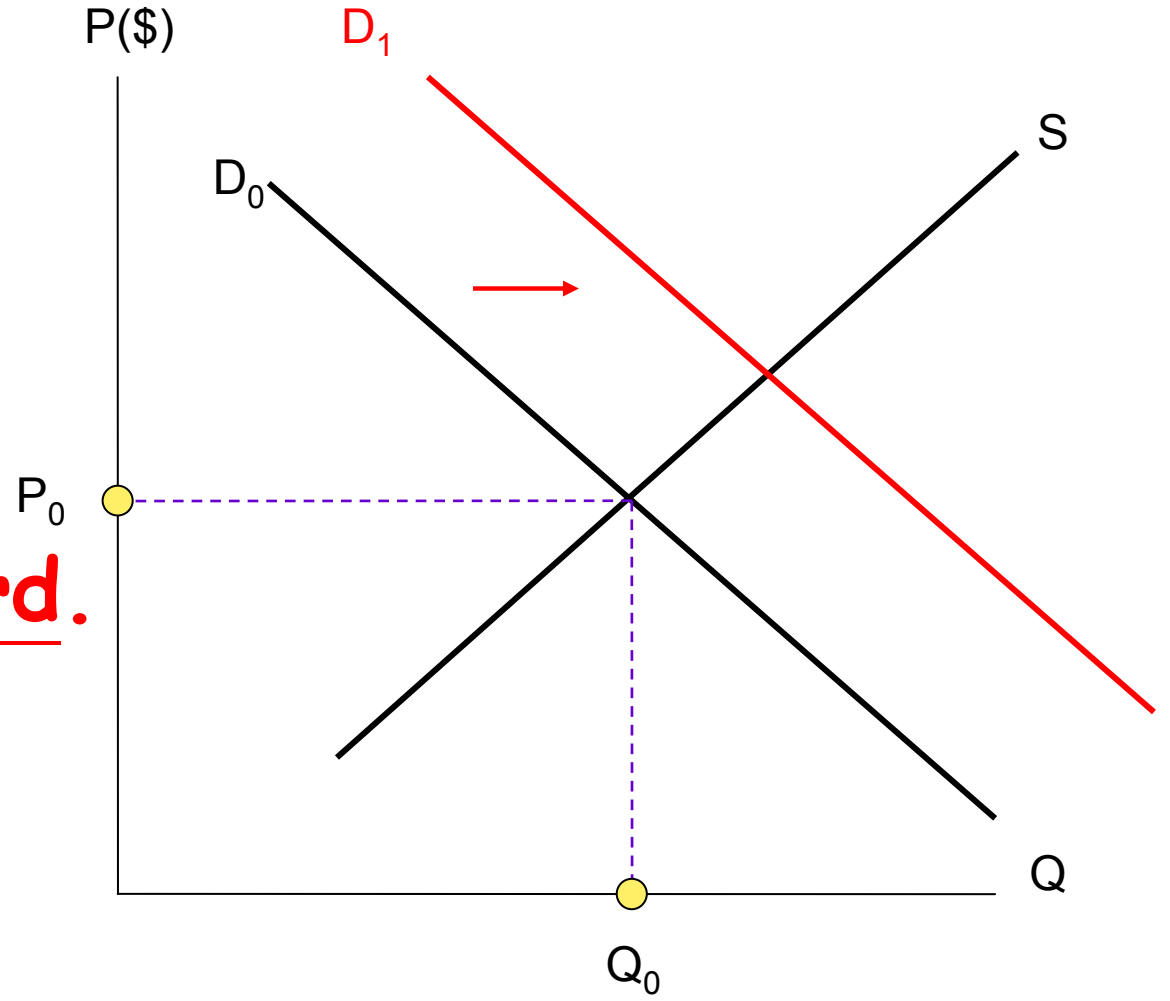


4. Diagrammatically, how did the market demand curve shift?

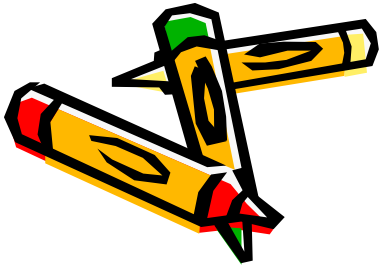


4. Diagrammatically, how did the market demand curve shift?

- **The market demand curve shifted rightward.**



5. Given the original supply curve and the new demand curve, was the quantity demanded equal to the quantity supplied at the equilibrium price level stated in Q.1?



