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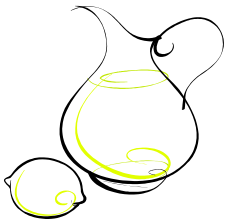
Lemonade for Sale:
How Much To Supply?



FOCUS:

Overview:

Students use the proverbial lemonade stand idea to learn about supply and quantity supplied by running a lemonade business. They create a schedule and graph while learning about costs of production and the factors that affect the amount supplied of a product. As producers they make decisions about which item to produce given costs of production and the price of the goods they can produce.

Objectives:

- Students will understand that supply is a relationship between price and quantity supplied of a good or service.
- Students will learn to create a supply schedule and graph.
- Students will learn about factors that affect supply.

Background Information:

Determining how much of a product to provide is a challenge for an entrepreneur. She must consider what it costs to produce the product, the price for which it will sell, and the profit margin. Each company has a different cost of production. Given these factors, entrepreneurs must make decisions that will result in a profit in order to stay in business. Therefore, the concepts of supply and demand are critical.

A supply schedule is a table which shows the relationship between the price of a product and the amount of the product producers are willing and able to sell. The schedule shows the supply in a given market as an aggregate of all suppliers. The amount at any one price shows the quantity supplied at that price. In the short run, the quantity supplied will increase as price increases. Changes in other factors, such as production costs or the price of other products producers might make, will cause a change in supply. These factors are called non-price determinants of supply. For example, if labor costs increase significantly, firms will supply less at each and every price, and supply will decrease. This lesson shows students how price changes affect quantity supplied and how changes in input prices and other factors affect the supply of products in a market.

Curriculum Multi-tasking:

- Mathematics (graphing)
- Economics
- Critical thinking

PREPARE:

Materials:

- tag board for signs
- 10 small paper cups
- lemonade mix
- Optional: calculator

Construct:

1. Set up two tables.
2. Fill 10 small paper cups with 2 Tbs. of lemonade in each cup.
3. Make two signs: lemonade and lemonade pops

TEACH:

Introduction:

If you are a business owner how do you determine how much of your product to supply? Which products will you produce? What motivates you to produce?

Activities:

Optional: Read *Lemonade for Sale* by Stuart J. Murphy; ISBN 0-06-027440-9 or ISBN 0-06-446715-5 (pbk.). In the story the Elm Street Kids' Club decides to sell lemonade to earn money for a club house. This story sets the stage for the running of a business by student entrepreneurs.

1. Describe the following scenario:
   The sixth grade class at Willis D. Shaw Elementary School needs to earn money for playground equipment. Shaw is a new school and there are few pieces of play equipment. PTA is hosting a rummage sale. The kids believe that they can sell lemonade to earn additional money for the playground. A market survey of some students (mostly siblings) indicates that two types of lemonade products are desired: lemonade drink and lemonade pops.

2. Ask all students to put on their 'producer hats' and think like business owners, not consumers.

3. Ask for one volunteer to be the manager of the lemonade stand. Explain the she will be making decisions about the production of lemonade products. Since the entire class will benefit from the profits, they can advise her on the best decision.

4. Ask for another volunteer to serve as the accountant for the business. Explain that she will calculate revenues from production decisions. She really needs to be good at math. Give her the calculator to use if you allowed.

5. Ask for 10 student employee volunteers. Give each student a cup with the lemonade mix in it. Have five students stand behind the table with the lemonade sign and have the other five stand behind the table with the lemonade pop signs. Explain to the students that the workers, lemonade and tables are productive resources or inputs. They can be used to produce either product.

6. Explain that each employee can produce 10 items with one cup of lemonade. Right now it costs 30 cents to produce each item. Both items sell for 50 cents. At this time the company is producing an equal amount of each product.

