What's the Difference?

Modeling Addition and Subtraction Based on Comparison Relationships

2023 NCTM Annual Meeting
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Agenda

01 Comparing Quantities

02 Increasing & Decreasing Quantities to Highlight Difference

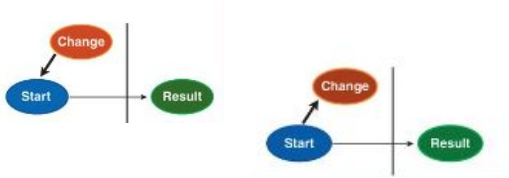
03 Finding the Difference

04 Finding the Difference on the Number Line

Finding the Difference

- Do you think students find subtraction more challenging than addition? Why or why not?
- What have you observed about student understanding of difference?

Addition and Subtraction Problem Structures

Structure		Example
Join (add to)/ Separate (take from)		Mark loved to eat fruit snacks. He counted 36 fruit snacks in his bag. He ate 17 fruit snacks. How many are left in his bag?
Part-Part-Whole		Genevieve bought 5-cent stamps and 25-cent stamps. Altogether she has 9 stamps. How many of each type of stamp might she have?
Compare		Lara has 4 more baseball cards than Alex. Alex has 5 baseball cards. How many baseball cards does Lara have?

Van de Walle, Karp, & Bay-Williams, 2019

Modeling Mathematical Concepts Using Continuous Quantities

Length Area Volume Mass

Measurement as a Context for Whole Number & Operations: Attributes

K = M

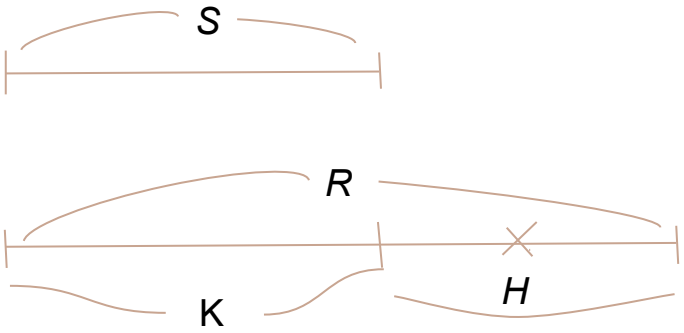
Comparing Quantities

Our friend Rabbert left a statement for us. What attribute (length, area, volume, or mass) could he be comparing?

$T > K$

Feeding Scottie

Lani’s neighbor, William, had a pet dog named Scottie. William’s family planned to go on a vacation and had to leave Scottie home. William asked Lani to feed Scottie while they were away, and she happily agreed. Scottie needed to be fed breakfast, lunch, and dinner.



