Monopoly

Introduction and Description

Lesson 5 extends the theory of the firm to the model of a *monopoly*. Students will see that the profit-maximization rules for the monopoly are the same as they were for a perfectly competitive firm. Because price (P) is greater than marginal revenue for a monopoly, however, the output will be smaller and the price higher than in a perfectly competitive market. It is in the monopoly's best interest to produce where MR = MC, not where P = MC. The monopoly will produce a smaller output than society would like it to produce. This results in the *total welfare* being smaller in a monopolistic market than in one that is perfectly competitive, thus creating a *deadweight loss* to society.

Objectives

1. Examine the demand, average revenue, marginal revenue, and total revenue functions of a monopoly.
2. Explain why price is greater than marginal revenue for a monopoly.
3. Explain the rules a monopoly uses to maximize its total profit.
4. Draw graphs of a monopoly and identify its optimal output, price, and total profit.
5. Discuss the barriers to entry that keep out other firms.
6. Compare monopoly to perfect competition in terms of output, price, total profit, consumer surplus, producer surplus, and total welfare.
7. Explain why *price discrimination* will increase the total profit of a monopoly.
8. Discuss three pricing plans for the *regulation of a natural monopoly*.

Time Required

Five class periods or 225 minutes

Materials

1. Activities 3-10, 3-11, 3-12, 3-13, 3-14, and 3-15
2. Visuals 3-10 and 3-11

Bell Ringer

Suppose a market that had many sellers of tee shirts changes so there is now only one seller of tee shirts. What do you think would happen to the price of tee shirts? What about the number of tee shirts sold?

Teacher Alert: **Society would like the monopoly to produce the output at which P = MC, but the firm will produce the output where MR = MC. Students must understand these two different perspectives and why they result in a monopoly producing less output than society wants it to produce.**

Procedure

1. Discuss the characteristics of *a monopolistic market*.
2. Give examples of *barriers to entry* that keep other firms from competing with a monopoly. *(Examples include patents, control of key resources, economies of scale, and price discounts on purchases of large quantities of resources.)*
3. Tell students why a monopoly is a *price maker* and can set the price for its product. *(Because it is the only supplier, the monopoly faces the market demand curve.)*
4. Ask students why a monopolist must lower the price to sell more output. *(This is because the market demand curve is downward sloping.)*

5. Display Visual 3-10 and discuss the shapes of the TR, AR, and MR curves of a monopoly. Point out these facts for a monopoly that has a downward-sloping, straight-line demand curve:
   (A) The firm's MR curve is also downward sloping and linear and twice as steep as the demand curve.
   (B) The upper half (don't say upper "part") of the demand curve is elastic, the midpoint is unitary elastic, and the lower half is inelastic.
   (C) The firm's total revenue is maximized at the output level where MR = 0 (and where demand is unitary elastic).
   (D) The firm's total revenue curve is a symmetrical, bell-shaped curve.
6. Explain that the rules followed by a monopoly trying to maximize total profit are the same as those of a perfectly competitive firm:
   (A) Produce the output where MR = MC.
   (B) The optimal price is found on the demand curve at the optimal output.
   (C) Shut down (produce no output) if, at the optimal output, TR < TVC.
7. Assign Part A of Activity 3-11, which requires students to calculate values of revenue, cost, and profit variables of a monopoly. They also must plot the revenue and cost data on a graph and determine the monopoly's optimal output and price. Have students shade in the areas that represent total revenue, total cost, and total profit at that output level. *(Total revenue is the area of the rectangle drawn from a point on the AR curve at the optimal output level. Total cost is the area of the rectangle drawn from a point on the ATC curve at the optimal output level. Total profit is the area of the rectangle between the TR rectangle and the TC rectangle.)*
8. Use the questions in Part B of Activity 3-11 to explain why producing the output where MR = MC maximizes a monopoly's total profit. Table 3-11.2 is there just for that purpose. Do not be satisfied with students memorizing "MR = MC"; stress the need to understand why the rule works.
9. Use Visual 3-11 to review how a monopoly determines its profit-maximizing quantity and price. Tell students to calculate this monopoly's total profit. *($T\Pi$ = \$650 = 65 units × \$100.)*
10. Assign Activity 3-12. After evaluating a perfectly competitive market, students are asked to evaluate that same market when it becomes a monopoly. They must compare price, quantity, and consumer surplus between the two different markets. They also must identify and calculate the value of the deadweight loss resulting from the market becoming monopolistic.
11. Now that you have examined the standard model of a monopoly, you will extend the analysis to two related topics. First, Activity 3-13 examines price discrimination. Next, Activity 3-14 covers government regulation of a natural monopoly.
12. Discuss the concept of *perfect price discrimination* (also called *first-degree price discrimination*). This means the monopolist is able to charge each individual consumer the highest price that particular consumer is willing to pay for a unit of the product. By doing so, the monopolist captures all of the consumer surplus and increases its total profit. In this model, the unique price paid by each individual consumer is the marginal revenue the firm receives from the extra unit. This means price is equal to marginal revenue, but note that the MR