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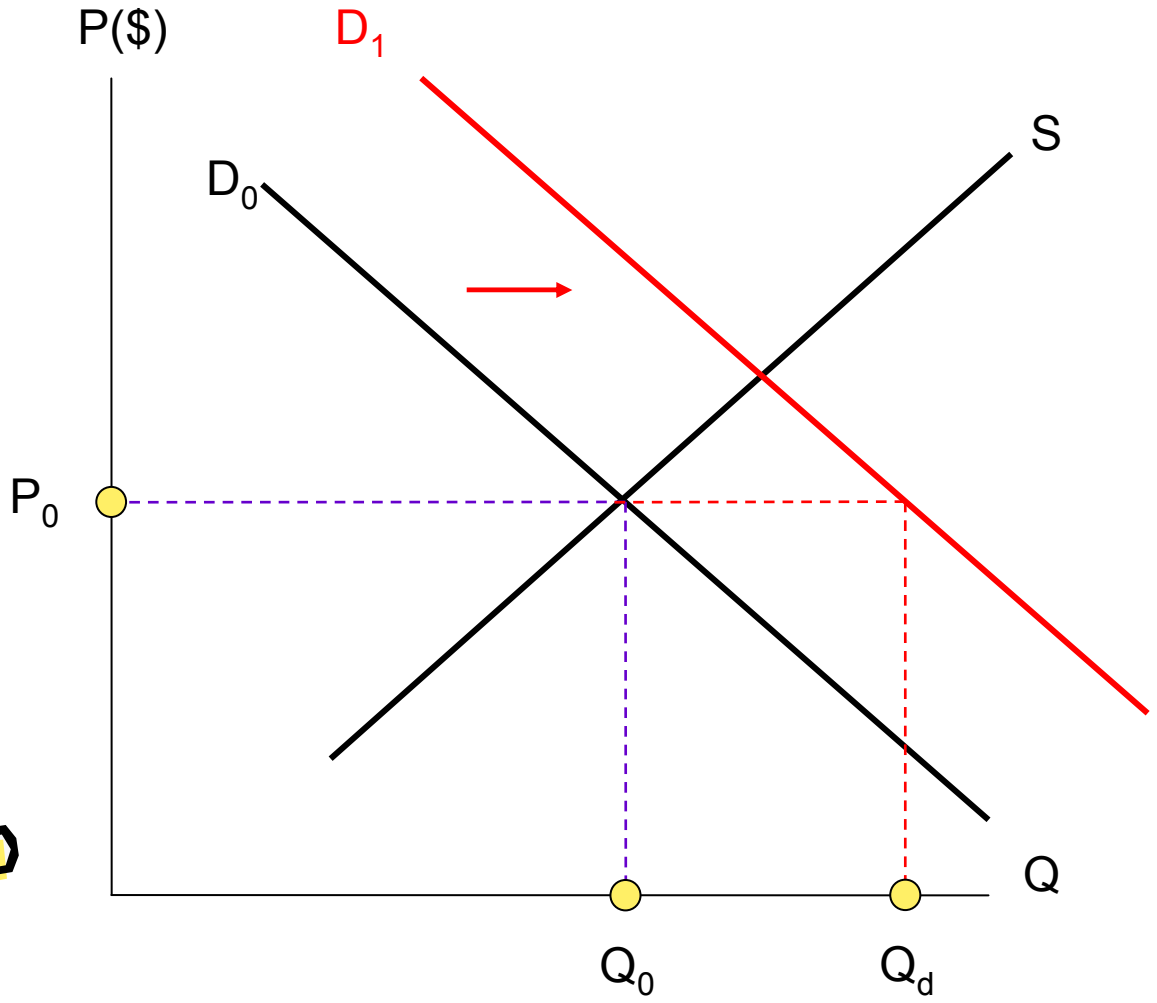
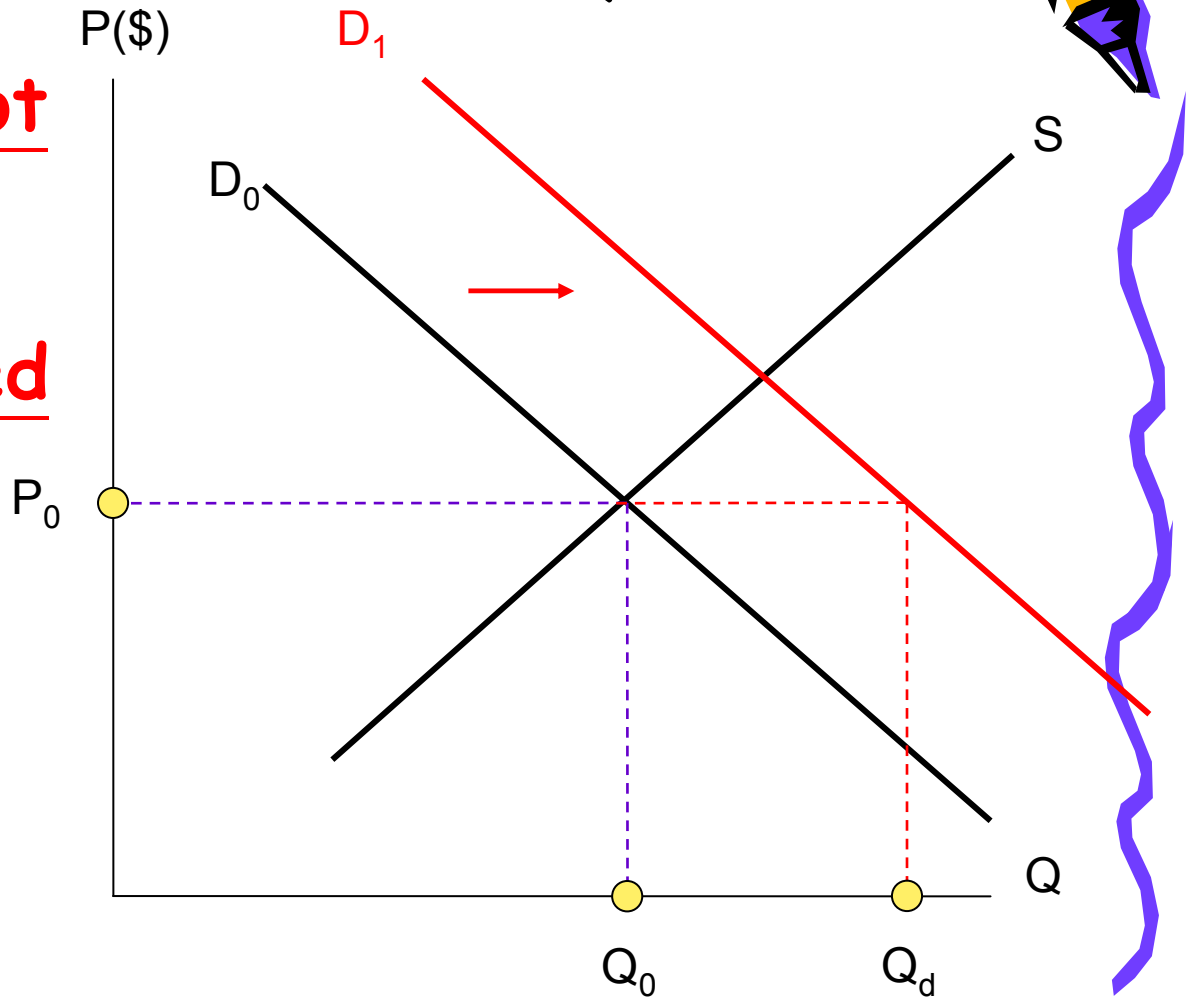
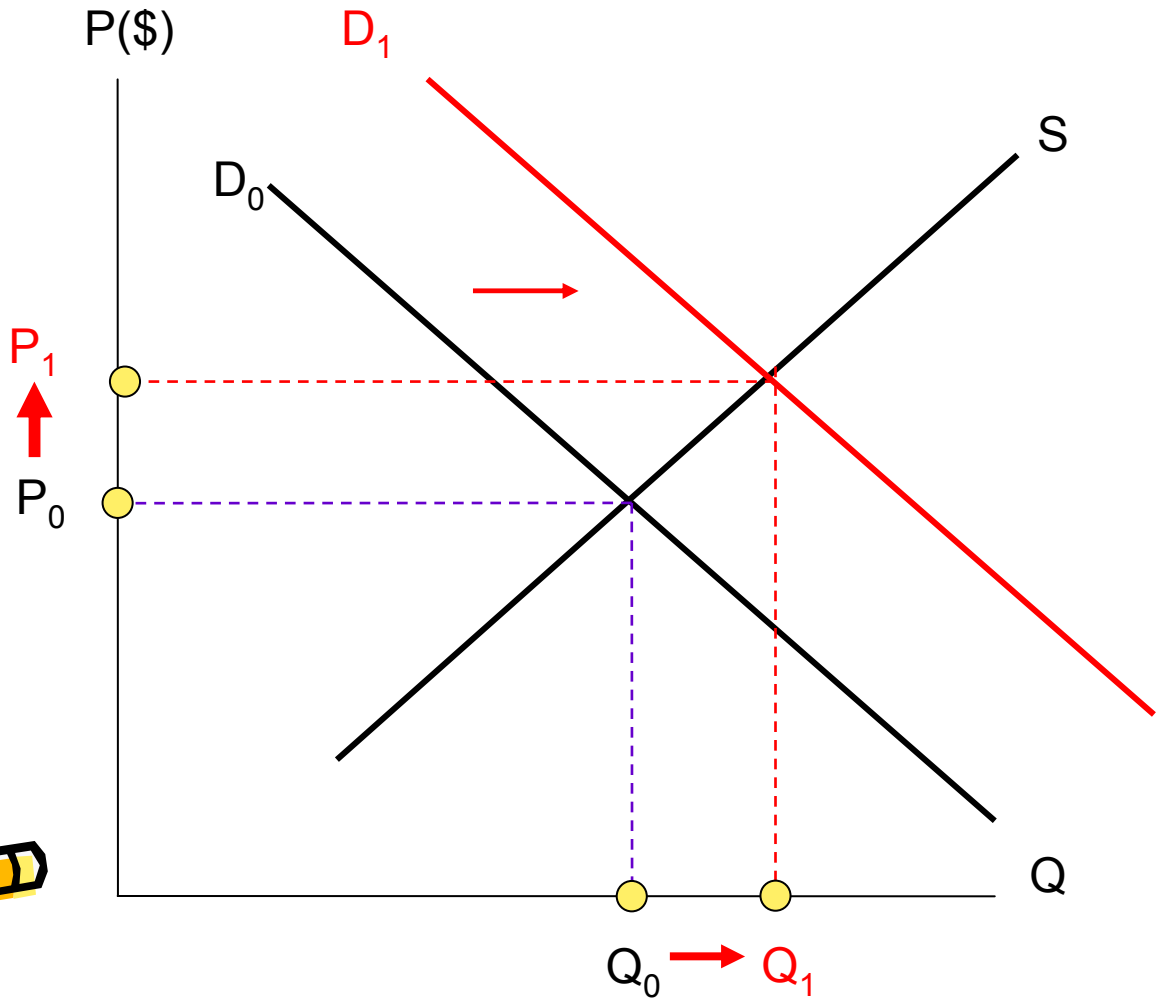


5. Given the original supply curve and the new demand curve, was the quantity demanded equal to the quantity supplied at the equilibrium price level stated in Q.1?

- **No, they were not equal. At this price level, the quantity demanded was greater than the quantity supplied.**

