

The **Equality Explorer: Two Variables** simulation allows students to explore the conditions that result in equality and inequality when there are two variables present. Students can build a system of equations and develop a meaningful understanding of a system of equations.

The screenshot shows the PhET Equality Explorer: Two Variables simulation interface. At the top, the equation  $y - 2 = -x + 3$  is displayed. Below it is a balance scale with a pink 'y' block on the left pan and a blue 'x' block with three white '1' blocks on the right pan. A green arrow points upwards from the center of the scale. To the right, there are controls for variables:  $x = 2$  and  $y = 3$ . Below these are 'Snapshots' showing two equations:  $x + 1 = y$  (with  $x=2, y=3$ ) and  $y - 2 = -x + 3$  (with  $x=2, y=3$ ). A 'RELOAD a snapshot' button is shown with the equation  $y - 2 = -x + 3$  (with  $x=2, y=3$ ). At the bottom, there are toolbars for adding blocks (x, -x, y, -y, 1, -1) and a 'RESET the sim' button. Callout boxes provide instructions: 'OBSERVE the statement reflecting what is on the balance', 'LOCK the balance so that an operation occurs on both sides', 'CONTROL the variable value', 'RELOAD a snapshot', and 'RESET the sim'.

## Insights into Student Use

- Students naturally want to find balanced situations. Encourage them to find as many as possible.

## Suggestions for Use

### Sample Challenge Prompts

- Build a balanced situation using both x and y. Hide the variable values and trade computers with a partner. Can you determine the values of x and y?
- Create an equation using both x's and y's and take a snapshot. Keeping the variable values the same, build a *different* equation and take a snapshot. What do you notice about *both* snapshots? What happens when you substitute the x and y values into both equations?

See all published activities for Equality Explorer: Two Variables [here](#).

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