Size Comparisons Using Percentages

One hundred percent of something is the entire thing. One hundred percent of 1 is 1. One hundred percent of 100 is 100. One hundred percent of 621 is 621. One hundred percent of \( \square \) is \( \square \).

So, an object one hundred percent larger than \( \square \) would have to be \( \square \) since we have increased the size of the original block by one hundred percent of itself.

Two Common Ways to Say the Same Thing:

- \( \square \) is two times the size of \( \square \)
- \( \square \) is 100% larger than \( \square \)

More Examples:

- \( \square \) is three times the size of \( \square \)
- \( \square \) is 200% larger than \( \square \)
- \( \square \) is three times the size of \( \square \)
- \( \square \) is 200% larger than \( \square \)

3 is three times the size of 1
3 is 200% larger than 1
5 is five times the size of 1
5 is 400% larger than 1
8 is four times the size of 2
8 is 300% larger than 2
5 is two and a half times the size of 2
5 is 150% larger than 2
Let's think about that last one with blocks:

In order to get five blocks from two, you must add on two blocks (100% of the original two) and then one block (50% of the original two), so 150% altogether.

A Few More Examples:

10 is ten times the size of 1
10 is 900% larger than 1
8 is four times the size of 2
8 is 300% larger than 2
25 is five times the size of 5
25 is 400% larger than 5

Three Ways of Comparing A to B:

To fill in: \( A \) is ____ times the size of \( B \) just compute \( A/B \).

To fill in: \( A \) is ____ % larger than \( B \) just compute \( (A-B)/B = \% \)
(Another way to think of this formula is to use:
\( \text{Larger} – \text{Smaller})/\text{Smaller} = \% \)

To fill in: \( A \) is ____ % smaller than \( B \) just compute \( (A-B)/B =\% \)
(Another way to think of this formula is to use:
\( \text{Smaller Value} – \text{Larger Value})/\text{Larger Value} = \% \)

Try the following examples to practice this idea, exactly following the steps in the example below:

Example: \( A = 21 \) and \( B = 6 \)

\[
A/B = 21/6 = 3.5 \\
\text{Check: } 6*3.5 = 21 \\
\text{So, } 21 \text{ is 3.5 times the size of six.}
\]

\[
(A-B)/B = (21-6)/6 = 2.5 = 250\% \\
\text{Check: } 250\% \text{ of } 6 \text{ is } 15 \text{ (2.5*6 = 15) and } 6 + 15 = 21 \\
\text{So, } 21 \text{ is } 250\% \text{ more than 6.}
\]

Try: \( A = 3, B = 17 \)
Answer: Since \( A \) is smaller you can’t find “times the size of”; \( A \) is 82.4% smaller than \( B \).