Word Problem Problems?
Effective Strategies for Math Word-Problem Instruction

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Maya has 120 caramel apples to sell. Each caramel apple is covered with one topping.

- $\frac{1}{5}$ of the caramel apples are covered with peanuts.

- $\frac{1}{3}$ are covered with chocolate chips.

- $\frac{3}{10}$ are covered with coconut.
- The rest are covered with sprinkles.

How many caramel apples are covered with sprinkles?

A 100

B 33

C 25

D 20

Solve the problem

What skills are necessary to solve this problem?

Problem-Solving Difficulties

Teaching Problem Solving

Attack Strategy

SOLVE

Study the problem.

Organize the facts.

Line up the plan.

Verify the plan with computation.

Examine the answer.

R-CUBES

Read the problem.
Circle key numbers.
Underline the question.
Box action words.
Evaluate steps.
Solve and check.

UPS✓

UNDERSTAND
Read and explain.

PLAN
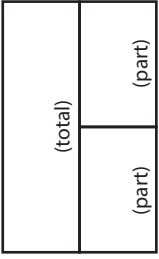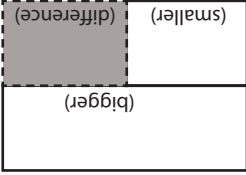How will you solve the problem?
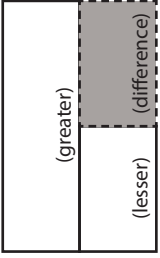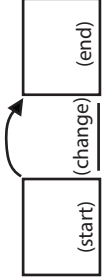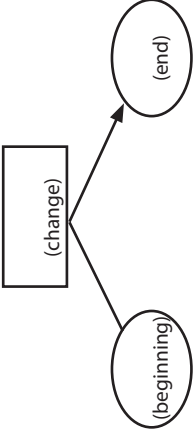
SOLVE
Set up and do the math!

✓CHECK
Does your answer make sense?

Additive Word Problems

Meanings of Addition

Meanings of Subtraction

Schema and Definition	Equations and Graphic Organizers	Examples	Variations
Total (Combine; Part-part-whole) Parts combined for a sum	$P1 + P2 = T$ (part + part = total)	Sum unknown: Lyle has 11 red apples and 18 green apples. How many apples does Lyle have altogether?	Part unknown: Lyle has 29 red and green apples. If 11 of the apples are red, how many green apples does Lyle have?	More than two parts: Lyle has 34 apples. Of the apples, 11 are red, 18 are green, and the rest are yellow. How many yellow apples does Lyle have?
Difference (Compare) Sets compared for a difference	$B - s = D$ (bigger − smaller = difference) $G - L = D$ (greater − less = difference)	Difference unknown: Sasha wrote 85 words in her essay, and Tabitha wrote 110 words. How many fewer words did Sasha write than Tabitha?	Bigger/greater unknown: Tabitha wrote 25 more words than Sasha. If Sasha wrote 85 words, how many words did Tabitha write? / Smaller/lesser unknown: Tabitha wrote 110 words in her essay. Sasha wrote 25 words fewer than Tabitha. How many words did Sasha write?	(None)
Change (Join; Separate) An amount that increases or decreases	$ST +/- C = E$ (start +/− change = end)	End (increase) unknown: Jorge had $52. Then, he earned $16 babysitting. How much money does Jorge have now? / End (decrease) unknown: Jorge had $52. Then, he spent $29 at the ballpark. How much money does Jorge have now?	Change (increase) unknown: Jorge had $52. Then, he earned some money babysitting. Now, Jorge has $68. How much did Jorge earn babysitting? / Change (decrease) unknown: Jorge had $52 but spent some money when he went to the ballpark. Now, Jorge has $23. How much did Jorge spend at the ballpark? / Start (increase) unknown: Jorge has some money, and then he earned $16 for babysitting. Now, Jorge has $68. How much money did he have to start with? / Start (decrease) unknown: Jorge had some money. Then, he spent $29 at the ballpark and has $23 left. How much money did Jorge have before going to the ballpark?	Multiple changes: Jorge had $78. He stopped and bought a pair of shoes for $42 and then he spent $12 at the grocery. How much money does Jorge have now?

Additive Word Problems

A.
Ali delivered 12 boxes of cookies on Friday and 25 boxes of cookies on Saturday. How many boxes of cookies did Ali deliver?

B.
In March and April, it rained a total of 11.4 inches. If it rained 3.9 inches in March, how many inches did it rain in April?

C.
Sam mows lawns and made $560 last week. She made $95 on Monday, $135 on Tuesday, and $70 on Wednesday. How much did Sam make on Thursday and Friday?

NOTES ABOUT TOTAL PROBLEMS:

Additive Word Problems

D.
Audrey has 162 wooden beads and 95 glass beads. What is the difference between Audrey's wooden beads and glass beads?

E.
Damian's dog eats 9 1/2 cups of dog food each week. Monte's dog eats 4 1/4 cups less each week than Damian's dog. How much does Monte's dog eat in a week?

F.
The temperature in Norfolk was 12 degrees warmer than in Roanoke where the temperature was 79 degrees. It was 86 degrees in Marion. What was the temperature in Norfolk?

NOTES ABOUT DIFFERENCE PROBLEMS:

Additive Word Problems

G.
A plant was 3 3/4 inches tall at the beginning of June. By the end of July, the plant was 9 1/8 inches tall. How many inches did the plant grow in 2 months?

