



# Match Me Plus

## Teacher Notes

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Activity Overview: Piecewise-defined and other functions

Match a position versus time graph shown on the TI-Nspire™ screen then write the function that describes the walk.

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Teacher Preparation and Notes:

- 45-50 minutes
- **To download the student and solution TI-Nspire™ documents (.tns files) go to [education.ti.com/exchange](http://education.ti.com/exchange) and enter “13822” into the quick search box.**

Lesson Materials:

- TI-Nspire™ handheld, TI-Nspire Navigator system
- Match\_Me\_Plus\_Student.pdf
- Match\_Me\_Plus.tns
- CBR2™

TI-Nspire™ Technology Skills:

- Open a document
- Move between pages
- Move between applications on same window
- Adjust window settings
- Enter and graph a function
- Use template palate to graph a piecewise-defined function

TI-Nspire™ Navigator Skills:

- Quick Poll
- Screen Capture



### Problem 1

- Begin the TI-Nspire Navigator class, initiate the transfer of the document *Match\_Me\_Plus.tns* and distribute the student activity “Match Me Plus” handout.
- Distribute a CBR 2™ to each student (or to each pair of students); instruct them to connect it to their handhelds.
- Have students log in to TI-Nspire Navigator; they should notice they have received a TI-Nspire document entitled “Match\_Me\_Plus” located within the class folder on their handhelds.
- Direct students to open the file; read the “Problem Situation” described on the student handout

**Step 1** Open the file *Match\_Me\_Plus* on your TI-Nspire™ handheld. Read page 1.2 then move to page 1.3

**Step 2** Answer the questions your teacher sends you in Quick Poll.

#### Quick Poll #1:

Send the following questions to students:

- What is measured on the input-axis (the horizontal axis)? Give the units.
- What is measured on the output-axis (the vertical axis)? Give the units.

Save the results to Portfolio.

*Teacher Tip: You can either send type the questions into Quick Poll or write them on the board/overhead for the students.*

**Step 3** Move to page 1.4. After the graph is displayed answer the questions your teacher sends you in Quick Poll BEFORE walking the graph. The screen to the right may not be the graph that you see on your handheld.

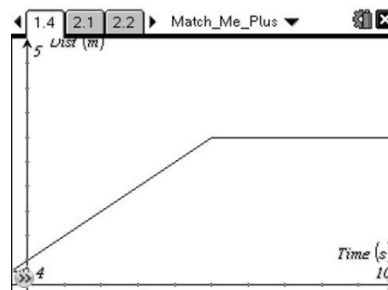
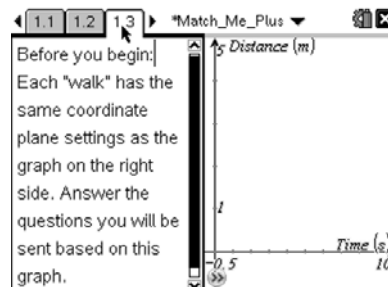
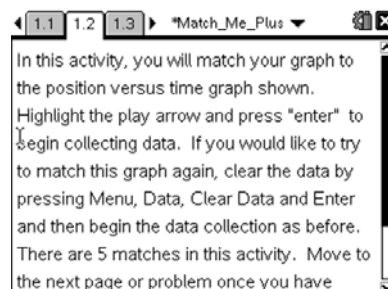
#### Quick Poll #2:


Send the following questions to students:

- How many segments are there to this walk?
- How far from the CBR 2 must you start for the first segment? The second segment? The third segment, if applicable.
- How long do you walk for the each segment?
- How far away from the CBR 2 are you at the end of the each segment?

