

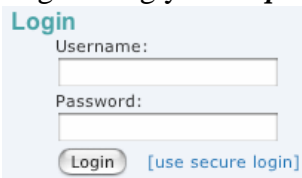
Exploring Distance-Time Graphs

Getting Ready

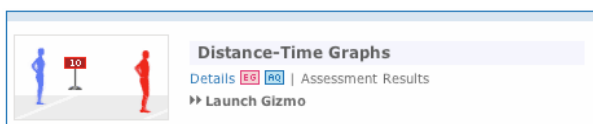
- 1.) Launch your Internet browser and go to the *ExploreLearning* website:
<http://www.explorelearning.com>
- 2.) Click on the Login button in the upper left corner of the screen under the *ExploreLearning* logo.



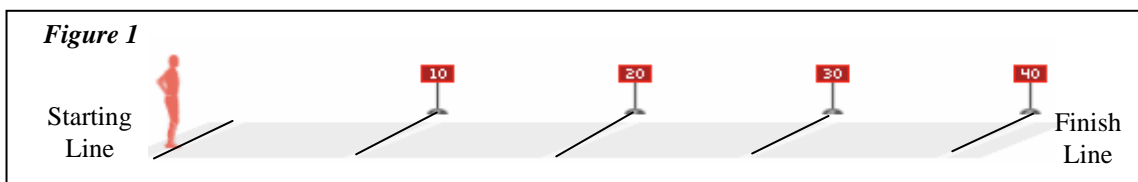
- 3.) Login using your *ExploreLearning* login and password.



- 4.) Scroll down to the *Distance-Time Graphs* and click

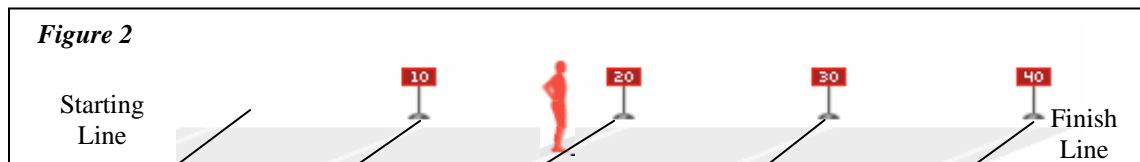


The following diagram, *Figure 1*, shows a runner getting ready to begin the 40-yard dash. Notice that the runner begins at the starting line and there are yard markers along the way to the finish line.



The diagram is drawn to represent perspective.

The runner below, in *Figure 2*, is actually at the 20-yard line even though it looks like he is not at the 20-yard marker. The *ExploreLearning Distance-Time Graph Gizmo™* is set up the same way although it can be difficult to see the yard lines. Keep this in mind while analyzing the graph and movement of the runner.



Part I. Exploration

1.) Explore the *Distance-Time Graphs* Gizmo™

Be sure to explore the following features: the stopwatch, the purple slider, the runner checkboxes, and the interactive graph. List any observations you made about how the Gizmo™ functions.



2.) Examine the graph. What does the x axis represent? What does the y axis represent?

3.) Refresh the Gizmo™ by clicking on the reload button.

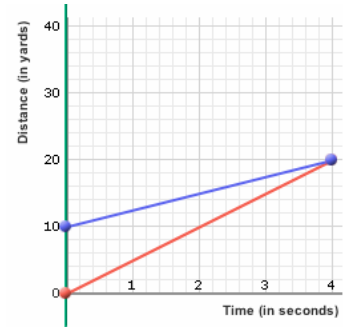
Click on the green button on the stopwatch. Observe the runner and examine the graph.

Click on the red button on the stopwatch to reset the race. Drag the second point on the graph down to the 20-yard line. Click on the green button on the stopwatch to begin the race.

How does the speed of the runner in the second race compare to the speed in the first race? If the speed is different, explain why you think the speed changed.

