

Unit 8: Solving Equations

Dear Parents/Guardians,

Unit 8 introduces students to solving equations using meaningful contexts. In Lesson 1, students use mobiles and revisit Nonna's pizza shop menu to write and solve equations. In Lesson 2, they relate equations and inequalities to balance scales and revisit tape diagrams to build and solve equations. In Lesson 3, students solve equations using all four operations.

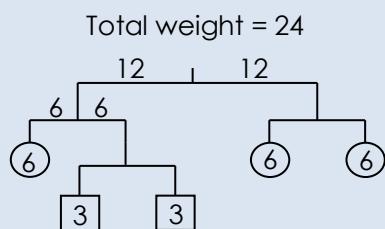
Mobiles and Balance

Students relate equations to balanced mobiles, determining values that maintain the mobile's balance (and maintain equality within the equation).

- A horizontal bar represents balance so there must be equal weight on both sides.
- Same shapes must have the same weight. Different shapes must have different weights.

The mobile on the right can be expressed as

$$6 + 3 + 3 = 6 + 6 \\ 12 = 12$$



Nonna's Pizza Menu and Solving Equations

Students revisit Nonna's Pizza Menu from Unit 6 to solve equations to determine missing items. Recall that the variables used in the equations represent the prices of the menu items.

NONNA's PIZZA MENU					
Pizza		Drinks			
Cheese slice	(c)	\$1.00	Small drink	(s)	\$0.75
Pepperoni slice	(p)	\$1.50	Medium drink	(m)	\$1.25
			Large drink	(L)	\$2.00

$$p + \square = \$2.75$$

$$\$1.50 + \square = \$2.75$$

$$\square = \$1.25$$

The missing item is a medium drink.

Strategies for Solving Equations

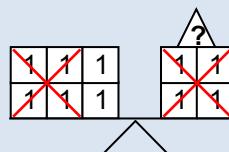
Students solve equations using a variety of methods.

Mental Math
Students think about what value is needed to make the equation true.

$x + 5 = 12$
Think, "What must I add to 5 to make 12?"
Since $7 + 5 = 12$, the value of x is 7.
 $x = 7$

Balance Scales
Students will use triangles to represent the unknown (the variable) and squares for each unit of 1. They determine the value of the triangle to maintain balance.

$6 = x + 4$
We can remove 4 squares of 1 from each side of the scale and maintain balance.
The triangle must have a value of 2.



$$x = 2$$

Tape Diagrams
Students revisit tape diagrams to solve equations.

$4n = 52$

n	n	n	n
52			

Each section for n must be the same. Since there are 4 sections of n , divide 52 by 4 to find out that $n = 13$.



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By the end of the unit, your student should know...

- How to solve equations using substitution within a given context [Lesson 8-1]
- How to relate equations to balanced mobile puzzles and solve the puzzles as a connection to solving equations [Lessons 8-1]
- How to use "mental math" to solve equations using all four operations [Lesson 8-2, 8-3]
- How to solve equations using balance scales and tape diagrams [Lessons 8-2, 8-3]
- How to find solutions that make equations and inequalities true [Lesson 8-3]

Additional Resources

- For definitions and additional notes please refer to section 8.5.
- Solving one-step equations using scales:
<https://bit.ly/3hFmbbZ>
<https://bit.ly/2UT7EQ8>
- Solving one-step addition equations symbolically:
<https://bit.ly/2ABVJzI>
- Solving one-step division equations symbolically:
<https://bit.ly/2URDOLC>
- Solving one-step multiplication equations symbolically:
<https://bit.ly/37Dbng4>