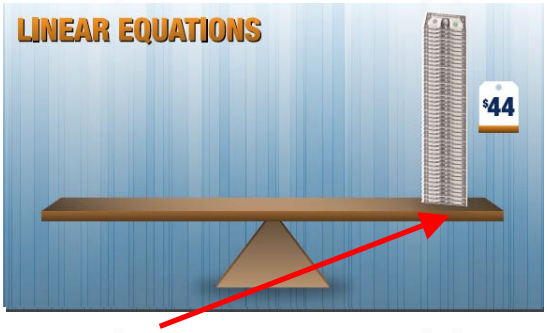
Linear Equations: Using Symbols
A Closer Look at the Video

After watching the *Linear Equations: Using Symbols* video, make sense of the mathematics by reading through the problem situation and solution. Use the comments and questions in bold to help you use a dynamic model and an algebraic equation to find a solution for the situation.

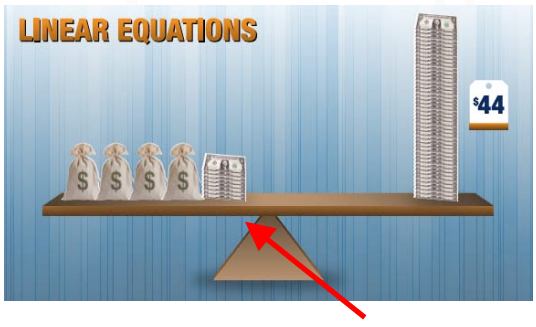
Problem: Adam needs to buy a new hockey stick before the first game of the season, which is just four weeks away. He has found a hockey stick that he can purchase for $44. He has already saved $8. How much money does Adam need to save during each week for the next 4 weeks so that he can purchase this hockey stick?

How does creating a dynamic model and using symbols for this problem help to solve the problem in a way that makes sense?
There are many ways to solve a problem. One of the ways is to **use a model** of the problem in order to better understand the situation. The model can be used to find the answer to the question being asked. The model can also be used to set up and solve an algebraic equation.

The dynamic model used for this problem is a balance.

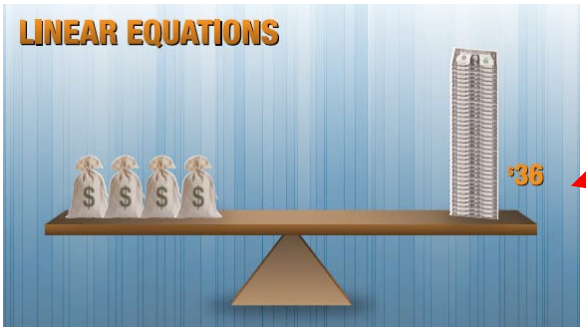


On the right side, we will place $44, the cost of the stick.



On the left side of the balance we will place the $8 Adam has already saved as well as four money bags, one for each week. Both sides of the balance have equal amounts. Eight dollars plus the amount Adam will save in the next four weeks = $44. We need to find how much money Adam needs to save each week.

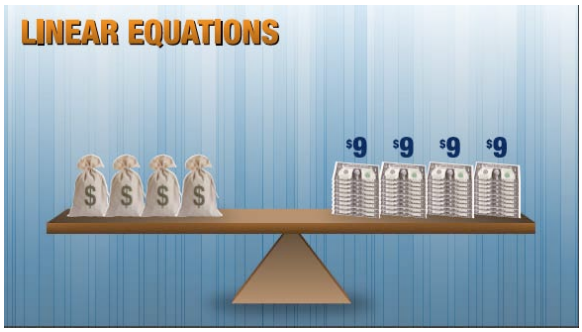
To find how much is in the bags, first subtract the $8 Adam has saved from both sides of the balance.



