Teacher Notes

Supply and Demand Curves and Market Price Equilibrium

Activity 1
Exploring Demand and Supply Schedules

Activity Overview

Describe to the class that the activity will be in two parts. First, using the handout titled **Demand Schedule** each student will complete an individual demand schedule for the price of a candy bar. Second, using the handout titled **Supply Schedule** students will create a supply schedule for paper airplanes. After completing the schedules the class will combine all their individual schedules and create, with the teacher, demand and supply schedules for the whole class. They will graph the schedules and discuss the properties of the demand curve and the supply curve. They will discuss how price affects the quantity demanded and supplied. The whole class will discuss what factors may cause changes in the demand and supply curves.

Tip

It will be worthwhile to select a product that the students can relate to in their own spending habits. I used candy bars for the demand activity and paper airplanes for the supply activity.

Directions for Demand Schedule

Before the Activity Begins

Make sure each student has a TI-83 Plus and that the lists and graphs are cleared. It may be easier for some students to read the numbers if they are rounded to 2 decimal places. This can be done by setting the mode to 2 decimal

places. Press ⎾MODE⏌ on the calculator and highlight the number 2 and press ⎾ENTER⏌. The screen should look like the following:
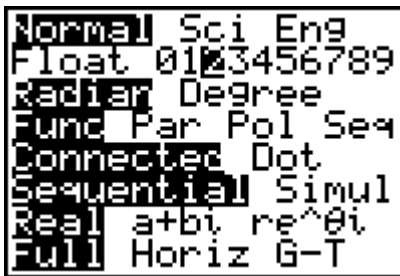
Warm-up Activity

Begin the activity by exploring with the students how price affects how much of a product they buy. Have them give concrete examples.

During the Activity

Distribute the **Demand Schedule** work sheet to the students. Make sure students understand that they should be realistic on how many candy bars they would purchase at a certain price. Monitor the students' progress to insure that students are completing their work. It may be necessary to start the students with an example of what you would purchase at the first few prices. When students have finished their work sheet, explain that they have completed an individual demand schedule. Now they will report as a class and generate a demand schedule for the whole class as if the entire class represented the marketplace.

- ◆ Discuss the parallels to this model in the real world where many individuals make up the marketplace.

- ◆ Discuss why the demand schedule for the entire marketplace for a good or service may be different than for an individual.

Collecting the data for the entire class may be done in various ways. Once completed, the class should write the demand schedule for the class in the table on the student work sheet and graph it on the TI-83 Plus.

By tracing on the graph, students should explore how quantity demanded changes as price changes. From this, students should be able to formulate the law of demand. Students should discuss why demand behaves the way it does and should comment on the effect of product substitution on demand as well as the effect of the income on demand.

Students should now investigate how an increase or decrease in demand affects the demand curve. They can do this on the TI-83 Plus by adding and then subtracting to the quantity demanded. Instructions are given on the work sheet.

After the Activity

Lead the class in a discussion on the factors that lead to a change in demand for a good or service causing the curve to shift. Factors to guide discussion could

include: income changes; population and demographic changes; preferences and tastes; consumer expectations about price; and the prices of substitute goods.

Directions for Supply Schedule

Warm-up Activity

Begin this part of the activity by exploring with the students by asking how price affects how much of a product is produced. Have them give concrete examples.

During the Activity

Distribute the **Supply Schedule** work sheet to the students. Make sure students understand that they should be realistic about how much they would supply at a certain price. Monitor the students' progress to insure that students are completing their work. It may be necessary to start the students with an example of what you would supply at the first few prices. When students have finished their work sheet, explain that they have completed an individual supply schedule. Now they will report as a class and generate a supply schedule for the whole class as if the entire class represented the marketplace.

- ◆ Discuss the parallels between this model and the real world where many individual businesses make up the marketplace.

- ◆ Discuss why the supply schedule for the entire marketplace for goods or services may be different than for an individual.

Collecting the data for the entire class may be done in various ways. Once completed, the class should write the supply schedule for the class in the table on the student work sheet and graph it on the TI-83 Plus.

By tracing on the graph, students can explore how quantity supplied changes as price changes. From this, students should be able to formulate the law of supply. Students should discuss why the law of supply works the way it does, and comment on the effects of revenue and profit.

