



Tips and Tools for Learning Improvement

Answer Key | Measurement - Variation vs. Improvement

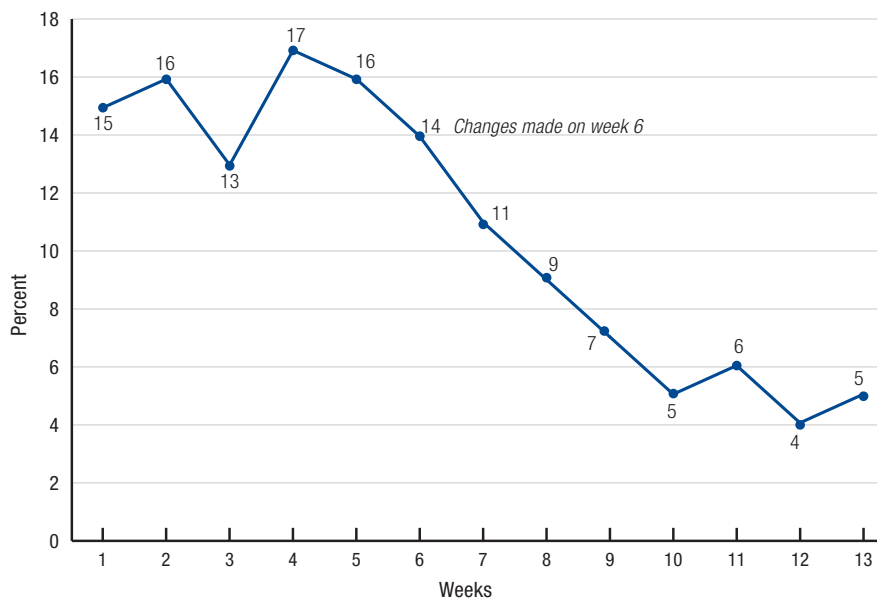
Exercise 1: Calculating a median

Data set	Line up the numbers in numerical order	Median
52, 41, 44, 60, 77, 41, 58	41 41 44 52 58 60 77	52
10, 6, 15, 20, 7, 3	3 6 7 10 15 20	8.5
4, 8, 0, 2, 4, 2, 6, 7	0 2 2 4 4 6 7 8	4
11, 82, 33, 59, 25, 71	11 25 33 59 71 82	46

Exercise 2: Determining variation or improvement

Example 1

Percentage of newborns with sepsis at 7 days of life, District Referral Hospital (Weeks 1-13)



**What can you tell from this graph?
Check the right answer.**

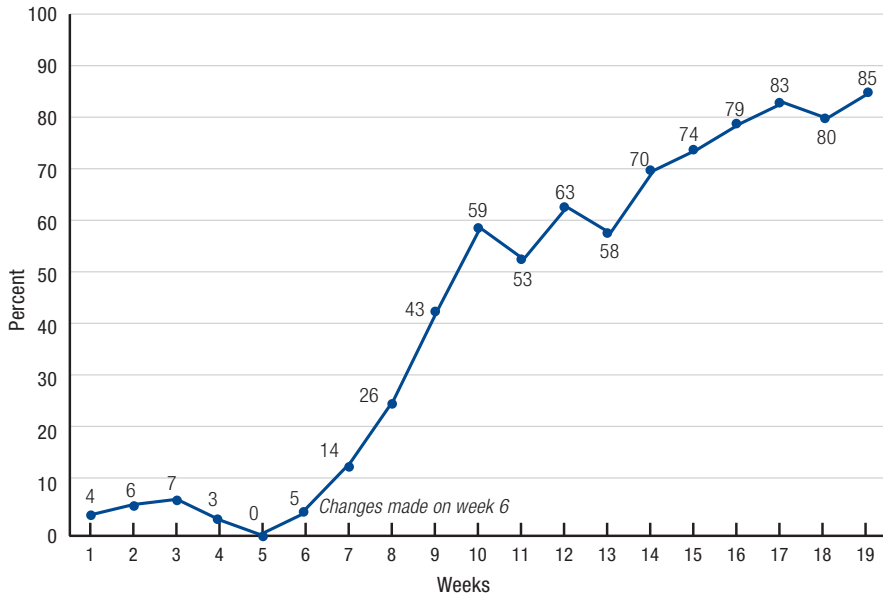
- It shows improvement
- It does not show improvement
- I can't tell. I need to do more analysis

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Example 2

Percentage of delivering women with correctly filled partograms, maternity ward (Weeks 1-19)