curve will be the same as the downward-sloping demand curve. It also means that by producing the output at which MR = MC, the perfect price-discriminating monopoly is producing the socially optimal output where P = MC. This is the same output that would be produced if the market were perfectly competitive.

13. Assign Part A of Activity 3-13. Students calculate the total revenue and marginal revenue values for a standard monopolist and draw the market demand curve.

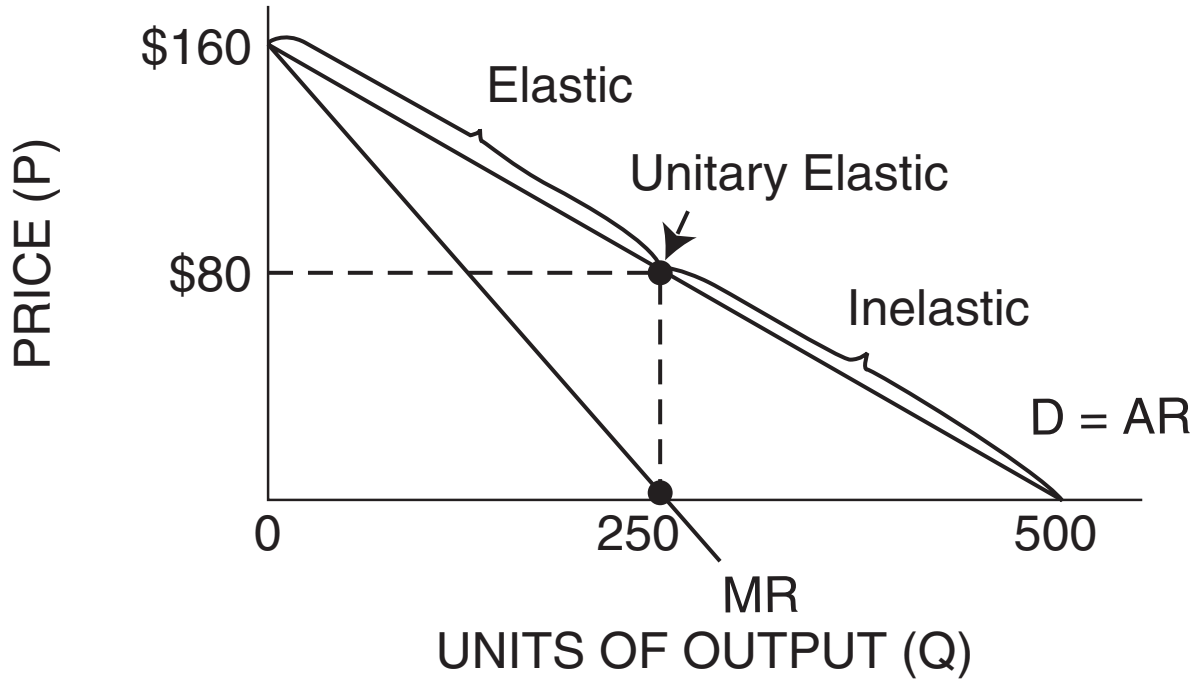
14. Now have students complete Part B of Activity 3-13. They will discover that by using perfect price discrimination, the monopolist has converted to profit all of the consumer surplus that existed in a perfectly competitive market. Because the output is the socially desired quantity, there is no deadweight loss if there is perfect price discrimination.

