

# BUILD A RULE

## What is it and why would I use it?

*Build a Rule* is a task structure that supports the development of students' algebraic thinking. Specifically, the task structure always asks students to do concrete calculations across several problems in which the *numbers* are changing in each problem but the *process* of calculation is not. This allows students to generalize the calculation process and use variables to 'stand in' for the concrete value(s). You can see an example below from the Minimum Wage task.

San Francisco, CA  
2 Adult, 1 Child  
Cost of Living \$10,000  
Minimum Wage \$15.50  
Working Adults 1

$\frac{\$10,000}{\$2} = \$2,702.21$  amount needed each week  
 $\frac{\$2,702.21}{\$15.50} = 174.34$  hours  
 $15.50 \times h = 2,702.21$  number of weekly hours  
 $h = \frac{2,702.21}{15.50} = 174.34$  hours

How did this student find Cece's hours?

Iowa City, IA  
2 Adult, 2 Child  
Cost of Living \$8,940  
Minimum Wage \$7.25  
Working Adults 2

$\frac{\$8,940}{2} = \$4,470$  amount needed each week  
 $\frac{\$4,470}{\$7.25} = 616.14$  hours  
 $2(7.25 \times h) = 4,470$  working adults  
 $7.25h = 2,235$   
 $h = \frac{2,235}{7.25} = 308.29$  hours

How did this student find Daniel's hours?

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Cost of Living \$10,000  
Minimum Wage \$15.50  
Working Adults 1

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What calculation process is staying the same?  
(even though the numbers in each case are different)

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This task structure provides support for students' development of Standard for Math Practice #8: Look for and express regularity in repeated reasoning ("Mathematically proficient students notice if calculations are repeated, and look for both general methods and shortcuts").

## What are some helpful tips for using this task structure?

- It is important that students repeat the calculations themselves (individually) in order to 'see' the repeated calculation process. To support this, try having partners do one together to ensure access, then give some individual think time for students to perform the repeated calculations.
- Ask: "What process is staying the same each time, even though the numbers in each case are changing?"
- It might help to start by having students list this process in words, making a numbered list. For example,
  1. "First I always . . .
  2. "Then I would . . .
  3. "And last I would . . . "

This list can then be translated into symbols to create a general expression.