

Problem Solving

+

Rigor

+

(Reading Proficiency?) =

Mathematical Thinker

Kathleen A. McKenna

Mathematics Specialist

(mckennaka@wmlcps.org)

Linda Boarman

4th Grade Math Teacher

Westmoreland County Public Schools

Cople Elementary School Hague, VA

Introduction – self evaluation...

Consider the following questions:

- *When did you first encounter problem solving? As a student? As a teacher?*
- *Were you “problem solving” phobic? Explain.*
- *Were you a good reader? If so, did that help you to understand the problem?*
- *Do you teach problem solving the way that you learned? Explain.*
- *What are some of the ways that you teach problem solving today?*

Re-evaluating Problem Solving

Use the Alpha Blocks Sort. Write words that are often used when teaching problem solving. If a word is associated with an operation, please note the operation using (A), (S), (M), or (D) next to the word.

ALPHA BLOCKS SORT

ABC	DEF	GHI
JKL	MN	OPQ
RST	UVW	XYZ

Practice and Evaluation

Math Story #1

~~Word Problem~~: Ricky had some magazines to sell. After selling 30 of them, he had 11 magazines left. How many magazines did Ricky have to sell at first?

Solve this story using any method. Show your work.

A New Generation of Problem Solving

Math Story #2

Word Problem: There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?

What do you notice about the vocabulary? How does it affect the way you solve this story?

Solution

Word Problem: There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?

Build a model to show what is being compared.

number of
girls

number of
boys

~~Word Problem:~~ There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?

Build a model to show what is being compared.



Check

~~Word Problem:~~ There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?



Add numbers to your model. Use a ? to show the missing number.



47

?

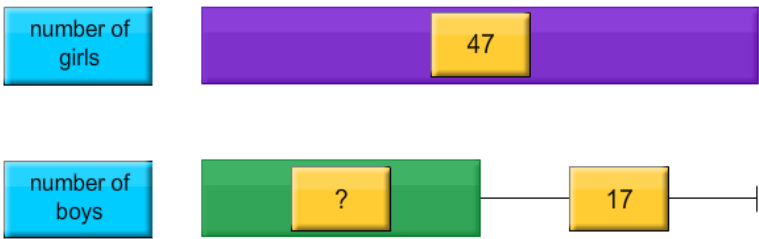
17

Check

~~Word Problem~~ There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?



Add numbers to your model. Use a ? to show the missing number.

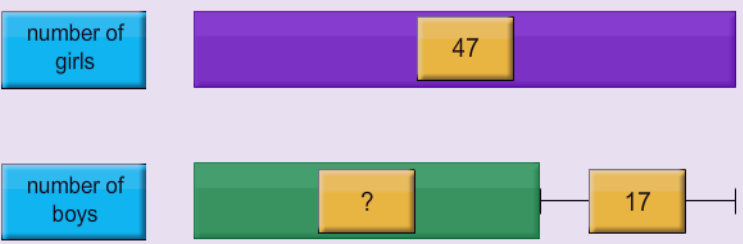


Check

~~Word Problem~~ There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?



Draw with your mouse.



1	2	3
4	5	6
7	8	9
0	.	\$
calculator off		C

ANSWER: boys

Check

Drawing Tools undo erase

Draw with your mouse.

number of girls: 47

number of boys: ? 17

ANSWER: boys Check

calculator on C

Drawing Tools undo erase

Comparison Model - 1 Step

Unlimited Practice

~~Word Problem~~ There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?

Thinking Blocks

Draw with your mouse.

number of girls: 47

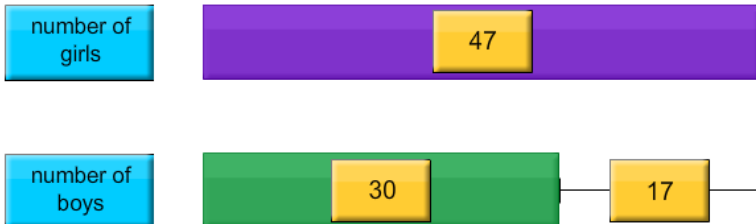
number of boys: ? 17

ANSWER: boys Check

calculator on C

Drawing Tools undo erase

~~Word Problem:~~ There were 17 more girls than boys at the track meet. If there were 47 girls, how many boys were there?



ANSWER: boys

Super!