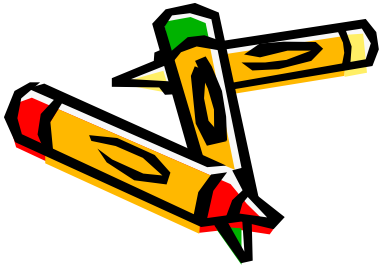


6. How did the market price tend to change so as to restore market equilibrium?

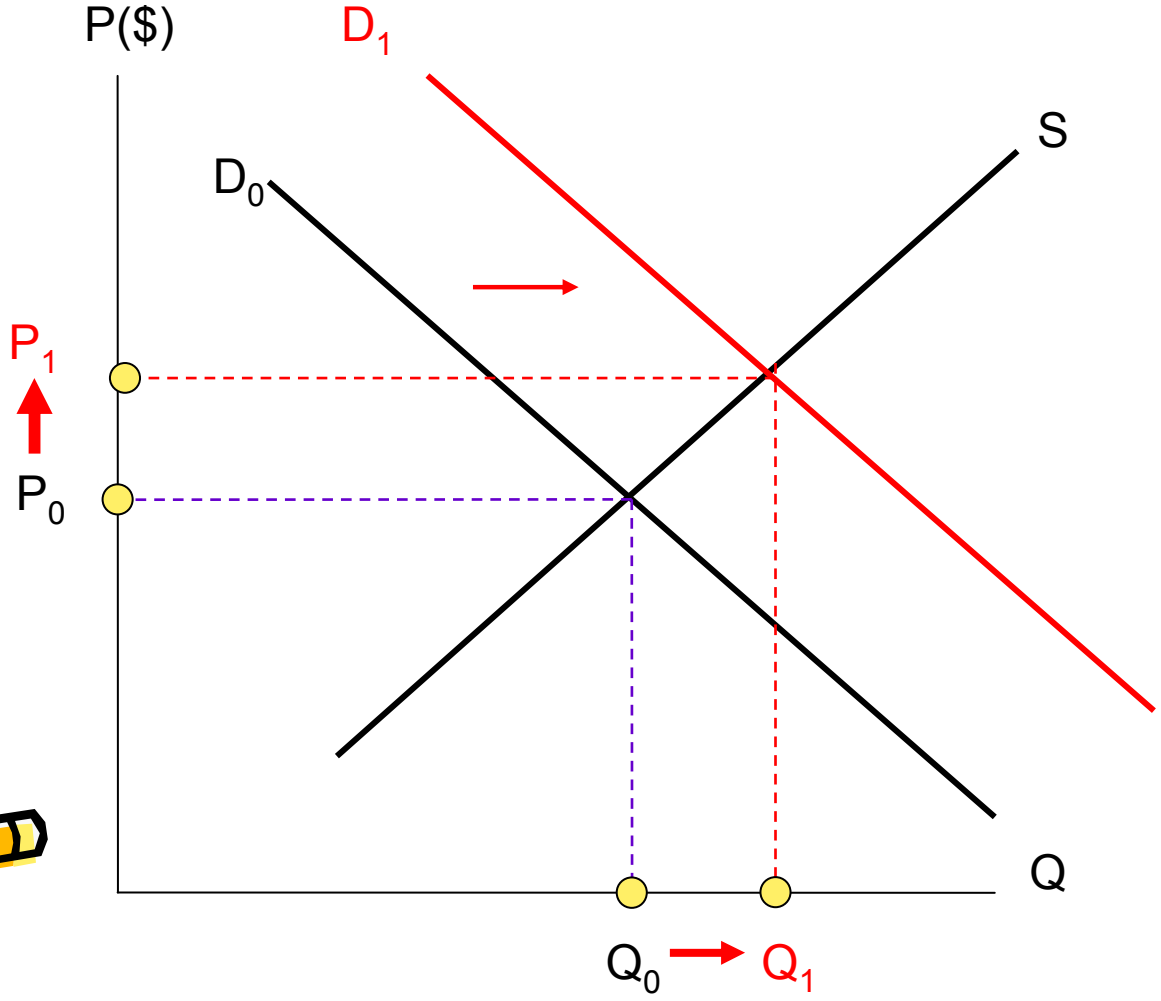


6. How did the market price tend to change so as to restore market equilibrium?

- **The market price tended to rise.**

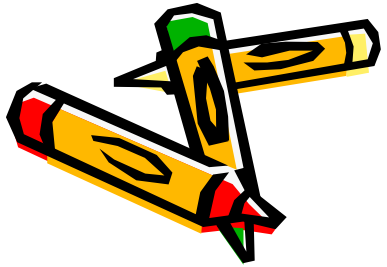


7. What was the new market equilibrium price and quantity?

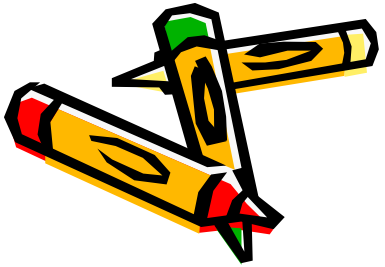


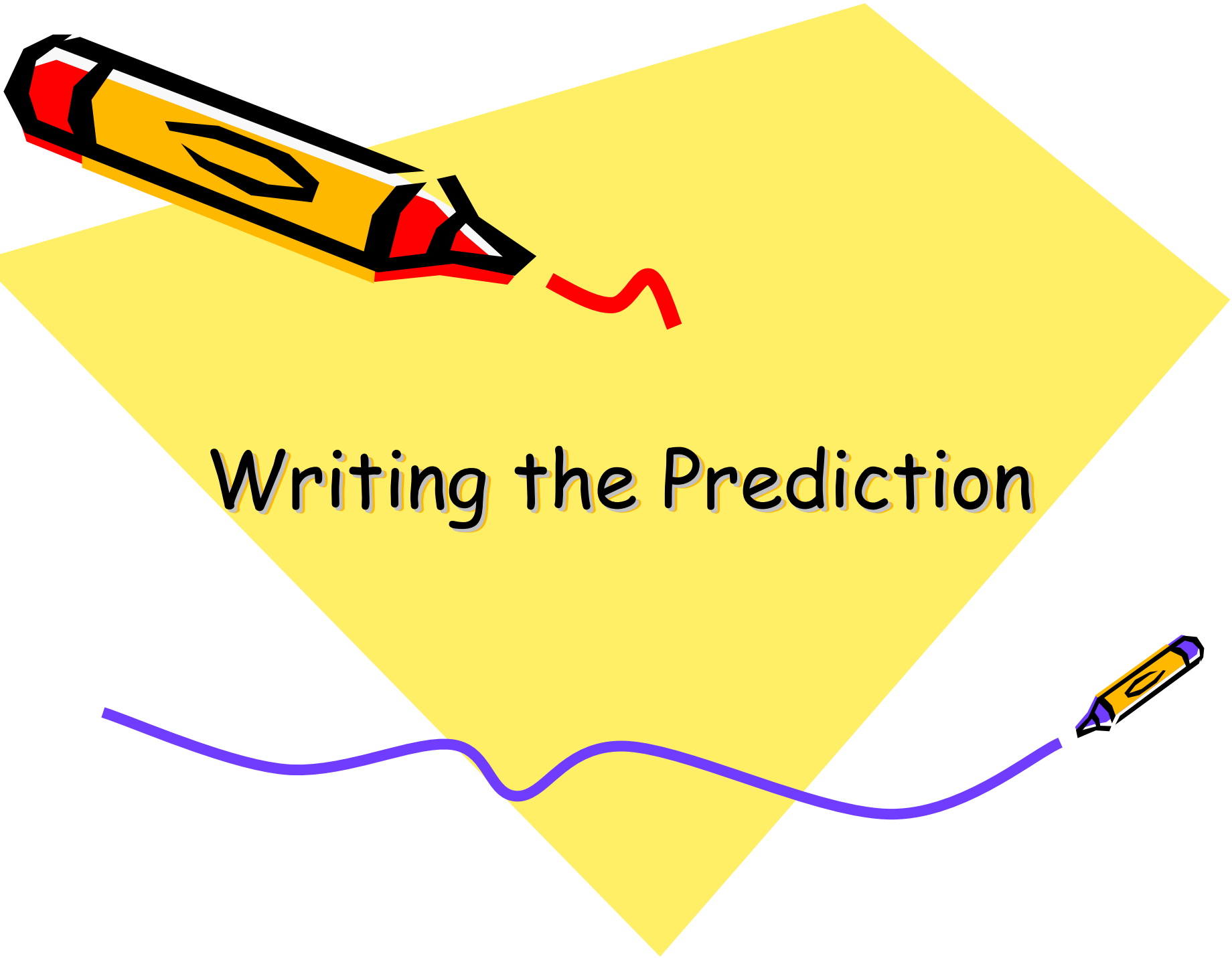
7. What was the new market equilibrium price and quantity?

- **The new market equilibrium price was P_1 and the market equilibrium quantity was Q_1.**



- Now, Please answer questions 1-7 by yourself.

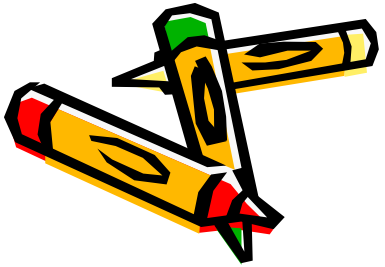



Writing the Prediction

How should we start a sentence?

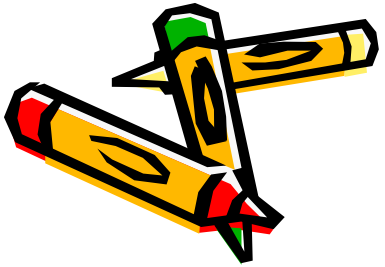
- If other things are the same……

Assume being constant

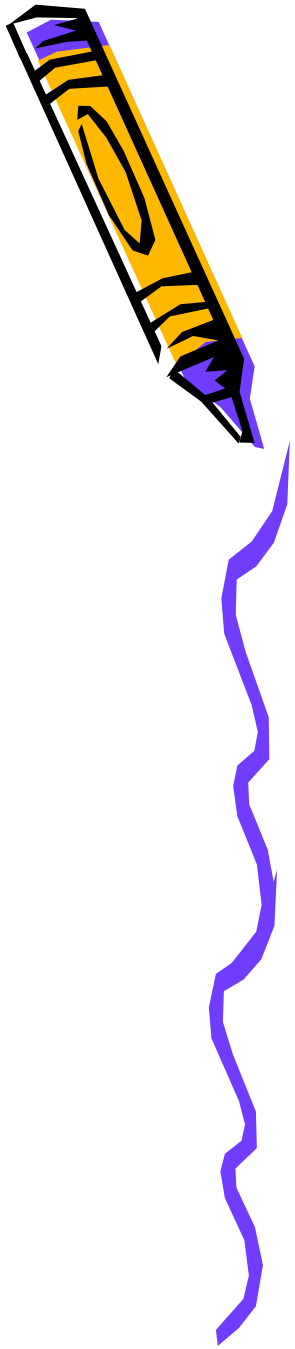


How should we start a sentence?

- Assume other things being constant

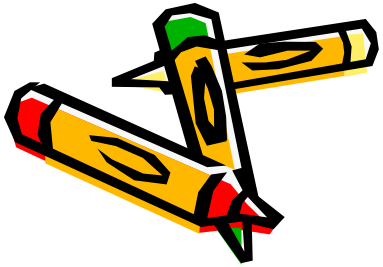


Then, what is the reason for the change of the market situation? What has changed?



- Assume other things being constant,

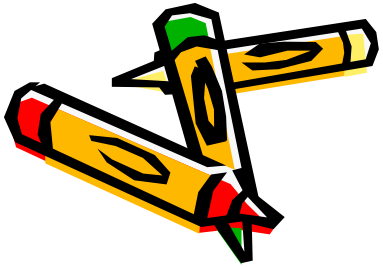
  as the temperature was getting higher,



Next, how does this factor affect the market demand of air-conditioner?

- Assume other things being constant, as the temperature was getting higher,

the market demand for air-conditioners increased.

