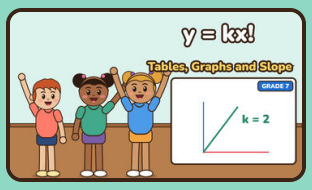
HAKILLO KIDS · TEACHER GUIDE · COMMON CORE EDITION · GRADE 7 · LESSON 2

Proportional Relationships and Slope



COMMON CORE
7.RP.A.2.a, 7.RP.A.2.b, 7.RP.A.2.c, 7.RP.A.2.d

VIDEO LENGTH
4:37 · Virginia SOL edition also available

WATCH THE LESSON FREE
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PRACTICE ONLINE
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7.RP.A.2.a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

7.RP.A.2.b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

7.RP.A.2.c Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.

7.RP.A.2.d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

Materials: Graph paper, tables of values, rulers.

Students will

- Find the constant of proportionality k = y/x from a table.
- Recognize a proportional graph as a straight line through the origin.
- Write y = kx.
- Interpret k as the slope (unit rate).

Key words

proportional relationship	y/x is the same for every pair
constant of proportionality (k)	the unit rate y/x
slope	rate of change: how much y goes up for each 1 in x
origin	the point (0, 0)

Before the video 2 minutes

Show a table: 1 level → 2 gems, 2 → 4, 3 → 6. Ask: “What rule connects levels and gems?”

What happens in the video

0:00	Welcome and today's goal: proportional relationships
0:21	Two gems per level: y/x is always 2
0:44	A straight line through the origin
1:01	y = 2x: k is the slope
1:18	Spot the mistake: y/x must be the same in every row
1:44	Your turn! Students answer during each pause (see below)
4:18	Recap and goodbye

Spot the mistake at 1:18

> **Sam:** One, five. Two, six. Three, seven. It's proportional, and k is five!
> **Ivy:** Hmm... is y divided by x the same in every row?
> **Mia:** Five, then three, then about two point three. Not the same, so it is not proportional.
> **Sam:** Oops! The same k in every row, or it's not proportional.

- Ask: “What is y/x in each row?” (5, 3, about 2.33.)
- Graph the points: the line does not go through the origin.
- Conclude: not proportional, so there is no single k.

Your-turn pauses students answer out loud, then the characters give the answer

TIME	QUESTION	ANSWER IN THE VIDEO
1:45	y equals four x. What is the slope?	Four! The slope is k, the number in front of x.
2:01	Ten miles in two hours. What is k?	Five miles per hour!
2:14	k equals three. What is y when x is five?	Fifteen! Three times five.
2:30	Twelve gems for four levels. Write the equation.	y equals three x! Twelve divided by four is three.
2:47	y equals six x. What is y when x is four?	Twenty-four!
3:01	A straight line goes through zero zero and two, ten. What is k?	Five! Ten divided by two.
3:18	y equals one half x. What is y when x is eight?	Four! Half of eight.
3:33	Eighteen dollars for six tickets. What is the unit rate?	Three dollars per ticket!
3:48	A table has one, five, then two, ten. What is k?	Five! Five over one, and ten over two.
4:04	y equals seven x. What is y when x is three?	Twenty-one!

Tip: pause the video a little longer on any question your class finds hard, and ask a student to explain how they know.

After the video: talk about it

1. How can you tell from a graph that a relationship is proportional?
2. What does k mean in a real situation?
3. Is y = x + 3 proportional? Why or why not?

Go further

Real rates: students collect two real proportional relationships (price per item, pay per hour), write each as y = kx, and graph them together.

Answer key for the practice page

1. 4
2. y = 4x
3. 15
4. No (y/x is not constant)
5. $3 per pound
6. A straight line through (0, 0) rising 3 for each 1 to the right.

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HAKILLO KIDS · GRADE 7 · LESSON 2 · PRACTICE

Proportional Relationships and Slope

Name: _____ **Date:** _____

1. **Table: (2, 8), (3, 12), (5, 20). What is k?**

   Answer: _____

2. **Write the equation for that table.**

   Answer: _____

3. **y = 2.5x. What is y when x = 6?**

   Answer: _____

4. **Is the table (1, 3), (2, 5), (3, 7) proportional?**

   Answer: _____

5. **$21 for 7 pounds of apples. What is the unit rate?**

   Answer: _____

6. **Graph y = 3x for x = 0, 1, 2, 3. Describe the line.**

   Answer: _____

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