

11.5 Fitting a Model to Data TEXAS 2A.1.B

MATERIALS • 20 index cards • graphing calculator

QUESTION How can you choose a mathematical model for a data set?

In this activity, you will measure the time it takes to learn a new task as it becomes more familiar. You will then find a function that models the data you collect. Work with a partner.

EXPLORE Collect data on learning time

STEP 1 Perform task

Write a different word on each index card. Shuffle the cards, then have your partner put them in alphabetical order. Measure the time your partner takes to complete the task.



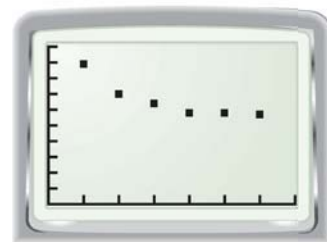
STEP 2 Record data

Have your partner repeat the task described in Step 1 at least five more times. Record your partner's completion times in a table like the one shown below.

Task number	Time (sec)
1	89
2	70
3	64
4	58
5	58
6	57

STEP 3 Make scatter plot

Let x be the task number and let y be the completion time. Use a graphing calculator to make a scatter plot of the data pairs (x, y) from the table in Step 2.



DRAW CONCLUSIONS Use your observations to complete these exercises

1. Describe the pattern shown in your scatter plot from Step 3. Explain why the pattern makes sense.
2. Find a function that is a good model for the data in your scatter plot. You can use one of the graphing calculator's regression features to find a model, or you may experiment with other types of functions that the regression features cannot generate.
3. Use the function you chose in Exercise 2 to predict the time your partner would take to alphabetize the index cards on the 10th trial.
4. Work with a second partner and repeat the experiment. Find a mathematical model to describe this partner's learning times. Do you get similar or different results? Explain why you might expect similar or different results.