

# Expressions and Equations: Growing through Middle School

Presented by:

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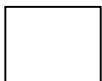
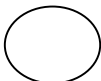
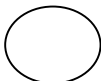
NCTM  
April 2018

If you would like a copy of this handout or Power Point, please visit: <https://goo.gl/QeJwPM>

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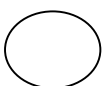
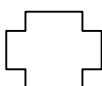
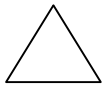
## NOTES

# EQUATION CHALLENGE

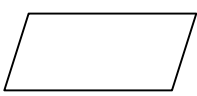
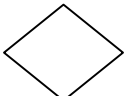
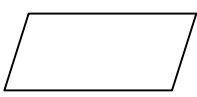
1.  +  = 

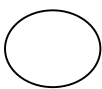
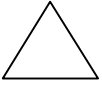

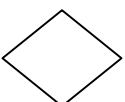
2.  •  = 

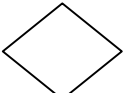


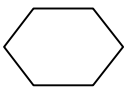
3.  ÷  = 

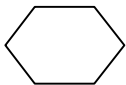
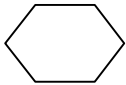
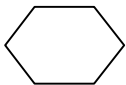
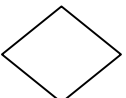
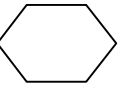
4.  -  = 

5.  +  = 

6.  •  = 

7.  •  =  

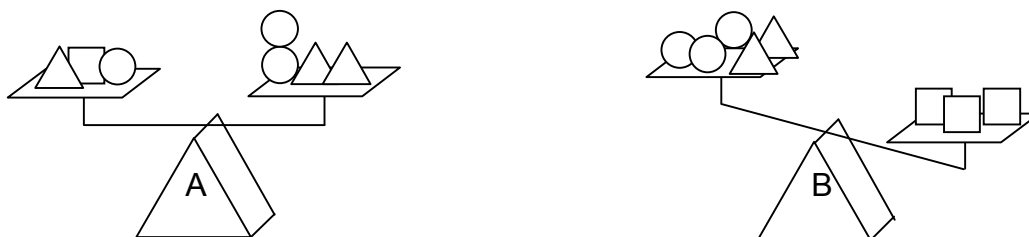
8.   ÷  = 

9.  +  +  =  

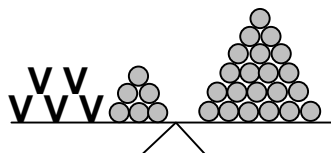
# SOLVING EQUATIONS: MENTAL MATH, BALANCE, CUPS AND COUNTERS

1. From Scale A I know that:

What **one** shape must be added to scale B and on what side so that it will balance?



2.



3.

$$2x + 6 = 4x - 4$$

4.

$$-x - 7 = 5(x + 1)$$

# TARGET EQUATIONS

For problems 1-3, consider this equation:

$$\square x + \square = \square$$

1. Use exactly three of the digits 1 through 9 one time each. Write an equation and find its solution.
1. Use exactly three of the digits 1 through 9 one time each. Write an equation so that it has the greatest solution possible.
2. Use exactly three of the digits 1 through 9 one time each. Write an equation so that it has the least solution possible.

For problems 4-6, consider this equation and solution:

$$\square x - \square = \square$$

3. Use exactly three of the digits 1 through 9 one time each. Write an equation and find its solution.
4. Use exactly three of the digits 1 through 9 one time each. Write an equation so that it has the greatest solution possible.
5. Use exactly three of the digits 1 through 9 one time each. Write an equation so that it has the least solution possible.

# BIG SQUARE PUZZLE

$x = -2$ $-3x + 7 = 1$	$x = 2$ $x = -0.5$	$x = -8$ $13 = 9x$	$x = 2.5$ $-2(x-1) = -3$
$x = 2.5$ $5x - 3 = 6$	$x = \frac{9}{5}$ $6x - 8x + 5 = 11$	$x = \frac{4}{5}$ $4 = \frac{5x}{2}$	$x = -6$ $-6 = 2 + 4x$
$x = 25$ $2(x+9) = 2$	$x = -3$ $\left(\frac{2}{5}\right)x = 10$	$x = -4$ $14 = 2(x+10) + 2$	$x = -2$ $x + 1 = -3$
$x = -8$ $0 = 3x - 6$	$x = 2$ $x - \frac{8}{9} = 0$	$x = -3$ $-8x + 4 = -5$	$x = \frac{1}{2}$ $9 = 3 - 2x$