Bar Diagrams

Add Parts

The workspace provides an automatic check system.

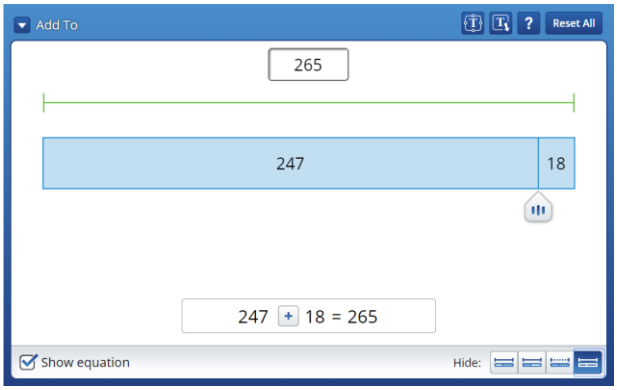
You can see how two values can be combined into a whole.

- You can input 2 values and combine them to create a whole. The parts can be equal or not equal to each other. An equation is shown to match the diagram.
- Make sure that the mode displays Add To in the upper-left shell.
- You can click on the + to change the equation from addition to subtraction.

Practice Using Add To

1. Find the sum of two parts 247 + 18 = ?.
2. Click the toggle button in the bottom shell of the workspace to hide the whole. The equation should change from 10 + 10 = 20 to 10 + 10 = ?.
3. Click on the left part of the bar diagram in the workspace.
   - Enter 247 next to "Enter a value" or enter using the numeric keypad. Then click OK.
4. Click on the right part of the bar diagram.
   - Enter 18 next to "Enter a value" or enter using the numeric keypad. Then click OK.

   The equation should now read: 247 + 18 = ?.
5. Find the value of the missing whole, or the "?," to make the equation true.
   - Click the toggle button to show the full equation with the whole, to see if your answer is correct.



Bar Diagrams

Subtract a Part from the Whole

To view the Take From mode, click to see the drop-down menu and select **Take From**.

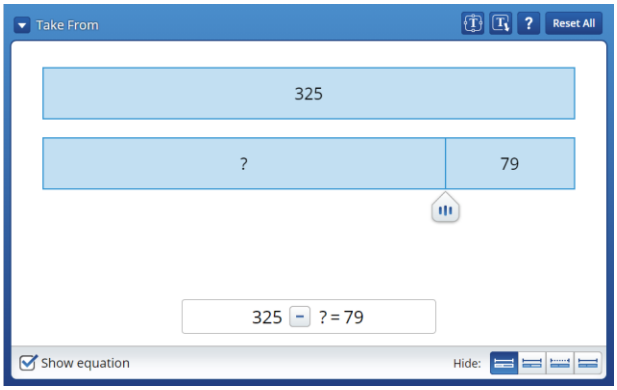
You can subtract a part from a whole, so the sum of the parts equals the whole.

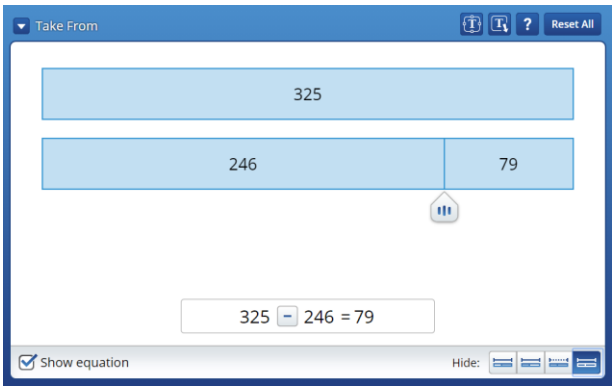
- You can input a number and divide it into 2 parts. The parts can be equal or not equal to each other. An equation is shown to match the diagram.
- You can click on the to change the equation from subtraction to addition.

Practice Using Take From

1. Find the missing part of the equation 325 – ? = 79.
2. Click on the box above the bar diagram in the workspace.
   - Enter 325 next to "Enter a value" or enter using the numeric keypad. Then click OK.
3. Click the toggle button in the bottom shell of the workspace to hide the left part. The equation should change from 325 – 162 = 163 to 325 – ? = 163.
4. Drag the so that the bar diagram shows 79 for the second part and "?" for the first part.

