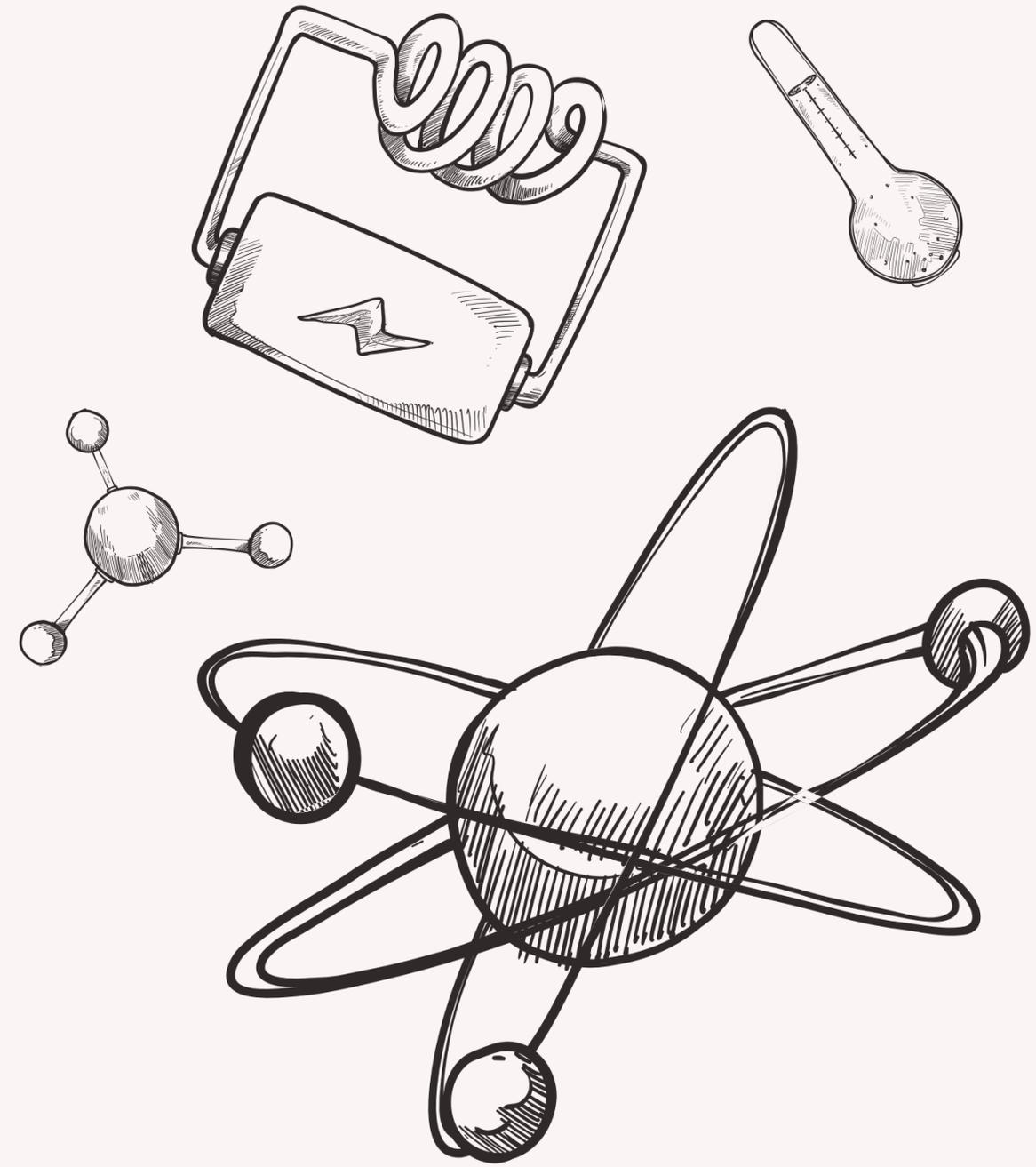
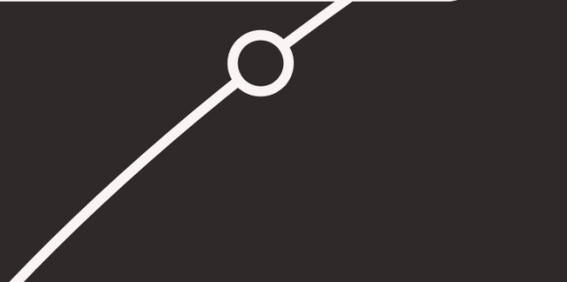
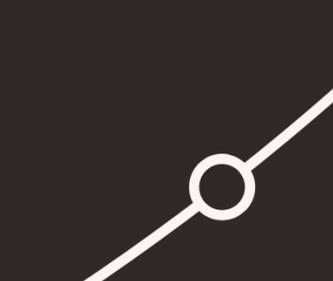


