

# THE PROFIT PUZZLE

## INTRODUCTION

The hope of earning profit motivates entrepreneurs and business firms to incur the risks involved in producing goods and services for the market. Profit is the difference between revenues and the costs entailed in producing or selling a good or service; it is a return for risk taking. Profit-seeking firms are the basic production units in a market economy. Businesses make decisions about production based partially on the hope of maximizing profits. The amount of profit a firm makes depends on price, quantity demanded, and the costs of production.

## ECONOMIC CONCEPTS

Accounting profit  
Economic profit  
Costs of production

## RELATED CONTENT AREAS

Mathematics  
Language arts

## OBJECTIVES

- ◆ Define costs of production, sales revenue, and accounting profit.
- ◆ Calculate the sales revenue and profit for a good.
- ◆ Determine from among choices the most profitable output level for a given product.
- ◆ Explain the function of profits in a market economy.
- ◆ Predict the impact of changes in sales price and input costs on revenue and profits.

## LESSON DESCRIPTION

Students help Pierre determine which items to continue to sell in his bakery, based on identifying the most profitable items. The concepts are reinforced as students make similar decisions for opening a school snack bar.

## TIME REQUIRED

- ◆ 2 class periods

## MATERIALS

- ★ Activities 1, *Prices and Profits*; 2, *Pierre's Product Picks*; and 3, *The Student Snack Shack* for each student
- Visuals 1, *Prices and Profits: Answers*, 2, *Pierre's Product Picks: Answers*, and 3, *The Student Snack Shack: Answers*
- Calculators

## PROCEDURE

1. Discuss how students might use \$30,000. (Options include: place in a savings account, buying stocks and bonds, buying precious metals, and so on.) People have many options regarding the use of their money. Investing in a business is one of the options. But, people will do this only if they think the business (their own or someone else's) will make a profit. In other words, they expect a return on their investment. Explain that profit is the motivating factor for a business to take the risks of producing goods or services.
2. Define accounting profit: Profit = Sales Revenue - Costs of Production. Define sales revenue and costs of production: Sales revenue = Price × Quantity Demanded; Costs of production include costs of all inputs (productive resources) used in the production process (wages and benefits, raw materials, capital equipment, utilities, and so on).
3. Ask students how much profit they think most businesses make as a percentage of total sales: 5%? 15%? 20%? 40%? (Answers will vary.) (Note that the average for a U.S. business is around 4-5%. Figures vary from one type of business to another. For example, grocery store profit on sales is only about 1%; figures for other types of retail firms include clothing, 4.1%; stereo equipment, 4.5%; fast food, 5.8%.)

4. Distribute a copy of Activity 1 to each student and read the background scenario.

Note: Pierre invested \$30,000 of his own money to start his business. He used the money to buy a building and equipment. He manages the business and works long hours to make it successful but does not pay himself a salary. The profits the business earns are his to use as he sees fit.

5. Have students work independently to complete the chart. Display transparency of Visual 1 and discuss the results.

- If his current price is \$1.50, will Pierre's sales revenues increase by raising the price? (No; it decreases at both \$1.75 and at \$2.00.)
- What caused his sales revenue to decrease? (Consumers were very responsive to the change in price. The quantity demanded decreased by a large number.)
- At what price does Pierre make the most profit on his Pecan Puffs? (The current price, \$1.50.)
- What other impact might there be if Pierre raises his price on this item? (If other area bakeries are selling similar items at a lower price, customers may go to those places.)
- Would you recommend that Pierre raise the price on Pecan Puffs? (Unless other factors change, he should keep the price at \$1.50.)

(See Lesson 4, *How Many Will You Buy?* for more information on the effect of higher prices on quantity demanded.)

6. Tell students: Since raising the current price on this item does not appear to be a good way to increase his profits, Pierre decides he could improve his profit by eliminating items on which profit is low and concentrate on producing and selling those items on which profit is higher. The resources now being used on the low-profit items could be switched to producing more of the high-profit items. Pierre is sure that many of his consumers will

switch from the items he drops to other items he continues. Help Pierre find which of his bakery items are most profitable.