   The equation should now read 325 – ? = 79.
5. Find the value of the missing part, or the "?," to make the equation true.
   - Click the toggle button to show the full equation with the missing part, to see if your answer is correct.





Bar Diagrams

Model Addition and Subtraction

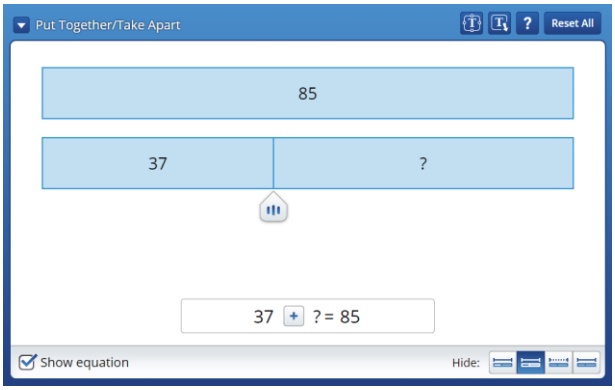
To view the Put Together/Take Apart mode, click to see the drop-down menu and select **Put Together/Take Apart**.

This workspace provides an automatic check system.

You can see how a value can be split into two parts, and compare the whole to each of the parts through addition or subtraction.

- You can input a number or its parts. The parts can be equal or not equal to each other. An equation is shown to match the diagram.
- You can click on to change the equation between addition and subtraction.

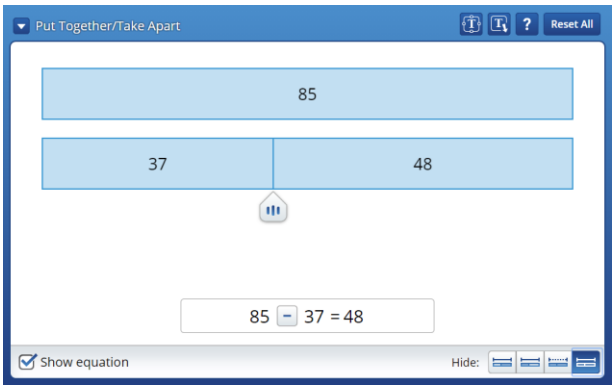
Practice Using Put Together/Take Apart



1. Find a related subtraction equation to solve the equation 37 + ? = 85.
2. Click on the box above the bar diagram in the workspace.
   - Enter 85 next to "Enter a value" or enter using the numeric keypad. Then click OK.
3. Click the toggle button in the bottom shell of the workspace to hide the right part. The equation should change to 42 + ? = 85.
4. Drag the so that the bar diagram shows 37 for the first part and "?" for the second part.

   The equation should now read 37 + ? = 85.
5. Click on and select to change the equation from addition to subtraction.

   The equation should now read 85 – 37 = ?.
6. Find the value of the missing part, or the "?," to make the equation true.
   - Click the toggle button to show the full equation with the difference, to see if your answer is correct.



Bar Diagrams

Comparing Parts By Addition and Subtraction

To view the Compare: Addition and Subtraction mode, click to see the drop-down menu and select **Compare: Addition and Subtraction**.

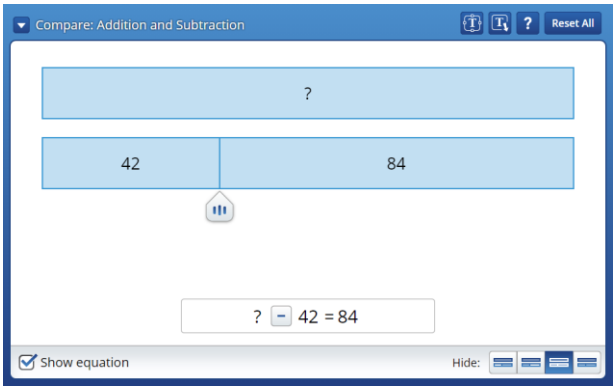
This workspace provides an automatic check system.

You can see how a value can be split into two parts, and compare the whole to each of the parts through addition or subtraction.

- You can click on to change the equation between addition and subtraction.

