=RAND()

Generates a random number between 0 and 1

Simplest random number generator. Excel will produce a number to about 15 decimal points. Multiply the result in order to achieve larger / integer numbers.

Examples:

=RAND()  Returns a random number, e.g. 0.738915316438748
=RAND()*10  Returns a random number and then multiplies by 10, e.g. 7.38915316438748
=RAND()*1000  Returns a random number and then multiplies by 1000, e.g. 738.915316438748

Tips:

Combine with =ROUND() in order to reduce/eliminate the decimal points.

=ROUND(RAND(),2)  Returns a random number and then rounds to two decimal points, e.g. 0.74
=ROUND(RAND()*10000,-2)  Returns a random number, multiplies by 10,000 then rounds to the nearest 1000, e.g. 7000
=ROUND(RAND()*10,0)  Randomly generates a number, multiplies it by 10, then rounds to a whole number (no decimals), e.g. 7

Notes:

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=RANDBETWEEN(bottom,top)

Generates a random number between two specified numbers. “Bottom” is the lowest possible number in the range, “top” is the highest possible number.

Useful if you want to limit the possibilities to a specific range, or if the calculation is meaningful only over a certain range of numbers.

Examples:

=RANDBETWEEN(1,10)       Returns a random number between 1 and 10
=RANDBETWEEN(200,500)     Returns a random number between 200 and 500

Tips:

Combine with VLOOKUP() in order to randomly select text from a sequential list. Very useful to produce randomly-generated questions that are non-numerical (see VLOOKUP() below).

Unlike RAND(), RANDBETWEEN() returns a whole number (integer). Much easier than using RAND() and then multiplying and rounding!

Notes:
=ROUND(number,digits)

Rounds the result of a formula to the specified number of digits

A positive number for “digits” means after the decimal, a negative number means before

Useful if you want to have “round” numbers, or a specified number of digits (e.g. dollars and cents).

Examples:

=ROUND(3.1415927,2)  
Returns 3.14

=ROUND(3.1415927,0)  
Returns 3

=ROUND(31415.927,-2)  
Returns 31400

=ROUND(RANDBETWEEN(1,100000),-2)  
Randomly generates a number between 1 and 100,000, then rounds it to the nearest 1,000

Tips:

Useful when creating solution keys. Give instructions to students on how many decimal points to carry their calculations (e.g. “Calculate to the nearest dollar”), then round the answer key to the same number of decimal places.

Also very useful when using RAND() in order to limit the number of decimal places and make the randomly-generated numbers easier to manage.

ROUND() follows standard rounding convention, i.e. 4 or less rounds down, 5 or more rounds up.

Variations on ROUND() include ROUNDUP(number,digits), which always rounds up (e.g. ROUNDUP(3.100415,0) would round to 4) and ROUNDDOWN(number,digits), which always rounds down (e.g. ROUNDDOWN(7.98974,0) would round to 7).

Notes:
RAND(OM) THOUGHTS

Using Microsoft Excel to Create Unique Student Assessments

&

Combines two strings of characters together

Useful for combining written text with the results of a formula. Very useful for creating questions with randomly-generated numbers!

Examples:

= "Today is June " & RANDBETWEEN(1,30)  
  Today is June 7 (or other random number)

= "Calculate the hypotenuse of a triangle whose sides are " & RANDBETWEEN(1,10) & " and " & RANDBETWEEN(1,10) & "."
  Randomly generates two numbers, then combines the results into the text, e.g.:  
  Calculate the hypotenuse of a triangle whose sides are 4 and 7.

= "Prepare the balance sheet for Jones Inc. on December 31, " & RANDBETWEEN(2015,2020)  
  Randomly generates a number between 2015 and 2020 and combines the result into the text, e.g.:  
  Prepare the balance sheet for Jones Inc. on December 31, 2019

Tips:

Punctuation and spaces, especially between two formulas, has to be presented as a separate text string, e.g. & " _ _ " & (in the example above, the word " and ", including the spaces on either side of the word, is presented as a separate text string).

Notes:
VLOOKUP(value,table,index,range)

“value” is the number you want to match to a list of data.

“table” is a range of Excel cells (e.g. A10:K43) that contain the data you wish to pull from. Make sure the range includes all of the cells from which you want to pull the data.

“index” is the number of columns to the right of the table from where you want to pull the data. The left-most column is 1. If you want to pull data from the third column, you would enter 3.

“range” is either True or False. If True, Excel will find the closest match to “value” (e.g. if “value” is 3.7, and the list in the first column of the table is 1, 2, 3, 4, Excel will match with 3). If False, Excel will only accept an exact match (e.g. if “value” is 3.7, and the list in the first column of the table is 1, 2, 3, 4, Excel will not find a match and return “0”).

Examples:

Assume the following Excel spreadsheet:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Monday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Tuesday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Wednesday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Thursday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Friday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Saturday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Sunday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

=VLOOKUP(5,A1:B7,2,FALSE)  
Returns “Friday”

=VLOOKUP(3.75,A1:B7,2,TRUE)  
Returns “Wednesday”

=VLOOKUP(RANDBETWEEN(1,7),A1:B7,2,FALSE)  
Randomly generates a number between 1 and 7, looks up that value in the table, and returns the text, e.g.: “Thursday”

Tips:

In the table of data, the “lookup column” (the first, left-hand column) MUST be in ascending order (i.e. 1, 2, 3 …)

There is no real limit to the number of columns from which you can pull data, but the more columns you have, the more difficult it is for you to keep them all straight (Excel has no problem with a lot of columns; it’s the human operator who gets confused!)
Putting it all Together

How to create randomly-generated non-numerical questions:

1) Create a table in Excel with the terms you want to randomly generate

![Excel Table Example]

2) In cell D1, add a formula: =RANDBETWEEN(1,8)

3) The formula to randomly generate the question is:

   ="Who was the "&RANDBETWEEN(4,25)&"th "&VLOOKUP(D1,A1:C8,2,FALSE)&" of "&VLOOKUP(D1,A1:C8,3,FALSE)&"?"

Examples of results:

   Who was the 13th Prime Minister of Canada?
   Who was the 15th Emperor of Japan?
   Who was the 15th President of United States?
   Who was the 9th President of Mexico?

Notes:
Questions? Need help?

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