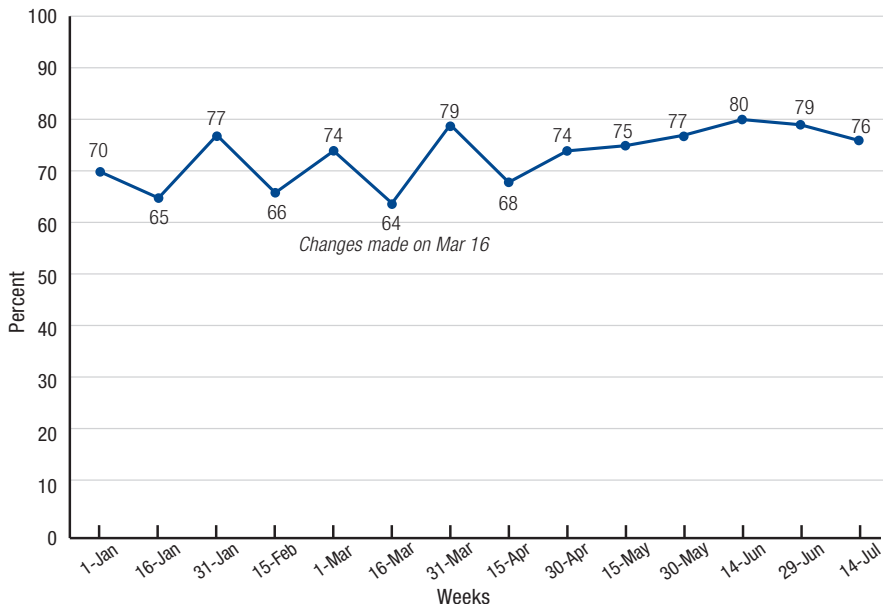


What can you tell from this graph?
Check the right answer.

- It shows improvement
- It does not show improvement
- I can't tell. I need to do more analysis

Example 3

Percentage of TB-HIV co-infected patients on ART, Clinic A (Jan 1 - Jul 14)

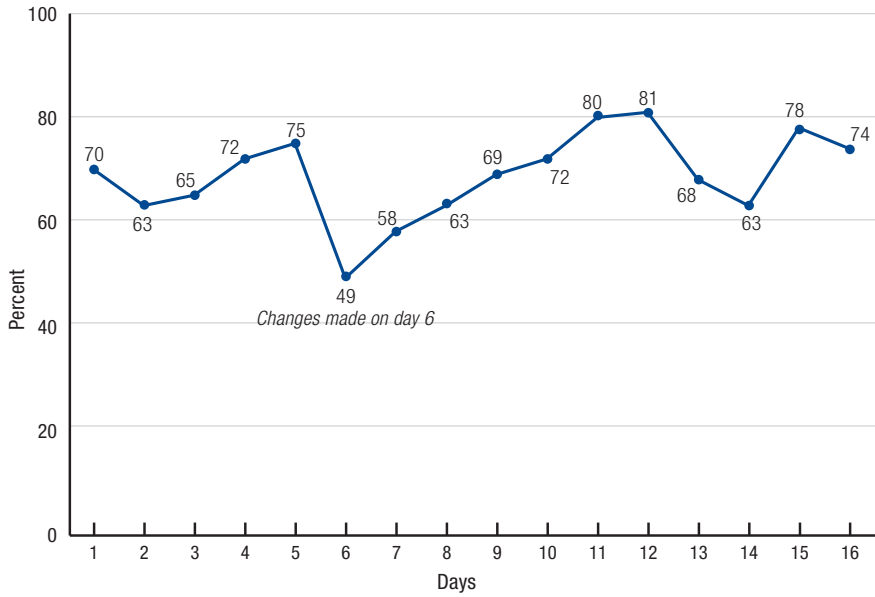


What can you tell from this graph?
Check the right answer.

- It shows improvement
- It does not show improvement
- I can't tell. I need to do more analysis

Example 4

Percentage of vulnerable children sleeping under bednets in Rural Community #3 (Days 1-16)