Students should now investigate how an increase or decrease in supply affects the supply curve. They can do this on the TI-83 Plus by adding and then subtracting to the quantity supplied. Instructions are given on the work sheet.

After the Activity

Lead the class in a discussion of the factors that lead to changes in supply and the reasons why the supply curve might shift. Factors to guide the discussion could include: cost changes (including cost of component parts, labor, transportation); number of businesses; technology changes; environmental changes; and the prices of related goods.

Student Work Sheet

Demand Schedule

Name: _____

Date: _____

In the following chart place the number of candy bars you would purchase in an average week if the price charged is as indicated in the table.

Individual Demand Schedule

Price (cents)	15	30	45	60	75	90	105
Quantity Purchased							

After everyone in the class has completed the above, combine everyone's individual schedule to compile a demand schedule for the entire class.

Class Demand Schedule

Price (cents)	15	30	45	60	75	90	105
Quantity Purchased							

1. How does the class schedule parallel the marketplace?

2. Why might the demand schedule be different for an individual when compared to the marketplace?

3. Construct a graph of the demand schedule for the class on the TI-83 Plus graphing calculator.

   Press STAT then select **1:Edit** by either pressing 1 or by highlighting the 1 with the cursor and pressing ENTER. If necessary, clear any previous data in the lists by moving the cursor to the title of the list and press CLEAR then ENTER.

Enter the prices under **L1** and the quantity demanded under **L2**. A sample screen is shown below.

L1	L2	■3	3
15	335	------	
30	286		
45	232		
60	175		
75	120		
90	71		
105	28		

L3 =

To graph the data, set up the plot by pressing ⟨2nd⟩ ⟨Y=⟩ [STAT PLOT]. Select the first plot by pressing 1 or highlighting 1 and pressing ⟨ENTER⟩.

Set up a scatter plot as shown below. Move the cursor to the appropriate selection and press ⟨ENTER⟩. The Xlist is the horizontal axis and will be the quantity. The quantity data is in L2. To change the Xlist to L2 press ⟨2nd⟩ 2. The Ylist is the vertical axis and will be the price. The price data is in L1. To change the YList to L1, press ⟨2nd⟩ 1.

```
Plot1  Plot2  Plot3
On  Off
Type: ⌐  ▨  dln
      ⊞··  ⊞⊞  ⌐
Xlist:L2
Ylist:L1
Mark:  □  +  ·
```

To graph the data, press ⟨ZOOM⟩ and either press 9 or highlight **9:ZoomStat** and press ⟨ENTER⟩. This allows the calculator to preset the scale to fit the data.

Use the arrow keys to find specific points on the graph.

Sketch a copy of the graph on the grid below. Indicate which axis is price and which is quantity demanded.
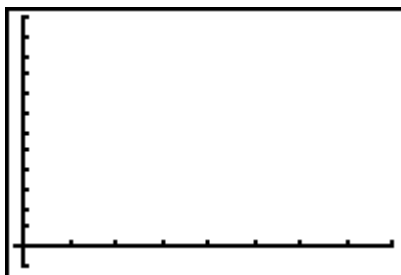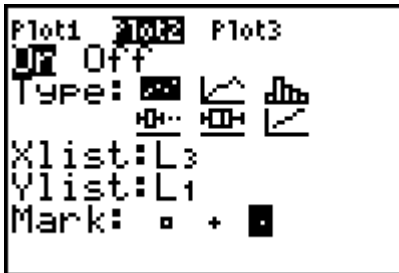
4. Describe how quantity demanded changes as price changes. Explain why this might occur.

5. How does the graph indicate this relationship between quantity demanded and price?

6. Describe how demand is changing according to the price (this is the Law of Demand).

7. We will now investigate how a change in demand affects the demand curve. To see this we will first examine an increase in demand.

Assume that the marketplace demands 100 more candy bars at the same price. On the TI-83 Plus, go back to the **Stat Editor**. To do this, press STAT then **1:Edit**. Move to highlight L3 and press ENTER. The cursor will move to the bottom of the screen and you can enter a formula. Add 100 to each number in L2. Press 2nd 2 (to select L2) then type +100 and press ENTER.