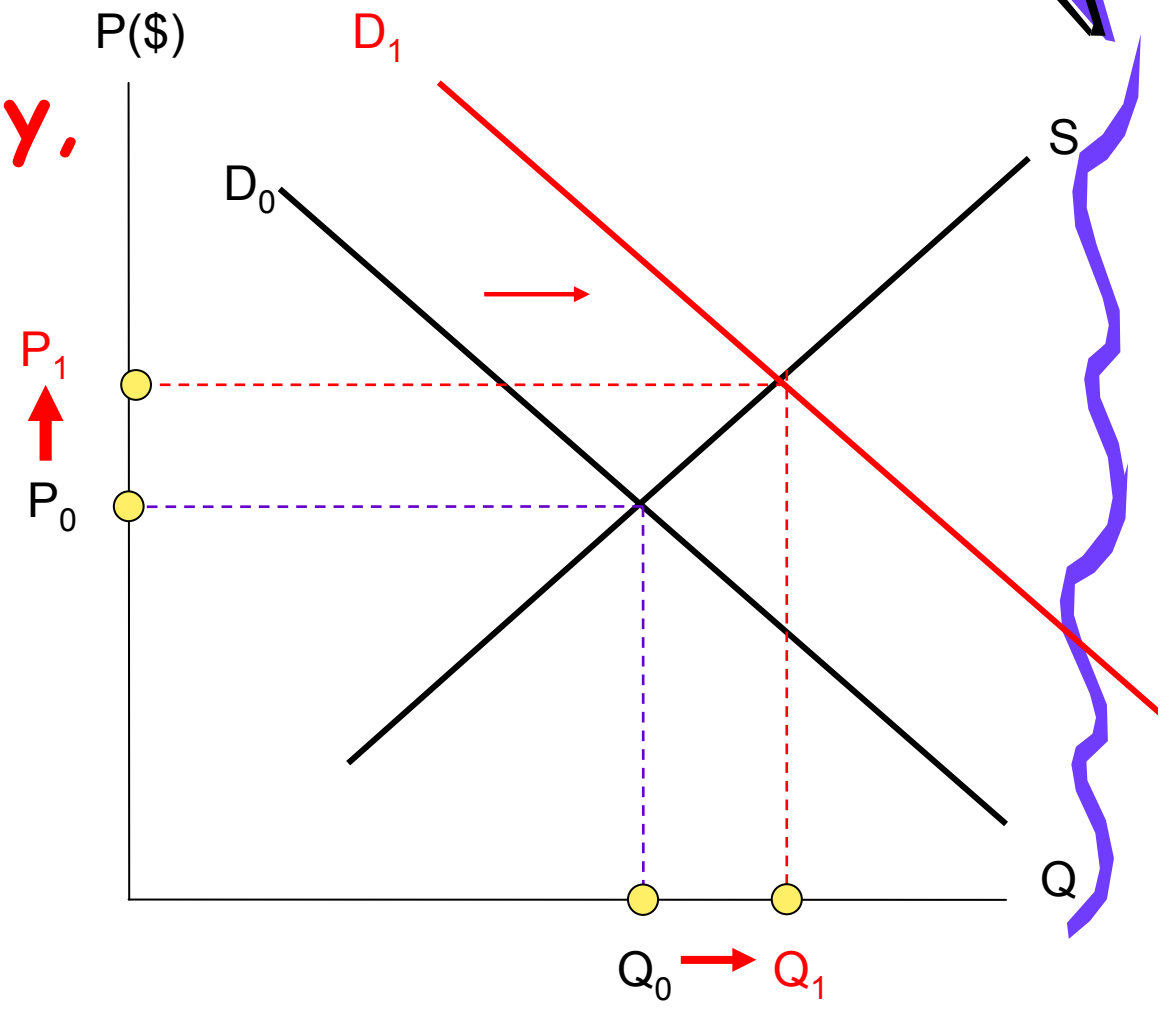


- Assume other things being constant, as the temperature was getting higher, the market demand for air-conditioners increased.

Diagrammatically,

the market demand i.e. from D_0 to D_1.

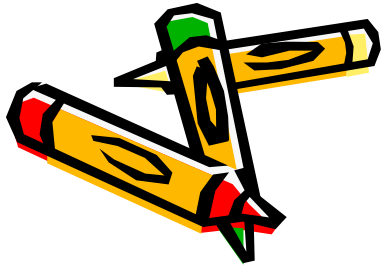
curve shifted rightward,



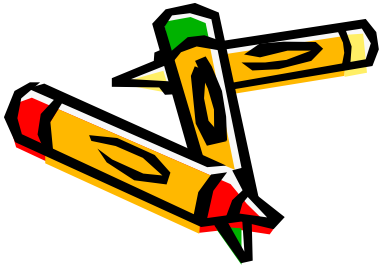
Assume other things being constant, as the temperature was getting higher, the market demand for air-conditioners increased.

Diagrammatically, the market demand curve shifted rightward, i.e. from D_0 to D_1.

As a result, the equilibrium price rose from P_0 to P_1 and the equilibrium quantity increased from Q_0 to Q_1.

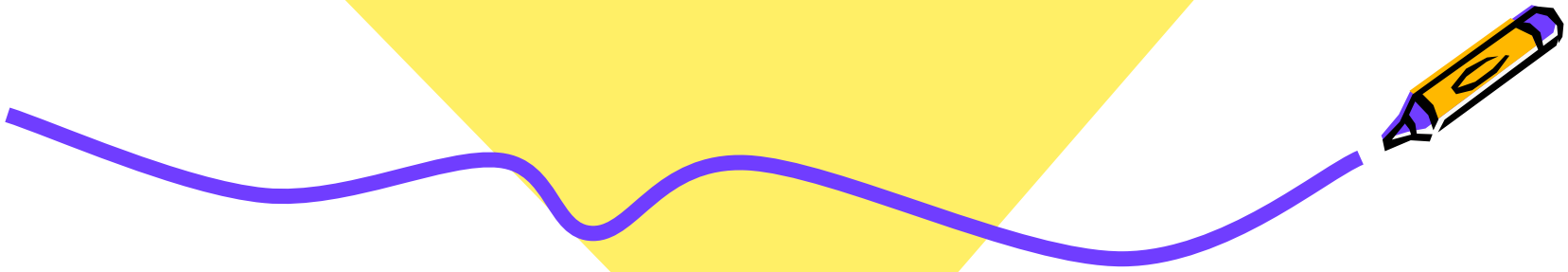


- Now, please fill in the blanks on your worksheet!

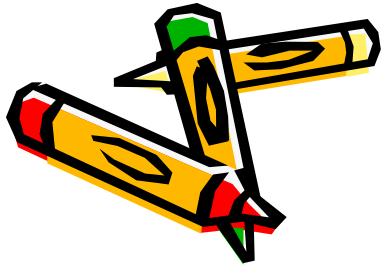


Change in Market condition

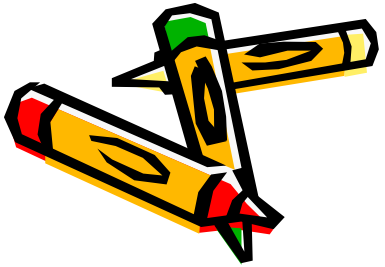
Worksheet 2



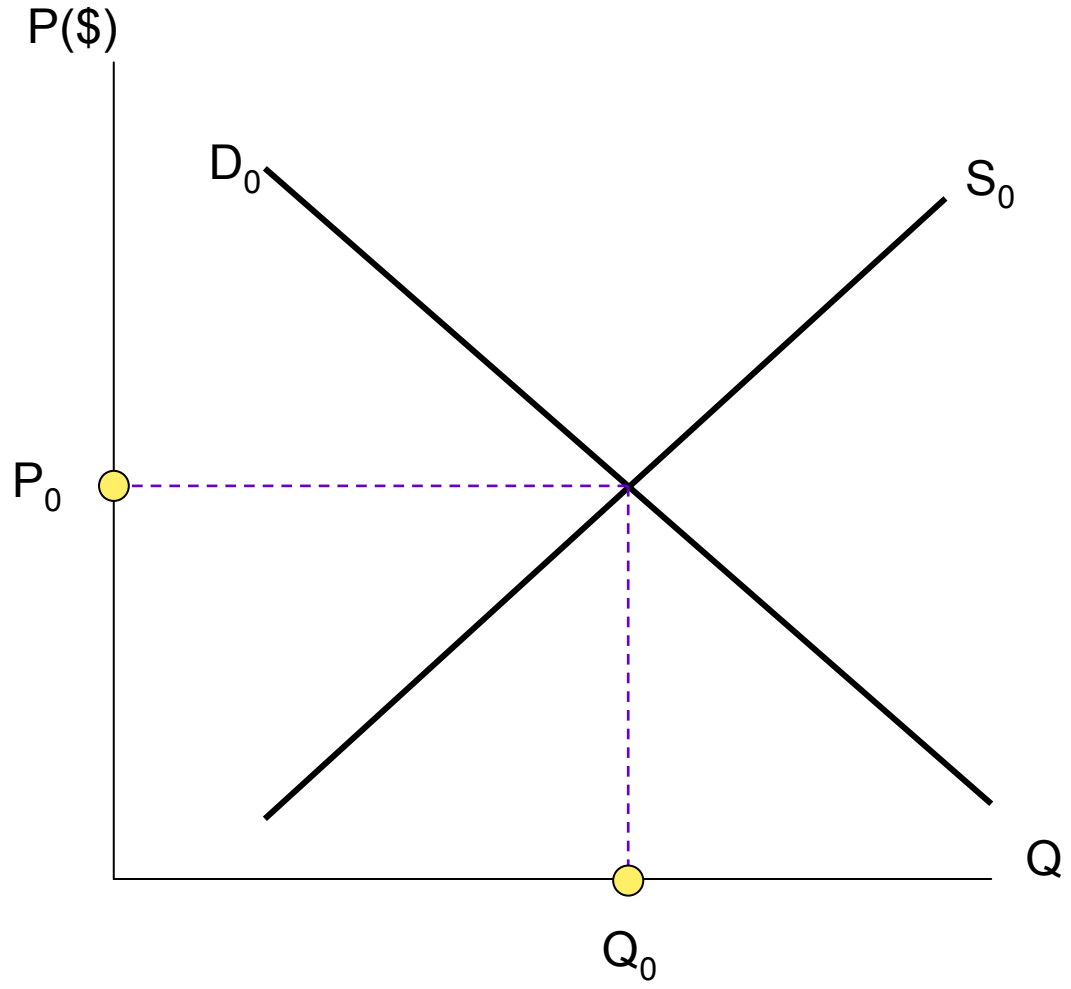
- Suppose the production cost of air-conditioners increased, what would be the effects on the market equilibrium of air conditioners?