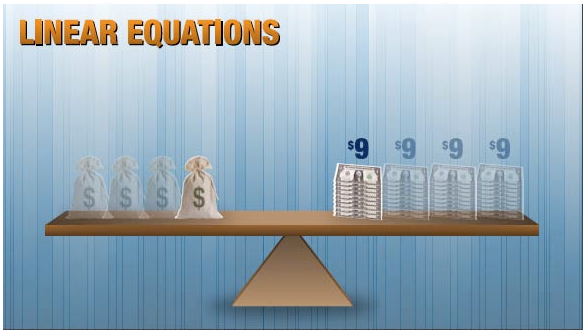
$44 - $8 = $36

Adam needs to save an additional $36 to buy the hockey stick.

To figure out how much he needs to save each week, determine how much is in each one of the four bags. Since we have four bags on the left side of the balance, divide $36 into four equal amounts. $36 divided by four equals $9.



This means that $9 needs to be saved every week.



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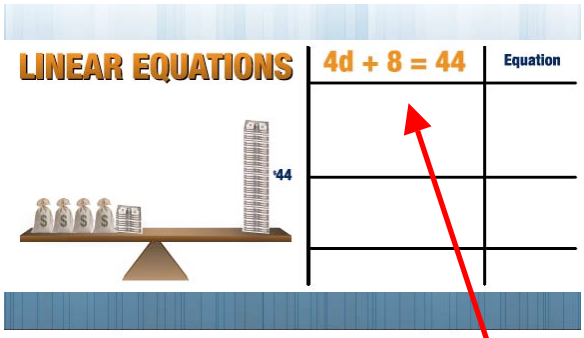
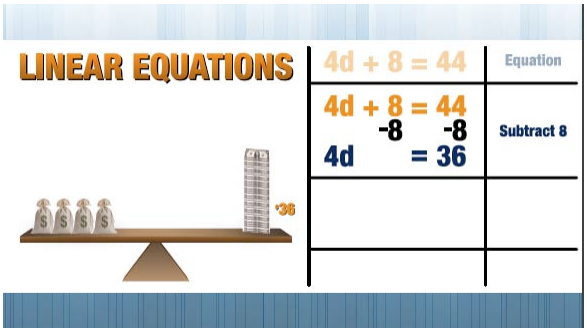
How does creating a dynamic model and using symbols for this problem help to create an algebraic equation that represents the problem?

To solve this problem algebraically, look at the model. Let *d* represent the number of dollars to be saved each week (the amount of money in each of the 4 money bags).



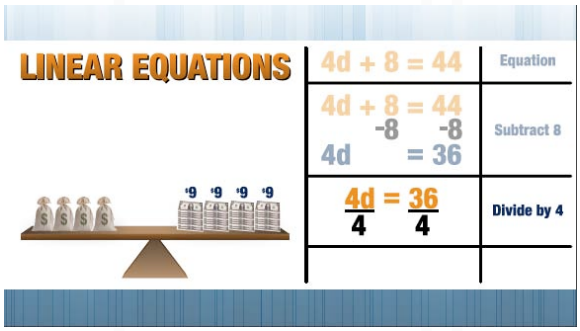
The algebraic equation represented by the model is 4d + 8 = 44.

To solve this equation, first subtract the 8 dollars that Adam already has from both sides of the equation.

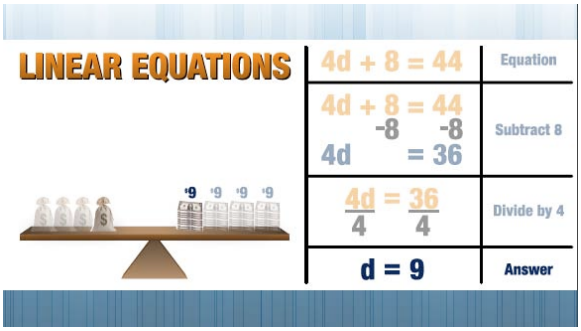


The result is 4 (the number of weeks) times *d* (the number of dollars saved each week) which equals 36.

The next step is to divide each side of the equation by 4, or you can multiply each side by one fourth.



Either way, you get the answer *d* equals 9.



Adam must save $9 per week for each of the next four weeks to be able to purchase the hockey stick.