Reasoning and Problem Solving
Step 1: Read and Interpret Line Graphs

National Curriculum Objectives:

Mathematics Year 5: (5S2) Solve comparison, sum and difference problems using information presented in a line graph

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Read and interpret the line graph to work out which set of data it is presenting. Graphs use labelled increments of 2, 5 or 10. Data points fall on labelled increments.
Expected Read and interpret the line graph to work out which set of data it is presenting. Graphs use labelled increments of any value, for example: 3's, 9's. Data points fall on labelled increments.
Greater Depth Read and interpret the line graph to work out which set of data it is presenting. Graphs use labelled increments of any value, for example: 20's, 200's, 50's or 500's. Most data points are between labelled increments where the minor lines are shown but not labelled. Some reading between labelled increments of 2, 5 or 10 where an estimate of the value must be given.

Questions 2, 5 and 8 (Problem Solving)
Developing Read and interpret the line graph to identify and explain the mistake. Graphs use labelled increments of 2 or 10. Some data points are halfway between labelled increments where the halfway lines are shown but not labelled.
Expected Read and interpret the line graph to identify and explain the mistake. Graphs use labelled increments of 5 and 10. Some data points fall between labelled increments where the minor lines are shown but not labelled.
Greater Depth Read and interpret the line graph to identify and explain the mistake. Graphs use labelled increments of any value, for example: 20's, 200's, 50's or 500's. Most data points are between labelled increments where the minor lines are shown but not labelled. Some data points fall between labelled increments of 2, 5 or 10 where an estimate of the value must be given.

Questions 3, 6 and 9 (Reasoning)
Developing Explain if an interpretation about a line graph is correct. Reading between labelled increments of 2, where an estimate of the value must be given.
Expected Explain if an interpretation about a line graph is correct. Some readings fall between labelled increments of 2 or 5, where an estimate of the value must be given. Some data of time ,shown on the x-axis, have labelled o'clock times and minor lines show unlabelled half past the hour times.
Greater Depth Explain if an interpretation about a line graph is correct. Graphs use labelled increments of any value, for example: 20's, 200's, 50's or 500's. Most data points are between labelled increments where the minor lines are shown but not labelled.

More Year 5 Statistics resources.

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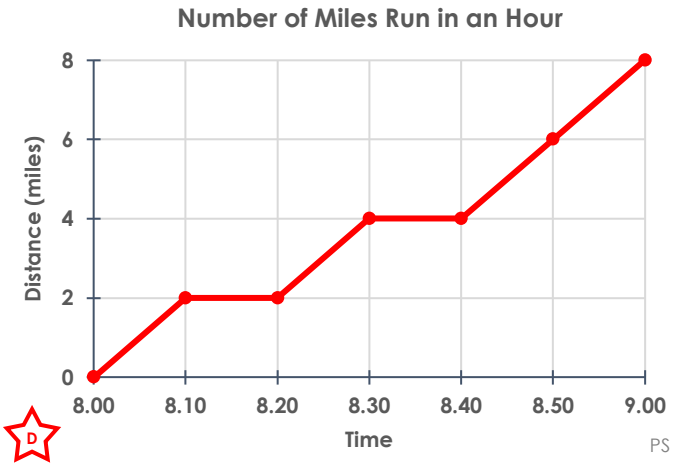
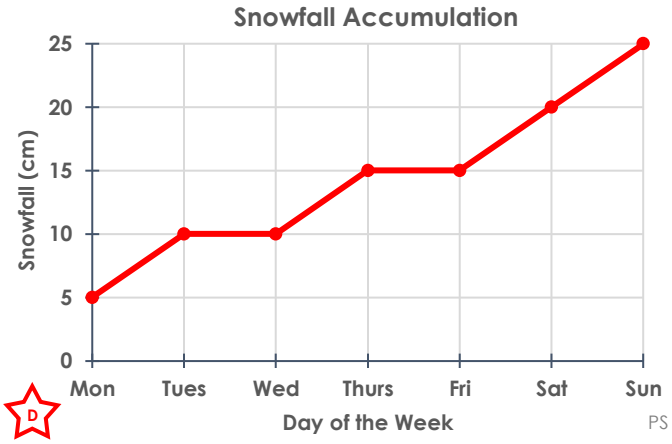
Read and Interpret Line Graphs