4.) Click on the **Show graph** and **Show animation** check boxes for both runners. Drag the points so that the graphs look like the figure below. Run the race by clicking the green start button.

a.) Which runner ran the fastest? Explain how you know using evidence from the graph.



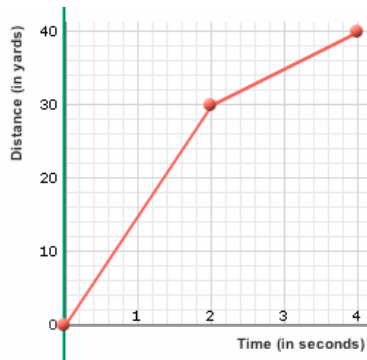
b.) Where did each runner begin the race? How is that shown on the graph?

Part II. Create and Describe

Create the graph given then run the race. Describe what happens to the runner including where the runner begins and ends the race, the runner's speed, and the direction the runner is going in each time interval of the race.

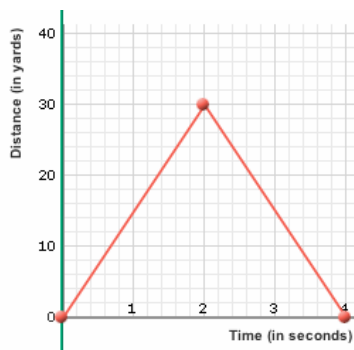
Graph	Description								
<p>Create 3 points using the purple slider. Adjust the graph to look like the figure below. Run the race.</p> <table border="1"> <caption>Data for Runner (Red Line)</caption> <thead> <tr> <th>Time (seconds)</th> <th>Distance (yards)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> </tr> <tr> <td>2</td> <td>10</td> </tr> <tr> <td>4</td> <td>40</td> </tr> </tbody> </table>	Time (seconds)	Distance (yards)	0	0	2	10	4	40	<p>Describe the race. Include evidence to support you answers.</p>
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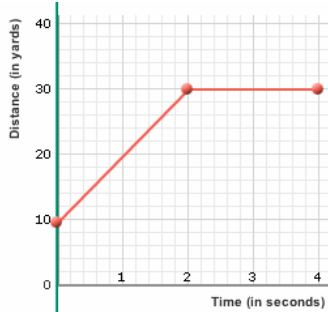
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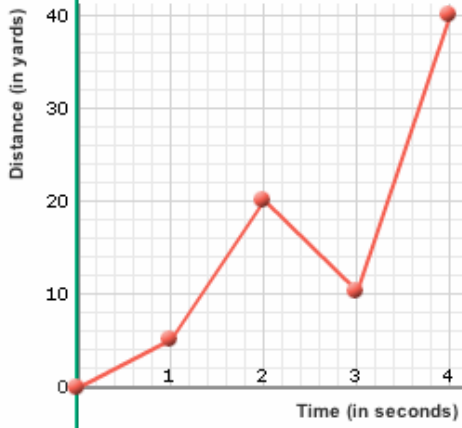


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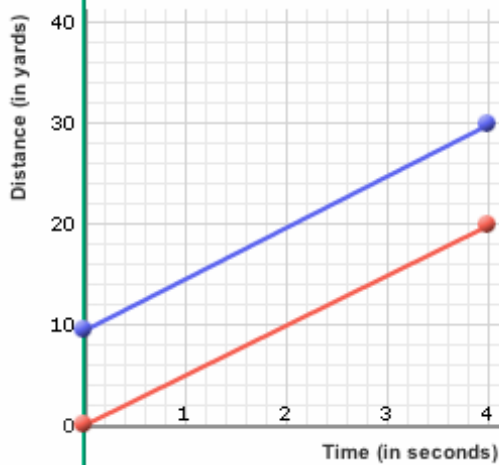
Part III. Predict, Describe, and Check

Predict what the runner will do. Describe the race. Include evidence to support you prediction. **AFTER** you have written your prediction, run the race and check your prediction. If your prediction was not completely accurate, make changes and explain where you made your mistake.