# The Moving Man Simulation

PSIM – Lab Practical 2025  
Kelli Bravo





# Simulation Overview

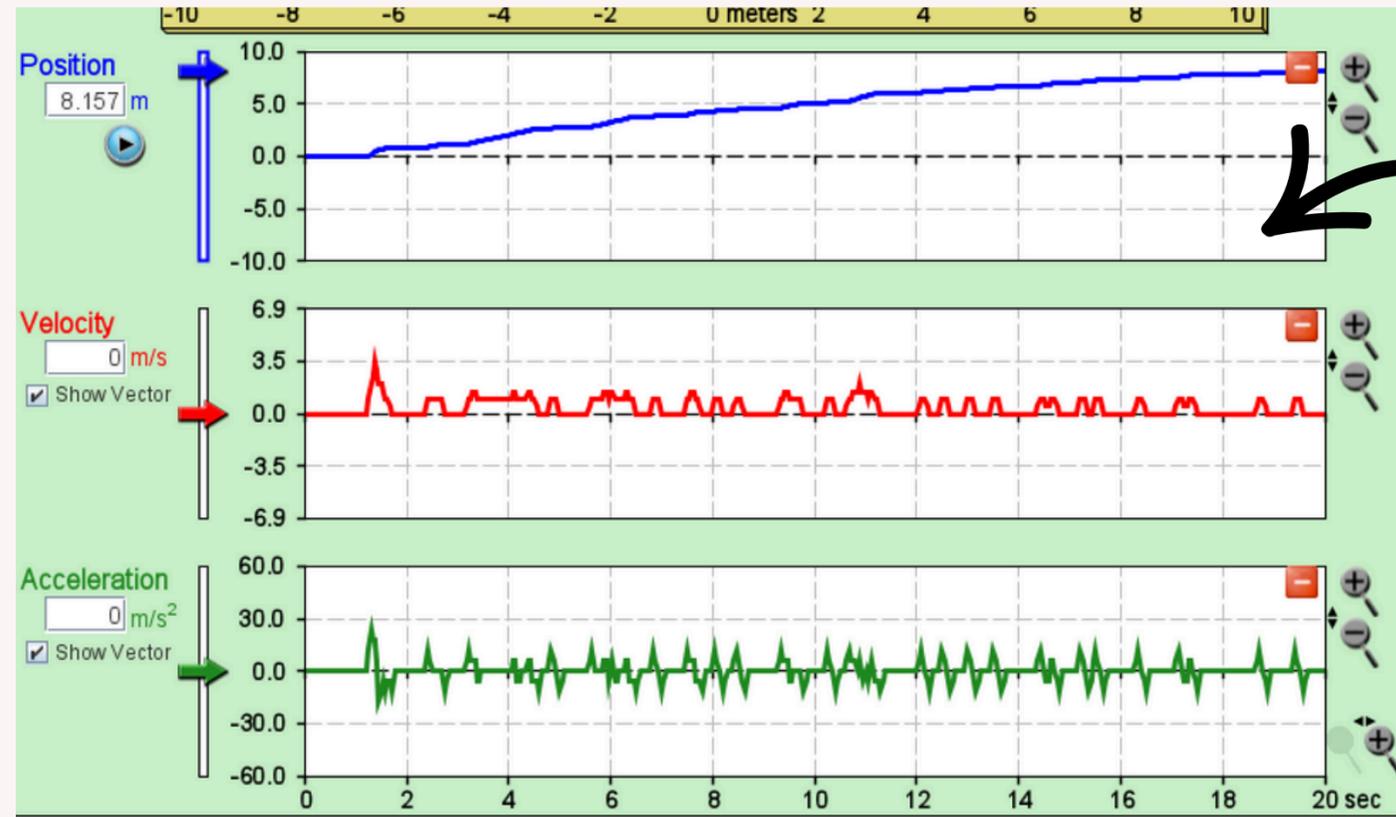


The purpose of this activity is to manipulate the simulation to create and analyze position, velocity and acceleration vs. time graphs.