Graph a second scatter plot. This time the graph will represent the new quantity demanded versus price. Press 2nd Y= and select Plot 2. Leave Plot 1 for comparison purposes. Plot 2 should use L3 (2nd 3) and L1. Select **.** (the period) as the mark to help distinguish the two graphs.

Press ZOOM 9 to see the two graphs. Recall that the one with the small squares is the original.

Sketch a copy of both graphs on the axis below, indicating the original demand curve and the curve representing the increased demand.
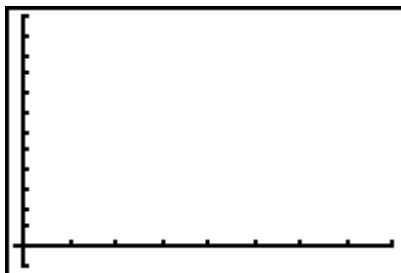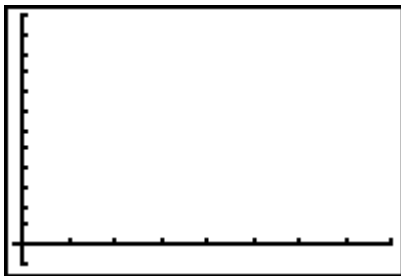
8. Describe how the curve changes with an increase in demand.

9. Assume that the marketplace demands 50 less candy bars at the same price. On the TI-83 Plus go back to the **Stat Editor** by pressing STAT then **1:Edit**. Select L3 and press ENTER. The cursor will move to the bottom of the screen and you can enter a formula. Subtract 50 from each number in L2. Press 2nd 2 (to select L2) then type -50 and press ENTER.

Graph the scatter plot. Use the same procedure as above.

Press ZOOM 9 to see the two graphs. Recall that the one with the small squares is the original.

Sketch a copy of both graphs on the axis below, indicating the original demand curve and the curve representing the decreased demand.

10. Describe how the curve changes with a decrease in demand.

Name: _____

Date: _____

In the following chart place the number of paper airplanes you would be willing to make and sell in an average hour if the price is as listed in the table.

Individual Supply Schedule

Price (cents)	5	15	25	35	45	55	65
Quantity Supplied							

After everyone in the class has completed the chart above, combine everyone's individual schedule to compile a supply schedule for the entire class.

Class Supply Schedule

Price (cents)	5	15	25	35	45	55	65
Quantity Supplied							

1. Why might the supply schedule be different for an individual when compared to the marketplace?

2. Construct a graph of the supply schedule for the class on the TI-83 Plus graphing calculator.

   Press STAT, then select **1:Edit** by either pressing 1 or by highlighting the option with the cursor and pressing ENTER. If necessary, clear any previous data in the lists by moving the cursor to the title of the list and press CLEAR then ENTER.

   Enter the prices under L1 and the quantity supplied under L2. A sample screen is shown below.

L1	L2	L3	3
5	65	------	
15	136		
25	210		
35	278		
45	352		
55	425		
65	503		
L3 =			

To graph the data set up the plot by pressing ⟮2nd⟯ ⟮Y=⟯ ⟮STAT PLOT⟯. Select the first plot by pressing 1 or highlighting 1 and pressing ⟮ENTER⟯.

Set up a scatter plot as shown below. Move the cursor to the appropriate selection and press ⟮ENTER⟯. The Xlist is the horizontal axis and will be the quantity. The quantity data is in L2. To change the Xlist to L2, press ⟮2nd⟯ 2. The Ylist is the vertical axis and will be the price. The price data is in L1. To change Ylist to L1, press ⟮2nd⟯ 1.
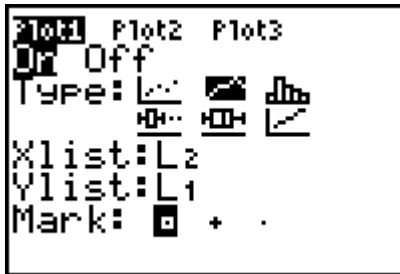
To graph the data, press ⟮ZOOM⟯ and either press 9 or highlight **9:ZoomStat** and press ⟮ENTER⟯. This allows the calculator to preset the scale to fit the data.

Use the arrow keys to find specific points on the graph.