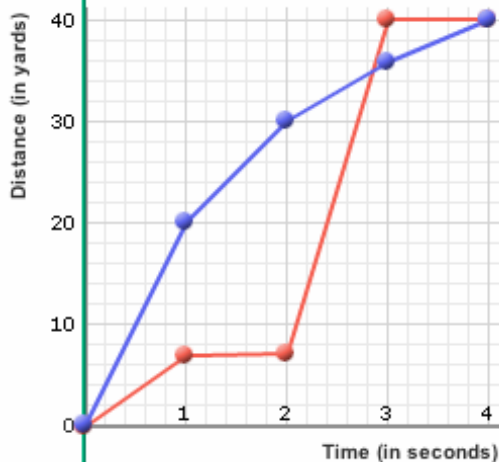
Create 5 points using the purple slider. Adjust the graph to look like the figure below.



Set up the graphs for the two runners as shown below.



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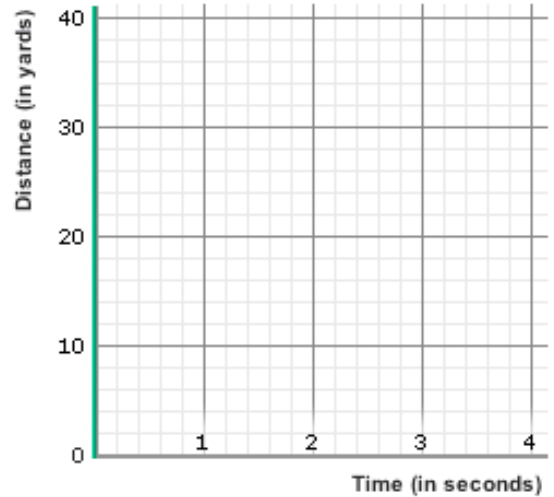


Part IV. Sketch the graph given a story

A runner begins at the starting line and sprints to the 20-yard line in 2 seconds time. He trips and falls down. He stays in the ground for 1 second. Then it takes him 1 second to sprint to the 35 yard line.

Sketch the race described above on the graph at the right.

(Hint - There are 3 distinct time intervals)

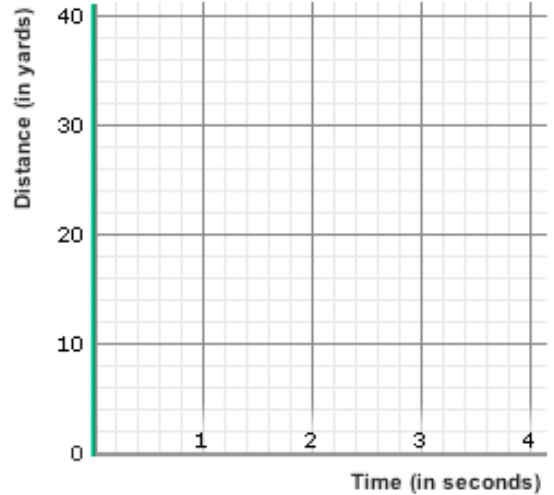


Two runners are competing in a race.

- Joe starts on the starting line and runs 30 yards in 4 seconds.
- Suzie starts on the 10 yard line and runs 20 yards in 4 seconds.

Sketch the race described above on the graph at the right.

Who runs the fastest? Give evidence from the graph to support your answer.



Part V. Create a race story

- 1.) Open a new word processing document. Add your name at the top of the document.
- 2.) Create a story about a runner completing a race. Make sure to include where the runner begins and ends the race, the runner's speed, and the direction the runner is going in each time interval of the race. The race must have 4 time intervals.
- 3.) Go to the ExploreLearning Gizmo.
- 4.) Create a graph to go with the story.
It must have 5 points to include all 4 time intervals.
- 5.) Take a picture of the graph with the camera.
- 6.) Go back to the word processor and paste it into the document.
- 7.) Save the document [first initial last name graphstory]
Example: jsmithgraphstory
- 8.) Print the story.