Read and Interpret Line Graphs

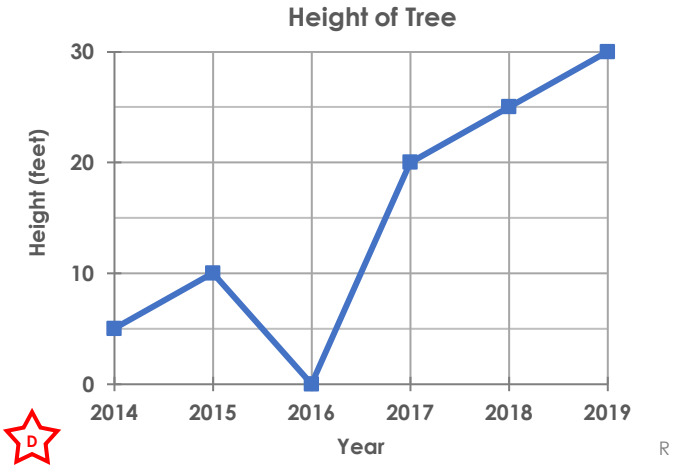
1a. By 8.50am, Bella had run 5 miles and Seth had run 6 miles. Whose performance is shown on the line graph?



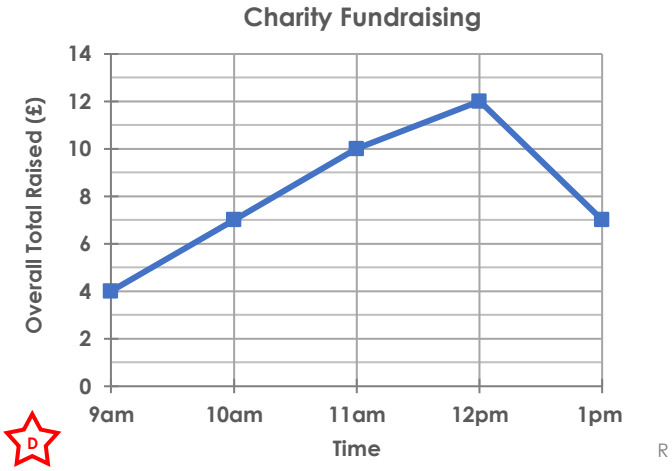
1b. Between Monday and Thursday, 5 cm of snow fell in Alaska, and 10 cm fell in Greenland. Which country is represented on the line graph?



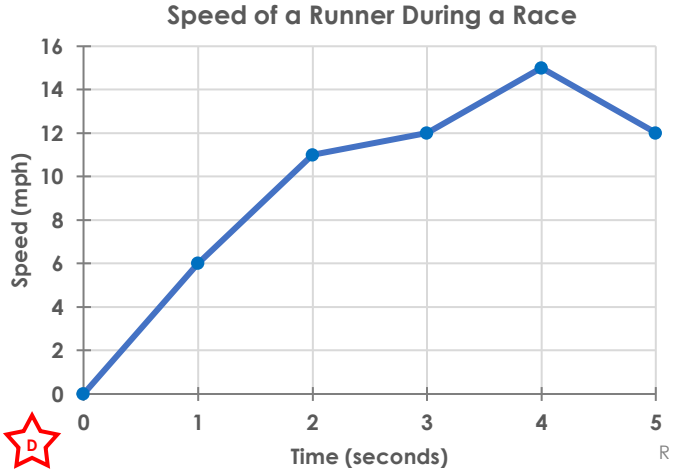
2a. Jen made a mistake when she plotted her line graph. Where do you think the mistake was made? Convince me.



