Fluency, Word Problems, and Mathematics Intervention for Students

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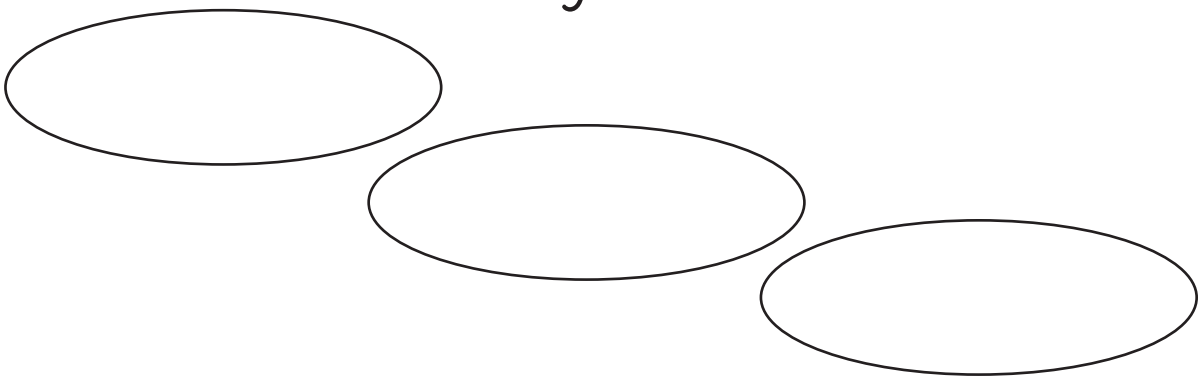
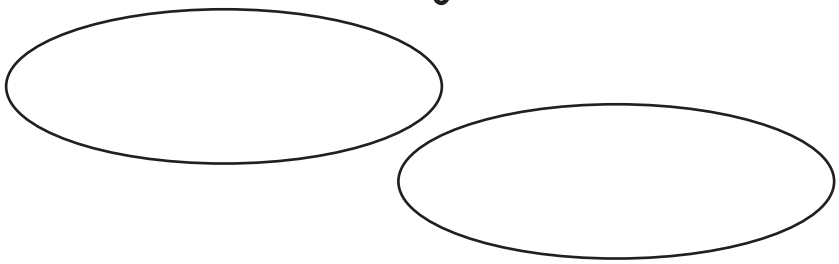
Instructional Platform

Instructional Delivery



Instructional Strategies



FLUENCY

Research and Information

Types of Fluency

Type	Memorization?	
	Yes	No

FLUENCY

Fact Fluency

Addition	Subtraction
Multiplication	Division

FLUENCY

Computational Fluency

Addition	Subtraction
Multiplication	Division

FLUENCY

What are your strengths?

What are your opportunities for growth?

What are your plans for next Monday?
Next month?
Next year?

WORD PROBLEMS

Research and Information

WORD PROBLEMS

Attack Strategies

SOLVE

Study the problem

Organize the information

Line up a plan

Verify the plan

Examine the answer

R-CUBES

Read the problem

Circle key numbers

Underline the question

Box action words

Evaluate steps

Solve and check

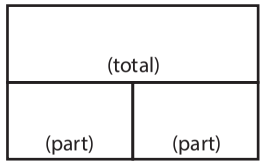
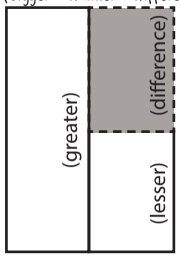
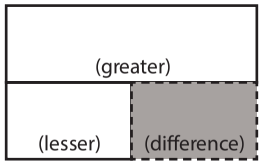
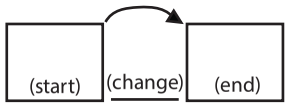
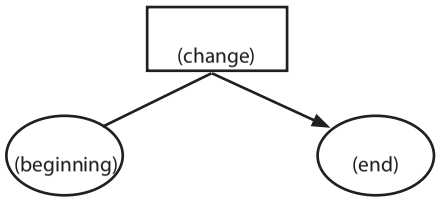
UPS Check

Understand

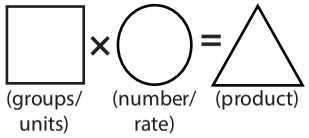
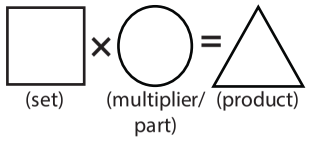
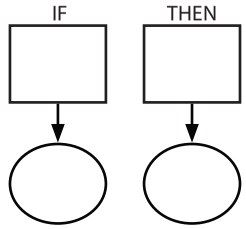
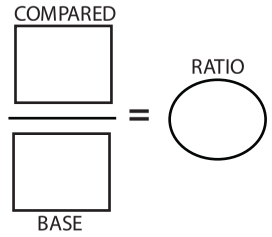
Plan

Solve

Check

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?

Powell & Fuchs (2018).
Material collected from: Griffin & Jitendra, 2009; Fuchs et al., 2014; Fuchs, Seethaler, et al., 2008; Fuchs et al., 2010; Jitendra, 2002; Kintsch & Greeno, 1985; Van de Walle, Karp, & Bay-Williams, 2013.