7. Discuss the following scenarios:
   - With the inputs divided the way they are now, how many glasses of lemonade can you produce? (*answer is 50 because you have 5 workers with lemonade and each produces 10 glasses – 5 workers X 10 glasses =* ***50 glasses of lemonade***)
   - With the current division of inputs how many lemonade pops can you produce? (*answer is 50 because you have 5 workers with lemonade and each produces 10 pops – 5 workers X 10 pops =* ***50 lemonade pops***)
   - If a market survey shows that you can sell each product at 50 cents each, how much profit will you make per item? *(.50 - .30 = .20 – it costs 30 cents to produce each item and you can sell them for 50 cents. This leaves .20 cents profit per item. .20 x the 100 items you can produce =* ***$20.00***) Write the math on the board so that each student follows your calculations and understands the concept of profit)
   - If you switched resources to produce only lemonade pops, how many of that item could you produce? (*answer is* ***100*** *of the one item*)
   - What would you give up if you switched all inputs to the production of lemonade pops? (*producing lemonade*)
   - Would it affect your sales if you produced only one product? (*encourage discussion but hopefully they will recognize that some customers might want lemonade who will not buy lemonade pops*)

Product	Cost	Price	Revenue	Quantity	Profit
Production 1					
Lemonade	.30	.50	.20	50	$10.00
Lemonade Pops	.30	.50	.20	50	$10.00
Production 2					
Lemonade	.30	.50	.20		
Lemonade Pops	.30	.50	.20	100	$20.00

8. Explain that profit is the money left after you pay the costs of producing the product. The objective of running the lemonade business is to earn as much profit as possible. Profit is the incentive for operating a business – unless it is a non-profit business. (Optional Information: Non-profit is given to businesses that would not exist because of the lack of ability to generate profit. These businesses are created to do things to make society better. They are tax exempt because they are doing things that are good for people.)

9. Ask the manager (with help from the class) what production changes she might make if the following events occur. Employees and cups should be moved from one table to the other to represent each decision. Ask the accountant to record the changes on Handout 9.1. Have the class help the accountant calculate how much of each product would be produced under each circumstance and how much profit would be made. Note, when a change occurs that is described, everything else remains the same.

    A. **Day 1:** The price of wooden sticks increases by .05 each. What does this do to the cost of production? (*Increases it from .30 each on the lemonade pops to .35 each. The profit is now only .15 each.*) How will you change the allocation of your productive resources? Will you produce more or fewer lemonade pops? How many? Record the production changes under Day 2. Calculate and record the profit. (*Students will probably want to switch some more of the production to lemonade since the profit margin is greater there.*)
    B. **Day 2:** A mother, Cindy BigFeather, works for DMD, a craft company. She donates all the wooden sticks needed for lemonade pops. This makes them cost only .20 each. What does this do to production costs? (*Production costs decreased by .10 each. This increases profits to .30 each.*)How will you change the allocation of your productive resources? Will you produce more or fewer lemonade pops? How many? Record the production changes under Day 3. Calculate and record the profit. (*Students will probably want to switch some more of the production to lemonade pops since the profit margin is greater there.*)
    C. **Day 3:** The National Weather Service has forecasted temperatures above 100 degrees Fahrenheit on the day of the rummage sale. One savvy sixth grader suggests that the price of lemonade pops could be .60 each because people would want something to cool them off. Demand had increased thereby increasing the price. Note: cost of producing lemonade pops is .30 each. What does this do to production costs? (*nothing, cost of production remain the same*) What has changed? (*The selling price of the product has changed and therefore the profit margin. It has increased.*) What happens to the quantity of lemonade pops produced? (*Students will probably decide to make a lot of lemonade pops since they make such a high profit on them.*)

10. Have students return to their seats for further discussion of this activity.

11. Discuss:
    a. Why did you shift productive resources in each case? (*To increase profit.*)
    b. What happened when the price of the product increased as in scenario three? (*Decided to produce and sell more of the product since the profit was greater.*)

12. Display Visual/Handout 9.2. Divide the class into two sections. Have one side answer the discussion questions referring to lemonade and the other to lemonade pops. Discuss:
    a. Look at both supply schedules. Would you be willing to sell either of your products at the lowest price? Why or why not? (*No, we would lose money because production costs are higher than the price.*)
    b. Would you be willing to sell either of your products at the next lowest price? Why or why not? (*The answer is yes to both of them. A profit is made at this price.*)
    c. Would you be willing to sell more at $1.00 than at .75? (*Answer should be yes since you would be making more of a profit.*)

13. Explain that the Law of Supply says that as price increases, the quantity supplied will increase. They just demonstrated this as they made their production decisions.