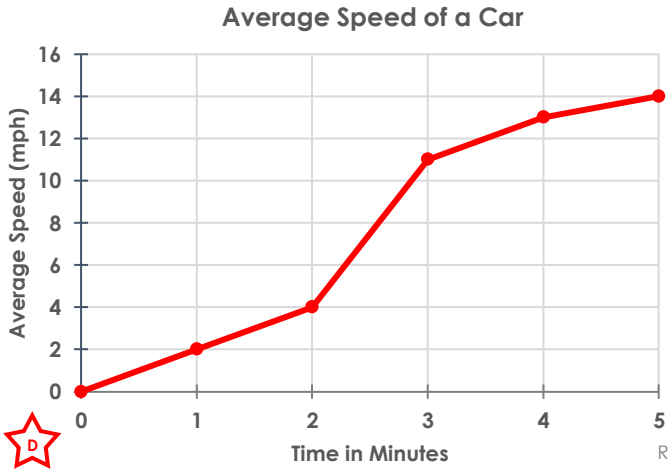
2b. Simon made a mistake when he plotted his line graph. Where do you think the mistake was made? Convince me.



3a. Freddie said that the runner took 5 seconds to reach their top speed. Is he correct? Explain why.



3b. Lily said that the average speed of the car decreased after 4 minutes. Is she correct? Explain why.



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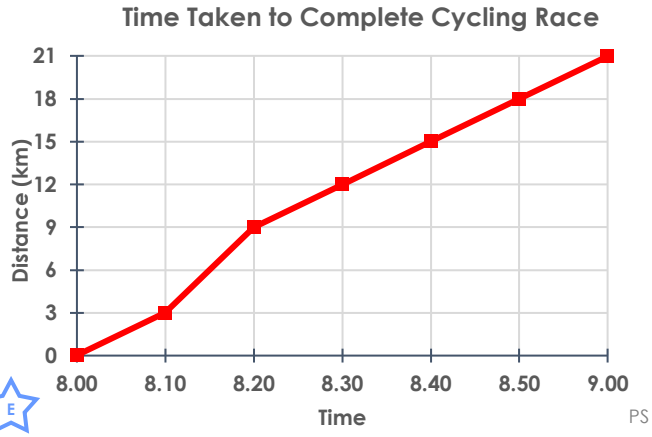
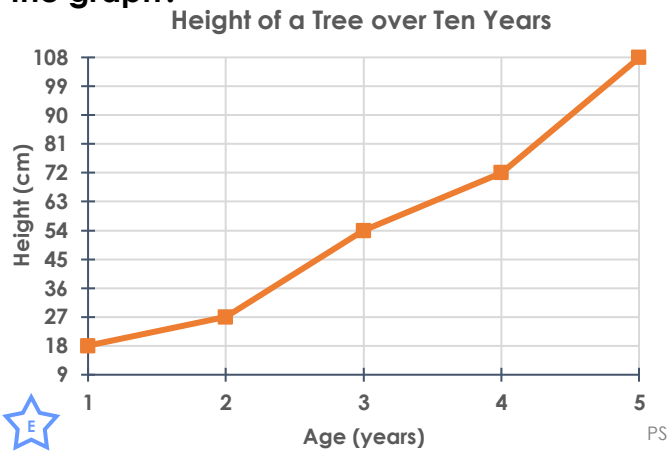
Read and Interpret Line Graphs

Read and Interpret Line Graphs

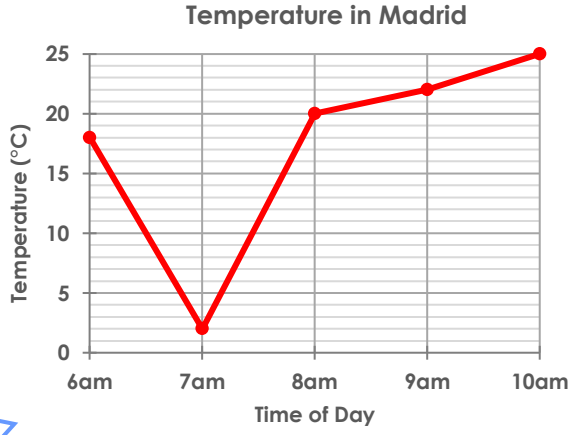
4a. Kim reached the finish line of the cycling race in 1 hour and Danny finished in 50 minutes. Whose performance is shown on the graph?