7. Hand out Activity 2 to all students. Have them work in groups of 4-5 to complete the information on the chart. If necessary, review how to calculate sales revenue and profit. Note that the sales figures on the chart are for three months of business.

## CLOSURE

1. When students have finished their work, display transparency of visual and discuss results.
  - Which six items make the highest profit for Pierre? (Doughnut Delights, Cocoa Cubes, Chocolate Clouds, Cinnamon Curis, Sweet Nothings, and Super Cinnamon Rolls.)
  - Which three items make the least profit? (Buttery Bread Sticks, Apple Tarts, and Paris Pound Cake.)
  - Do you think he should continue to sell the Pecan Puffs and Chez Cherree? (Answers will vary; although they are not as high-profit as some items, they are popular; dropping them may mean losing customers.) Should Pierre continue to sell Buttery Bread Sticks? (Answers will vary; again, it is a lower-profit item, but not nearly as low as Apple Tarts and Paris Pound Cake. Since the Bread Sticks are the only non-sweet item on his list and are very popular, he may decide to keep selling them.)
  - What might happen in each of these cases:
    - ✓the price of ingredients for the Super Cinnamon Rolls and Pierre's Pecan Puffs increase. (Profits on those items will decrease.)
    - ✓the cost of health insurance benefits for all his employees goes up. (Costs of production will increase and profits will decrease.)

✓the cost of ingredients for Buttery Bread Sticks decreases. (The profit on this item will increase.)

2. How much profit did Pierre make in one year (include all items)? (\$25,840) Is this high enough profit to keep Pierre in this business? (Since Pierre is managing the business, puts in long hours of work, and has invested \$30,000 of his own money, the profit is a fair return on his investment and a reward for taking the risks of running a business. If he paid himself a salary of \$20,000, he is earning \$5,840 for investing his money and taking the risks of operating the business. This is economic profit. Economic profit is calculated by including the salary forgone by the business owner. In this case, Pierre could earn \$20,000 working elsewhere.)

- If he sets aside 20% of his profits for future expenditures at the bakery (to replace equipment, expand, etc.), what is his profit then? (\$20,160; if you subtract a "salary" of \$20,000, his reward for risk taking and investment is only \$160).
- Would he be better off working for someone else and keeping his money in the bank? (Answers will vary. He might have been able to put his \$30,000 in a savings certificate earning 5% interest and earned a salary of \$20,000 working for someone else. His reasons for investing in his own business could include the promise of higher return on his investment than in savings; wanting to be his own boss; possibility of earning more than if he worked for someone else.)

## EVALUATION

1. Instruct students to write a memo to Pierre recommending the items he should continue to produce and sell. The memo should include the sales revenue, cost of production, and total profit for the recommended items. The memo should also

note the least profitable items. Give reasons for all recommendations. (Note: items students recommend may vary, but they should include all of the high-profit items. Answers should be accepted if they can provide good reasons for their choices.)

2. Have students using Activity 3, work in groups or independently to decide which items the students should sell at their new snack bar. Discuss results.
3. Ask students to suggest situations that might change their snack bar sales. They should explain what the changes would be and why. (Examples: Another organization sets up a competing business; cost of popcorn from supplier increases; the nearest store selling snacks to students goes out of business.)
4. Ask students to answer the following questions in their *Economics Role Journal* regarding the role of productive worker.
  - Is this one of your roles now? If so, how?
  - How will you fill this role in the future?
  - How will being a productive worker benefit you?
  - How is your role as decision maker related to being a productive worker?

## EXTENSION

1. Have students calculate the percent of total sales revenue for each of the items in Activity 1. Have students graph the results in a circle graph.
2. Ask the owner of a small business to speak to the class about costs of production, sales revenue, and profit for her or his business.
3. Ask students to write a paragraph answering the question: If you had the choice of putting \$30,000 in a savings certificate paying 5% interest, or investing

\$30,000 in your own business, which would you choose? (Answers will vary.)