- Before we predict the change in market equilibrium, we can try to answer the following questions.

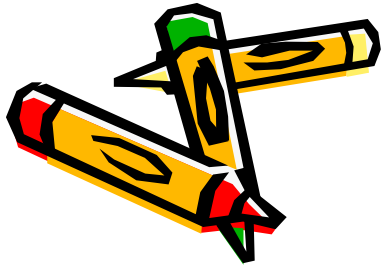


1. Before the increase in production cost of air-conditioners, what was the market equilibrium price and quantity?



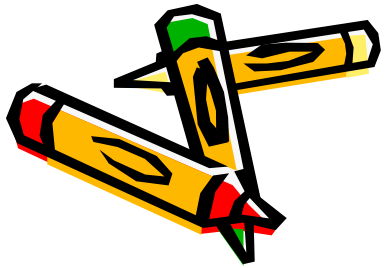
1. Before the increase in production cost of air-conditioners, what was the market equilibrium price and quantity?

- **The market equilibrium price was P_0 and the market equilibrium quantity was Q_0.**



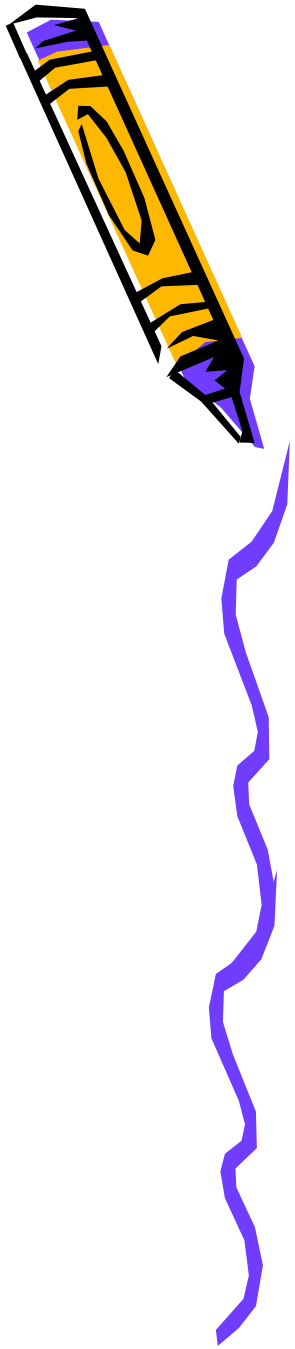
2. After the increase in production cost of air-conditioners, the producers would plan to sell more or fewer air-conditioners at each price level?

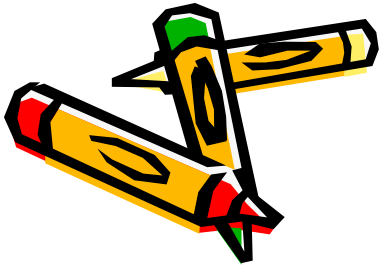
- **The producers would plan to sell more air-conditioners at each price level.**



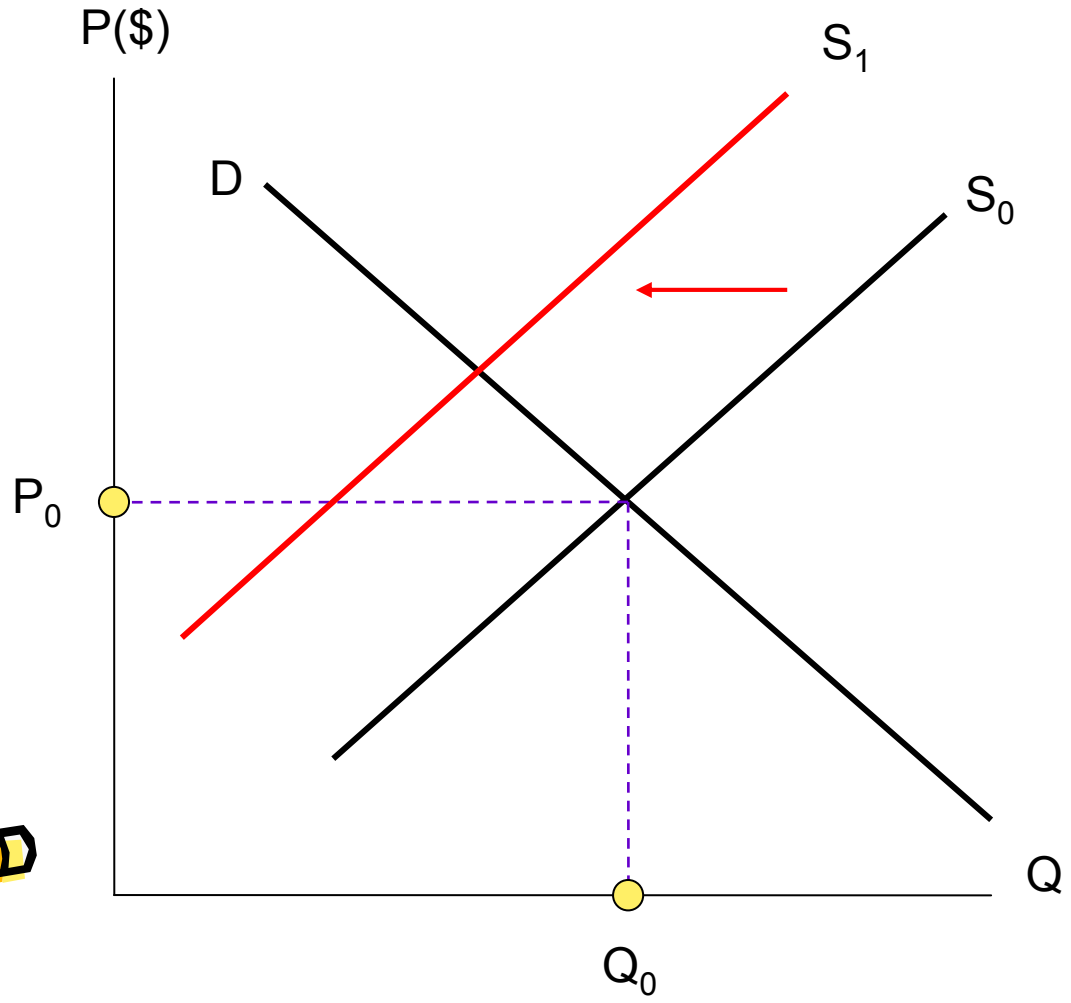
3. How would the market supply of air-conditioners change?

