

Lesson Title: Writing Word Problems and Equations Pre 5a.3	
Utah State Core Algebra and PreAlgebra Standard 2.1 Process Standards 1-5	
Summary	
In this activity, students work backwards and write the word problem to go with given equations. They also practice writing and solving equations from word problems.	
<p style="text-align: center;">Enduring Understanding</p> <p>Thinking backwards and writing word problems from given equations enables us to think about writing symbolic equations to represent the stories told in word problems. Using these equations we can solve the problems.</p>	<p style="text-align: center;">Essential Questions</p> <p>How do you translate problems into equations in order to solve the problems?</p>
<p style="text-align: center;">Skill Focus</p> <ul style="list-style-type: none"> • Writing word problems from given equations • Writing equations from word problems 	<p style="text-align: center;">Vocabulary Focus</p> <p>less than, greater than, equation language</p>
Materials	
<p>Launch ideas: “give the students word problems that were simple to start out with, come up with stories that they could relate to”</p>	
<p>Explore ideas: “let the students work through the problems and piece together the equations from the sentences”</p>	
<p>Summarize ideas: “practice, practice, practice”</p>	
Apply	
Assess	

Directions:

As a starter, the teacher might choose a word problem from a textbook. Do the problem as a think aloud with the class—modeling how to translate the words in the problem into an equation. Then ask the students to do one word problem. These examples will then lead to the importance of working backwards—seeing the equations and writing the word problem from which they could have been taken.

2.1a Writing word problems. The teacher should model the first problem, thinking aloud and writing—the students write and solve the problem as well. Then have students work in teams to write one word problems which match the equations. Then solve for the missing information. Have each student present their work. The remainder of the problems can be used for classwork or homework.

2.1b Writing equations from word problems. Allow students to use trial and error to solve the first problems (some will undoubtedly go to writing equations, others won't). Then switch to writing equations. If students can write the equations but cannot solve them, save the solving part and finish it during the next module which focuses on solving equations.

You may wish to turn to your textbooks for more word problem practice.

Part I Thinking Backwards

Writing Word Problems from Equations

Write the word problem which goes with the following equations. Then solve for the unknown information.

1) Let a = Ali's age now _____
 $2a - 3$ = Mel's age now _____
 $a + 2a - 3 = 39$ yr _____

2) Let s = small angle _____
Let $4s$ = larger angle _____
 $s + 4s = 70$ degrees _____

3) Let w = width of rectangle _____
 $2w + 4$ = length of rectangle _____
 $w + 2w + 4 + w + 2w + 4 = 62$ in. _____

4) Let v = Vicki's money _____
 $5v$ = Wally's money _____
 $5v - v = \$84$ _____

5) Let t = Tally's age now _____
 $3t$ = Cami's age now _____
 $2(t + 14) - 3t = 14$ yr. _____

6) Let e = Elisabeth's age now _____
 $e - 7$ = Zack's age now _____
 $e + 4$ = Gail's age now _____
 $2e$ = Bob's age now _____
 $e + (e-7) + (e + 4) + 2e = 82$ _____

7) Let E = Eddie's height _____
 $E + 4$ = Pam's height _____
 $E - 3$ = Andy's height _____
 $E + E + 4 + E - 3 = 199$ in.. _____

8) Let c = cost of a shirt _____
 $c + 3.95$ = cost of a sweater _____
 $3c + 2(c + 3.95) = \$71.65$ _____

9) Let m = price of a quart of milk _____
 $1.5m$ = price of a pint of yogurt _____
 $2m + 3(1.5m) = \$4.68$ _____

10) Let z = length of 1 side of a triangle _____
 $2z$ = length 2nd side of a triangle _____
 $2z + 3$ = length of 3rd side of triangle _____
 $z + 2z + (2z + 3) = 73$ cm. _____

11) Let s = the price of a pair of shoes _____
 $2s - 5$ = the price of a pair of boots _____
 $3s + 2(2s - 5) = \$130$ _____

Part II Writing Equations from Word Problems

- 1) A whole object has been broken into 4 pieces, all of different sizes. Each piece is 2 times the size of the next smallest piece. What fractions describe each piece of the whole object?
- 2) A collection of marbles has been divided into 3 different sets. The middle sized set is 2 times the size of the smallest set, and the largest set is 3 times as large as the middle-sized set. What fraction describes each part of the total marble collection?
- 3) Mr. Jones drove to Boise, Idaho in 4 days. On Monday and Wednesday he traveled exactly the same distance. On Tuesday he traveled 2 times as far as he did on Monday, and on Thursday he traveled 3 times as far as he did on Wednesday. Which fraction describes the part of the trip covered on each day?

If the total trip covered 602 miles, how far did Mr. Jones travel each day of his trip?

- 4) Mrs. Smith rode the bus 720 miles in 3 days. On the first day, she traveled 3 times as far as she did on the second day. On the third day, she traveled 2 times as far as she did on the second day. How far did she travel each day?
- 5) The neighborhood grocery store sold 1463 bottles of soft drinks last month. Twice as many bottles of root beer were sold than lemon-lime soda, and twice as many bottles of cola were sold than root beer. How many bottles of each type of soft drink were sold?
- 6) A total of 960 students attend Bosco School. Some students walk to school, some ride the bus, and the rest come by car. The number riding the bus is 6 times greater than the number arriving by car. The number walking to school is $\frac{1}{2}$ the number riding by bus. How many students come to school by each form of transportation?