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Building a Conceptual Understanding: Solving Systems of Linear Equations

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Common Core Standards for Mathematical Content

Overview

- Two Grades 6–8 domains are important in preparing students for Algebra in high school. The Number System prepares students to see all numbers as part of a unified system, and become fluent in finding and using the properties of operations to find the values of numerical expressions that include those numbers. The standards of the Expressions and Equations domain ask students to extend their use of these properties to linear equations and expressions with letters.

— Progressions for the Common Core State Standards in Mathematics, Algebra, www.commoncoretools.wordpress.com

Session Goals

In this session we will:

- Use models and tools that support students understanding and proficiencies called for in the Common Core State Standards
- Recognize and support students understanding of system of equations
- Share strategies in ways that emphasize the important mathematical ideas that are inherent in the strategies.

Solve

There are 36 students in a class. There are 8 more boys than girls.

How many boys and how many girls are in the class?

Solving this any way you can.

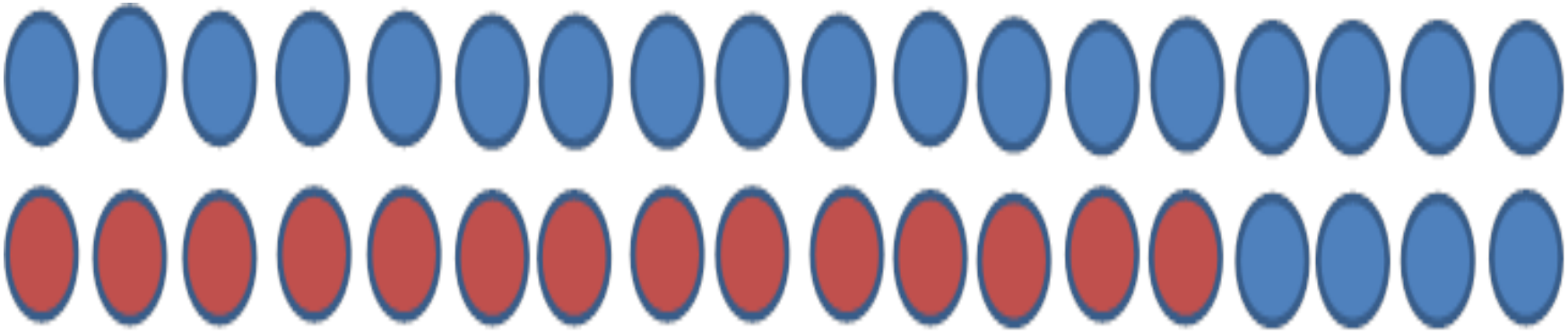
Misconception

36/2 = 18

18 + 8 = 26

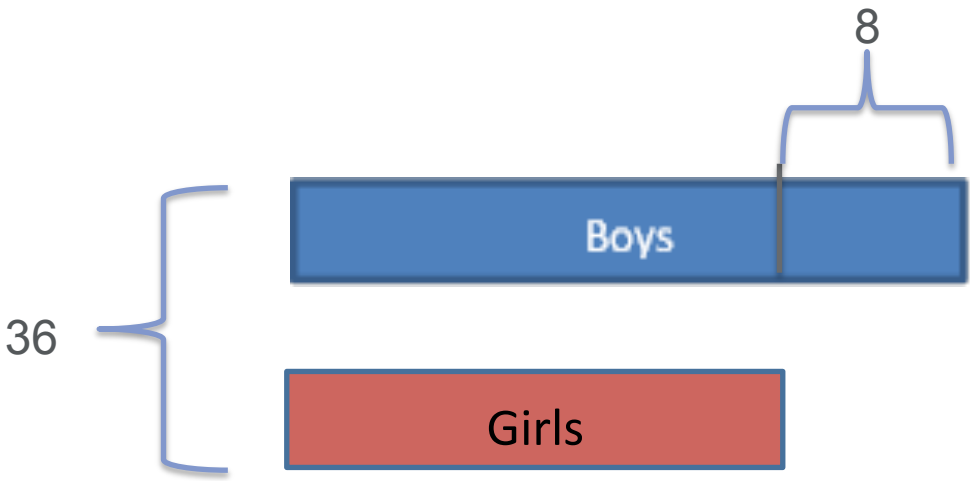
Boys = 26
Girls = 18

Picture Solution



14 girls, 22 boys

Tape Models, Analytical and Algebra



Analytical expression

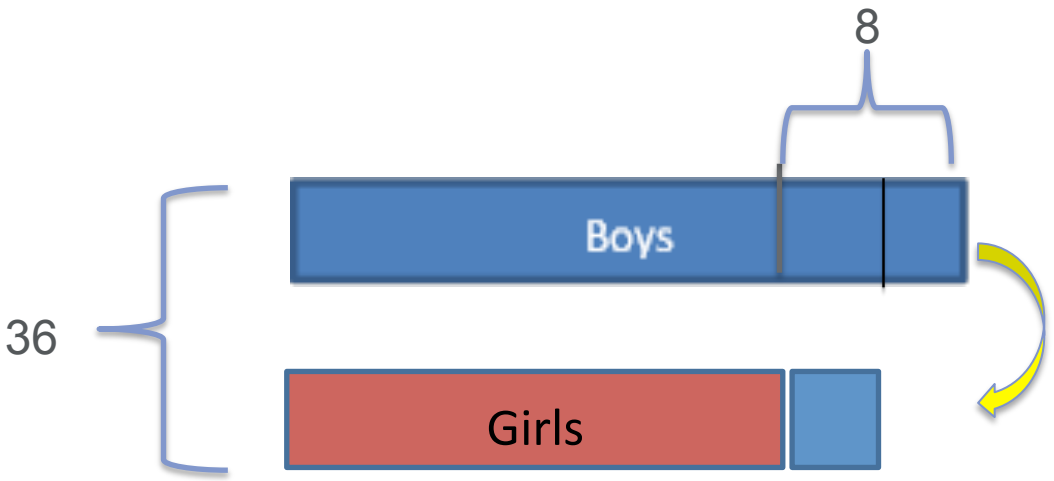
36 – 8 = 28
28/2 = 14
14 + 8 = 22

Algebra:

b + g = 36
# of girls = x
# of boys = x + 8

x + (x + 8) = 36

Tape Models, Analytical and Algebra



Analytical expression:

36 / 2 = 18
8 / 2 = 4
18 - 4 = 14
18 + 4 = 22

Algebra:

b + g = 36
# of girls = x
# of boys = x + 8

$$\frac{2x + 8 = 36}{2}$$

Table Solutions

1. Keeping the total as 36 students

# of boys	# of girls	# of students	Difference
18	18	36	0
20	16	36	4
22	14	36	8

2. Keeping the difference as 8

# of boys	# of girls	Difference	# of students
30	22	8	52
26	18	8	44
22	14	8	36

Solve

- Tom and Mary have 153 stickers altogether. If Mary has 37 more stickers than Tom, how many stickers does Mary have?

- Use a method you have not used with the previous problem.

Reflection

- How do tools and models support students understanding of system of equations?

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Thank you!

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