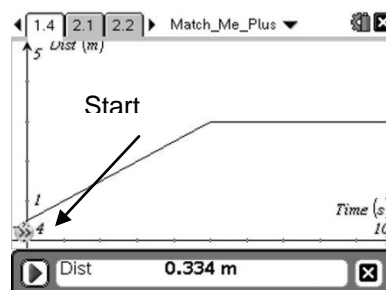
Save the results to Portfolio


*Teacher Tip: If the data collection window closes press  $\text{ctrl} + \text{D}$  to get the window back.*



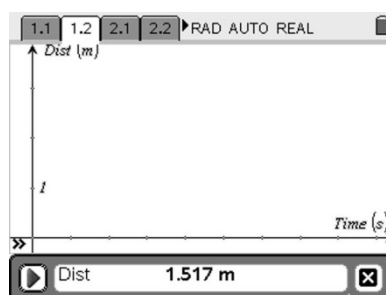
**Step 4:** To match the graph, aim the CBR 2™ at the wall and walk toward or away from the wall to match the graph. Use your knowledge of distance, velocity, and acceleration and their interrelationships to match the graph. Highlight the play arrow and press  to start sampling.

*Teacher Tip:* Use a window setting of  $XMin=-0.4$ ,  $XMax=10$ ,  $XScale=1$ ,  $YMin=-0.2$ ,  $YMax=5$ ,  $YScale=1$  for all graphs #1-4. Graph #5 settings are best set to a  $XMax=5$  and  $YMax=2$ .



**Step 5:** If you need to try again, press .

**Step 6:** Sketch the graph on the screen in the figure to the right. Then, sketch your best attempt of walking the graph.



**Quick Poll #3:**

- What is the slope of the first segment? The second? The third (if applicable)?
- What is the linear equation of each segment?
- What are the input values (domain) of the first segment? The second? The third?

Save the results to Portfolio

**Step 7:** Write the piecewise-defined function that describes the complete walk.

*Teacher Tip:* Press   to use the piecewise –defined function template.

**Problems 2-5**

There are 4 matches in this activity. Once you have matched the first graph, proceed to the other graphs and match them. Answer the following questions BEFORE walking each graph.

- How many segments are there to this walk?
- How far from the CBR 2™ must you start for the first segment? The second segment? The third segment, if applicable.
- How many seconds do you walk for the each segment?
- How far away from the CBR 2™ are you at the end of the each segment?
- What is the piecewise-defined equation for the walk?

**Reflection**

- Which graph was the most challenging to match? Explain why.

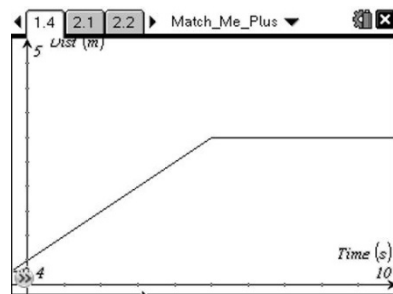
**Extension**

- Insert a new page, enter your own function, and try to match it.

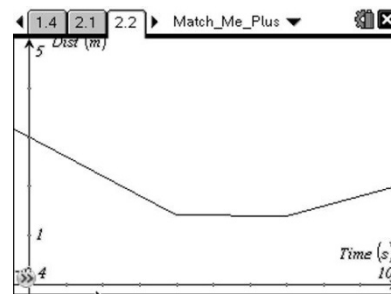


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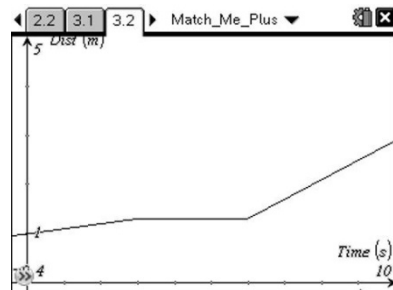
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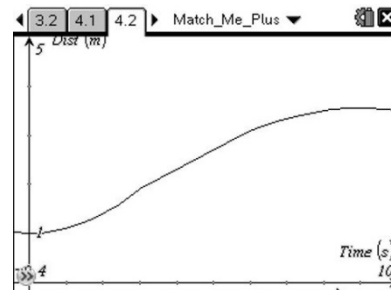
Match Me Graph 1



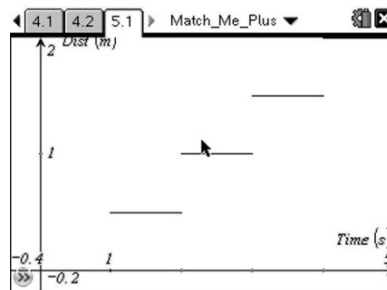
Match Me Graph 2



Match Me Graph 3



Match Me Graph 4



Match Me Graph 5