14. Have students graph the supply schedule for their group on the grid provided on Visual/Handout 9.2.

15. As students look at their graphs, explain that the price and quantities to be sold make up a supply schedule. The schedule and graph show the relationship between price and quantity supplied. For supply this is a direct or positive relationship. As price goes up the quantity sold increases and vice versa.

Note: You may wish to stop here. The continuation of this lesson is optional – given the age and level of your students as well as educational goals. The remainder of the lessons teaches supply shifts. At this point your students should understand the concept of supply.

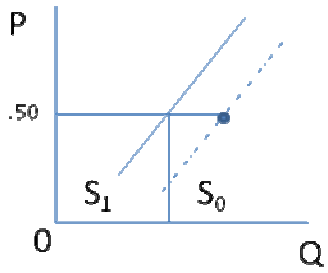
Optional Challenge

16. Point to a price on the schedule and the quantity supplied at this price. Emphasize that at any one price this is the quantity supplied. A change in price results in a change in quantity supplied – not a change in supply. Supply is the entire schedule or graph.

17. Have students point to the price for their product when the activity began. This should be .50 each. What are the Qs (Quantity Supplied) at this price? (50) When the price of lemonade pops increased to .60 each, what happened to the Qs of lemonade pops? (increased to 65) Reinforce that this is a movement along the supply curve; a change in quantity supplied; not a shift of supply.

18. Explain that for supply to shift the quantity will change at each and every price.

19. When the cost of production of lemonade pops decreased, did the price change? (No, it was still 50 cents.) How can we show this change? Have students find the price on the price axis. Use the quantity supplied at this price to locate a new point not on the original supply schedule or curve for lemonade pops. Use the price of 50 cents and the quantity of 65. This point is part of another supply curve that represents an increase in supply.



20. Create a new supply schedule integrating this point. (Assign values to the new quantities supplied that would fit the Law of Supply – as price increases the quantity supplied increases. An example would be 0, 50, 65, 75, 85 & 105 with the quantity of 0 starting at the price of 20 cents. This will help the students to assign values based on Law of Supply. Graph it. This shows an increase in the supply of lemonade pops. The graph moves down and to the right – representing an increase in supply. The producer was willing to supply more because the profit on each item is more.

21. Ask students to predict what will happen to the supply curve when the price of the wooden stick increased causing an increase in the cost of production? This would result in a supply decrease. At each price the Qs would be less. (Ex. 0, 30, 40, 60, 70, 95) This is a movement down and to the left. Note that the price of the product stayed the same.

22. Ask students how they would show the change that occurred in Qs of lemonade when the price of lemonade pops increased due to an increase in demand. They should state that the Qs of lemonade decreases because of the price change of another producible product. (Ex. 0, 30, 40, 60, 70, 95) The decrease in supply would be a movement up and to the right.

23. Explain that if things other than price of the product changes, supply will shift (sellers will offer more or less at all prices.) These factors are called non-price determinants or supply shifters. They include things such as:
    a. Changes in input costs (free wooden sticks or more expensive sticks)
    b. Changes in the price of other goods the firm could produce (price increase in lemonade pops), and
    c. Change in the number of suppliers in the market.

Closure: Discuss:

- Why a producer would supply more if the selling price of the product increases. (*more profit*)
- Discuss what causes the cost of production to change. (*change in resource price, technology*)
- Discuss the incentive for the entrepreneur to be in business. (*to make a profit for the hard work and time spent on the project*)

Standards:

Voluntary National Content Standards in Economics:

Standard 7: Markets - Price and Quantity Determination

Students will understand that:

Markets exist when buyers and sellers interact. This interaction determines market prices and thereby allocates scarce goods and services.