4. Read *The Toothpaste Millionaire* by Jean Merrill (Boston: Houghton Mifflin, 1972). Discuss the cost, price, and profit for Rufus' toothpaste enterprise.
5. Read *LeRoy and the Old Man* and use the corresponding lesson in *Economics and Children's Literature*, (St. Louis: SPEC Publishers, Inc., 1993).
6. Read *The Store that Mama Built* by Robert Lehman (New York: Macmillan, 1992). Discuss the revenue, costs of production, and profit for the family.

Name \_\_\_\_\_

## ACTIVITY 1

### PRICES AND PROFITS

*Background:* Pierre's Bakery is doing a good business, but Pierre would like to improve his profits. Some items cost more to produce than others. (They take more labor time to make, have more expensive ingredients, and so on.) He has thought about raising the price on those items, but there are several other bakeries in the area, so he must keep his price close to theirs if he wants to stay competitive. Also, he knows that raising prices will have an effect on how much people will buy. He is not sure whether raising prices on some items will actually increase sales revenue for those items. Pierre decides to use a market survey to see if raising the price of Pierre's Pecan Puffs will increase his sales revenue (and, therefore, his profits). Fill out the chart below to help Pierre find out whether raising prices will increase his sales revenue. (All figures are for three months of business)

PRICES AND PROFITS FOR PIERRE'S PECAN PUFFS

Price	Quantity Demanded	Sales Revenue	Cost of Production	Accounting Profit
\$2.00	300	\$	\$285.00	\$
1.75	450		427.50	
1.50	800		760.00	
1.30	1000		950.00	
1.10	1100		1045.00	
1.00	1200		1140.00	

1. What happens to quantity demanded (the amount consumers will buy) when price goes up?
2. Does sales revenue increase as price increases?
3. Does profit increase with each increase in price?

# VISUAL 1

## *Answers*

### PRICES AND PROFITS

#### PRICES AND PROFITS FOR PIERRE'S PECAN PUFFS

Price	Quantity Demanded	Sales Revenue	Cost of Production	Accounting Profit
\$2.00	300	\$ 600.00	\$285.00	\$315
1.75	450	787.50	427.50	360
1.50	800	1200.00	760.00	440
1.30	1000	1300.00	950.00	350
1.10	1100	1210.00	1045.00	165
1.00	1200	1200.00	1140.00	60

1. What happens to quantity demanded (the amount consumers will buy) when price goes up? (decreases)
2. Does sales revenue increase as price increases? (It does from \$1.00 up to \$1.30; then it begins to decrease.)
3. Does profit increase with each increase in price? (It does from \$1.00 up to \$1.50; then profit decreases as prices continue to go up.)

Name \_\_\_\_\_

**ACTIVITY 2**

**PIERRE'S PRODUCT PICKS**

*Instructions:* Using the information provided, calculate the missing numbers and decide which items make the profit for Pierre. Mark the six most profitable items in the profit column with a (+); mark the three least profitable items with a (-). The figures for Columns 3–6 are for three months at Pierre's Gourmet Bakery.

Item	Price	Quantity Demanded	Sales Revenue	Cost of Production	Profit
Pierre's Pecan Puffs	\$1.50	800	\$	760	\$
Buttery Bread Sticks	.75	1100		605	
Chez Cherree		1.20	1080	675	
Doughnut Delights	.85	2000		1000	
Cocoa Cubes		3000	1500	600	
Apple Tarts	1.00	400		360	
Chocolate Clouds	1.50	200		1000	
Paris Pound Cake	4.00	200		760	
Cinnamon Curis		4000	4000	2000	
Sweet Nothings	.60	5000		2500	
Super Cinnamon Rolls	1.50	1200		1140	

1. Do the highest priced items always provide the highest sales revenue? the highest profit? Why or why not?
2. Do the items that sell the most (quantity demanded) provide the highest revenue? Why or why not?