- **The market supply of air-conditioners decrease.**



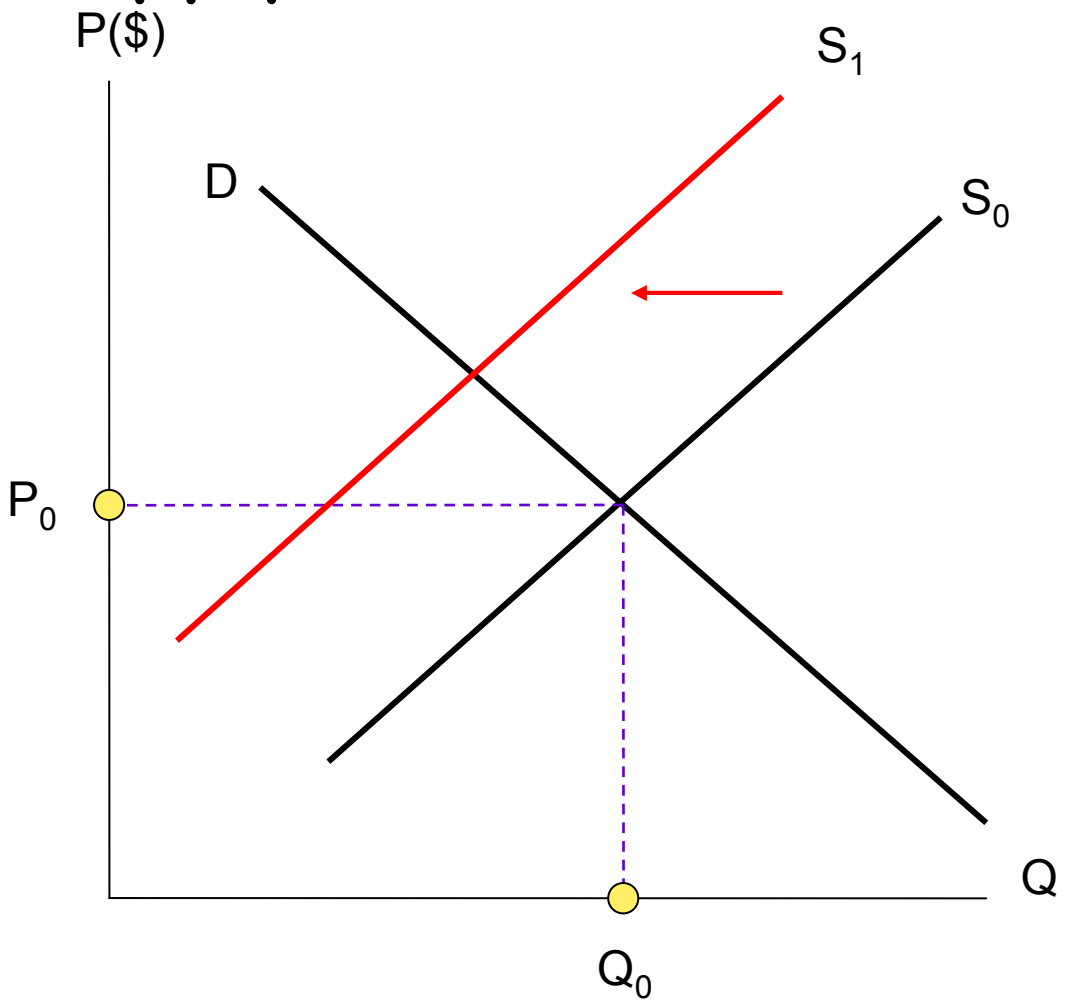


4. Diagrammatically, how would the market supply curve shift?

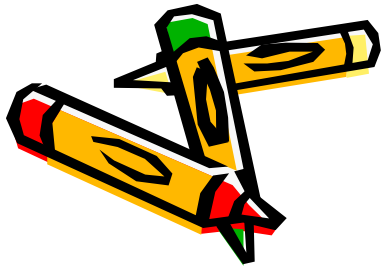


4. Diagrammatically, how did the market supply curve shift?

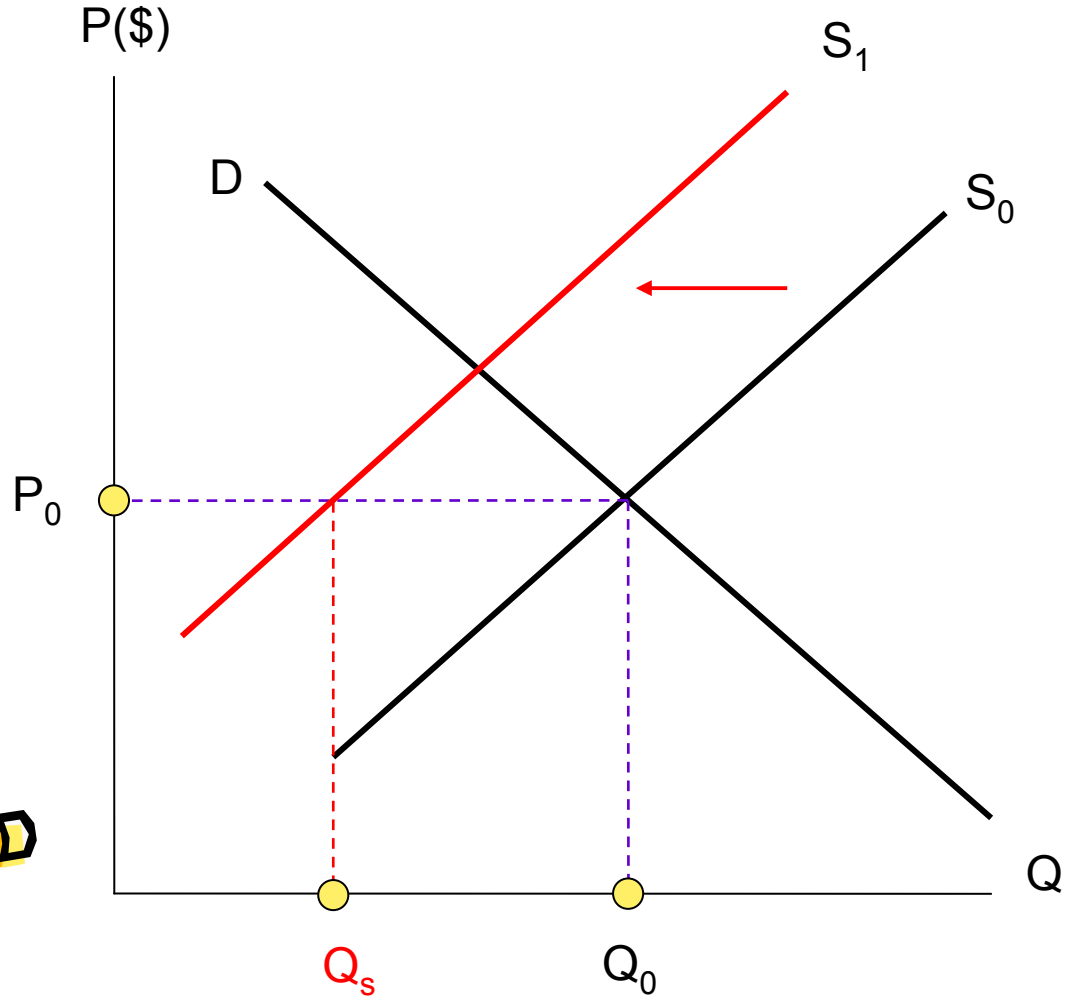
- **The market supply curve would shift leftward.**



5. Given the original demand curve and the new supply curve, would the quantity demanded be equal to the quantity supplied at the original equilibrium price level stated in Q.1?

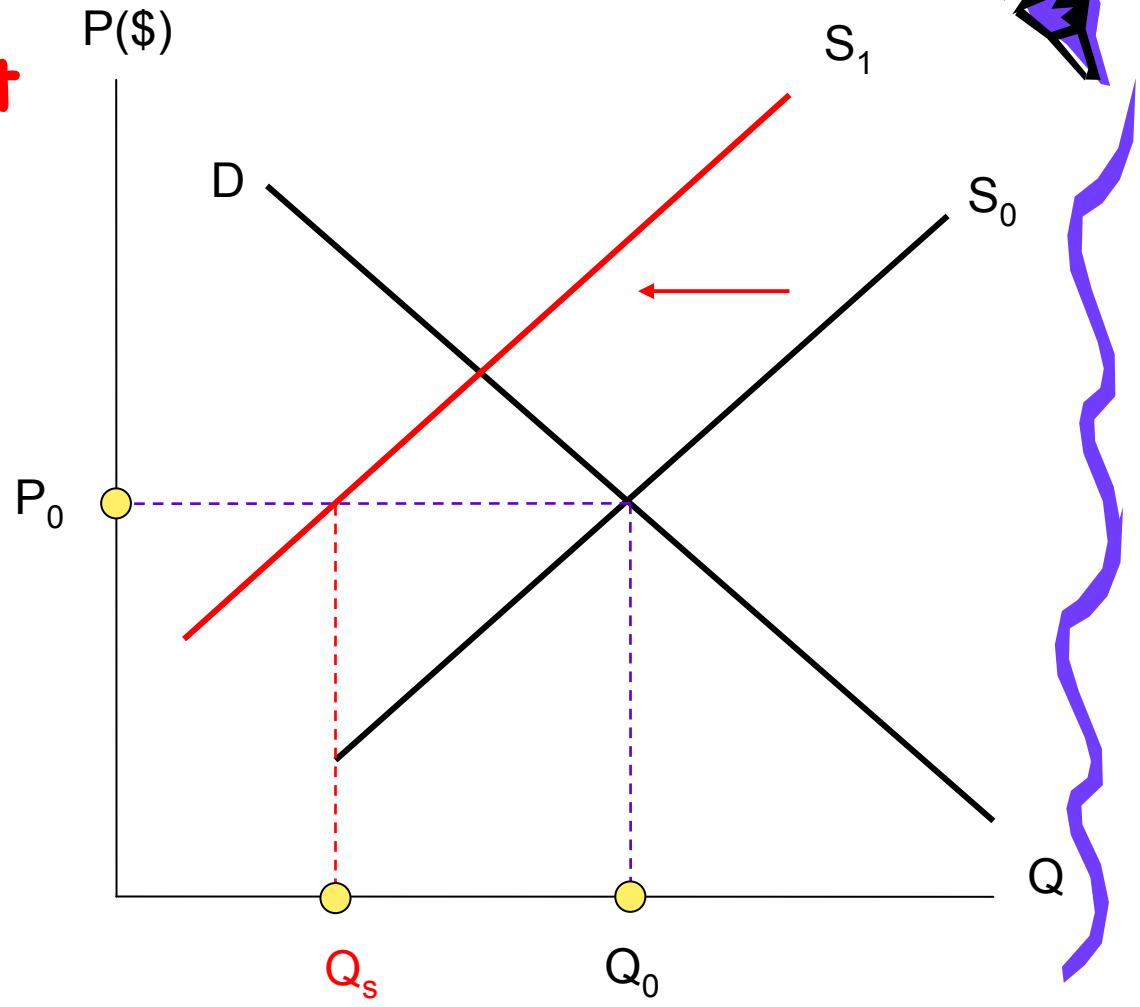


5. Given the original supply curve and the new demand curve, was the quantity demanded equal to the quantity supplied at the equilibrium price level stated in Q.1?