H.
Martina has some money in her bank account. Then, she spent $135.69 and has a balance of -$24.80. How much money did Martina have to begin with?
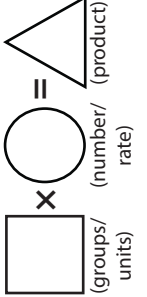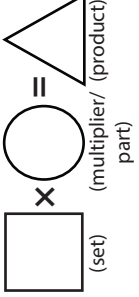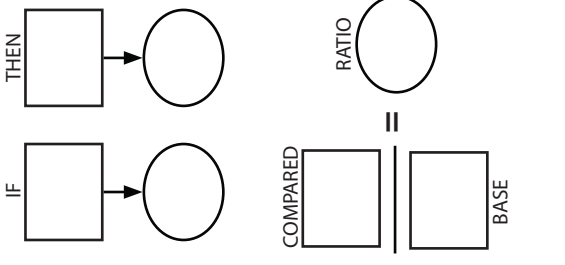
I.
Hui saved $70 in January. In February, she spent $64 of the money she saved. She saved $92 more in March. How much has Hui saved by the end of March?

NOTES ABOUT CHANGE PROBLEMS:

Multiplicative Word Problems

Meanings of Multiplication

Meanings of Division

Schema and Definition	Graphic Organizers	Examples	Variations
Equal Groups (Vary) A number of equal sets or units	$\boxed{} \times \bigcirc = \triangle$ (groups/ units) (number/ rate) (product)	Product unknown: Maria bought 5 cartons of eggs with 12 eggs in each carton. How many eggs did Maria buy?	With rate: Maria bought 5 cartons of eggs. Each carton cost $2.95. How much did Maria spend on eggs?
		Groups unknown: Maria bought 60 eggs. The eggs were sold in cartons with 12 eggs each. How many cartons of eggs did Maria buy?	Number unknown: Maria bought 5 cartons of eggs for a total of 60 eggs. How many eggs were in each carton?
Comparison One set as a multiple or part of another set	$\boxed{} \times \bigcirc = \triangle$ (set) (multiplier/ part) (product)	Product unknown: Malik picked 7 flowers. Danica picked 3 times as many flowers. How many flowers did Danica pick?	With fraction: Malik picked 25 red and yellow flowers. If 1/5 of the flowers were yellow, how many were red?
		Set unknown: Danica picked 3 times as many flowers as Malik. If Danica picked 21 flowers, how many flowers did Malik pick?	Times unknown: Malik picked 7 flowers. Danica picked 21 flowers. How many times more flowers did Danica pick?
Proportions	IF □ → ○ THEN □ → ○ COMPARED □ / BASE = RATIO ○	Subject unknown: Sally typed 56 words in 2 minutes. How many words could Sally type in 7 minutes? Base unknown: Justin baked cookies and brownies. The ratio of cookies to brownies was 3:5. If he baked 15 cookies, how many brownies did he bake?	Object unknown: Sally typed 56 words in 2 minutes. How many minutes would it take Sally to type 192 words? Compared unknown: Justin baked cookies and brownies. The ratio of cookies to brownies was 3:5. If he baked 25 brownies, how many cookies did he bake?
			With percentage: Watson received an 80% on his science quiz. If the test had 40 questions, how many questions did Watson answer correctly? With unit rate: Paula bought 5 boxes of markers. She spent $9.75. What is the price of one box of markers? Ratio unknown: Justin baked 15 cookies and 25 brownies. What's the ratio of cookies to brownies?

Multiplicative Word Problems

A.
Lola baked 6 pies. For each pie, Lola used 5 apples. How many apples did Lola use?

B.
Jane bought 112 light bulbs. The light bulbs come in packs of 4. How many packs of light bulbs did Jane buy?

C.
Zachary has 3 feet of string. He makes braclets, and each bracelet needs 5 1/4 inches of string. How many bracelets could Zachary make?

NOTES ABOUT EQUAL GROUPS PROBLEMS:

Multiplicative Word Problems

D.
Enrique has 2 times as many pencils as Ava. Ava has 6 pencils. How many pencils does Enrique have?

E.
Susan has 7 times as many books as Mo. Mo has 18 books. How many books Susan has?

NOTES ABOUT COMPARISON PROBLEMS:

F.
Sally typed 56 words in 2 minutes. At this rate, how many words could Sally type in 7 minutes?

G.
An airplane's altitude changed -378 feet over 7 minutes. What was the mean change of altitude in feet per minute?

Multiplicative Word Problems

H.
The number of blueberry muffins that a baker makes each day is 40% of the total number of muffins she makes. On Monday, the baker makes 36 blueberry muffins. What is the total number of muffins that the baker makes on Monday?

I.
Sara buys a sweater at a department store. The sweater costs $30. The store is having a 25% off sale on everything in the store. Enter the amount of money, in dollars, Sara saves from the sale. Do not consider the sales tax.

J.
Margarita baked cookies and brownies. The ratio of cookies to brownies was 3:5. If she baked 25 brownies, how many cookies did she bake?

NOTES:

Multi-Step Problems

A.
Leslie had 3 pizzas. Each pizza was cut into 8 pieces. Leslie ate 2 pieces. How many pieces were left?

B.
Mr. Kahn gave away 8 blue balloons and 6 red balloons. He gave away 3 times the number of white balloons as red balloons. What was the total number of balloons Mr. Kahn gave away?

C.
An egg farm packages 264 total cartons of eggs each month. The farm has 3 different sizes of cartons.
The small carton hold 8 eggs, and 1/6 of the total cartons are small.
The medium carton holds 12 eggs, and 2/3 of the total cartons are medium.
The large carton holds 18 eggs, and the rest of the total cartons are large.

Determine how many each size of carton is needed each month. Then determine how many eggs are needed to fill the 264 cartons.