PROBLEM SOLVED
MAKING SENSE OF MATHEMATICS

Graphing Proportional Relationships
Video Script

Scene		Full Transcript
1	**Allie:**	Hi! It's Allie, and I'm here with my friend, Mark, who is a helicopter pilot. Talk about a cool job! Before I met Mark, I thought that being a pilot was all about flying, but you would be amazed at all the pre-flight checks and briefings that occur before each mission.
	Voice-Over Allie:	Earlier, he was telling me about mapping out flights and calculating how fast and far helicopters travel.
	Allie:	I told him that even though I'm not a pilot, I'm pretty good at figuring distance and time. My secret weapon? Graphing proportional relationships! So get on board, and let's get another *Problem Solved*.
2	**Allie:**	They let me sit in here as long as I promised not to touch anything! I wonder how long it would take to fly to my hometown. Graphing proportional relationships can help us answer that question. This helicopter travels at an average of 120 miles per hour. My hometown is 420 miles away. How long will it take to get there?
3	**Voice-Over Allie:**	The units we are using are miles and hours. One hundred twenty miles per hour is a ratio. It means the helicopter can travel 120 miles in 1 hour. It could travel 240 miles in 2 hours and 360 miles in 3 hours. We can put this data in a table. Let's label our columns hours and miles. We know that in 1 hour, the helicopter can travel 120 miles. For every hour, we add 120 miles. Another way to visualize this is by plotting points on a graph. The vertical or y-axis represents distance in miles, and the horizontal or x-axis represents time in hours. Let's plot our points. In 1 hour, the helicopter can travel 120 miles, and in 2 hours, it can travel 240 miles; in 3 hours, 360 miles, and in 4 hours, 480 miles. These points form a straight line that could be extended. Back to our problem.
4	**Voice-Over Allie:**	My hometown is 420 miles away. The helicopter can travel at an average speed of 120 miles per hour. How long will it take to travel to my hometown? The table and the graph show that it will take 3 hours to travel 360 miles and 4 hours to travel 480 miles at an average rate of 120 miles per hour. We want to find how long takes to travel 420 miles. If you look at the graph and find 420, it corresponds with 3½ hours. Now look at the table. Does 3½ hours make sense? Four hundred twenty is between 360 and 480. Four hundred twenty is 60 miles more than 360. If the helicopter travels 120 miles per hour, it would travel 60 miles in ½ hour. So, 3½ hours makes sense. Now that we've found the answer to our problem, let's take a look at some of the characteristics of our graph.

MakingSense

5	**Voice-Over Allie:**	These characteristics are also true of all graphs of proportional relationships. You can see the graph of this relationship is linear, which means the graph results in a straight line. The line also passes through the origin, or (0, 0). This makes sense because in 0 hours the helicopter would travel 0 miles. The slope of the line is the constant of proportionality, in this case the rate of 120 miles per hour. We can express this relationship using an equation: "d" for distance equals "r" for rate multiplied by "t" for time. The equation shows us the answer is correct.
6	**Allie:**	Proportional reasoning can be used to represent all sorts of relationships. Like I showed Mark and his pilot friends, you can graph proportional relationships when looking at miles per hour; but you can also use it for cost per pound, miles per gallon or even scoops of lemonade mix to cups of lemonade. With just a little practice, you will be ready to take off! *Problem Solved*!