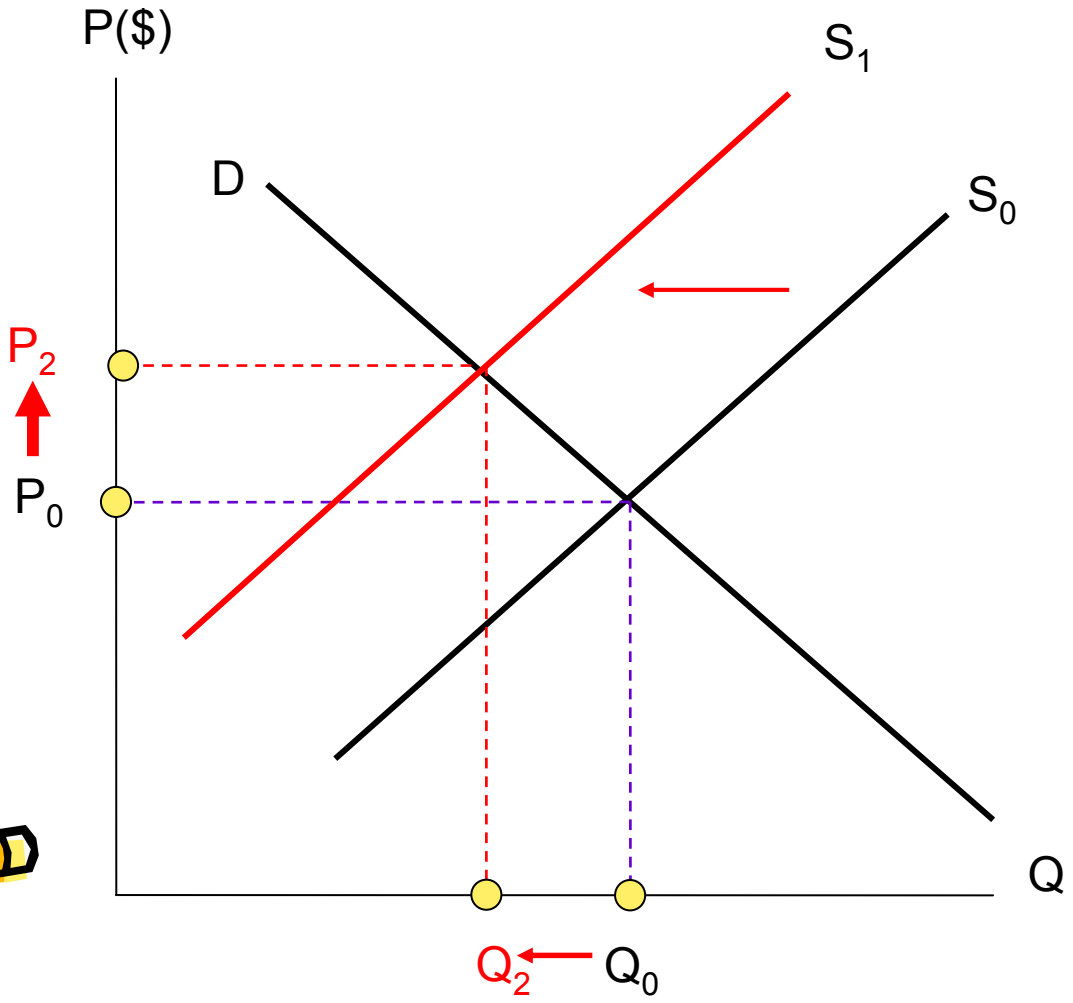


5. Given the original demand curve and the new supply curve, would the quantity demanded be equal to the quantity supplied at the original equilibrium price level stated in Q.1?

- **No, they would not be equal. At this price level, the quantity demanded would be greater than the quantity supplied.**