Next

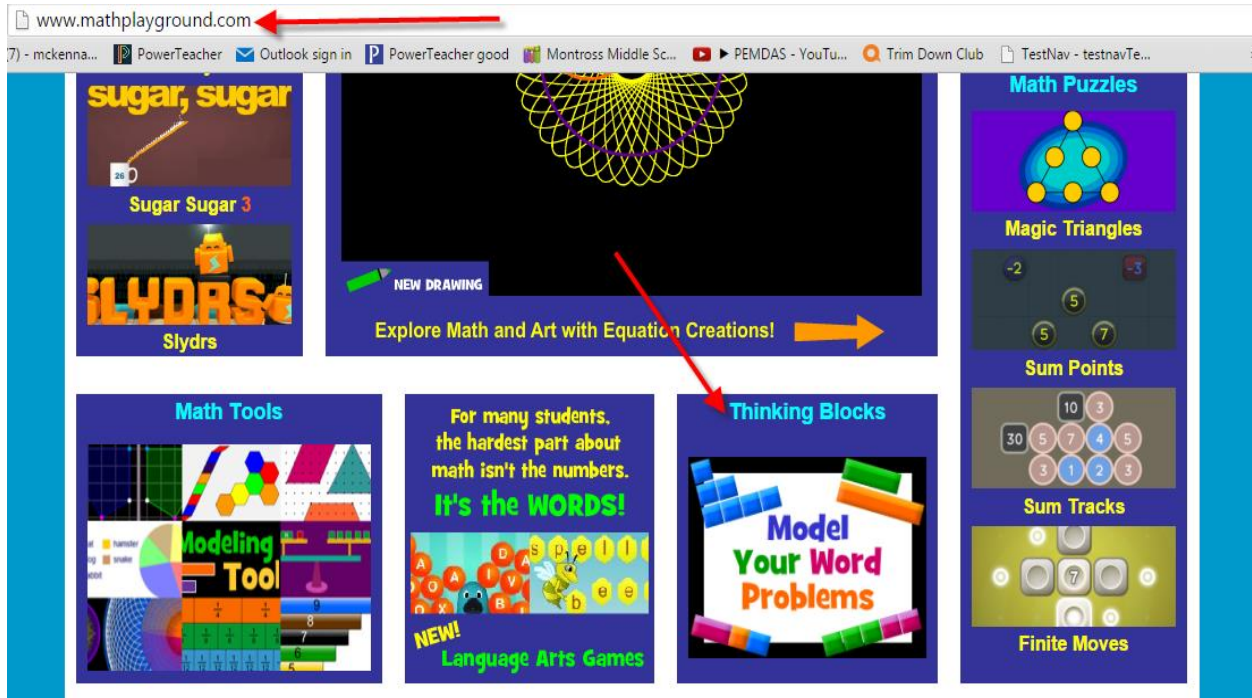
Now you try ...

Use the blocks to create your model. Draw a picture to show the relationships in the story.

Math Story #3

~~Word Problem:~~ The difference between two numbers is 15. If the smaller number is 16, what is the bigger number?

Math Stories Through THINKING BLOCKS



Thinking Blocks

Model and Solve Word Problems

Addition and Subtraction Practice

Addition and Subtraction Word Problems

This interface features a purple background with a green oval containing seven bar models. The first six models show different ways to represent addition and subtraction problems using colored blocks. The seventh model is a simple bar with a question mark. A large orange plus sign is in the bottom right corner.

Thinking Blocks

Model and Solve Word Problems

Multiplication and Division Practice

Multiplication and Division Word Problems

This interface features a blue background with a green oval containing seven bar models. The first six models show different ways to represent multiplication and division problems using colored blocks. The seventh model is a simple bar with a question mark. A large orange multiplication and division symbol is in the bottom right corner.

Thinking Blocks

Model and Solve Word Problems

Fraction Practice

Fraction Word Problems

This interface features a purple background with a green oval containing seven fraction models. The first six models show different ways to represent fraction problems using colored blocks and mathematical symbols. The seventh model is a simple bar with a question mark. A large orange fraction symbol is in the bottom right corner.

Thinking Blocks

Model and Solve Word Problems

Ratio and Proportion Practice

Ratio and Proportion Word Problems

This interface features a teal background with a green oval containing seven ratio and proportion models. The first six models show different ways to represent ratio and proportion problems using colored blocks and mathematical symbols. The seventh model is a simple bar with a question mark. A large orange ratio symbol is in the bottom right corner.

NEW!
Grades 1 and 2


Thinking Blocks JR

addition and subtraction with small numbers


Model and Solve Word Problems

Addition and Subtraction Practice

Models Part Whole Model - 2 Parts



Numbers



Just Starting?
View Progress to reset Thinking Blocks.

Full Screen Mode OFF

Video Tutorials View Progress Start Modeling

Let's practice ...

<http://www.mathplayground.com/thinkingblocks.html>

For more information regarding teaching problem solving through math stories, research Singapore Math.

https://www.youtube.com/results?search_query=singapore+math

Examples:

<https://www.youtube.com/watch?v=w20DDgkHQAk>

<https://www.youtube.com/watch?v=U2bPwW4wc2E>