

Basics and Explore Screen

Start out with just three different coins on the Basics screen before including four additional coins on the Explore screen. Use coins as a context for thinking about variable terms and expressions.

VIEW the total value of all coins/terms

COMBINE like-coins/terms

ADD coins/terms to form an expression

SUMMARIZE all coins/terms

SHOW the values of every coin/term

SHOW all coefficients

REPRESENT as coins or variables

Total: 202 cents

My Collection:

2 (2) 5 4 (10)

2(2) (5) 4(10)

coin values

all coefficients

1 (triangle)

2x y 4z

Negatives Screen

Create more advanced expressions that can include subtraction and negative variable values.

CHANGE the variable values

TAP to see expression controls

break apart

rearrange terms

CANCEL opposite terms

SIMPLIFY subtraction

Total: 14

Variables:

x = -3

y = 5

3x + -4x + 2

My Collection:

x x x

-x -x -x -x

1 1

x²

variable values

all coefficients

0x²

3x - 4x + 2

Game Screen

Challenge yourself to build expressions that match the targets! Play levels 1-3 with coins and 4-8 with variables. Levels 7-8 include challenges with distribution.

RETURN to the level selection screen

REFRESH to get a new set of challenges

BUILD an expression that matches the target

Suggestions for Use

Sample Challenge Prompts

- What are the two different ways to combine coins?
 - What does it mean when you see the yellow glow?
 - What does it mean when you see the background rectangle?
- Build an expression that equals 97 cents.
- Minimize the Total. Build an expression that includes x , y , and z . Set the values for x , y , and z and find the total value for your expression.
- What will happen when you combine x and $-x$?
- Find the “All Coefficients” checkbox. How would you describe a coefficient? How do you change a coefficient?
- Create an expression that is equivalent to $x^2 - 2x^2 + 3y$. How do you know they are equivalent?

See all published activities for Expression Exchange [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).