

Features of coherence

To achieve coherence in PreK – Grade 8 math we need to focus on top priorities, we need depth and connections, and we need teacher education:

- Acknowledge the top priority in PreK – Grade 8: numbers and operations
- Allow enough time and set the expectation for sense-making
- Support depth with varied contexts and problems and by connecting to other mathematical topics
- Do not derail the focus by requiring coverage of all content strands at every grade level
- Teachers should have the opportunity and expectation to think in depth about the specific math they teach

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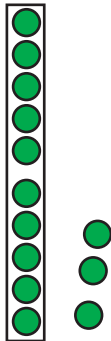
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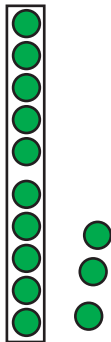
Subtracting by decomposing 10

$13 - 9$



Subtracting by decomposing 10

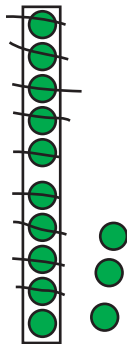
$$\begin{array}{r} 13 - 9 \\ \swarrow \quad \searrow \\ 10 \quad 3 \end{array}$$



Subtracting by decomposing 10

$$\begin{array}{r} 13 - 9 \\ \swarrow \quad \searrow \\ 10 \quad 3 \end{array}$$

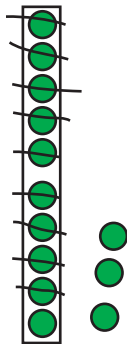
take 9
from 10



Subtracting by decomposing 10

$$\begin{array}{r} 13 - 9 \\ \swarrow \quad \searrow \\ 10 \quad 3 \end{array}$$

take 9
from 10
1 and 3
make 4



The common subtraction algorithm

$$\begin{array}{r} 62 \\ - 45 \\ \hline \end{array}$$

The common subtraction algorithm

$$\begin{array}{r} 62 \quad | | | | | \quad - \quad 0 \\ - 45 \quad \quad 4 \quad 5 \\ \hline \end{array}$$

The common subtraction algorithm

Handwritten subtraction problem: $510 - 45 = 465$. The number 510 is written with a 5 in the hundreds place, a 1 in the tens place, and a 0 in the ones place. The number 45 is written below it. A horizontal line is drawn under the numbers. Below the line, the result 465 is written. To the right of the numbers, there are base ten blocks: one hundred block, one ten block, and five one blocks. An arrow points from the ten block to a diagram of a ten's block, which is a rectangle divided into ten smaller squares, with five squares shaded to represent the ten's block being used to make the ones place.

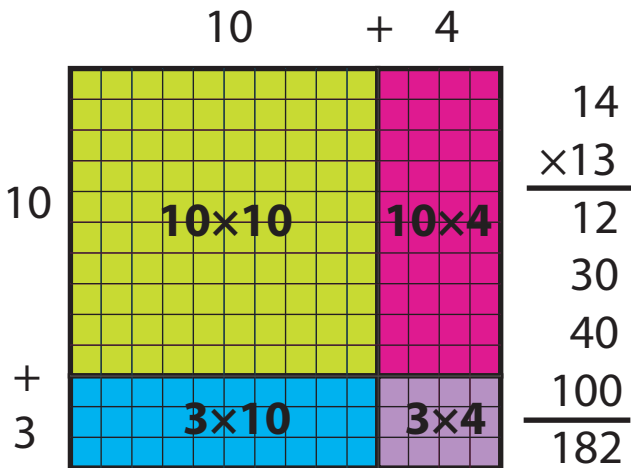
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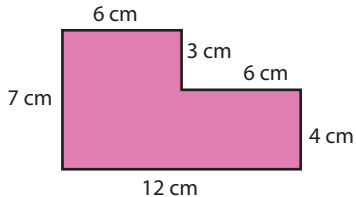
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Understanding the common multiplication algorithm

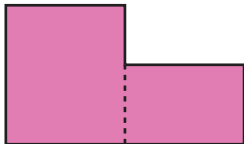


Areas of regions composed of several rectangles

What is the area of the shaded shape?

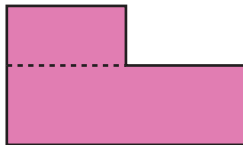


Method 1



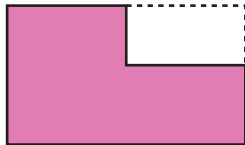
$$7 \times 6 + 4 \times 6$$

Method 2



$$3 \times 6 + 4 \times 12$$

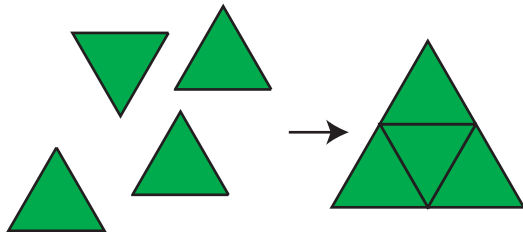
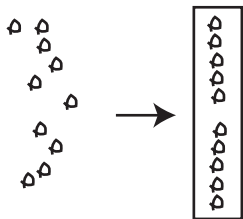
Method 3



$$7 \times 12 - 3 \times 6$$

Grouping to create a new unit

Can geometric and numerical work support each other?



10 ones are grouped
to form one ten

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It's time to recognize that we have broad agreement:

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- on the need for math to make sense to students
- on the need for teachers to know the math they teach

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