Sketch a copy of the graph on the grid below. Indicate which axis is price and which is quantity supplied.
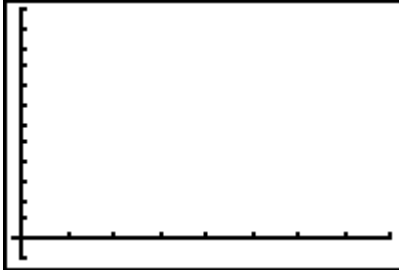

3. Describe how quantity supplied changes as price changes. Explain why this might occur.

4. How does the graph indicate this relationship between quantity supplied and price?

5. Describe how supply is changing according to the price (this is the Law of Supply).

6. You will now investigate how a change in supply affects the supply curve. To see this, you will first examine an increase in supply.

    Assume that the businesses paper airplanes supply 100 more paper airplanes at the same price. On the TI-83 Plus, go back to the **Stat Editor**. To do this, press ⟮STAT⟯ then **1:Edit**. Move to highlight L3 and press ⟮ENTER⟯. The cursor will move to the bottom of the screen and you can now enter a formula. Add 100 to each number in L2. Press ⟮2nd⟯ 2 (to select L2), then type +100 and press ⟮ENTER⟯.

```
L1      L2      ▓▓      3
 5      65      ------
15      136
25      210
35      278
45      352
55      425
65      503
L3 =L2+100
```

Graph a second scatter plot. This time the graph will represent the new quantity demanded versus price. Press [2nd] [Y=] and select Plot 2. Leave Plot 1 for comparison purposes. Plot 2 should use L3 ([2nd] 3) and L1. Select **.** (the period) as the mark to help distinguish the two graphs.

```
Plot1  ▓▓▓▓  Plot3
▓▓ Off
Type: ▓▓  ⌇⌃  ⊞⊞
      ⊞⊞·  ⊞⊞  ⌇⌃
Xlist:L3
Ylist:L1
Mark:  □  +  ■
```
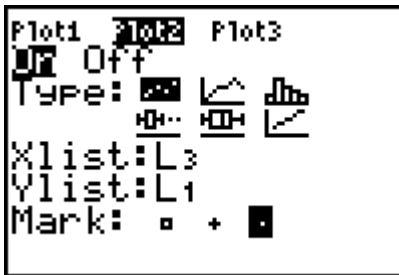
Press [ZOOM] 9 to see the two graphs. Recall that the one with the small squares is the original.

Sketch a copy of both graphs on the axis below, indicating the original supply curve and the curve representing the increased supply.
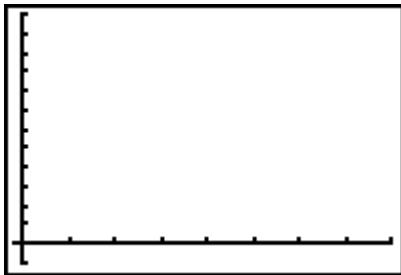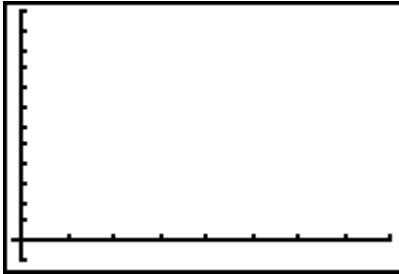
7. Describe how the curve changes with an increase in supply.

8. Assume that the businesses that supply paper airplanes supply 50 less airplanes at the same price. On the TI-83 Plus, go back to the **Stat Editor** by pressing [STAT] then **1:Edit**. Select L3 and press [ENTER]. The cursor will move to the bottom of the screen and you can enter a formula. Simply subtract 50 from each number in L2. Press [2nd] 2 (to select L2) then type -50 and press [ENTER].

L1	L2	L3	3
5	65	------	
15	136		
25	210		
35	278		
45	352		
55	425		
65	503		

L3 =L2-50■

Graph the scatter plot. Use the same procedure as above.

Press ZOOM 9 to see the two graphs. Recall that the one with the small squares is the original.

Sketch a copy of both graphs on the axis below, indicating the original supply curve and the curve representing the decreased supply.

9. Describe how the curve changes with a decrease in supply.