



Stacking Cups

Project Goal:

Based on Andrew Stadel [Stacking Cups Lesson](#).

Students will model two different types of cups being stacked based on their heights. They will use the model to find when the two cups will reach the same height.

Standard:

CCSS.MATH.CONTENT.8.EE.C.7: Solve linear equations in one variable.

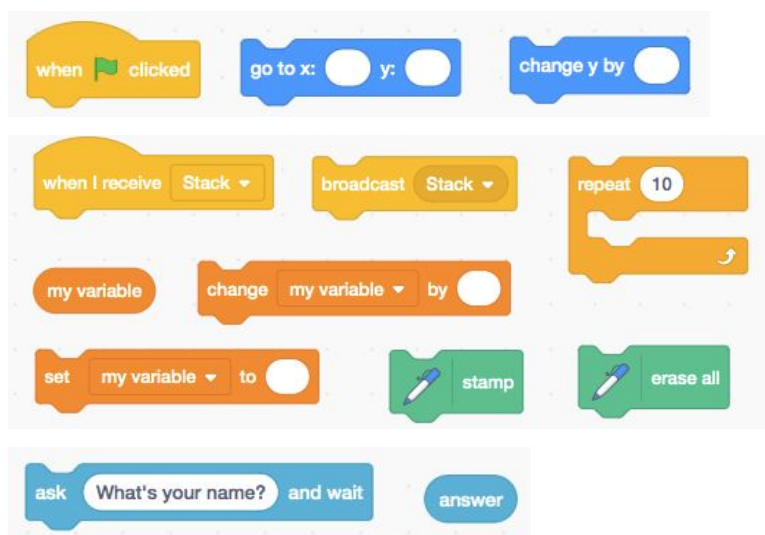
CCSS.MATH.CONTENT.8.EE.C.7.B: Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

CCSS.MATH.CONTENT.8.EE.C.8: Analyze and solve pairs of simultaneous linear equations.

CCSS.MATH.CONTENT.8.EE.C.8.A: Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

CCSS.MATH.PRACTICE.MP4: Model with mathematics.

Blocks:





Student Handout: [Stacking Cups Student Guide](#)

Teacher Guide: [Stacking Cups Teacher Guide](#)

Solution: Use the commenting feature to enhance student understanding of the math and their program: seen under the blue plastic cup code below.

Under this Sprite:



```
when green flag clicked
  erase all
  go to x: -114 y: -125
  set Styrofoam Height to 9.2
  stamp
  wait 1 seconds
  ask "How many more cups are you stacking?" and wait
  set number_of_cups to answer
  set Total Number of Cups to number_of_cups + 1
  broadcast Stack
  repeat number_of_cups
    change y by 15
    change Styrofoam Height by 1.3
    stamp
```



Under this Sprite:



The image shows a Scratch script for a stack of cups. The script starts with a 'when clicked' event, followed by 'go to x: 59 y: -122' and 'set Solo Height to 12.1'. A callout box explains that 12.1 is the initial height, like the b value in the equation $y = mx + b$. The script then enters a 'when I receive Stack' event, followed by a 'stamp' block. A 'repeat' loop with 'number_of_cups' iterations contains three blocks: 'change Solo Height by .8', 'change y by 10', and another 'stamp' block. A second callout box explains that .8 is the width of the lip of each stack, like a slope or constant rate of change, typically given the symbol m in the equation $y = mx + b$.