PROBLEM SOLVED
MAKING SENSE OF MATHEMATICS

Inverse Proportionality
Video Script

Scene		Full Transcript
1	**Allie:**	Hi. Well hello there, it's Allie, and I'm here at Qualitech. My brother Jon is the factory manager. I'm taking him to lunch today. Qualitech produces several kinds of industrial pins.
	Voice-Over Allie:	Jon just told me one of his workers is worried because they just received a big order for 300 industrial pins that need be produced as soon as possible.
	Allie:	But, half of their machines are down for scheduled maintenance. They're trying to figure out how long the job will take with the machines available. You know, I might be able to help. Understanding inverse proportionality will help them determine the time it will take to complete the job and get another *Problem Solved*!
2	**Allie:**	This is one of the machines that makes the industrial pins. There are usually six machines like this available. When all six machines are working, they can produce 300 pins in only eight days! But, half of the machines are down for maintenance, leaving three to do all the work. So, how long will it take them to produce the 300 pins? If there are half as many machines, the job will take twice as long, but why is this? Let's look at the relationship between the number of machines and the number of days to answer this question.
3	**Voice-Over Allie:**	There is an inverse relationship between the number of machines used and the amount of time it takes to produce them. As one quantity increases, the other decreases proportionally. The more machines that we use, the less time is needed to produce the same number of pins. This table will help us make sense of the situation. If 6 machines can produce 300 industrial pins in 8 days, how many pins can be produced with half the machines? We have three machines. Three is ½ of 6. The same number of industrial pins needs to be produced. If you have half the number of machines, the work will take twice as long to get done. We multiply 8 days by 2 and get 16. It will take 16 days for 3 machines to produce 300 industrial pins. I told you it was easy. One half is the inverse of two. It's kind of like flipping it; the inverse of one over two is two over one, which is just two.
4	**Allie:**	They just got a new order for 1500 pins. Two of the three machines are scheduled for use on another project, so if only one machine is available for the job, how long would it take to produce 1500 pins?

MakingSense

5	**Voice-Over Allie:**	Just like before, we need to look at the relationship of the number of machines, the number of pins, and the number of days. Let's break this problem into two parts. First, determine how long it will take 3 machines to produce 1500 pins. We need to produce 5 times as many pins. Three hundred times 5 equals 1500. If we take 300, the number of pins, times 5, then we should also take the number of days times 5. Sixteen times 5 is 80. It would take 3 machines 80 days to make 1500 pins. Now determine how many days it will take one machine. We have 1/3 the number of machines, so it will take 3 times as long. Three times 80 is 240, so it would take one machine 240 days to complete the job. They're going to need those pins before that!
6	**Allie:**	Yikes! I just overheard that the customer needs the job completed in 20 days. They need to get more machines in operation!
7	**Voice-Over Allie:**	Let's figure out how many machines we need. The number of industrial pins remains the same, and we know the number of days has gone down to twenty. Two hundred forty divided by 20 is 12; that is 1/12 the number of days. So, we need 12 times the number of machines. We were originally working with one machine. Twelve times 1 is 12. It will take 12 machines to make 1500 pins in 20 days.
8	**Allie:**	Things are getting pretty busy around here. Maybe Jon and I will have to go out to lunch another day, but you can see how inverse proportionality can help you pin down another *Problem Solved*!