The students are asked to create graphs on their own based on different scenarios. They then use the simulation to create the actual graphs and compare and make changes to their original graphs.

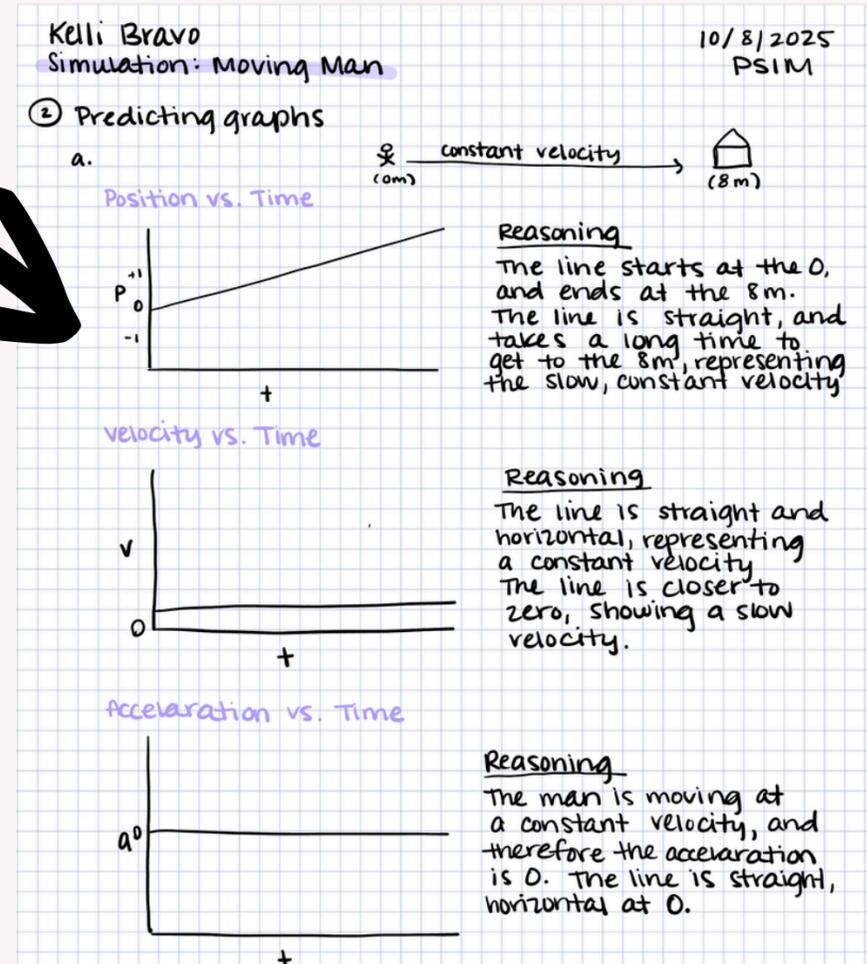
# Scenario a:

The man moves from the center of the screen (0m) to the house (at 8m to the right) at a slow, constant velocity

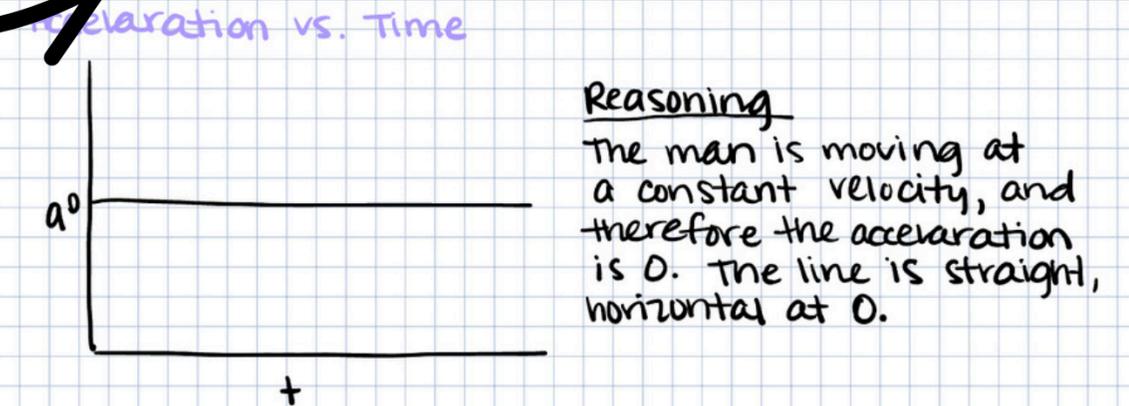
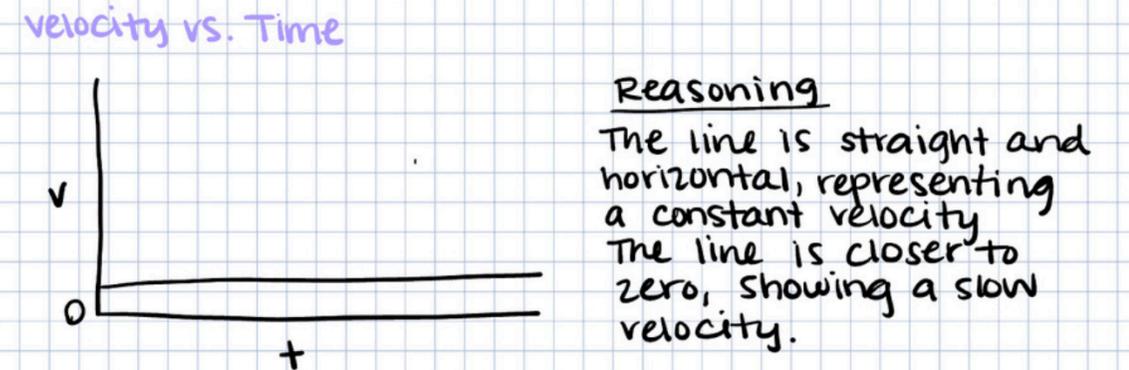
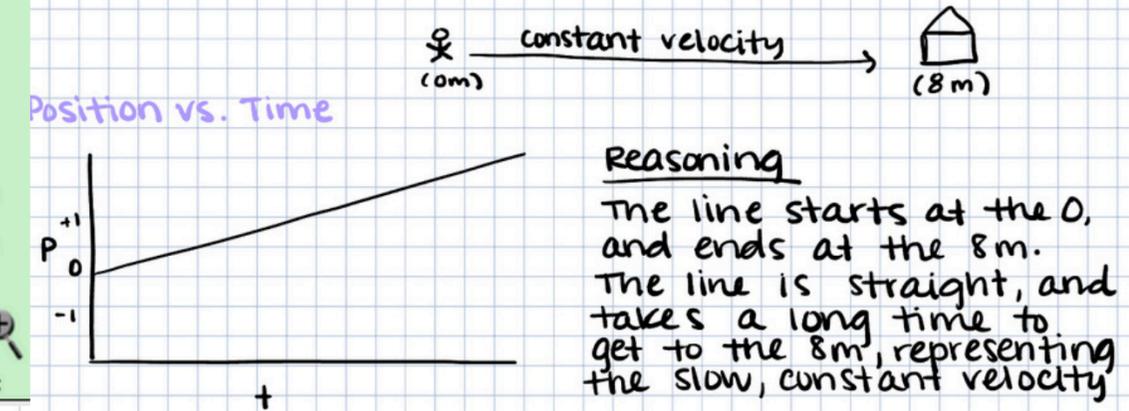