A price is what people pay when they buy a good or service, and what they receive when they sell a good or service.

Market prices are determined through the buying and selling decisions made by buyers and sellers.

Standard 8: Role of Price in Market System

Students will understand that:

Prices send signals and provide incentives to buyers and sellers. When supply or demand changes, market prices adjust, affecting incentives.

High prices for a good or service provide incentives for buyers to purchase less of that good or service, and for producers to make or sell more of it. Lower prices for a good or service provide incentives for buyers to purchase more of that good or service, and for producers to make or sell less of it.

An increase in the price of a good or service enables producers to cover higher per-unit costs, causing the quantity supplied to increase, and vice versa. This relationship between price and quantity supplied is normally true as long as other factors influencing costs of production and supply do not change.

Scarce goods and services are allocated in a market economy through the influence of prices on production and consumption decisions.

Visual/Handout 9.1

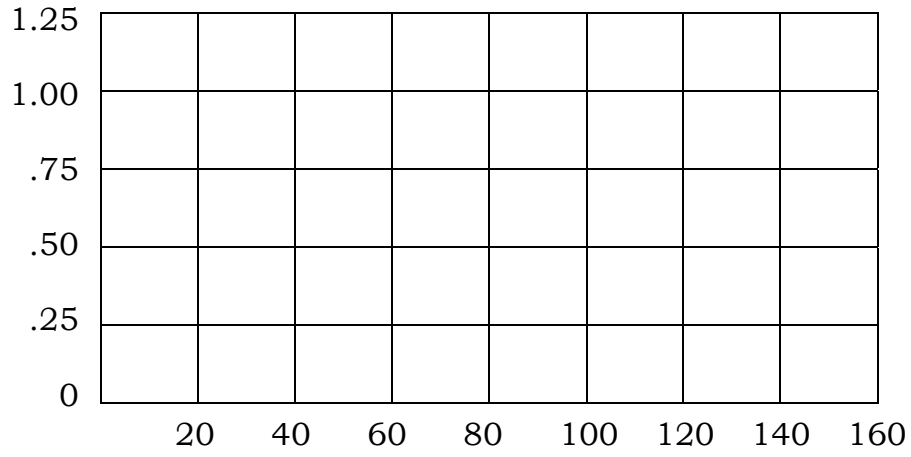
Product	Cost	Price	Revenue	Quantity	Profit
Production day 1			Amount X profit	Amount produced	
Lemonade	.30	.50	.20	50	$10.00
Lemonade Pops	.30	.50	.20	50	$10.00
Production day 2					
Lemonade	.30	.50	.20		
Lemonade Pops	.35	.50	.20	100	$20.00
Production day 3					
Lemonade	.30	.50			
Lemonade Pops	.20	.50			
Production day 4					
Lemonade	.30	.50			
Lemonade Pops	.20	.60			

Visual/ Handout 9.2

Supply Schedule for Lemonade

Price	Quantity Supplied	Quantity Supplied – from class production decisions
$1.00	100	_____
$.80	75	_____
$.60	65	_____
$.50	50	_____
$.40	40	_____
$.20	0	_____

Price

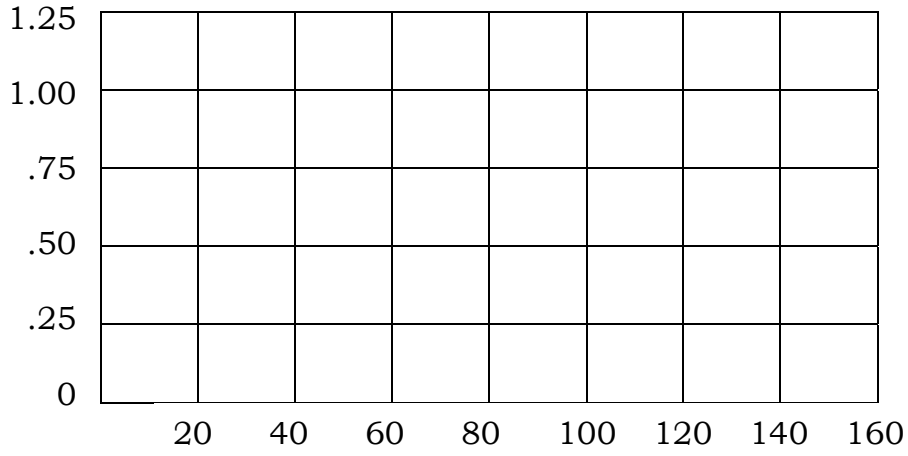


Visual/ Handout 9.2 (continued)

