KHANACADEMY

CollegeBoard SAT®

Official SAT Practice

Lesson Plans

for Teachers by Teachers

LESSON 8 (3 OF 5 FOR PROBLEM SOLVING AND DATA ANALYSIS)

Interpreting Relationships Presented in Scatterplots, Graphs, Tables, and Equations

Subscore: Problem Solving and Data Analysis

Focus: Interpreting and analyzing linear, quadratic, and exponential models and graphs

Objectives:

Students will

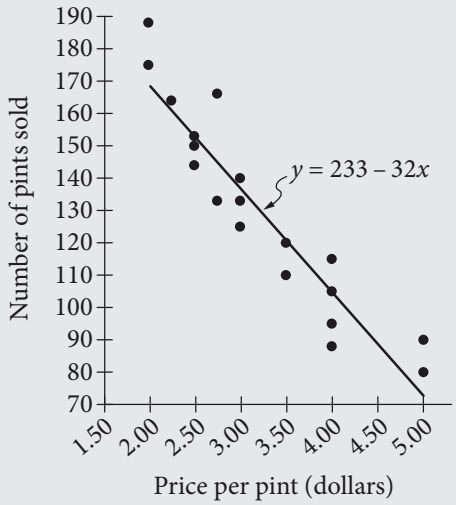
- use best fit lines to interpret contexts.
- distinguish whether contexts are linear or exponential functions.
- use the formulas for simple interest and compound interest to represent contexts.
- interpret graphs that show the relationship between two variables.

Before the Lesson:

- ☐ Review the Teacher Notes.
- ☐ Make sure you have a way to share the example problems with students.
- ☐ Make sure students have access to Official SAT® Practice during class.

Warm Up and Discussion | 10 minutes

- Have students complete the set of questions for this context:



A grocery store sells pints of raspberries and sets the price per pint each week. The scatterplot above shows the price and the number of pints of raspberries sold for 19 weeks, along with a line of best fit for the data and an equation for the line of best fit.

A. According to the line of best fit, how many pints of raspberries would the grocery store expect to sell in a week when the price of raspberries is $4.50 per pint?

B. For how many of the 19 weeks shown was the number of pints of raspberries sold greater than the amount predicted by the line of best fit?

C. What is the best interpretation of the meaning of the slope of the line of best fit?

Teacher Notes

- See pages 214–215 for Example 6 in Chapter 17 of the *SAT Study Guide for Students* for answers and explanations. Page 215 provides good insights into the assumptions and limitations of using a linear function to model this context.

Group/Partner Work | 30 minutes

- Have students complete these Example Problems in groups of 2–3 and discuss their processes and solutions.

1.

Time (hours)	Number of bacteria
0	1.0×10^3
1	4.0×10^3
2	1.6×10^4
3	6.4×10^4

The table above gives the initial number (at time $t = 0$) of bacteria placed in a growth medium and the number of bacteria in the growth medium over 3 hours. Which of the following functions best models the number of bacteria, $N(t)$, after t hours?

A. $N(t) = 4{,}000t$

B. $N(t) = 1{,}000 + 3{,}000t$

C. $N(t) = 1{,}000(4^{-t})$

D. $N(t) = 1{,}000(4^{t})$

2. A bank has opened a new branch and, as part of a promotion, the bank branch is offering $1,000 certificates of deposit at simple interest of 4% per year. The bank is selling certificates with terms of 1, 2, 3, or 4 years. Which of the following functions gives the total amount, A, in dollars, a customer will receive when a certificate with a term of k years is finally paid?

A. $A = 1{,}000(1.04k)$

B. $A = 1{,}000(1 + 0.04k)$

C. $A = 1{,}000(1.04)^k$

D. $A = 1{,}000(1 + 0.04^k)$

3. A bank has opened a new branch and, as part of a promotion, the bank branch is offering $1,000 certificates of deposit at an interest rate of 4% per year, compounded semiannually. The bank is selling certificates with terms of 1, 2, 3, or 4 years. Which of the following functions gives the total amount, A, in dollars, a customer will receive when a certificate with a term of k years is finally paid?

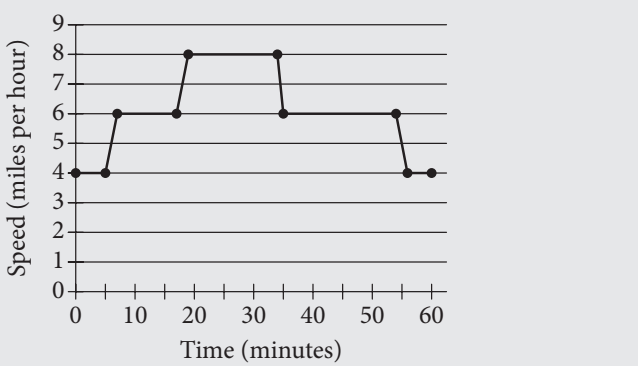
A. $A = 1{,}000(1 + 0.04k)$

B. $A = 1{,}000(1 + 0.08k)$

C. $A = 1{,}000(1.04)^k$

D. $A = 1{,}000(1.02)^{2k}$

4.



Each evening, Maria walks, jogs, and runs for a total of 60 minutes. The graph above shows Maria's speed during the 60 minutes. Which segment of the graph represents the times when Maria's speed is the greatest?

A. The segment from (17, 6) to (19, 8)

B. The segment from (19, 8) to (34, 8)

C. The segment from (34, 8) to (35, 6)

D. The segment from (35, 6) to (54, 6)

Teacher Notes

- 1–4 are Example Problems 7–10 in the SAT Study Guide. See pages 215–218 in Chapter 17 of the *SAT Study Guide for Students* for explanations and discussion.
- If students are struggling with these problems, have them read the explanations in the *Study Guide*.
- Students should know the general formulas for simple interest and for compound interest (which are included on page 217 of the *SAT Study Guide)*
  - Simple interest is an example of linear growth.
  - Compound interest in an example of exponential growth.
- Have students complete the Basic and Harder Examples for Scatterplots, Key features of growth, and linear and exponential growth in Official SAT Practice on Khan Academy® as time allows.

  Remind students to pause the video as soon as they can see the problem. Once students have worked through the problem, have them watch the video to check their work.

Wrap-Up: For your term book | 5 minutes

- Scatterplot
- Line of best fit
- Linear growth
- Exponential growth
- Simple interest
- Compound interest

Homework | 20 minutes

- Complete practice problems in Official SAT Practice on Khan Academy in these skill areas:
  - Scatterplots
  - Key features of growth
  - Linear and exponential growth
- Encourage students to move on to the higher skill level once they successfully complete the problems in their current skill level and can “level up.”