

# Olympic Sprinter Activity

Watch the video showing Florence Griffith-Joyner in the 1988 Olympics 100-meter sprint. She is in Lane 3 (third lane from the right as you view the video). You will probably need to watch it several times as you work to develop a graph of Griffith-Joyner’s distance from start as a function of time. The following questions are designed to promote your thinking about your thinking concerning this situation.

1. On your whiteboard, create a graph that could plausibly be Griffith-Joyner’s distance from start as a function of time.

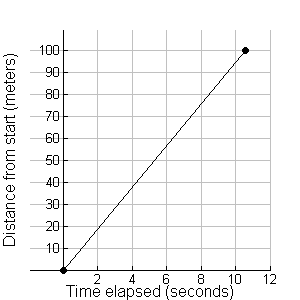
2. This graph is to appear as part of an article or report and you are given the task of writing the caption for this graph. Write a concise caption that communicates the information that the graph provides.

3. Choose a particular point on the graph. Describe the meaning of this point.

4. What aspect of the graph do you hope your audience envisions as you describe the meaning of the point in #3 by pointing to it?

5. Students are asked to create the graph as you were asked to do. A student decides to take the initial point (initially, time is 0 and distance from start is 0) and connect it to the final point (after 10.54 seconds, Griffith-Joyner was 100 meters from start). The graph below shows this graph.

* Discuss how the student might be thinking while creating such a graph.
* What aspects of the situation might the student NOT be thinking about?
* What would you ask the student to promote further thinking?



**Activity – The Sprinter Situation – Notes for Teacher**

While any video of an Olympic sprinter will work, we used [the video of Florence Griffith-Joyner in the 1988 Soul Olympics.](http://www.youtube.com/watch?v=oq5JXVC8oM4)

**Item Analysis**

1. On your whiteboard, create a graph that could plausibly be Griffith-Joyner’s distance from start versus time.

*At this point, no tools or ways of thinking have been presented. Participants are expected to just begin thinking about how to track covarying quantities. By creating the graphs on small whiteboards, participants can present their work and rationale to the rest of the class. Comparing and contrasting will become possible as a result of the presentations.*

2. This graph is to appear as part of an article or report and you are given the task of writing the caption for this graph. Write a concise caption that communicates the information that the graph provides.

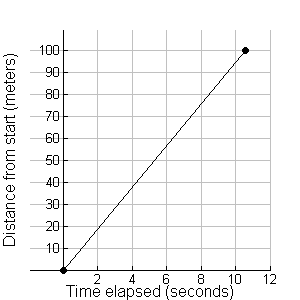
*Participants will be forced to describe the quantities and how they covary. They may tend to features of the graph such as how the graph increases, concavity, rate of change. They may also choose specific points on the graph and explain what they mean in the context of the situation.*

3. Choose a particular point on the graph. Describe the meaning of this point.

*If this hasn’t come up naturally in #2, the issue is explicitly brought up here.*

4. What aspect of the graph do you hope your audience envision as you describe the meaning of the point in #3 by pointing to it?

*Do the participants see a point on the graph as just a blip on the paper? Or, do they see the point as representing a horizontal quantity and vertical quantity from the origin? Here, we begin to push the idea of how to envision quantities that will be helpful for later work. This is important as we develop a need for the Coordinating Quantities Tool.*

5. Students are asked to create the graph as you were asked to do. A student decides to take the initial point (initially, time is 0 and distance from start is 0) and connect it to the final point (after 10.54 seconds, Griffith-Joyner was 100 meters from start). The graph below shows this graph. Discuss how the student might be thinking while creating such a graph. What aspects of the situation might the student NOT be thinking about?

*Rather than reasoning covariationally about continuously changing quantities, we have seen students simply plot points and connect dots. However, this way of thinking will be problematic in other situations. This item is designed to get participants thinking about such issues and about the power that covariational reasoning can have as it works in all situations.*