Supply Schedule for Lemonade Pops

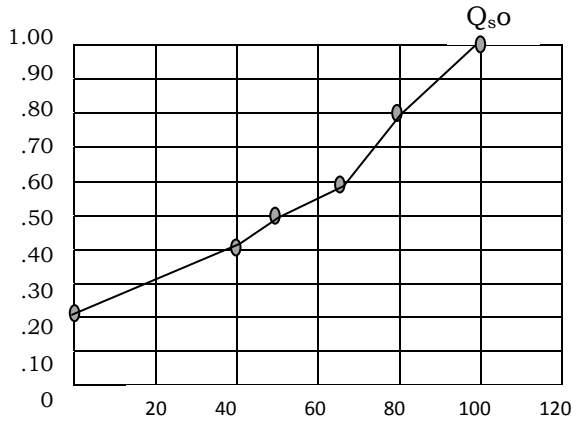
Price	Quantity Supplied	Quantity Supplied – from class production decisions
$1.00	100	_____
$.80	75	_____
$.60	65	_____
$.50	50	_____
$.40	40	_____
$.20	0	_____

Price



Supply Increase

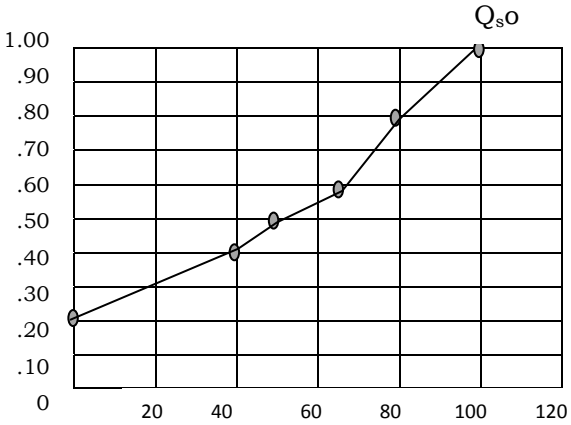
P		Q_s	New Q_s
$1.00		100	_____
$.80		80	_____
$.60		65	_____
$.50		50	65
$.40		40	_____
$.20		0	_____



Donated Wooden Sticks- decreased cost of production

Supply Decrease

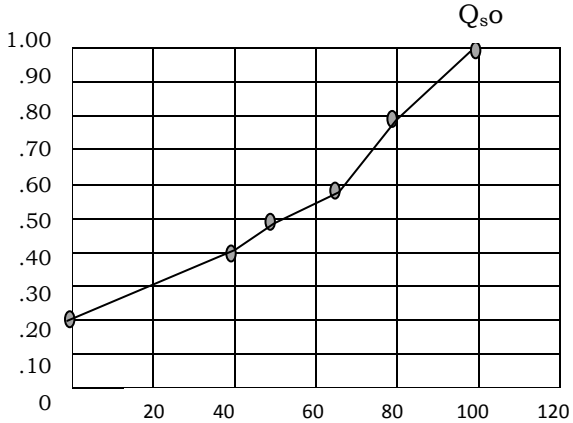
P		Q_s	New Q_s
$1.00		100	_____
$.80		80	_____
$.60		65	_____
$.50		50	40
$.40		40	_____
$.20		0	_____



Increased Wooden Stick Price – increased cost of production

Supply Decrease

P		Q_s	New Q_s
$1.00		100	_____
$.80		80	_____
$.60		65	_____
$.50		50	30
$.40		40	_____
$.20		0	_____



Price increase of another producible good

Visual/ Handout 9.3