

Car Wash Fundraiser

Working on the Unit Project Exercises

Section 5-1

36. a. In your group, set a reasonable goal of how much money your class wants to raise at the car wash.
- b. Make a table or spreadsheet to model your income if you charge \$3 for each car you wash. Show the number of cars you need to wash to reach your goal.
- c. What is the effect on the number of cars you need to wash to reach your goal if you raise the price by \$2? Lower the price by \$2?
- d. What do you think is the highest price you can charge and still attract customers?

Section 5-2

37. a. In your group discuss ways you can advertise your car wash. Where are potential customers most likely to find out about the car wash?
- b. **Research** Find out the costs of your advertising options.
- c. Based on the costs and the number of potential customers you could reach, decide on two or three ways to advertise your car wash.
38. a. Make a list of supplies you will need for your car wash. Include advertising materials as well as cleaning supplies.
- b. **Research** Call or visit several stores to find the least expensive places to buy your supplies. Make a table to record the information.

Section 5-3

34. Write and solve an equation to find how many cars you have to wash to reach your goal if you charge:
- a. \$3 per car
- b. \$5 per car
- c. another price you are considering
35. a. Find the total cost for advertising and supplies based on your research.
- b. Write an equation to model your total income.
36. a. When your income equals your total expenses, you *break even*. Write and solve an equation to find out how many cars you need to wash at the price you are considering in order to break even.
- b. Is the number of cars you have to wash to break even a reasonable number? If you have to wash too many or too few cars, adjust your price and repeat part (a) until the number of cars you have to wash is reasonable.

Section 5-4

42. Write and solve an inequality to show how many cars you would have to wash at \$5 per car to raise at least \$300.
43. Write and solve an inequality to show how many cars you would have to wash at your price per car to at least reach your goal.
44. Write and solve an inequality to show how many cars you would have to wash at your price per car to raise more than you spend on supplies and advertising.
45. Decide on the price you will charge for each car you wash.

Section 5-5

32. Your *profit* from your car wash is your income minus your expenses. Your profit will depend on the number of customers you get.
Write a formula for your profit after expenses.
Let n = the number of cars you wash.
33. One way to estimate which location will have the most customers is to study traffic patterns. The number of cars on a certain street may depend on the day of the week or on the time of day.
 - a. **Research** Design and carry out an experiment at your three location choices to estimate the number of customers you will have. Include different locations, days, and times.
 - b. Summarize the results of your experiment. You may want to use a table or spreadsheet.
 - c. Based only on the number of potential customers, which location is best? What are some reasons to choose another location?
 - d. Choose one location to be the place for your car wash.

Section 5-6

30. Suppose one student can wash a car in 20 min. In one minute the student can wash $\frac{1}{20}$ of the car.
rate of washing = $\frac{1}{20}$ car per minute
 - a. What part of a car can 10 students working together wash in one minute?
 - b. Do you think 20 students working together can wash a whole car in one minute? Why or why not?
31. a. **Research** Suppose a group of students is washing a car together.
group's rate of washing = $\frac{1}{\text{group's time to wash a car}}$
Experiment with different numbers of students. Find the different group rates of car washing. Decide how many people are needed to wash a car quickly and efficiently.
 - b. Using a group the size you chose in part (a), how long will it take you to wash enough cars to reach your goal?

- c. Will there be enough time in one day for your group to reach your fund-raising goal if only one group of students washes cars? Why or why not?
- d. If you do not have enough time, what are some things you could do to reach your goal?

Section 5-7

28. Make a list of the number of students you need to work at the car wash. You may want to consider people for these jobs: advertisers, car washers, fee collectors, traffic controllers, and "runners" who bring dry towels and other supplies.
29. Make a diagram of the car wash area. Show where students will work. Also mark where you will have signs and the locations of supplies (including the location of the water supply). Make sure each student has a big enough work area.
30. Decide on the hours of your car wash. Make a schedule listing the jobs and the time periods. Write in the number of students needed for each job during each time period.

Section 5-8

28.
 - a. The equation $P = I - E$ shows your profit after you subtract the expenses for the car wash from your income. Substitute your goal for P and your total expenses for E .
 - b. Write an equation to represent your income after washing n cars at your price.
 - c. Write a system of equations using your answers to parts (a) and (b).
 - d. Solve the system you wrote in part (c) to find out how many cars you need to wash for your profit to equal your goal.

Completing the Unit Project

Now you are ready to present your plan of action. Your presentation should include reasons for your recommendations. Include these things in your presentation.

- a description of the best location for the car wash
- the price you have decided to charge for each car
- a list of the supplies you need and where you will purchase these items
- a discussion of how many cars you need to wash to break even
- a table showing your income and how many cars you need to wash to meet your fund-raising goal
- samples of advertisements and posters
- a diagram of the car wash area
- a list of the jobs and the number of people needed to run the car wash efficiently

Look Back

What did you learn from this project that can help you plan for future fund-raising events?