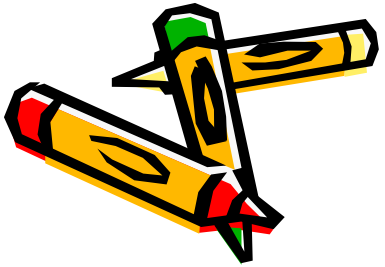


6. How did the market price tend to change so as to restore market equilibrium?

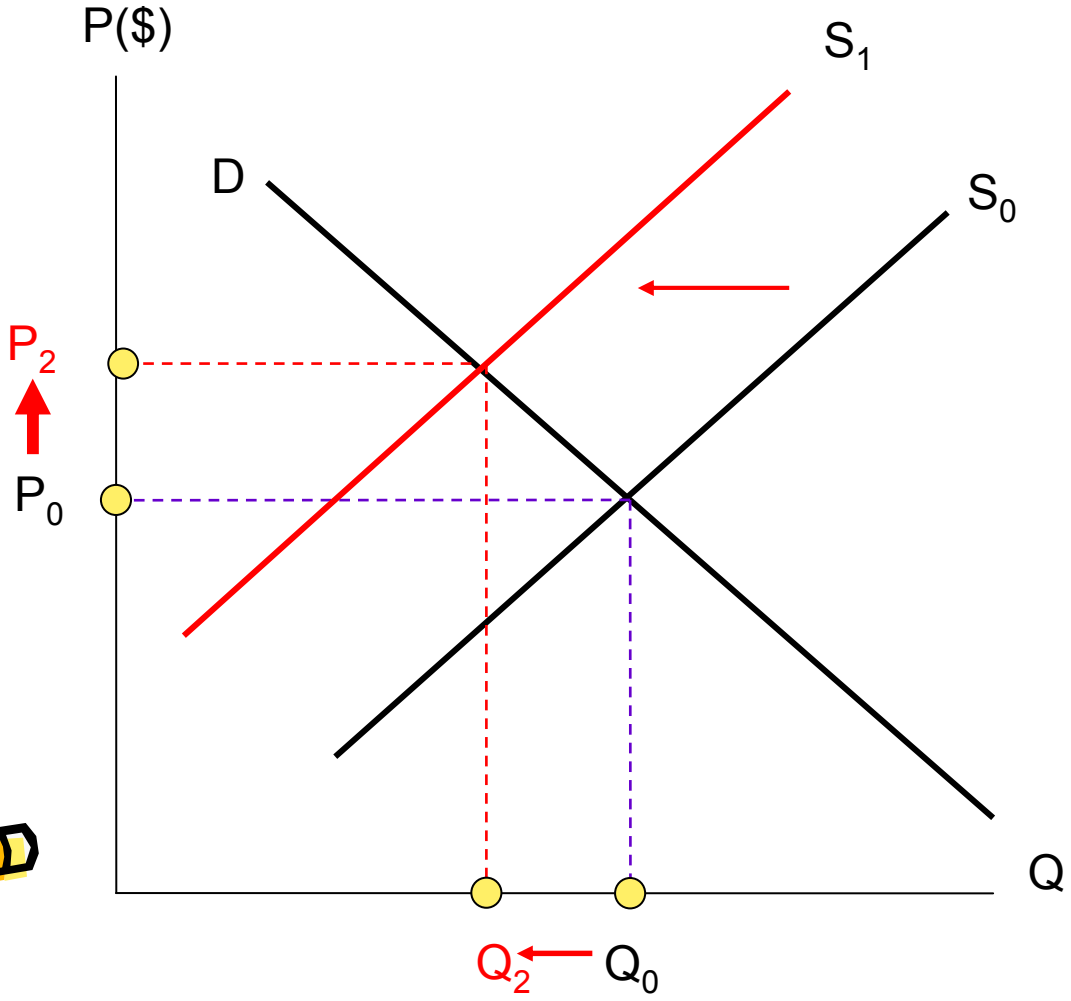


6. How did the market price tend to change so as to restore market equilibrium?

- **The market price tended to rise.**

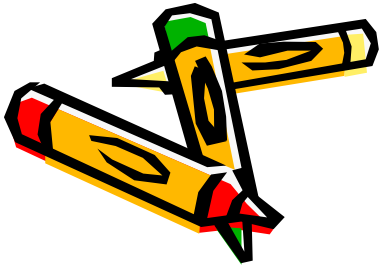


7. What would be the new market equilibrium price and quantity?

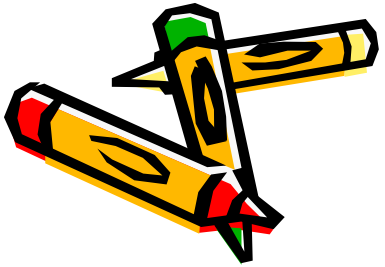


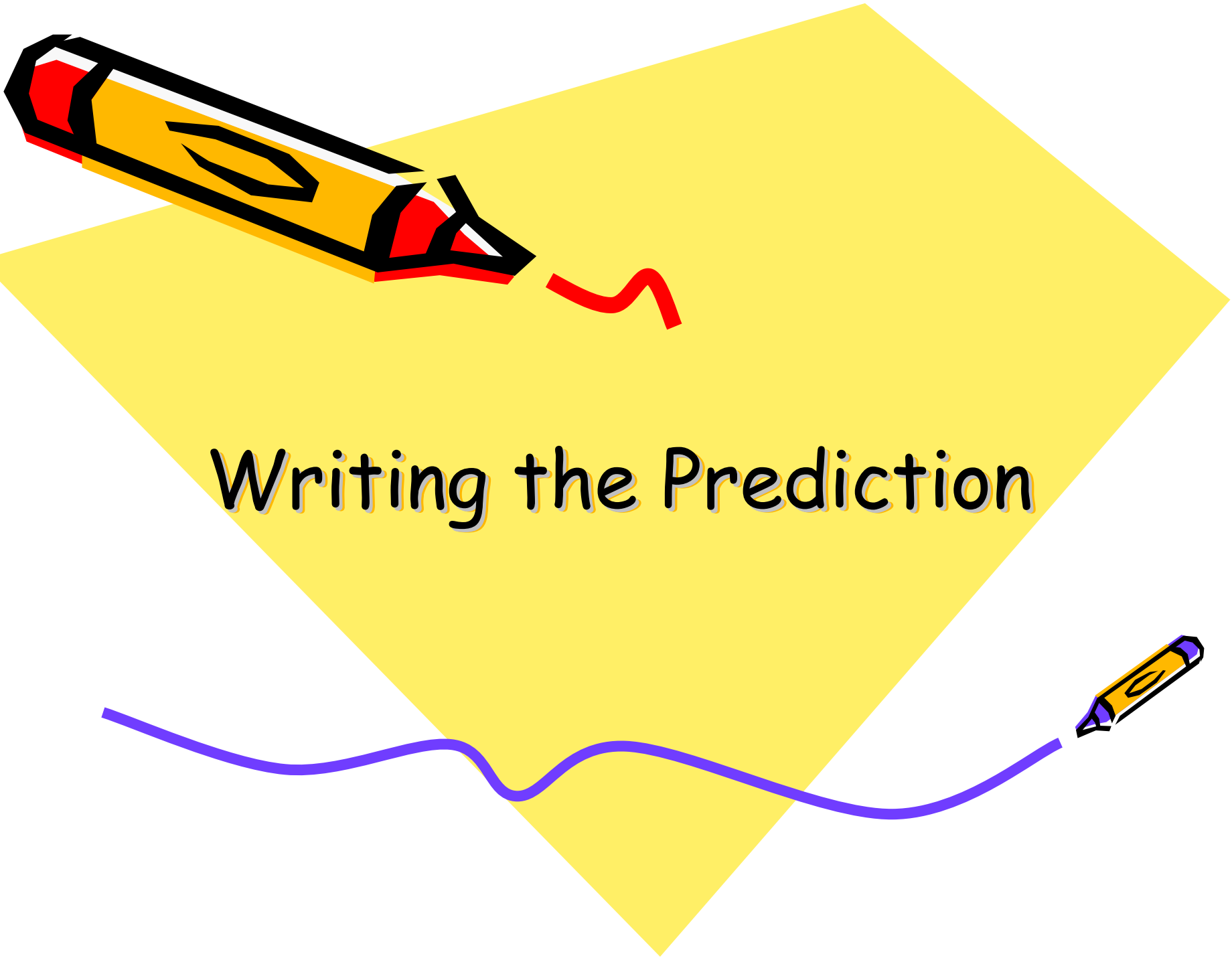
7. What would be the new market equilibrium price and quantity?

- **The new market equilibrium price would be P_1 and the market equilibrium quantity would be Q_1.**



- Now, Please answer questions 1-7 by yourself.

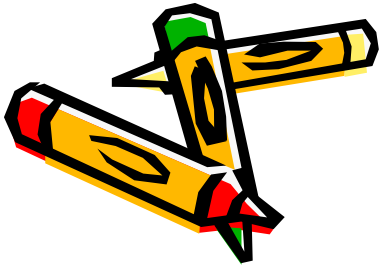



Writing the Prediction

How should we start a sentence?

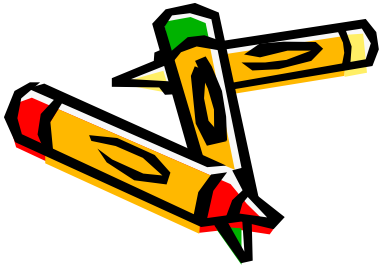
- If other things are the same……

Assume being constant



How should we start a sentence?

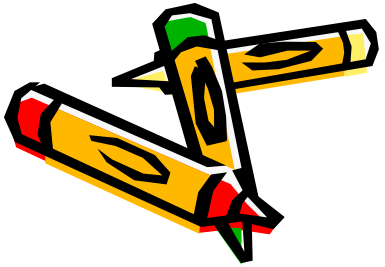
- Assume other things being constant



Then, what do we suppose? Are there any special situation? What has happened to the production cost of the air-conditioners?

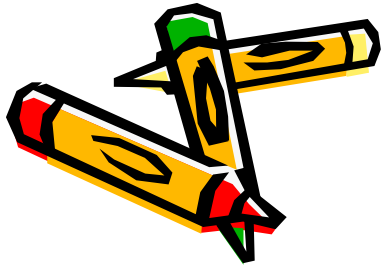
- Assume other things being constant,

  there was an increase in the production cost of air-conditioners,



Next, how does this factor affect the market supply of air-conditioners? Increase or decrease?

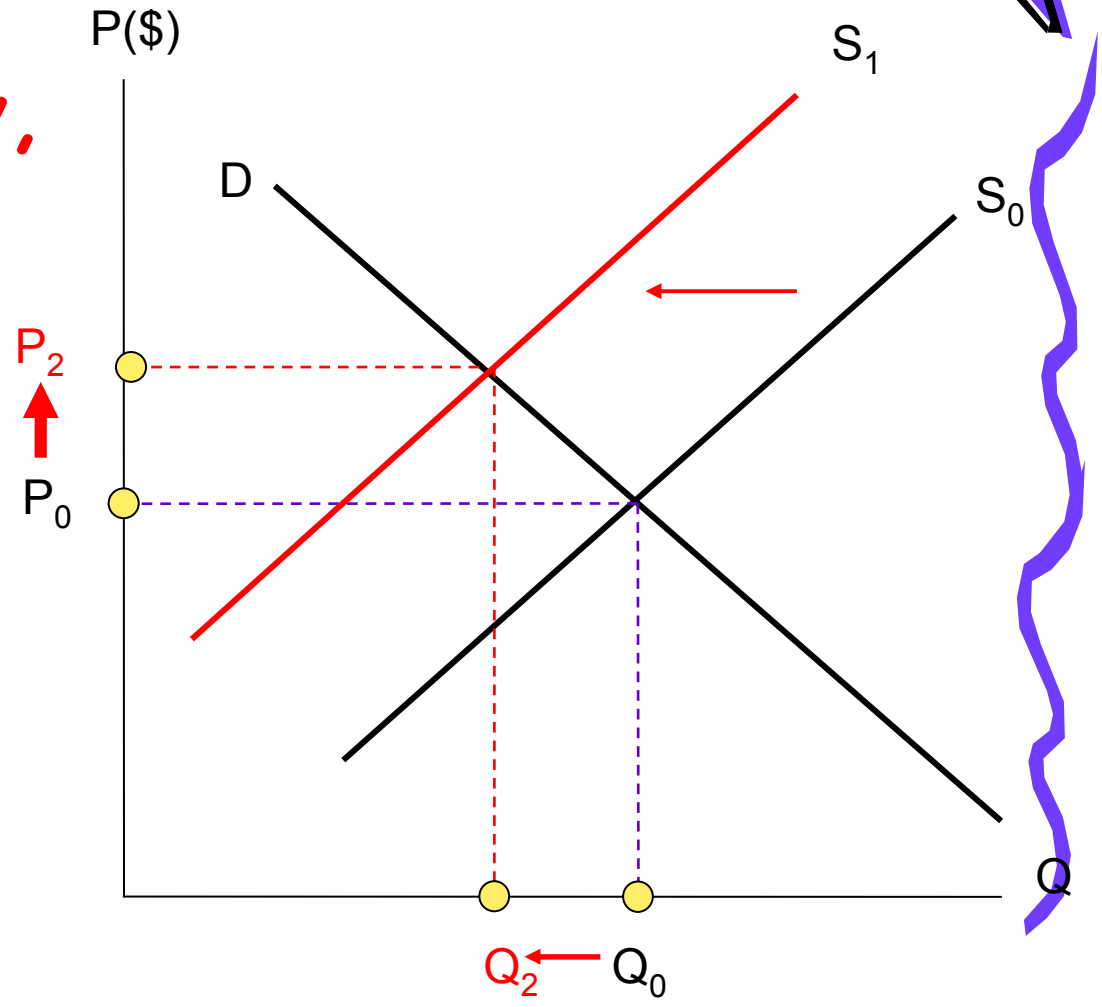
- Assume other things being constant, there was an increase in the production cost of air-conditioners, the market supply of air-conditioners would decrease.



- Assume other things being constant, there was an increase in the production cost of air-conditioners, the market supply of air-conditioners would decrease.

Diagrammatically,

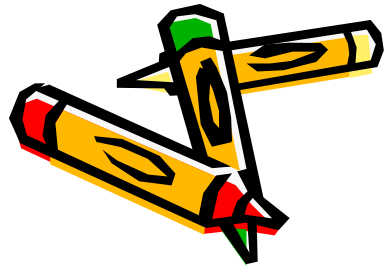
the market supply curve would shift leftward, from S_0 to S_1.



Assume other things being constant, there was an increase in the production cost of air-conditioners, the market supply of air-conditioners would decrease.

Diagrammatically, the market supply curve shifted leftward, i.e. from S_0 to S_1.

As a result, the equilibrium price would rise from P_0 to P_1 and the equilibrium quantity decreased from Q_0 to Q_1.



- Now, please write the prediction on your worksheet!