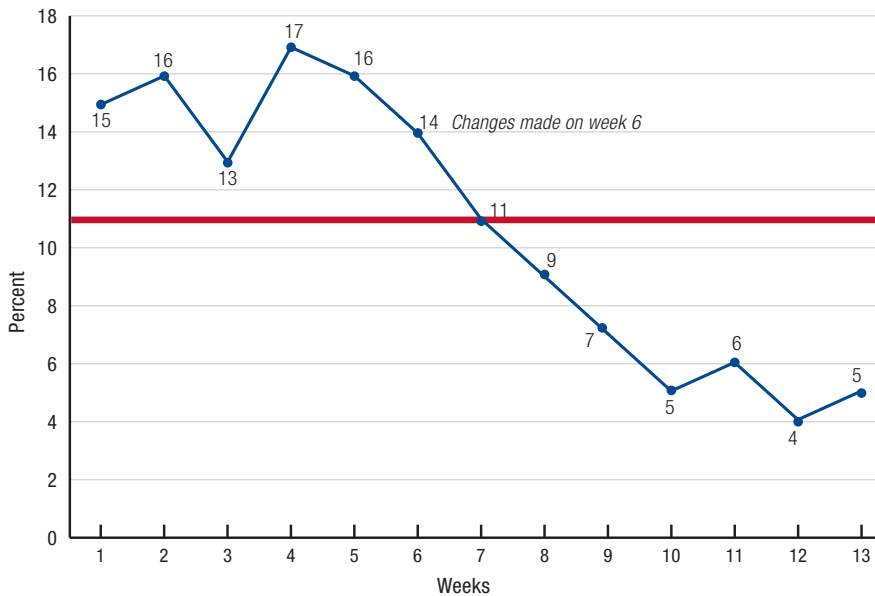
**What can you tell from this graph?
Check the right answer.**

- It shows improvement
- It does not show improvement
- I can't tell. I need to do more analysis

Exercise 3: Practicing run chart rules

Example 1

Percentage of newborns with sepsis at 7 days of life, District Referral Hospital (Weeks 1-13)



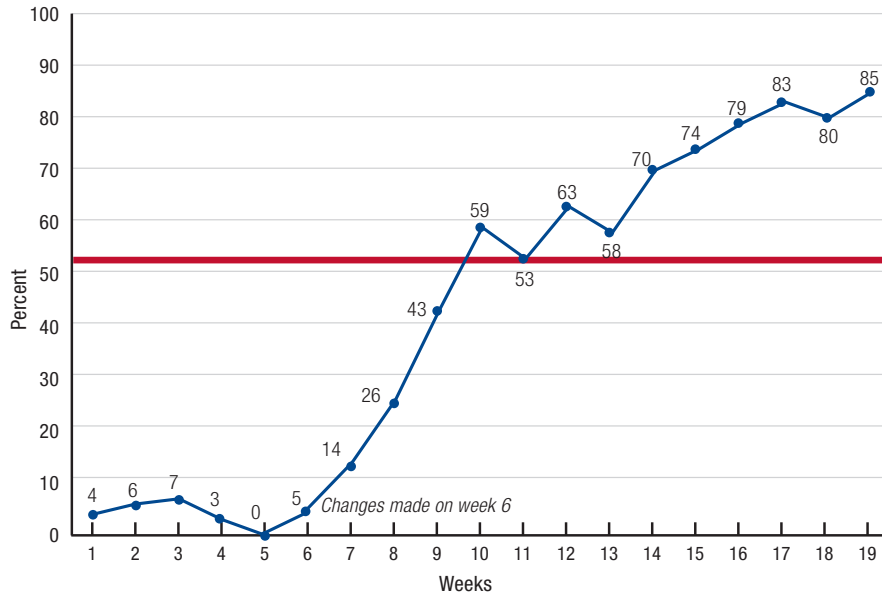
Circle or write in the answer

Analysis question

- At least 10 data points? Yes No
- Do at least 5 points continue up or down in the same direction? Yes No
- Is there a trend? Yes No
- What is the median? (write in and draw on graph) 11
- Are there 6 or more points above or below the median? Yes No
- Is there a shift? Yes No
- Does this graph show improvement? Yes No

Example 2

Percentage of delivering women with correctly filled partograms, maternity ward (Weeks 1-19)