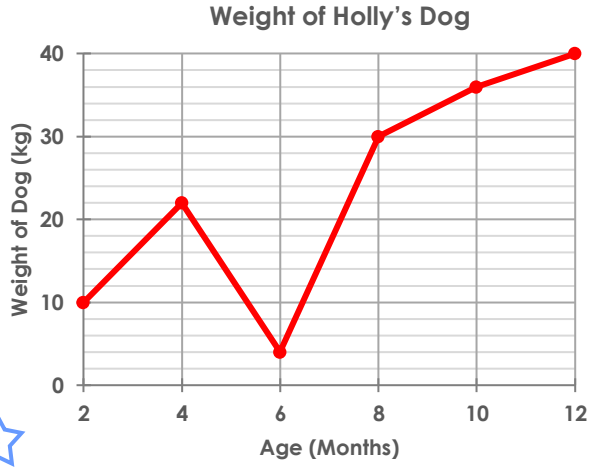
4b. Between 3 and 4 years old, the oak tree grew 27 cm, and the beech tree grew 18 cm. Which tree is represented on the graph?



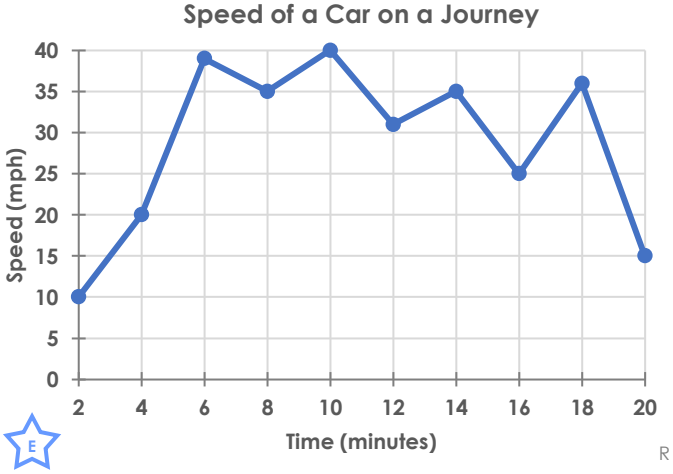
5a. Liz made a mistake when she plotted her line graph. Where do you think the mistake was made? Convince me.



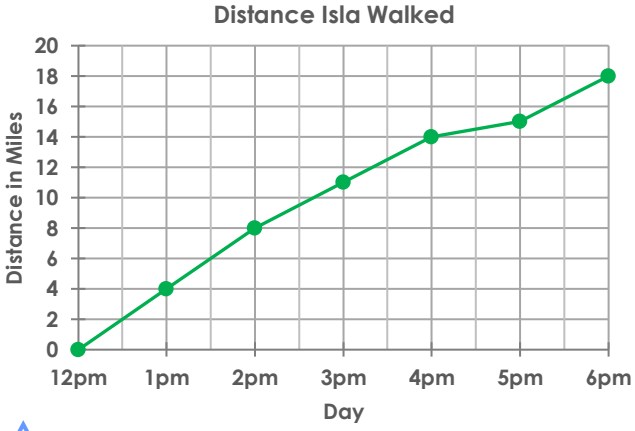
5b. Martin made a mistake when he plotted his line graph. Where do you think the mistake was made? Convince me.



6a. Peter said that his car first reached its top speed of the journey after 6 minutes. Is he correct? Explain why.



6b. Isla said that she has walked 4 miles by 1:30pm. Is she correct? Explain why.