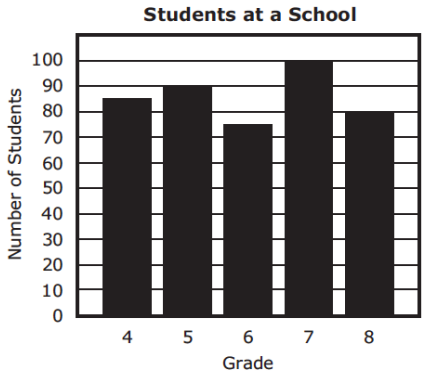
Schema and Definition	Graphic Organizers	Examples			Variations
Equal Groups (Vary) A number of equal sets or units	GR x N = P  	Product unknown: Maria bought 5 cartons of eggs with 12 eggs in each carton. How many eggs did Maria buy?	Groups unknown: Maria bought 60 eggs. The eggs were sold in cartons 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?	With rate: Maria bought 5 cartons of eggs. Each carton cost $2.95. How much did Maria spend on eggs?
Comparison One set as a multiple or part of another set	S x T = P  	Product unknown: Malik picked 7 flowers. Danica picked 3 times as many flowers. How many flowers did Danica pick?	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?	With fraction: Malik picked 25 red and yellow flowers. If 1/5 of the flowers were yellow, how many were red?
Ratios/ Proportions (Percentages; Unit Rate) Relationships among quantities	 	Subject unknown: Sally typed 56 words in 2 minutes. How many words could Sally type in 7 minutes?	Object unknown: Sally typed 56 words in 2 minutes. How many minutes would it take Sally to type 192 words?		With percentage: Watson received an 80% on his science quiz. If the test had 40 questions, how many questions did Watson answer correctly?
Ratio	 	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?	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?	Ratio unknown: Justin baked 15 cookies and 25 brownies. What's the ratio of cookies to brownies?	With unit rate: Paula bought 5 boxes of markers. She spent $9.75. What is the price of one box of markers?

Material collected from: Jitendra, DiPipi, & Perron-Jones, 2002; Jitendra & Star, 2011; Jitendra et al., 2009; Van de Walle et al., 2013; Xin, Jitendra, & Deatline-Buchman, 2005; Xin & Zhang, 2009.

WORD PROBLEMS

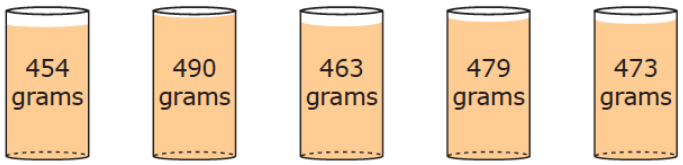
Additive Word Problems

A.
The bar graph shows the number of students in each grade at a school. How many more students are in grade 7 than are in grade 4?



B.
A package of bread has a mass of 623 grams. One slice of bread is removed from the package. The slice of bread has a mass of 55 grams. What is the mass, in grams, of the package of bread after the slice of bread is removed?

C.
A student measures the mass of 2 jars of sand. The total mass of the 2 jars of sand is 963 grams. Which two jars of sand have a total mass of 963 grams?



D.
A photographer has a picture album that holds 100 pictures. The photographer fills 57/100 of the album with pictures of trees. She fills 30/100 of the album with pictures of animals. What fraction of the album is filled with either pictures of trees or animals?

E.
There are 8 people. They each have 4 oranges. Which expression shows how many oranges the people have altogether?

A. 8 + 4
B. 8 – 4
C. 8 × 4
D. 8 ÷ 4

F.
A farmer plants 4 rows of trees. Each row has an equal number of trees. There are 1,580 trees on the farm. What is the number of trees in each row?

G.
A store has two lamps for sale. Lamp A costs $9. Lamp B costs 6 times more than Lamp A. How much is Lamp B ?

H.
There are 3,726 students spending the summer at a camp. The students are divided equally into 9 groups. How many students are in each group?

WORD PROBLEMS

Total
Difference
Change
Equal Groups
Comparison
Ratios and Proportions

Multi-Step Word Problems

I.
A frog wants to reach a pond that is 10 feet away. The frog hops 5 times. Each hop is 18 inches.
How many more inches does the frog need to travel to reach the pond?

J.
Three people play a video game.
- Person A scores 3,793 points.
- Person B scores 4,286 points.
- Person C scores 5,941 points.

How many more points do Person A and Person C have together than Person B ?

K.
A store has a parking lot. There are 6 rows of parking spaces in the parking lot. There are 8 parking spaces in each row. There are 19 cars parked in the parking lot. How many parking spaces in the parking lot are empty?

L.
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.

M.

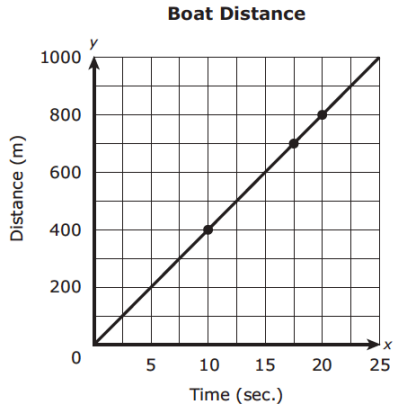
N.

O.
What fraction, when added to 3/8, would make one whole?

P.
Three shapes are listed in the table. Place a check mark to show what is true for each shape. Select one or more than one box per row.

Shape	Is a Quadrilateral	Has More Than 5 Sides
rectangle	☐	☐
hexagon	☐	☐
square	☐	☐

Q.
Which coordinate pairs represent points on the graph? Select the two coordinate pairs.



R.
A fish tank is in the shape of a right rectangular prism. The fish tank has a length of 6 feet, a width of 2 feet, and a height of 3 feet. What is the volume, in cubic feet, of the fish tank?

WORD PROBLEMS

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Next month?
Next year?

INSTRUCTIONAL PLATFORM

Instructional Platform

SCOPE AND SEQUENCE