



## Teacher Guidelines for Writing Word Problems

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Note to teachers: The following guidelines have been developed by the Solutions Project team at UNC Charlotte. Recommendations for writing word problems have been synthesized from the problem solving literature in special education.

1. Choose a theme that is high interest and relevant for 4<sup>th</sup> – 8<sup>th</sup> grade students
2. Follow the formula for each problem type using the problem template page
  - Group problems combine two distinct things (parts) into one large group (whole)
  - Change problems involve one thing which either increases (change-add) or decreases (change-subtract) in value
  - Compare problems involve two people/objects comparing amounts of one thing or one person/object comparing amounts of two things
3. Avoid reliance on key words (total, altogether, leftover, etc.)
4. Keep sentences the same length and use words which are easy to decode
5. Use a variety nouns (“things”) which are familiar, concrete, and relate to the theme
6. Choose names that will increase engagement such as those of your students, familiar people (family, people around the school), or that reflect their interest (celebrities, athletes, etc.)

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## 7. Use verbs that are familiar to students

Addition Verbs	Subtraction Verbs	General Verbs
make combine put together/more pick find pick up add collect gather buy	take away lose pop break smash spill crack pay	give eat share plant count grow

## 8. Intentionally choose numbers based on student ability

- Represent as numerals
- Do not use 0
- Sums of less than 10 for making sets
- Consider calculator use
- Alternate between putting smaller or larger number first in addition word problem

## 9. Check for bias

- Gender
  - Equal use of female and male characters and themes
  - Avoid gender stereotypes
- Culture
  - Avoid cultural or racial stereotypes
  - Use scenarios that all students including culturally and linguistically diverse students can relate to or understand
  - Use scenarios that are relevant and meaningful for students

## Problem Type Examples

Type	Formula	Examples	
<b>Group problems combine two small groups of different, but related, things into one larger group.</b>			
<b>Group</b>	Anchor Sentence	Aaron and Jose bought snacks at the school basketball game	There are cheerleaders at the school basketball game.
	# thing 1	Aaron bought 2 pretzels.	There are 2 boys on the cheerleading team.
	# thing 2	Jose bought 1 hotdog.	There are 4 girls on the cheerleading team.
	Question <i>*may or may not contain key common key words; include both examples.</i>	How many snacks did they buy in all?	How many cheerleaders are on the team?
	Provide answer with label.	They bought 3 snacks.	There are 6 cheerleaders.
<b>Change problems are a dynamic problem type where a starting amount of something is either increased or decreased (change action verb and amount) to result in a new ending amount.</b>			
<b>Change - addition</b>	Anchor sentence	Aaron saved his money to go to the school basketball game.	Aaron cheers for his team when they score points.
	1 Thing & beginning state (#)	Aaron had \$5 to spend at the basketball game.	In the first half they had 5 points.
	Increase verb + increase amount	Aaron's mom gave him \$3 more to spend at the basketball game.	Then they scored 2 more points.
	Question	How much money does Aaron have now?	How many points does the team have total?
	Provide answer with label	Aaron has \$8.	The team has 7 points.
<b>Change – subtraction</b>	Anchor sentence	Students have to pay money to get into the basketball game.	Jose likes to eat sour straws at the basketball game.
	1 Thing & beginning state (#)	Jose had \$6 to get into the basketball game.	Jose had 8 sour straws.
	Decrease verb + decrease amount	Jose had to pay \$2 to get into the basketball game.	Jose ate 3 sour straws.
	Question	How much money does Jose have left?	How many sour straws does Jose have remaining?
	Provide answer with label	Jose has \$4 left.	Jose has 5 sour straws.

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<b>Compare problems either contain two people comparing a quantity of an item or two different items being compared. The question will contain the phrase “how many more” or “how many fewer” as shown.</b>			
<b>Compare - More</b>	Anchor Sentence	Aaron and Jose both like to go to basketball games.	Jose likes to look at the player’s shoes.
	Person/Thing 1 #	Aaron has been to 5 games this school year.	There are 5 orange basketballs.
	Person/Thing 2 #	Jose has been to 2 games this school year.	There are 2 white basketballs.
	Key phrase Question	How many more games has Aaron been to than Jose?	How many more orange basketballs are there than white basketballs?
	Provide answer with label	Aaron has been to 3 more games.	There are 3 more orange basketballs.
<b>Compare - Fewer</b>	Anchor Sentence	Jose sees many coaches at the game	Aaron watched the first half of the game.
	Person/Thing 1 #	Jose sees 4 female coaches.	The home team scored 10 points.
	Person/Thing 2 #	Jose sees 2 male coaches	The away team scored 9 points.
	Key phrase Question	How many fewer coaches are male than female?	How many fewer points did the away team score than the home team?
	Provide answer with label	There are 2 fewer male coaches.	The away team scored 1 fewer point.

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