

PROJECT

Applying Chapters 7–9

Fitting a Model to Data

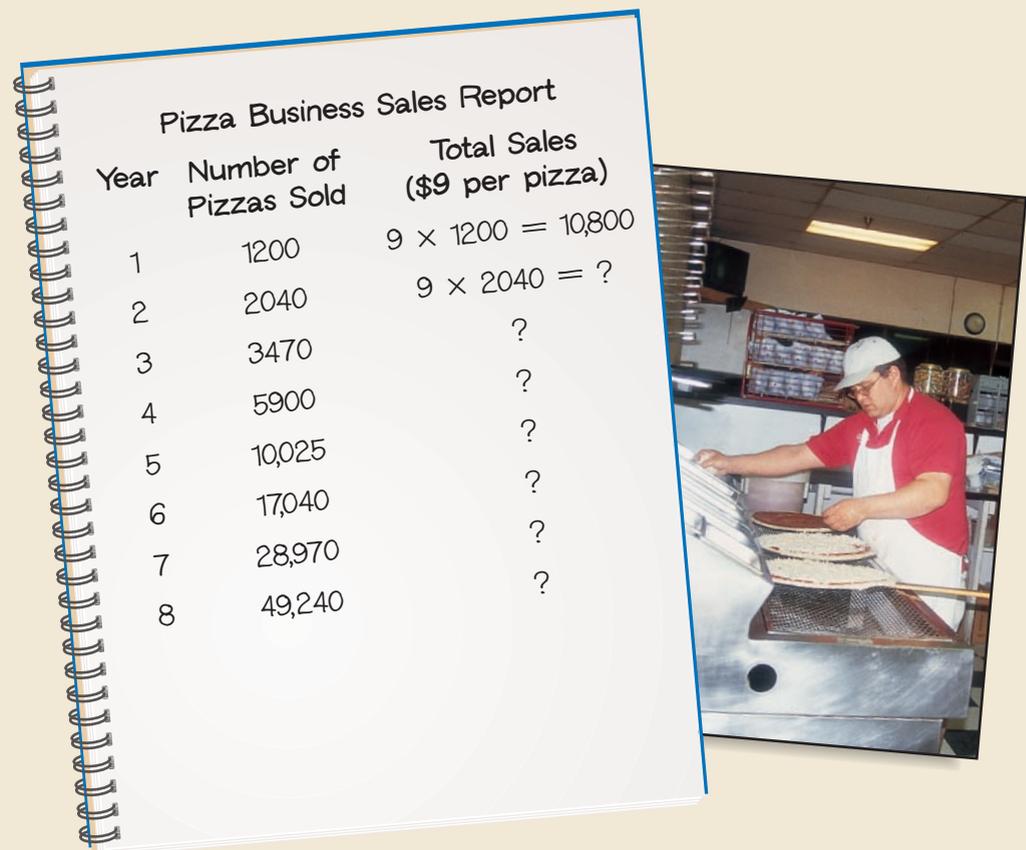
OBJECTIVE Fitting a model to data and then using the model to predict future outcomes.

Materials: graph paper, graphing calculator or computer (optional)

COLLECTING YOUR DATA

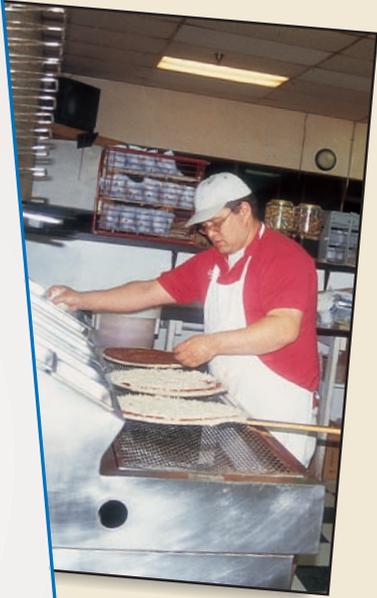
You opened a pizza business eight years ago, and you want to write an equation to represent the growth of the business since you opened.

1. Copy and complete the table.



Pizza Business Sales Report

Year	Number of Pizzas Sold	Total Sales (\$9 per pizza)
1	1200	$9 \times 1200 = 10,800$
2	2040	$9 \times 2040 = ?$
3	3470	?
4	5900	?
5	10,025	?
6	17,040	?
7	28,970	?
8	49,240	?



INVESTIGATING YOUR DATA

2. Make a scatter plot of the data. Describe any patterns you see.
3. To write an equation that represents your data, test a linear model, a quadratic model, and an exponential model to determine which fits the data best. You may want to use a graphing calculator or computer. (See the Graphing Calculator Activity in Chapter 8, page 492, on how to fit a model to a given set of data.) Explain why you think that each model either fits or doesn't fit the data.
4. Make a prediction on what the total sales would be in the tenth year.

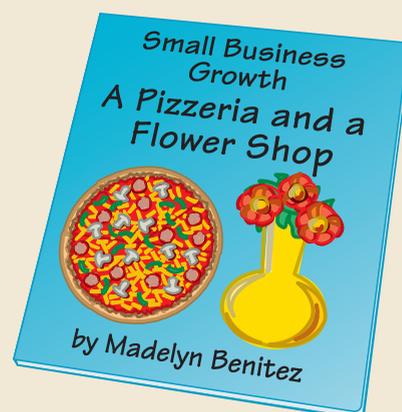
INVESTIGATING ANOTHER BUSINESS

5. Find the annual sales for at least four years for a business or an industry that interests you. Make a table of the data.
6. Make a scatter plot of the data. Try to fit a linear model, a quadratic model, and an exponential model to the data. Which model fits best?
7. Can you use the best-fitting model from Exercise 6 to predict future sales for this business or industry? If you can, use your model to predict sales five years from now. If you cannot, explain why not.

PRESENT YOUR RESULTS

Write a report or make a poster to report your results.

- Include your answers to Exercises 1–4.
- Include all the curves you tried and your explanations of whether they fit or not.
- Describe the business or industry you looked at in Exercises 5–7. Tell where you found your data. Explain whether you were able to fit a model to your data. Include your answers to Exercises 5–7.
- If you used a graphing calculator or a computer to create your models, give the r -value for each model and explain what the values mean.
- Describe what you learned about fitting a model to data. For example, what information or values helped you to determine the best model to use?



EXTENSION

- Find sales data for a business or industry related to the one you used for Exercises 5–7. Compare the two sets of data. Compare the growth in sales in the two businesses or industries.
- Do some research to find a stock market index that you can use to compare the performance of the business or industry you used in the project with the performance of stocks during the same period of time.

