LESSON MAKER PRO

Relationship Roadmap

Connect words, tables, graphs, and equations.

GRADE 6 · TEKS 6.6

6.6 "Expressions, equations, and relationships. The student applies mathematical process standards to use multiple representations to describe algebraic relationships. The student is expected to: identify independent and dependent quantities from tables and graphs; write an equation that represents the relationship between independent and dependent quantities from a table; and represent a given situation using verbal descriptions, tables, graphs, and equations in the form y = kx or y = x + b."

NAME _____ DATE _____

Connect the representations

In these models, x is the independent input and y is the dependent output. y = kx starts at zero and adds k for each unit of x. y = x + b starts at b and adds one for each unit of x.

Worked example

A game awards 3 coins per puzzle. Write the rule for the table.

Find the output for zero puzzles: 0. Each additional puzzle earns 3 coins.

y = 3x; x is puzzles and y is coins.

Puzzles, x	Coins, y
0	0
1	3
2	6

Use the supplied tables and graphs. Show calculations and explain the relationships. Label plotted points as requested.

1. Identify quantities and a rule

Each notebook costs the same amount. Use the table to identify the independent and dependent quantities. Write an equation using x and y.

_____

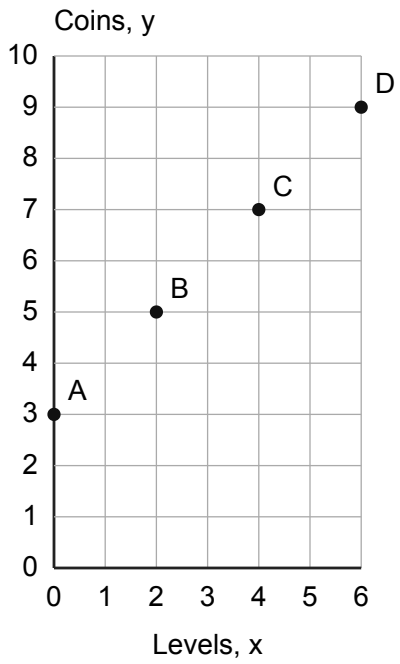
_____

_____

Notebooks, x	Cost ($), y
0	0
1	2
3	6
5	10

2. Read a graph

This game starts with some coins and adds one coin per completed level. Identify the independent and dependent quantities from the axes. Read A and B and write an equation.



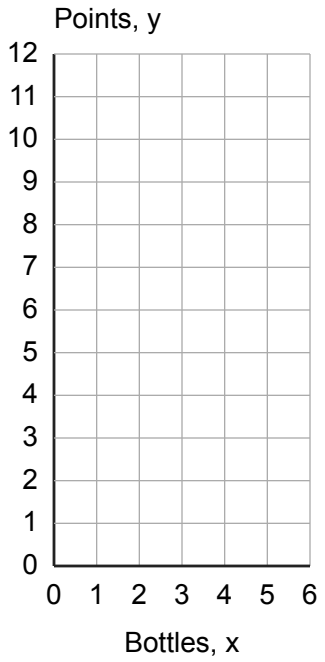
3. Describe and complete

A bottle-return machine awards 2 points per bottle and no starting points. Write a verbal rule, complete the table, and write an equation.

Bottles, x	Points, y
0	
1	
3	
5	

4. Graph the bottle rule

Use Task 3 to plot A, B, C, D in table order on the blank grid. These are whole bottles, so leave the points unconnected. What does point C mean?



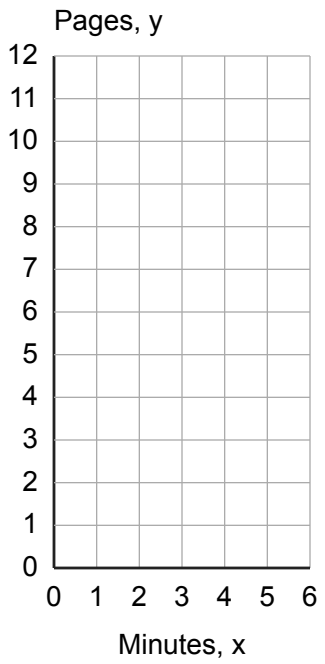
5. A starting amount

A reader has already read 4 pages and then reads 1 page per minute. Let x be additional minutes and y total pages. Describe the rule in words, write an equation, and complete the table.

Minutes, x	Pages, y
0	
2	
4	
6	

6. Graph the starting amount

Use Task 5 to plot A, B, C, D in table order. Connect them to model steady reading. Identify both quantities and explain why the graph does not pass through (0,0).



7. Compare two rules

Rule A is y = 2x. Rule B is y = x + 4. Complete the table, then find where they have the same output. Explain how the outputs differ when x = 0 and x = 6.

x	A: y = 2x	B: y = x + 4
0		
4		
6		

ANSWER KEY

Relationship Roadmap

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Check all four representations. Whole-item counts use separate points. The reading model connects points because elapsed time and modeled reading progress vary continuously.

Task 1

Independent x: notebooks. Dependent y: cost in dollars. y = 2x.

Task 2

Independent x: levels completed; dependent y: total coins. A = (0,3), B = (2,5); y = x + 3.

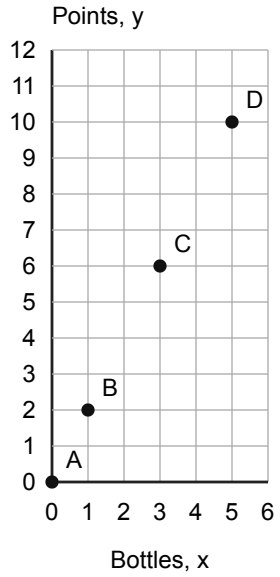
Task 3

The total points are twice the bottles returned. y = 2x. y-values: 0, 2, 6, 10.

Bottles, x	Points, y
0	0
1	2
3	6
5	10

Task 4

A(0,0), B(1,2), C(3,6), D(5,10). C means 3 bottles earn 6 points.



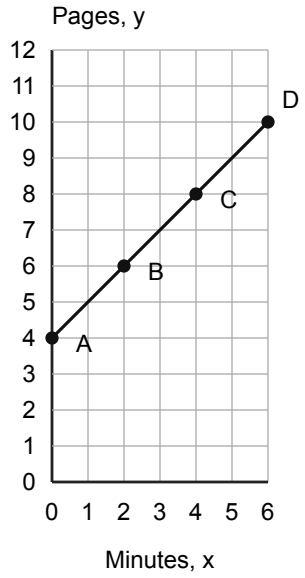
Task 5

Total pages are 4 more than additional minutes. y = x + 4; y-values: 4, 6, 8, 10. Check that the representation and explanation agree with the given quantities.

Minutes, x	Pages, y
0	4
2	6
4	8
6	10

Task 6

A(0,4), B(2,6), C(4,8), D(6,10). Independent: additional minutes; dependent: pages. The reader starts with 4 pages already read. Check that the representation and explanation agree with the given quantities.



Task 7

At x = 4, both give y = 8. At x = 0: A gives 0, B gives 4. At x = 6: A gives 12, B gives 10.

x	A: y = 2x	B: y = x + 4
0	0	4
4	8	8
6	12	10