



Common Core Math, K-8

Berkeley Unified School
District

Background

- 2013-14 Used *A Story of Units* and *A Story of Ratios* to learn the Common Core State Standards in Mathematics
- ASOU & ASOR built from ground up on Standards based on instructional shifts of Focus, Coherence & Rigor
- Very effective, “bare bones” curriculum

Robin Ramos from Eureka Math on Coherence



Changes in the Classroom

- Fewer and more consistent models used throughout grades

Math Models in *A Story of Units*

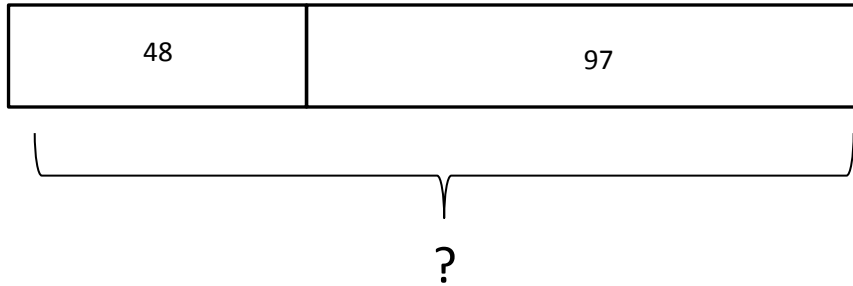
Numbers Through 10 <ul style="list-style-type: none">▪ Number Towers▪ Number Path▪ Number Bond	Place Value and Standard Algorithms <ul style="list-style-type: none">▪ Bundles▪ Place Value Chart▪ Base-Ten Blocks▪ Money▪ Number Disks (with Place Value Chart)	Fractions <ul style="list-style-type: none">▪ Number Line▪ Area Model
Addition and Subtraction <ul style="list-style-type: none">▪ Ten-Frame	Multiplication <ul style="list-style-type: none">▪ Array and Area Model▪ Rekenrek	Word Problems <ul style="list-style-type: none">▪ Bar Diagram

Changes in the classroom

Making Sense of Math (versus Answer Getting)

Where? -- Application Problems

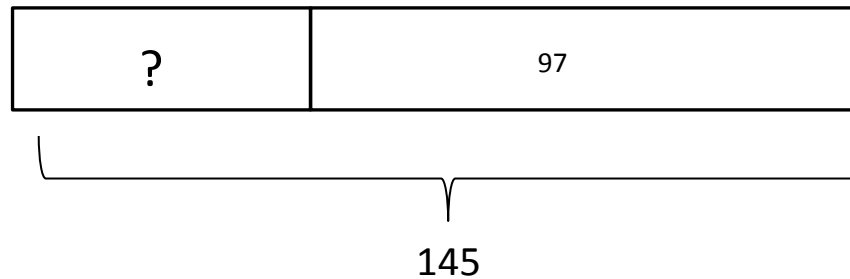
How? -- Read / Draw / Write



Rachel collected 48 seashells. Sam gave her 97 more. How many seashells did she have then? (Grade 2)

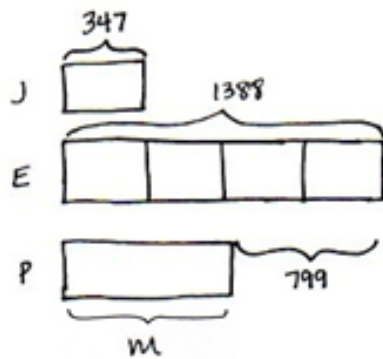
How could you turn this problem into a subtraction problem and represent it with Tape Diagram?

Rachel collected 97 seashells. Sam gave her some more. She then had 145. How many shells did Sam give her?



