

Forested area, released item #2 (CMA161Q02)

PISA 2022

Forested Area

Question 2 / 4

How to Use the Spreadsheet

Refer to "Forested Area" on the right. Use the spreadsheet to help you answer the question below. Click on a choice to answer the question.

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

Which one of the following statements correctly describes the mean change in the percentage of forested area for both time periods?

The mean change was positive for both time periods.
 The mean change was negative for both time periods.
 The mean change was the same for both time periods.
 The mean change was positive for one time period, and negative for the other time period.

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
Algeria	0.64	0.81	0.82	0.17	0.01	
Armenia	11.77	11.74	11.77	-0.03	0.03	
Colombia	54.26	52.85	52.73	-1.41	-0.12	
Germany	32.66	32.73	32.76	0.07	0.03	
Greece	29.11	30.28	31.45	1.17	1.17	
India	22.77	23.47	23.77	0.70	0.30	
Kazakhstan	1.24	1.23	1.23	-0.01	0.00	
Lebanon	13.34	13.38	13.42	0.04	0.04	
Panama	64.33	63.21	62.11	-1.12	-1.10	
Peru	59.01	58.45	57.79	-0.56	-0.66	
Portugal	36.52	35.89	35.25	-0.63	-0.64	
Senegal	45.05	44.01	42.97	-1.04	-1.04	
South Korea	64.42	64.08	63.69	-0.34	-0.39	
Thailand	31.51	31.81	32.1	0.30	0.29	
United States	33.26	33.7	33.85	0.44	0.15	
	33.33	33.18	33.05	-0.15	-0.13	

Calculate

Column D Subtract Column C Run

Mean Column D Run Clear All

In the second item in this unit, students are told to consider the data in terms of two time periods, 2005 to 2010 and 2010 to 2015, and then asked to identify the statement that correctly describes the mean change in the percentage of forested area for each time period.

One possible solution method is to have the spreadsheet compute the mean of Columns B, C, and D and just notice that it decreased from 2005 to 2010 (from 33.33 down to 33.18) and that it also decreased from 2010 to 2015 (from 33.18 down to 33.05). Since the mean change decreased in each time period, the correct answer is that "The mean change was negative for both time periods."

Students may also choose to perform a sequence of operations, such as:

- "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.
- Compute the mean of Columns E and F.

This is a difficult item that scaled at Level 5 on the proficiency scale. Students again have to devise a strategy for using the spreadsheet but this time there is more flexibility in how the spreadsheet can be used before having to interpret the results. Possibly contributing to the difficulty of this item is having to correctly interpret "change" in the context of the problem, when the results can be either positive or negative depending on what operations the student performs, and the order in which they perform them.

Unit Name – Item #	Forested Area – CMA161Q02
Content Area	Uncertainty and data
Process	Interpret/Evaluate
Context	Societal
Item Format	Simple Multiple Choice - Computer Scored
Answer	The mean change was negative for both time periods.
Proficiency Level	5