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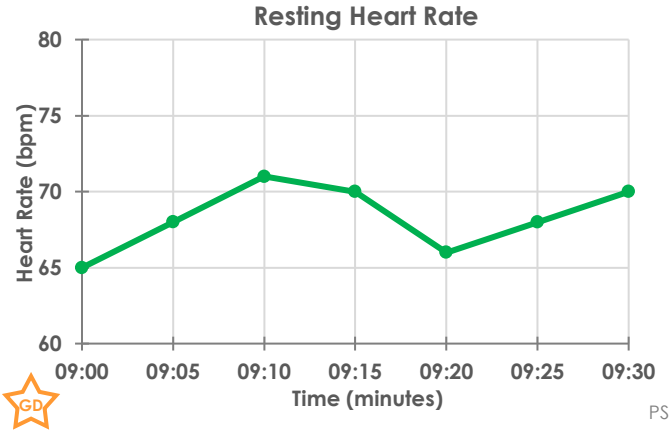
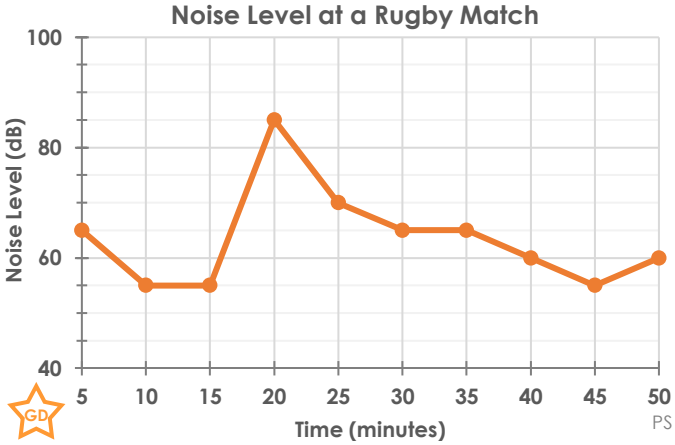
Read and Interpret Line Graphs

Read and Interpret Line Graphs

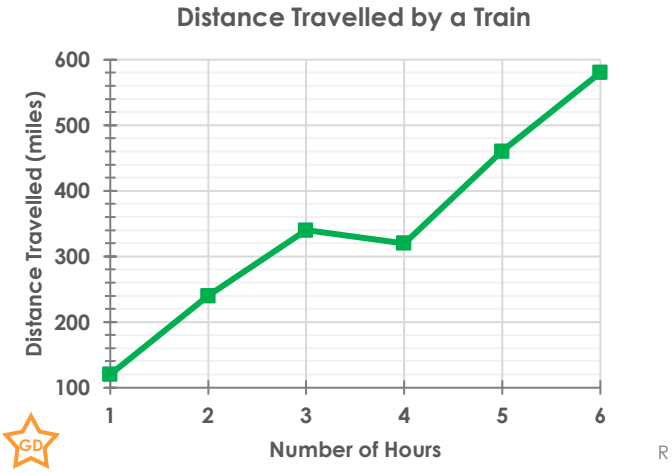
7a. Hammad's heart rate had a total range of 6 bpm and Lucy's heart rate had a range of 9 bpm. Whose resting heart rate is represented on the line graph?



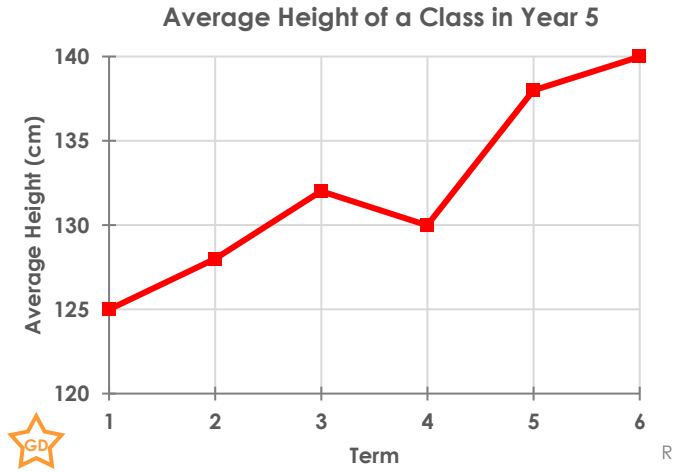
7b. The noise level at the match in Hull was 60dB three times and in Halifax it was 55dB three times. Which match is represented on the line graph?



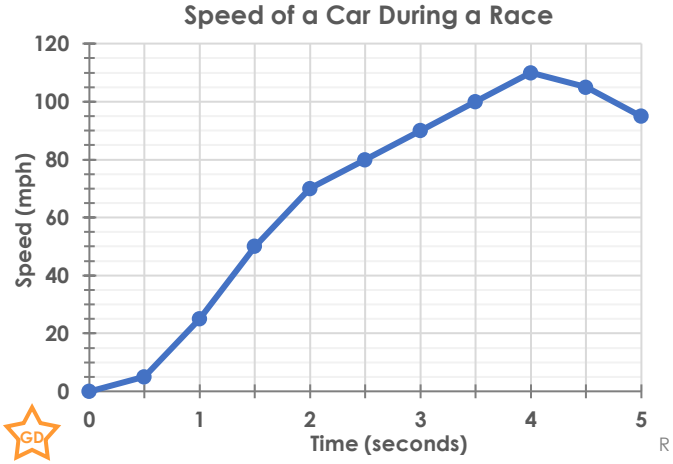
8a. Eva made a mistake when she plotted her line graph. Where do you think the mistake was made? Convince me.