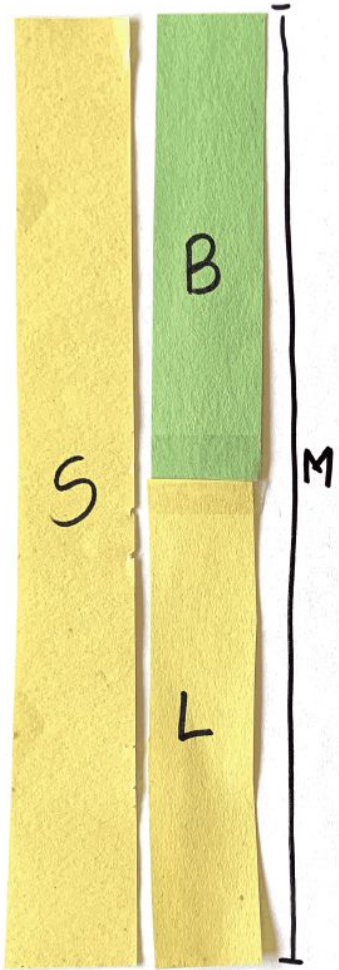
$R > S$ *or* $S < R$

Decreased *R* by *H* to make volume *K*

$S = K$

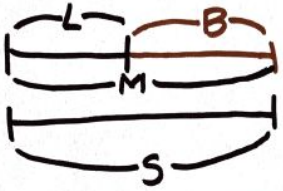
$S = K$ by H

$R - H = K$



$L < S$

$S = M$



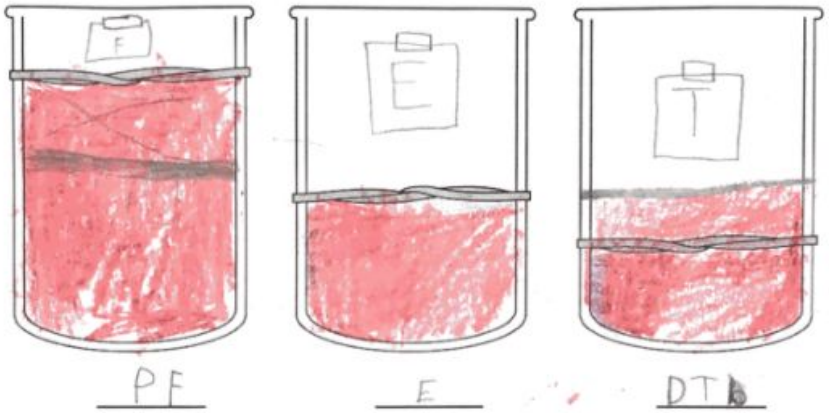
$S = M$ by B

$L + B = M$

$M = S$

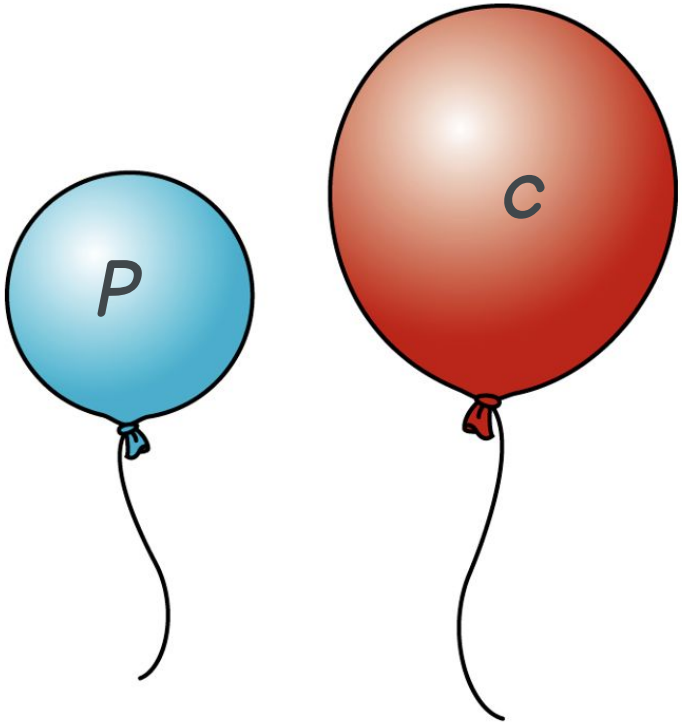
$L + B = S$

Increase
Add



D = E

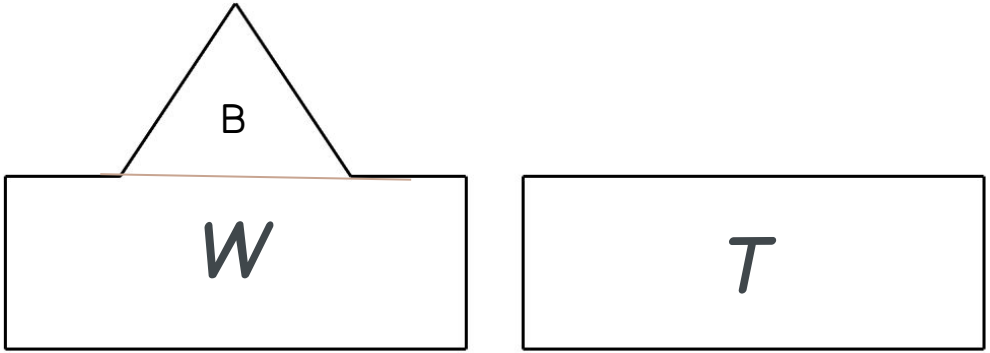
F = E



$C > P$

$C > P$ by M

$P + M = C$
$C - M = P$



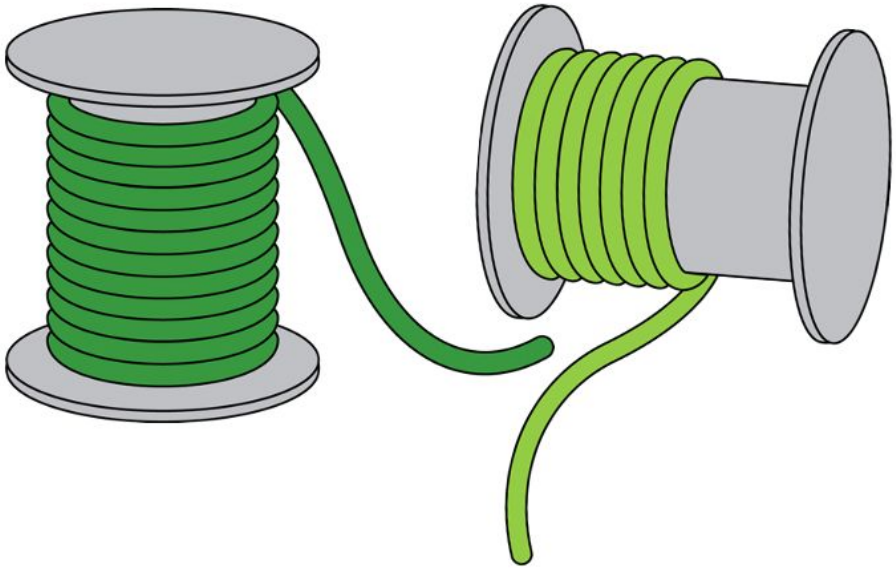
$T < W$

$T =$

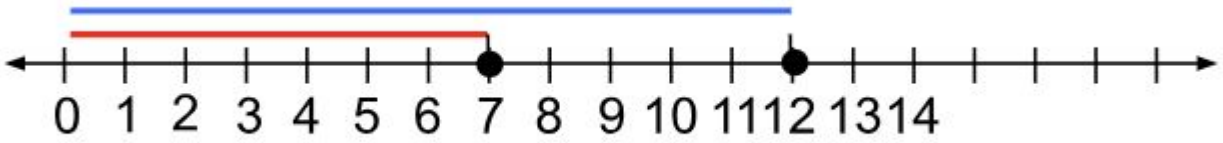
$T = W$ by B

$W - B = T$

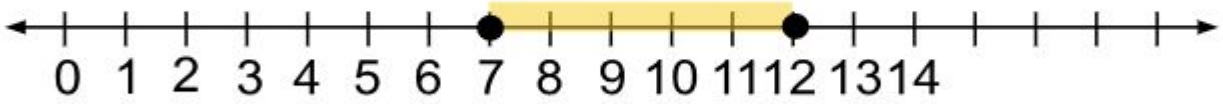
One spool has 7 meters of wire.
The other spool has 12 meters of wire.



- Represent the lengths of wire on a number line.
