

Forested area, released item #3 (CMA161Q03)

PISA 2022

Forested Area

Question 3 / 4

How to Use the Spreadsheet

Refer to "Forested Area" on the right. Use the spreadsheet to help you answer the question below. Select from the drop-down menus to answer the question.

Consider the two time periods: 2005 to 2010 and 2010 to 2015.

In terms of percentage points, which two countries had the biggest change in the percent of forested area from one **time period** to the other time period?

Answers: and

FORESTED AREA

The spreadsheet below shows the amount of forested area as a percentage of the total land area in each of the 15 countries in this data set. Data are shown for the years 2005, 2010, and 2015.

Column A	Column B	Column C	Column D	Column E	Column F	Column G
Country	2005	2010	2015	↺ X	↺ X	↺ X
India	22.77	23.47	23.77	0.70	0.30	0.40
United States	33.26	33.7	33.85	0.44	0.15	0.29
Algeria	0.64	0.81	0.82	0.17	0.01	0.16
Peru	59.01	58.45	57.79	-0.56	-0.66	0.10
South Korea	64.42	64.08	63.69	-0.34	-0.39	0.05
Germany	32.66	32.73	32.76	0.07	0.03	0.04
Portugal	36.52	35.89	35.25	-0.63	-0.64	0.01
Thailand	31.51	31.81	32.1	0.30	0.29	0.01
Senegal	45.05	44.01	42.97	-1.04	-1.04	0.00
Lebanon	13.34	13.38	13.42	0.04	0.04	0.00
Greece	29.11	30.28	31.45	1.17	1.17	0.00
Kazakhstan	1.24	1.23	1.23	-0.01	0.00	-0.01
Panama	64.33	63.21	62.11	-1.12	-1.10	-0.02
Armenia	11.77	11.74	11.77	-0.03	0.03	-0.06
Colombia	54.26	52.85	52.73	-1.41	-0.12	-1.29

Calculate

Column E Subtract Column F Run

Mean Column Run Clear All

In the third item in this unit, students are again told to consider the data in terms of the two time periods, 2005 to 2010 and 2010 to 2015, but this time they are asked to identify the two countries that had biggest change in their percentage of forested area from one time period to the other time period. Answers are given by selecting the country name from a drop-down menu. The order that the countries are given in the response does not matter.

One possible solution method, which is reflected in the image above, is to perform the following sequence of operations using the spreadsheet (Note that these two calculations are the same two calculations that could also be performed in the second item in the unit):

- "Column C subtract Column B" (the results of that operation are shown in Column E), which represents the change in the percentage of forested area for the time period 2005 to 2010.
- "Column D subtract Column C" (the results of that operation are shown in Column F), which represents the change in the percentage of forested area for the time period 2010 to 2015.

Once the students have calculated the change in the percent of forested area for each time period, they need to compute the change between the two time periods by performing a calculation such as "Column E subtract Column F" (the results of that operation are shown in Column G). Students may also find it helpful to sort the results in Column G.

The two countries with the biggest change between time periods are India (0.40 percentage points) and Colombia (-1.29 percentage points). Full credit is given for correctly identifying both countries, and partial credit is given for correctly identifying one country.

This is a very difficult item that scaled at Level 6 on the proficiency scale. Partial credit was also difficult at Level 5, and similar to the first item in the unit, requires doing the same work that is needed for a full-credit response. Students again have to devise a strategy for using the spreadsheet, which this time requires performing multiple operations, before being able to evaluate the results with respect to the context. Possibly contributing to the difficulty of this item is recognising that “biggest change” in this context does not just mean an increase, and in fact, one of the correct answers is the country with the biggest decrease in its percentage of forested area between time periods. However, unlike previous items in this unit, the correct countries can still be identified even if the signs of the results are reversed (due to the order that operations are performed) because students are looking for change in term of the absolute value, and not interpreting the results specifically as increases or decreases.

Unit Name – Item #	Forested Area – CMA161Q03
Content Area	Uncertainty and data
Process	Interpret/Evaluate
Context	Societal
Item Format	Complex Multiple Choice - Computer Scored
Answers	Full Credit: India and Colombia [in any order] Partial Credit: Only one selection is correct (other selection is incorrect or missing)
Proficiency Levels	6 (full credit) 5 (partial credit)