# VISUAL 2

## Answers

### PIERRE'S PRODUCT PICKS

Item	Price	Quantity Demanded	Sales Revenue	Cost of Production	Profit
Pierre's Pecan Puffs	\$1.50	800	\$1200	760	\$440
Buttery Bread Sticks	.75	1100	825	605	275(-)
Chez Cherree	1.20	900	1080	675	405
Doughnut Delights	.85	2000	1700	1000	700(+)
Cocoa Cubes	.50	3000	1500	600	900(+)
Apple Tarts	1.00	400	400	360	40(-)
Chocolate Clouds	1.50	200	1500	1000	500(+)
Paris Pound Cake	4.00	1000	800	760	40(-)
Cinnamon Curls	1.00	4000	4000	2000	2000(+)
Sweet Nothings	.60	5000	3000	2500	500(+)
Super Cinnamon Rolls	1.50	1200	1800	1140	660(+)

- Do the highest priced items always provide the highest sales revenue? the highest profit? Why or why not? [No to both; revenue depends on quantity demanded as well as price; profit depends on costs as well as revenue.]
- Do the items that sell the most (quantity demanded) provide the highest revenue? Why or why not? [No; if price is low, total revenue may not be as high as for some items that sell less in quantity.]

Name \_\_\_\_\_

**ACTIVITY 3**  
**THE STUDENT SNACK SHACK**

*Instructions:* The seventh graders at Pioneer School have decided to open a snack bar. They will be able to sell items to students before and after school. After doing some market surveys, they have come up with the information below on what items will sell best at prices that will be similar to prices at other stores in the area.

Using the information provided, calculate the missing numbers and decide which items make the most profit for the Snack Shack. Then write a letter to your principal recommending the items that will make the most profit.

(figures are for one month)

Item	Price	Quantity Demanded	Sales Revenue	Cost of Production	Accounting Profit
Doughnuts	\$ .60	200	\$	\$100.00	\$
Yogurt	1.00	50		42.50	
Orange juice	1.20	100		100.00	
Fresh fruit	.85	50		25.00	
Nachos	1.75	250		400.00	
Chips (bags)	.75	300		180.00	
Popcorn	.50	500		175.00	
Soda	.50	400		185.00	
Lemonade	.75	100		50.00	
Candy	.40	150		52.50	
Gum	.25	200		30.00	

1. Select 3 items for selling before school and 5 items for selling after school, based on which will provide the greatest profit.
2. Are there any reasons for choosing items to sell that make less profit?

# VISUAL 3

## *Answers*

### THE STUDENT SNACK SHACK

Item	Price	Quantity Demanded	Sales Revenue	Cost of Production	Accounting Profit
Doughnuts	\$ .60	200	\$120.00	\$100.00	\$20.00
Yogurt	1.00	50	50.00	42.50	7.50
Orange Juice	1.20	100	120.00	100.00	20.00
Fresh Fruit	.85	50	42.50	25.00	17.50
Nachos	1.75	250	437.50	400.00	37.50
Chips (bags)	.75	300	225.00	180.00	45.00
Popcorn	.50	500	250.00	175.00	75.00
Soda	.50	400	200.00	185.00	15.00
Lemonade	.75	100	75.00	50.00	25.00
Candy	.40	150	60.00	52.50	7.50
Gum	.25	200	50.00	30.00	20.00

- Selected 3 items for selling before school and 5 items for selling after school, based on which will provide the greatest profit. (Doughnuts, orange juice, fresh fruit, nachos, chips, popcorn, lemonade, and gum.)
- Are there any reasons for choosing items to sell that make less profit? (It might be pointed out that soda is a complementary good to popcorn, nachos, and chips. If the stand does not sell soda, popcorn, chip and nacho sales may drop. Therefore, it may be better to sell soda than gum—even though profit is less.)