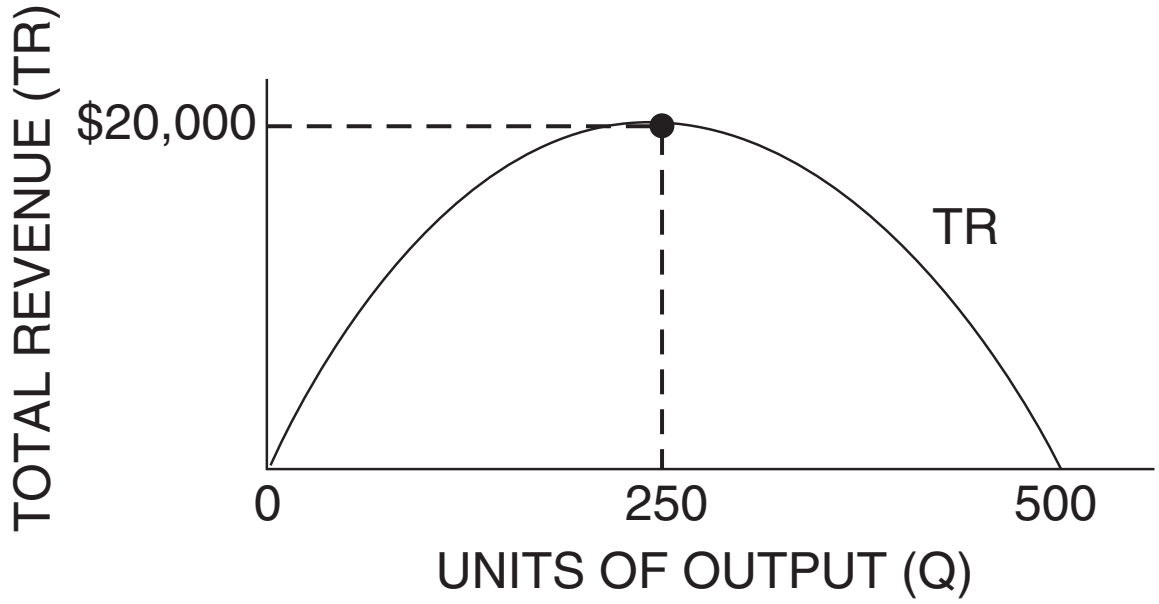
15. Before you assign Activity 3-14, you need to define the term *natural monopoly* and explain the three pricing plans that can be used by a government agency to *regulate* the natural monopoly.
    (A) A natural monopoly exists when a single firm's average total cost declines over a large range of output because of economies of scale.
    (B) The three pricing plans illustrated in this activity are:
        (1) *Monopoly pricing* – Let the firm do as it wishes. It will produce the quantity at which MR = MC and charge the price on its demand curve at that output level. The firm will earn a positive total profit and produce less output than society wishes it would produce.
        (2) *Fair return pricing* – The government eliminates the firm's profit by having it charge a price equal to its average total cost (P = ATC). This output is where the demand curve intersects the average total cost curve. The output is more than under plan (1) but still less than the socially optimal quantity.
        (3) *Socially optimal pricing (also called efficiency pricing)* – The government tries to force the firm to produce the socially optimal quantity by telling it to set its price equal to its marginal cost (P = MC). This output is where the demand curve intersects the marginal cost curve. Because the firm will incur a loss under this plan (its price will be less than its average total cost), the firm will resist it unless provided a subsidy to offset its loss.

