

Simple Editor Randomization

For some kinds of Mastering answers, you can *randomize* question values. You can enter a range of values or a list of specific values. Values can be numbers or strings.

Each student is given a randomly chosen value from each range or list.

Different students get different values, so different answers are correct. This helps discourage cheating.

To randomize, first create variables that store a range or list of values. Then use the variables in questions and answers.

Let's start with two simple numeric variables. To define your first variable, select the dice icon.

Define A with values 1-10 and a step, or difference between values, of 1. The possible values of this variable are 1, 2, 3, and so on through 10.

Save the variable.

Name	Type	List ID	Value
A	Numeric	<input checked="" type="radio"/> Range of values <input type="radio"/> Formula or single numeric value	1 - 10 Step: 1

Define a second variable, B. Values are 2 to 67 with a step of 1.5. So the possible values are 2, 3.5, 5 and so on.

B	Numeric	<input checked="" type="radio"/> Range of values <input type="radio"/> Formula or single numeric value	2 - 67 Step: 1.5
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For more information about the optional settings, select the Help.

Save the variable.

To hide the variables window, select the dice again.

Enter the instruction and the answer that use those variables.

Edit												
Insert			Format			Table						
↶	↷	T _E X	☒	B	<i>I</i>	<u>U</u>	☰	☷	🖼️	🔗	🔧	?
Multiply	A	times	B									

Type "Multiply." Right-click, choose **Insert variable**, choose **A**. Type "times" and insert the variable **B**.

Choose the **numeric value or expression** answer type and enter the correct answer, A times B, in the answer box. Use the asterisk to show multiplication.

$$A*B$$

Answer Answer Type: numeric value or expression ▼

Enter the correct answer. Use Tex for mathematical notation. [Learn more.](#)

Correct answer set has 1 terms.

Correct Answer

[add](#) [add](#)
[solve for](#) [units](#)

[add pre-text](#) [add post-text](#)

Acceptable variation or rounding error: %
Default tolerance is 2%. [Learn more.](#)

Answer format (display of significant figures):
Default display is 3 significant figures. [Learn more.](#)

Select **Save and preview**. You see the item. The variables have been given values, and the correct answer is the product of those values.

Multiply 6 times 66.5 .

□ ∑ φ ↶ ↷ ↻ 🗨 ?

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To see the item with different values, select **Restart work** from the menu.

Standard View Randomized ▼

- Standard View Randomized
- Standard View Non-Randomized
- Solution View Randomized
- Solution View Non-Randomized
- Comments View
- Print View
-
- Restart Work
- Copy and Edit Item
- Edit Item
- Manage Assets
- Manage eText Links

The variable values change and the correct answer is the product of the new values.

Multiply 10 times 17 .



You may want to change the tolerance or the number of significant figures; you can find information on that in the Help. Be a little careful; tolerance and sig figs react with one another. Too few significant figures with too tight a tolerance can make it impossible for a student to answer correctly.

Acceptable variation or rounding error:

Default tolerance is 2%. [Learn more.](#)

Answer format (display of significant figures):

Default display is 3 significant figures. [Learn more.](#)

How did you know to select the answer type **numeric value or expression**? Open the Simple Editor Help by selecting the question mark icon. You see the Simple Editor Overview, which includes a section, "Use the Simple Editor to create these kinds of questions (answer types)." Expand this section to see all the kinds of answers you can currently create or edit in the Simple Editor.

Variable lists and list IDs

Now let's try something a little more spectacular. We're going to ask students a few questions about chemical formulae. The students will randomly see one of several chemical formulae and will answer questions about them. For example, one student might see the formula for nitric acid and be asked to enter the common name; another might see the same question but about sulfuric acid.

To make this work, use variable lists and list IDs.

- Variable lists are lists of possible values. They can be numeric or string values.
- List IDs connect variable lists together.

We'll ask students

- What the chemical formula of a compound is, given the common name
- The converse, what the common name is, given the chemical formula
- How many hydrogen atoms it has

You'll learn

- How to use lists and list IDs
- How to display a variable in instructions, and
- How to use a string variable in an answer

Let's define a variable that is a string list. The variable name is **chemformula**, short for chemical formula. We give it a list ID, 1, and three possible values, H₂SO₄, HNO₃, and H₂O.

Define another string list variable that is the common name of the compound. Let's call it **commonnameUS**. In a moment you'll see why it's called "US."

Here's the magic: We also give this list the list ID of **1** and make the two lists the same length. If Mastering randomly chooses value 2 from the first variable list in the item, it uses value 2 from any other variable list with the same list ID in the same item.

Suppose we ask students to enter the chemical formula for commonnameUS. Enter the **commonnameUS** variable in the instructions. Use the chemical formula or expression answer type and the answer **:chemformula:**

The colons before and after the variable name are magic to indicate that **:chemformula:** is a variable. Otherwise, Mastering will expect that the correct answer is always the string "chemformula".

Save and preview.

Now ask students to enter the common name of the chemical. There are two tricks here.

Trick 1: In the instructions, you want to display the chemical formula in a pretty way. You use a display language called TeX, which is an educational standard. You can learn more about TeX and see examples in the Help.

Set up a variable, **displayname**, that contains the formulas in TeX. Enter the formula, select it, then select **TeX** from the editor.

Use the **simple text input** answer type. Mastering picks a random value for **displayname**, then looks in the same place on the list for the correct value of **commonnameUS**.

So if Mastering chooses nitric acid as the value of **chemformula**, then in the same item, the value of **displayname** is also nitric acid.

Mastering picks a random value for **displayname**, then looks in the same place on the list for the correct value of **chemformula**.

▼ commonnameUS	List - String	1	sulfuric acid
			nitric acid
			water
▼ chemformula	List - String	1	H_2SO_4
			HNO_3
			H_2O
▼ displayname	List - String	1	<tex>H_2SO_4&l.....
			<tex>HNO_3<.....
			<tex>H_2O</.....

But, Trick 2: Suppose you're teaching a class in Australia or the Caribbean. Your students come from different cultures with different ways of spelling. You can get Mastering to accept either American or British spellings.

Define another string list variable, identical except for the spelling of sulfuric acid. Call it **commonnameUK**. Add both variables as correct answers.

Answer Answer Type: simple text input ▼

Enter the correct answer. The correct answer may not contain HTML or TeX markup. [Learn more](#)

Correct answer set has 1 terms.

Case Sensitive

[add pre-text](#) Correct Answer [add post-text](#)

[delete additional answer](#)

Correct Answer

[add an additional correct answer](#)

Numeric lists act like string lists. Suppose we want to ask how many hydrogen atoms there are in **commonnameUS**. We define a numeric list variable, a list of specific numbers. We use the same list ID, 1, and the list is the same length as our other lists. Use the **numeric value or expression** answer type. Edit the answer format so the answer appears as an integer. Select **Learn more** to learn about displaying numbers.

Randomization has many more features, including wrong answer feedback. For more information, see the online Help.

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