

Basics and Explore Screens

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

202 cents

2 2

2 2 4 10

2(2) (5) 4(10)

1

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

CANCEL opposite terms

SIMPLIFY subtraction

14

Variables

$y = -3$

$y = 5$

$3x + -4x + 2$

$0x^2$

$3x - 4x + 2$

break apart

rearrange terms

variable values

all coefficients

$+ -x \rightarrow -x$

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 has x , y , and z in it. 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](#).