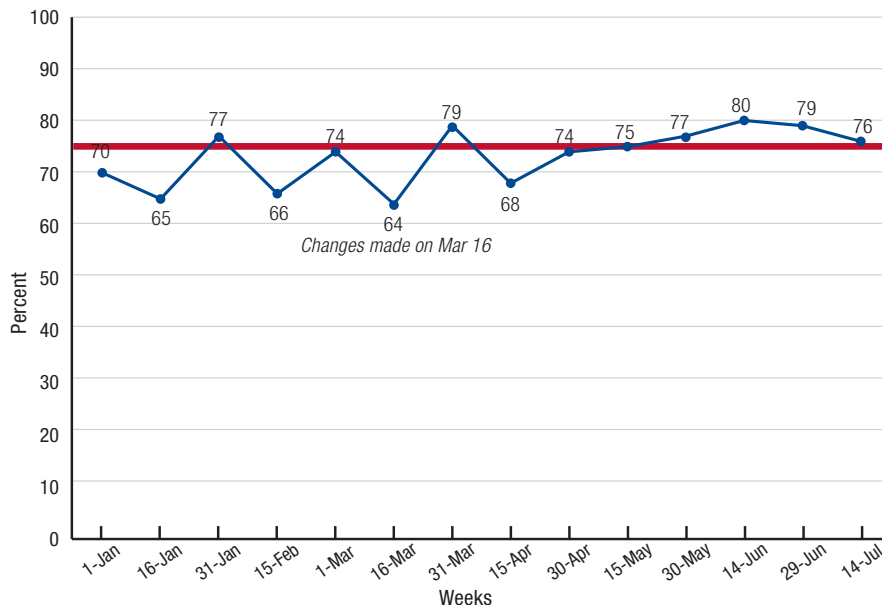
Circle or write in the answer

Analysis question

- At least 10 data points? Yes No
- Do at least 5 points continue up or down in the same direction? Yes No
- Is there a trend? Yes No
- What is the median? (write in and draw on graph) 53
- Are there 6 or more points above or below the median? Yes No
- Is there a shift? Yes No
- Does this graph show improvement? Yes No

Example 3

Percentage of TB-HIV co-infected patients on ART, Clinic A (Jan 1 - Jul 14)



Circle or write in the answer

Analysis question

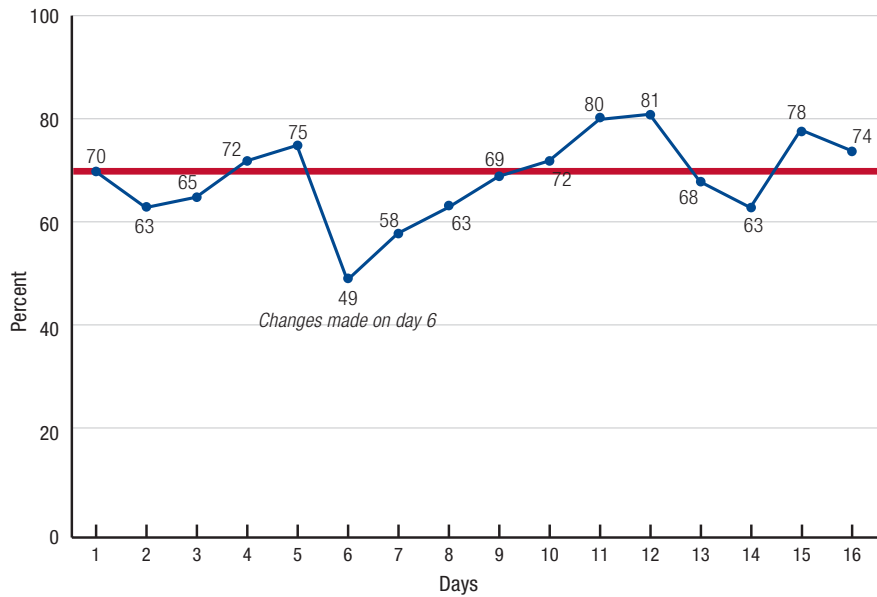
- At least 10 data points? Yes No
- Do at least 5 points continue up or down in the same direction? Yes No
- Is there a trend? Yes No
- What is the median? (write in and draw on graph) 74.5
- Are there 6 or more points above or below the median? Yes No
- Is there a shift? Yes No
- Does this graph show improvement? Yes No

There is no trend here. You begin counting with the first data point going up, in this case Apr 30 (74). There are only 4 points.

The data show that there appears to be a change in the right direction towards improved performance. There are currently 5 points above the median. If the next point turns out to be above the median, then we would have a shift and could claim improvement in the process.

Example 4

Percentage of vulnerable children sleeping under bednets in Rural Community #3 (Days 1-16)



It is not clear whether improvement will be sustained as the last few points on the graph are dropping. An improvement team would want to watch performance carefully and make note of anything that might be hindering performance.

There are options for more advanced analysis which are not covered here and not expected for the learner to know. For example, you can compare the median for the baseline period (days 1 – 6) with the median after the baseline (days 7 – 16). In this case, the baseline median is 67.5 and the median for the period after changes were made is 70.5 which shows improvement. We may be seeing a new variation pattern at the end of the graph. We would need more data points to understand exactly what is happening.

Analysis question	Circle or write in the answer
At least 10 data points?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Do at least 5 points continue up or down in the same direction?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Is there a trend?	<input checked="" type="radio"/> Yes <input type="radio"/> No
What is the median? (write in and draw on graph)	69.5
Are there 6 or more points above or below the median?	Yes <input checked="" type="radio"/> No
Is there a shift?	Yes <input checked="" type="radio"/> No
Does this graph show improvement?	<input checked="" type="radio"/> Yes <input type="radio"/> No <i>between days 6 and 12</i>