Practice Using Compare: Addition and Subtraction

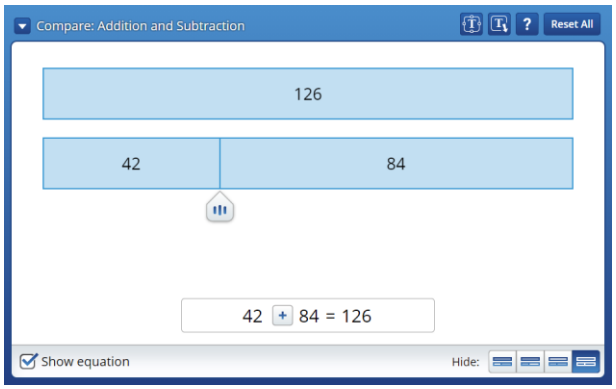
1. Find a related addition equation to solve the equation ? – 42 = 84.
   - Click on and select to change the equation from addition to subtraction.



2. Click the toggle button in the bottom shell of the workspace to hide the whole. The equation should change to ? – 10 = 10.
3. Click on the left part of the bar diagram in the workspace.
   - Enter 42 next to "Enter a value" or enter using the numeric keypad. Then click OK.
4. Click on the right part of the bar diagram.
   - Enter 84 next to "Enter a value" or enter using the numeric keypad. Then click OK.

   The equation should now read ? – 42 = 84.
5. Click on and select to change the equation from subtraction to addition.

   The equation should now read 42 + 84= ?.
6. Find the value of the missing whole, or the "?," to make the equation true.
   - Click the toggle button to show the full equation with the sum, to see if your answer is correct.



Bar Diagrams

Finding Equal Groups

To view the Equal Groups mode, click to see the drop-down menu and select **Equal Groups: Multiplication and Division**.

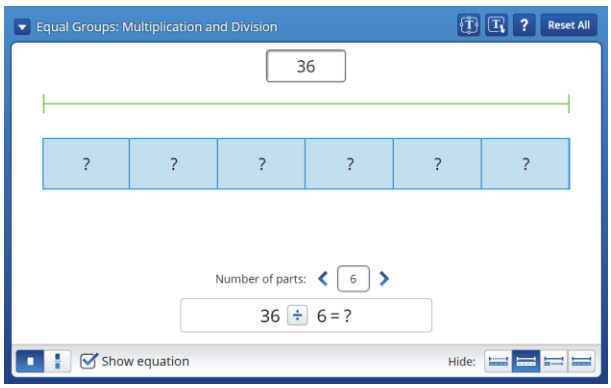
The workspace provides an automatic check system.

You can see how a value can be split into various parts and how parts can be multiplied to make a value. These parts can be whole numbers or fractions.

- You can click on to change the equation from multiplication to division.

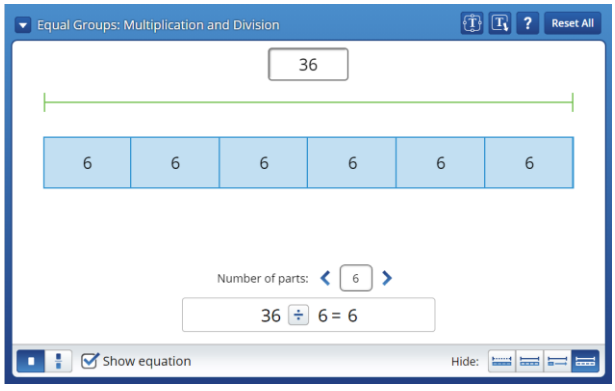
Practice Using Equal Groups

1. Divide 36 into 6 equal groups. Find the value of the groups.
   - Click on the top box in the workspace.
   - Enter 36 next to "Enter a value" or enter using the numeric keypad. Then click OK.
   - Click on and select .



2. Click the toggle button in the bottom shell of the workspace. The equation should change from 36 ÷ 2 = 18 to 36 ÷ 2 = ?.
3. Make sure that the Whole Numbers button is selected in the left part of the bottom shell.
4. Click on the right arrow located under the bar diagram until the box shows "6." 6

   The equation should now read: 36 ÷ 6 = ?.
5. Find the value of the 6 equal groups, or the value of the "?," to make the equation true.
   - Click the toggle button to show the full equation with the missing part, to see if your answer is correct.



