Story Problem Pieces NAME:

The purpose of this worksheet is to practice using algebraic notation to represent real world ideas. For instance, if w is the width of a rectangle, and the length is twice the width, give an expression for the length. Some of us have trouble with this. However at the same time, if I told you the width was 5 inches and the length is twice the width, you could tell me the length is "2 times 5" or 10. This worksheet investigates several phrases you might encounter by first using actual numbers and then substituting the variables.

1. Consider a rectangle whose length is twice the width. Complete the table for the various values of length.

Width	Length
5	
10	
15	

Because the length was twice as long as the width, we multiplied the width by 2 to get the corresponding length. So if the width was w *inches, what's the length?*

2. Consider a rectangle whose length is 3 more inches that its width. Complete the table for the various values of length.

Width	Length
7	
12	
20	

Now ask yourself "what did I do to the width to get the length?" (Do you see that you added 3?) So if the width was w *inches, what's the length?*

3. Consider a rectangle whose length is equal to the width squared. Complete the table for the various values of length.

Width	Length
3	
5	
10	

Now ask yourself "what did I do to the widths to get the lengths?" So if the width was w *inches, what's the length?*

4. Consider an investment problem. We'll invest a total of $100,000 in two separate accounts. Complete the table for the amounts in each account.

Amount in first account	Amount left over for second account
20,000	
50,000	
75,000	

Now ask yourself "what did I do to the amount in the first account to get the amount in the second account?" So if I invest x *dollars in the first account, how much is left over for the second account?*

5. Consider a football game score. Touchdowns are worth 6 points each. Complete the table for the total points earned from touchdowns.

Number of touchdowns	Total points from touchdowns
3	
5	
7	

Now ask yourself "what did I do to the number of touchdowns to get the total points?" So if my team scores x *touchdowns, how many points (from touchdowns) will they have?*

6. Consider a barrel containing 60 pounds of peanuts. To this barrel, we'll add some cashews. Complete the table for the total pounds of nuts after adding the cashews.

Pounds of cashews added	Total pounds of nuts
25	
30	
50	

Now ask yourself "what did I do to the pounds of cashews to get the total pounds of nuts?" So if I add x *pounds of cashews to my 60 pounds of peanuts, how many total pounds of nuts will I have?*

7. Huckleberry Finn can paint a fence in 7 hours. Since it takes him 7 hours to paint one fence, we can assume that in one hour he can paint $\frac{1}{7}$ of the fence. Tom Sawyer can paint the same fence in 5 hours. So, we can assume that in one hour Tom can paint $\frac{1}{5}$ of the fence. Complete the table for the amount of the fence painted by each boy.

Amount of time spent painting together (hours)	**Amount of fence painted by Huckleberry Finn**	**Amount of fence painted by Tom Sawyer**
1		
2		
3		

Now, if they spend x *hours painting, how much of the fence does Huck Finn paint?*

If they spend x *hours painting, how much of the fence does Tom Sawyer paint?*

8. I have a bottle of 80% antifreeze solution. (This means that for every 100 gallons of solution, there are 80 gallons of antifreeze and 20 gallons of plain water.) I want to add some of this to a vat containing 50 gallons of 30% antifreeze solution until I end up with 50% antifreeze solution. (So this vat, before I add anything, has 15 gallons of pure antifreeze and 35 gallons of pure water mixed together.) Complete the table for the component pieces that we would need. Remember the vat starts off with 15 gallons of pure antifreeze and 35 gallons of pure water. All that changes is the amount of 80% solution we're adding.

Amount of 80% solution added to vat (gallons)	**Amount of pure antifreeze we're adding (gallons)**	**Total amount of pure antifreeze in vat (gallons)**	**Total amount of liquid in vat (gallons)**	**Concentration of antifreeze of final mixture (divide last two columns)**
0				
50				
100				

Again, we have a vat with 50 gallons of 30% solution.
If we add x *gallons of the 80% solution to this, how much* ***pure antifreeze are we adding****?*

How much ***pure antifreeze*** *do we have* ***in total****?*

How much ***total liquid (including pure antifreeze and water)*** *is in the vat?*

What is the ***concentration*** *of the final mixture?*