Grade 4: Tape Diagram

Jayden has 347 marbles. Elvis has 4 times as many as Jayden. Presley has 799 fewer than Elvis. How many marbles does Presley have?



$$\begin{array}{r} 347 \\ \times 4 \\ \hline 1388 \end{array}$$

$$1388 - 800 = 588$$

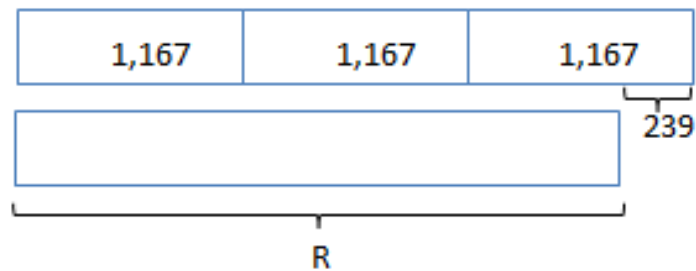
$$588 + 1 = 589$$

$$m = 589 \text{ marbles}$$

Presley has 589 marbles.

Grade 4: Tape Diagram

- a. Write an equation that would allow someone to find the value of R.



The Shift – How best to support students

At Home – Parents as **facilitators** of learning

- Time-bound not task-bound (set timer)
- ASK GOOD QUESTIONS
 - Ask students to **explain the model**
 - Start with what they DO know – having them explain their understanding helps deepen it

The Shift – How best to support students

- Use “Read Draw Write”
- Look for patterns in the day’s Sprint

Extra Support

- Review Math Facts a few minutes each day
- Start with word problems that have simple math but complex reasoning – help students figure out what the problem is asking. Have them draw tape diagrams.
- See Progressions at ime.math.arizona.edu/progressions/

Table 1: Addition and subtraction situations

	Result Unknown	Change Unknown	Start Unknown
Add To	<p><i>A</i> bunnies sat on the grass. <i>B</i> more bunnies hopped there. How many bunnies are on the grass now?</p> $A + B = \square$	<p><i>A</i> bunnies were sitting on the grass. Some more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies hopped over to the first <i>A</i> bunnies?</p> $A + \square = C$	<p>Some bunnies were sitting on the grass. <i>B</i> more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies were on the grass before?</p> $\square + B = C$
Take From	<p><i>C</i> apples were on the table. I ate <i>B</i> apples. How many apples are on the table now?</p> $C - B = \square$	<p><i>C</i> apples were on the table. I ate some apples. Then there were <i>A</i> apples. How many apples did I eat?</p> $C - \square = A$	<p>Some apples were on the table. I ate <i>B</i> apples. Then there were <i>A</i> apples. How many apples were on the table before?</p> $\square - B = A$

Counting and Cardinality; Operations and Algebraic Thinking

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare	<p>"How many more?" version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many more apples does Julie have than Lucy?</p> <p>"How many fewer?" version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many fewer apples does Lucy have than Julie?</p> $A + \square = C$ $C - A = \square$	<p>"More" version suggests operation. Julie has <i>B</i> more apples than Lucy. Lucy has <i>A</i> apples. How many apples does Julie have?</p> <p>"Fewer" version suggests wrong operation. Lucy has <i>B</i> fewer apples than Julie. Lucy has <i>A</i> apples. How many apples does Julie have?</p> $A + B = \square$	<p>"Fewer" version suggests operation. Lucy has <i>B</i> fewer apples than Julie. Julie has <i>C</i> apples. How many apples does Lucy have?</p> <p>"More" suggests wrong operation. Julie has <i>B</i> more apples than Lucy. Julie has <i>C</i> apples. How many apples does Lucy have?</p> $C - B = \square$ $\square + B = C$

Challenge

- Illustrative Mathematics daily problems
- Inside Mathematics Problems of the Month
- Khan Academy Common Core problems:

www.khanacademy.org/commoncore

What Works?

- Use of consistent models, adding complexity in each grade
- Asking real-life questions that don't immediately make sense . . . Just like *real life!*
- Working on fluency skills each day in a fun way

What are the challenges?

- Backfilling from prior grades – what students don't know
- Working with previous knowledge – what students do know
- Waiting for materials to be developed for challenge & re-teaching

What are the challenges?

- Curriculum bare bones – not bells & whistles – not project-based
- Language in word problems can be tough
- No answer key for teachers or parents

Questions?

Thank you for your time and
care!