16. Assign Activity 3-14 to students. Discuss the results of their evaluation of the three pricing plans.

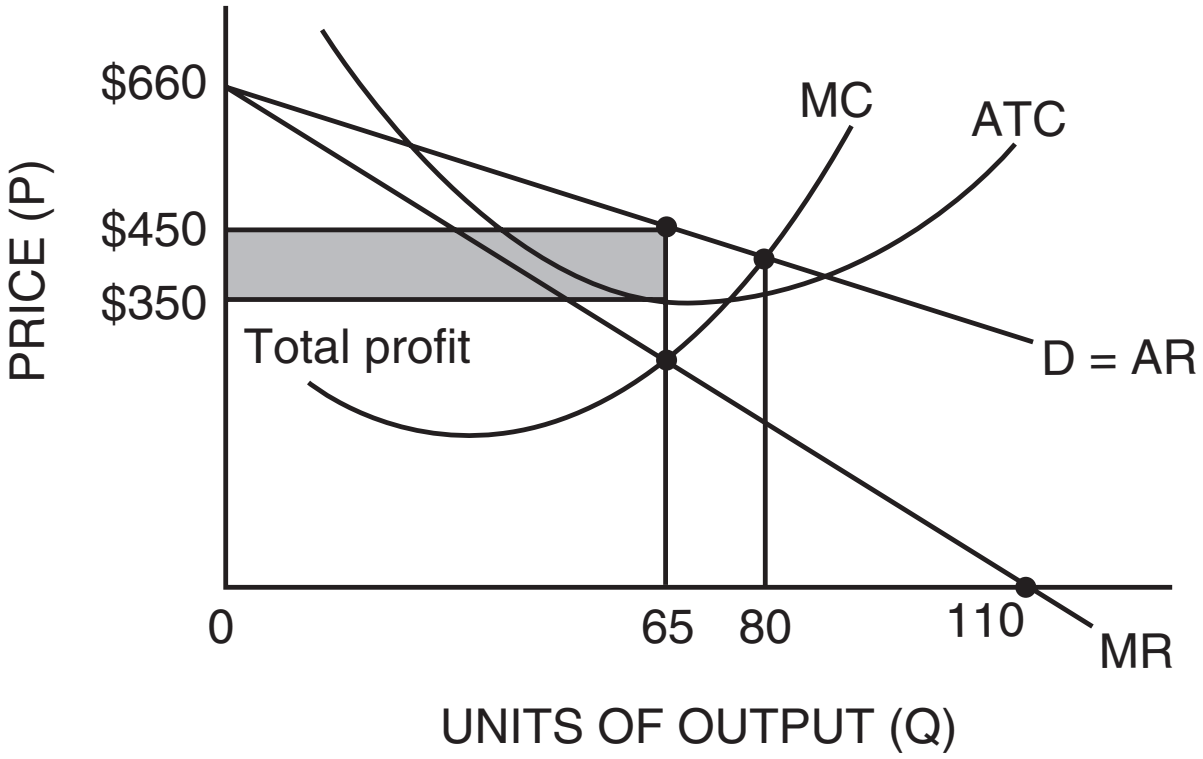
17. The last activity in Lesson 5 is Activity 3-15, which has students comparing the results of perfect competition with those of monopoly. By now they should be ready to complete this activity and discuss their answers.

The Revenue Graphs of a Monopoly





The Graph of a Profit-Maximizing Monopoly



Output	Result	Rule
65 units	Monopoly maximizes total profit.	MR = MC
80 units	Monopoly produces socially optimal output.	P = MC
110 units	Monopoly maximizes total revenue.	MR = $0