- Write a statement to represent how the lengths compare
- Highlight the difference and record the difference in your statement:
  _____ < _____ by _____



$7 < 12$ by 5



How can we make lengths of wire equal if only one length is changed?

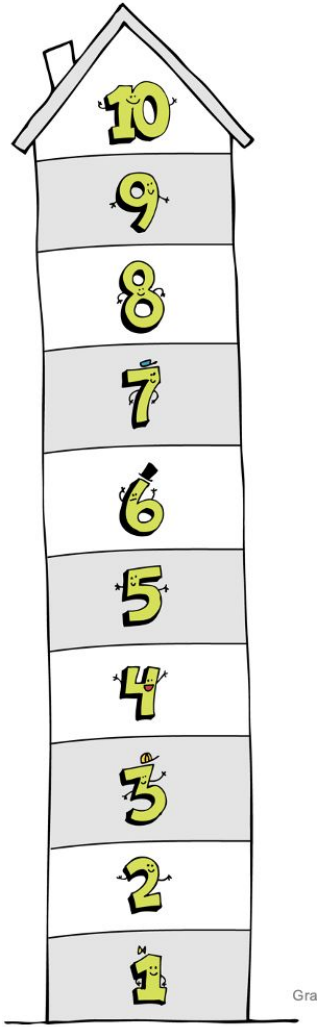
Increase

12 meters = 7 meters + 5 meters

Decrease

12 meters – 5 meters = 7 meters

Elevator Game



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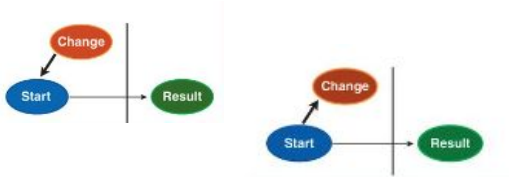
Join (add to)/ Separate (take from)		Mark loved to eat fruit snacks. He counted 36 fruit snacks in his bag. He ate 17 fruit snacks. How many are left in his bag?
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Mahalo!

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