6. Divide 25 into 8 equal groups. Find the value of the groups.
7. Click the Reset All button in the top shell above the workspace. Then click OK.
8. Click on the top box in the workspace.
   - Enter 25 next to "Enter a value" or enter using the numeric keypad. Then click OK.

9 Click the  toggle button in the bottom shell of the workspace. The equation should change from $1 \times 25 = 25$ to $1 \times ? = 25$.

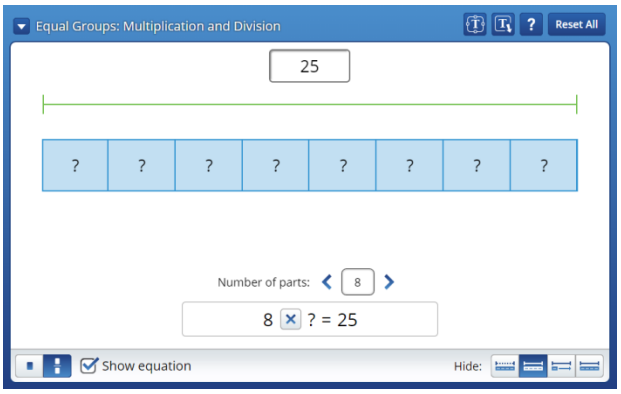
10 Make sure that the fractions button  is selected in the left part of the bottom shell.

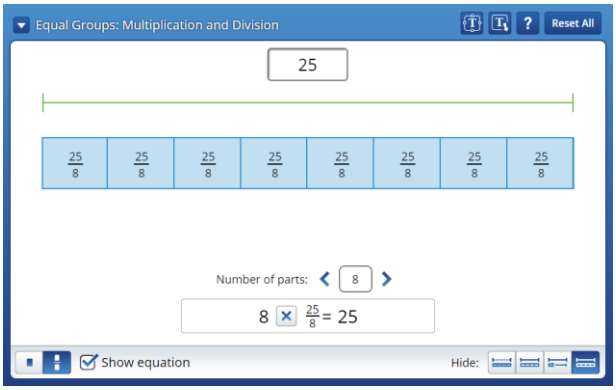
11 Click on the right arrow after the "Number of parts," located under the bar diagram, until the box shows "8". 

The equation should now read $8 \times ? = 25$.

12 Find the value of the 8 equal groups, or the value of the "?," to make the equation true.

- Click the  toggle button to show the full equation with the missing part, to see if your answer is correct.





Bar Diagrams

Comparing Factors

To view the Factor Comparison mode, click to see the drop-down menu and select **Compare: Multiplication and Division**.

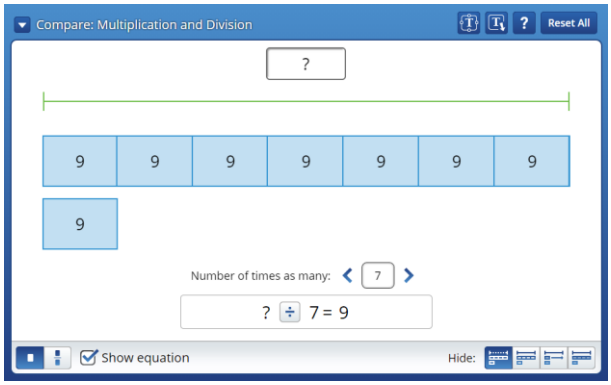
The workspace provides an automatic check system.

You can see how parts can be multiplied to make a value and compare the parts to the whole. These parts can be whole numbers or fractions.

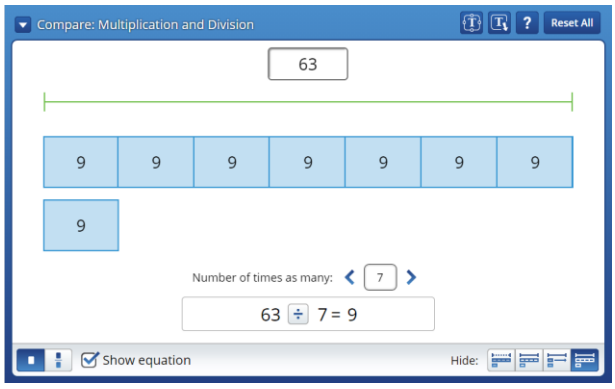
- You can click on to change the equation from multiplication to division.

