



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Student Exploration: Solving Formulas for any Variable

**Vocabulary:** formula, solve

**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.)

Laura has \$18.45 left after buying a shirt for \$16.80 and a sweater for \$24.75.

1. How much money did Laura start with? \_\_\_\_\_
2. Explain how you figured this out. \_\_\_\_\_  
\_\_\_\_\_

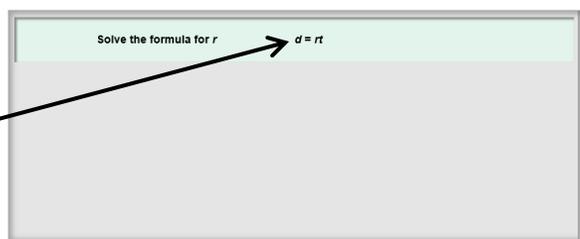
### Gizmo Overview

In the *Solving Formulas for any Variable* Gizmo, you will be given a **formula** (a rule or relationship between variables) expressed as an equation. You will **solve** each formula for a variable, by isolating that variable, step-by-step.

Here's how the Gizmo looks at first:

The formula for you to solve is here.

The tiles give you four choices for the next step. Choose the one you think is correct and drag it into the white area above.



Click **Undo** to undo your last choice.

Click **New** to go to a different problem.

Read your feedback in the Gizmo. (No feedback is given for correct answers.)

Click **Proceed** to go to the next step.



Continue until you solve the formula for the correct variable. Then click **New** for a new problem to work on.



<b>Activity:</b> <b>Solving the formula</b>	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> <li>You should see the formula <math>d = rt</math>. If not, click <b>Refresh</b> in your browser.</li> </ul>	
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- When you begin, you should see the formula shown to the right. This is short for “distance = rate • time.”
 

Solve the formula for $r$	$d = rt$
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  - What mathematical operation “attaches”  $r$  and  $t$  in this formula? \_\_\_\_\_
  - What operation undoes the operation that “attaches”  $r$  and  $t$ ? \_\_\_\_\_
  - Choose the correct step to solve the formula for  $r$ . If your choice is incorrect, read the given feedback and try again. What is  $r$  equal to? \_\_\_\_\_
  
- Click **New**. You should now see the formula shown at the right in the Gizmo. This is the slope-intercept formula.
 

Solve the formula for $x$	$y = mx + b$
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  - The first thing you want to do is isolate the  $mx$  term. What should your first step be?  
\_\_\_\_\_
  - Choose the correct first step. The equation should now be  $y - b = mx$ . What should you do next to isolate  $x$ ? \_\_\_\_\_
  - What is  $x$  equal to? \_\_\_\_\_
  
- Click **Undo** twice to get back to the beginning. You should still be solving  $y = mx + b$  for  $x$ . This time, divide each side by  $m$  first. Choose the correct tile for this step.
  - What simplified equation do you get after dividing? \_\_\_\_\_
  - Choose the next correct step. What is  $x$  equal to? \_\_\_\_\_
  - The result should be the same as the first one. Both methods (subtracting  $b$  first or dividing by  $m$  first) are valid. Tell which method you prefer and why. \_\_\_\_\_  
\_\_\_\_\_
  
- Click **New**. Work through more problems in the Gizmo. Be sure to read the feedback in the Gizmo along the way.

**(Activity continued on next page)**



**Activity (continued from previous page)**

5. Solve each formula for the indicated variable. Write all your steps in the space below each problem.

A. Solve  $C = 2\pi r$  for  $r$ .

D. Solve  $A + B + C = 180$  for  $B$ .

B. Solve  $f = \frac{1}{T}$  for  $T$ .

E. Solve  $V = lwh$  for  $w$ .

C. Solve  $K = C + 273$  for  $C$ .

F. Solve  $S = 180(n - 2)$  for  $n$ .