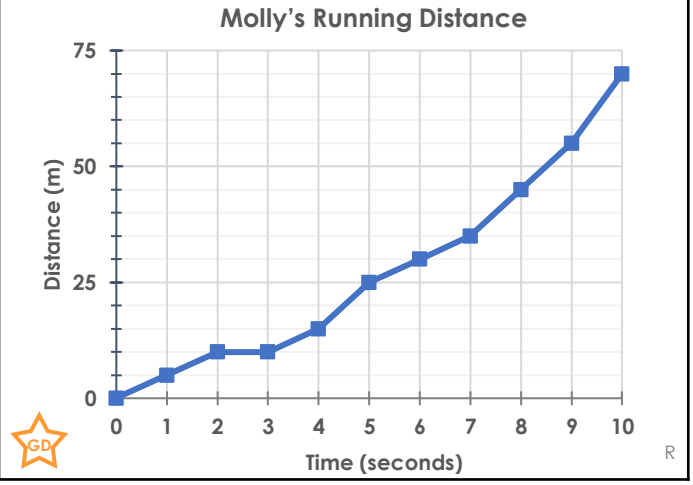
8b. Emilio made a mistake when he plotted his line graph. Where do you think the mistake was made? Convince me.



9a. Isaac said that his car took 5 seconds to reach its top speed. Is he correct? Explain why.



9b. Molly thinks she ran the furthest between 4 and 5 seconds. Is she correct? Explain why.



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Developing

1a. The line graph represents Seth's performance.

2a. Various answers, for example: Jen has plotted the height of the tree in 2016 incorrectly. The height has dropped to 0 rather than staying the same or increasing. In 2016, it is likely the height of the tree would be 15 feet.

3a. Freddie is not correct because the runner reached their top speed of 15mph at 4 seconds.

Expected

4a. The line graph represents Kim's performance.

5a. Various answers, for example: Liz has plotted Madrid's temperature at 7am incorrectly. The temperature has dropped to 2°C rather than going up as you would expect at this time of day. At 7am, it is likely the temperature would have been approximately 19°C.

6a. Peter is not correct because the car reached its top speed of 40mph after ten minutes. At 6 minutes the car is travelling at approximately 39mph.

Greater Depth

7a. The line graph represents Hammad's heart rate.

8a. Various answers, for example: Eva has plotted the distance travelled by the train at 4 hours incorrectly. The distance has dropped which is impossible. It is likely that the train would have travelled 400 miles at 4 hours.

9a. Isaac is incorrect because it took his car 4 seconds to reach its top speed of 110mph. 5 seconds was the last recording.

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Developing

1b. The line graph represents Greenland.

2b. Various answers, for example: Simon has plotted the overall total raised by 1pm incorrectly. The total has dropped to £7 which is very unlikely since he had already raised £12 by 12pm. By 1pm it is likely he would have raised £14.

3b. Lily is not correct because the car's average speed increased from 13mph to 14mph after 4 minutes.

Expected

4b. The line graph represents the beech tree.

5b. Various answers, for example: Martin has plotted the weight of Holly's dog at the age of 6 months incorrectly. The weight has dropped to only 4 kg rather than increasing as you would expect. At 6 months, it is likely the dog would weigh approximately 26 kg.

6b. Isla is not correct because she has walked 6 miles by 1:30pm. At 1pm she had walked 4 miles.

Greater Depth

7b. The line graph represents Halifax.

8b. Various answers, for example: Emilio has plotted the average height for the class in term 4 incorrectly. The average height has dropped from approximately 132 cm to 130 cm rather than going up as you would expect. It is likely the average height would be approximately 135 cm at term four.

9b. Molly is incorrect because she travelled 10 m between 4 and 5 seconds, but travelled 15 m between 9 and 10 seconds.

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