Practice Using Compare: Division

1. Find the number that, when divided by 7, equals 9.
   - Click on one part of the bar diagram in the workspace.
   - Enter 9 next to "Enter a value" or enter using the numeric keypad. Then click OK.
   - Click on and select .



2. Click the toggle button in the bottom shell of the workspace. The equation should change from 18 ÷ 2 = 9 to ? ÷ 2 = 9.
3. Click on the right arrow located under the bar diagram until the box shows "7." 7
   The equation should now read: ? ÷ 7 = 9.
4. Find the value of the dividend, or the value of the "?," to make the equation true.
   - Click the toggle button to show the full equation with the missing whole, to see if your answer is correct.



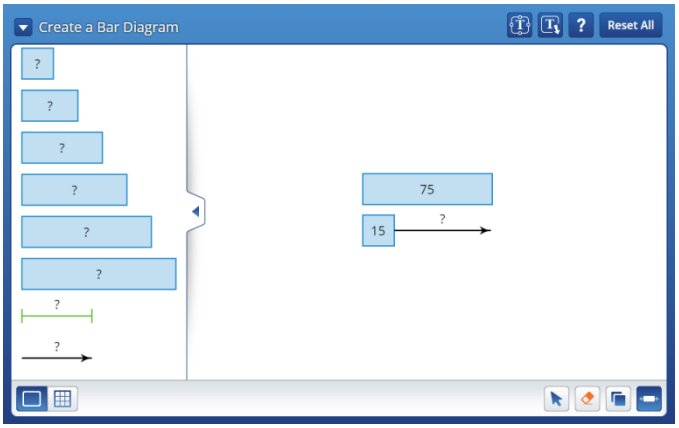
Bar Diagrams

Creating Diagrams

To view the Create a Bar Diagram mode, click to see the drop-down menu and select **Create a Bar Diagram**.

You can construct a bar diagram to model any situation.

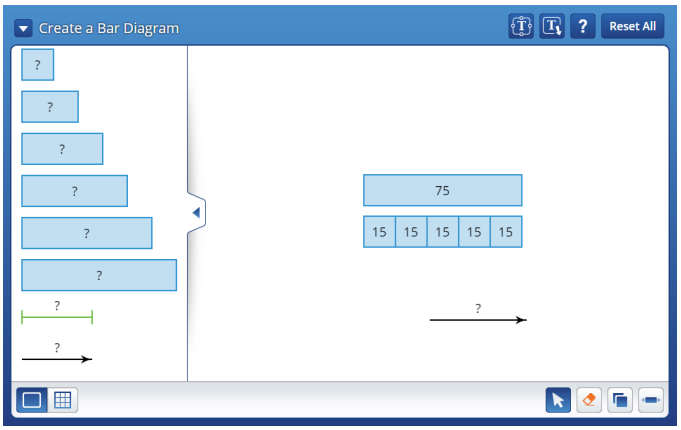
Practice Creating a Bar Diagram



1 Model the problem 75 ÷ 15.

- Click on a medium-sized ? bar from the palette and drag it into the workspace.
- Click on the bar and enter 75 next to "Enter a value" or enter using the numeric keypad. Then click OK.
- Click on the smallest ? bar from the palette and drag it to line up with the left side of the first bar.
- Click on the bar and enter 15 next to "Enter a value". Then click OK.
- Click on the ? → icon and drag it into the workspace.
- Use the to resize the arrow to match the large bar.

  This bar diagram models 75 ÷ 15.



2 Model the problem 75 ÷ 15 = 5.

- Select and click on the 15 bar to make 4 copies.
- Use the to drag the arrow out of the way, and then line up the 15 tiles below the 75 bar.
- Use the to resize the large bar to match the length of the 5 smaller bars.

  This bar diagram models the problem 75 ÷ 15 and its solution, 5.

Additional Features

- Use to erase an element from the workspace.