Graphs FROM Simulation

Graphs BEFORE Simulation



Graphs AFTER Simulation



no changes needed for Part A

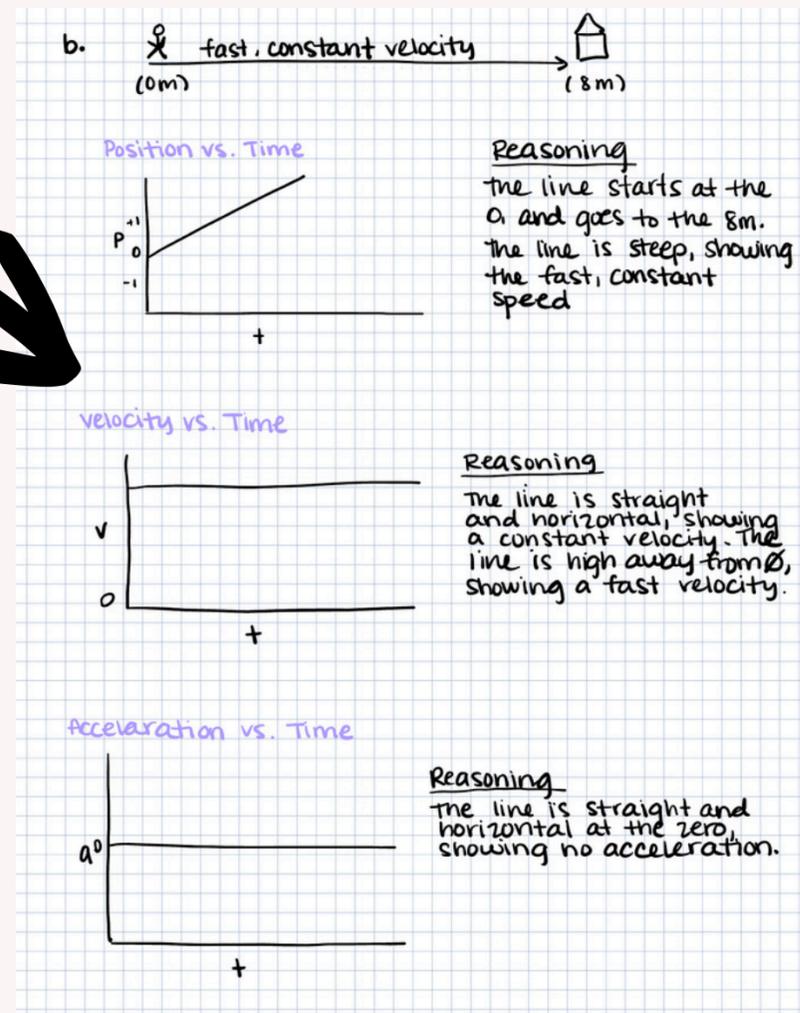
# Scenario b:

The man moves from the center of the screen (0m) to the house (at 8m to the right) at a fast, constant velocity

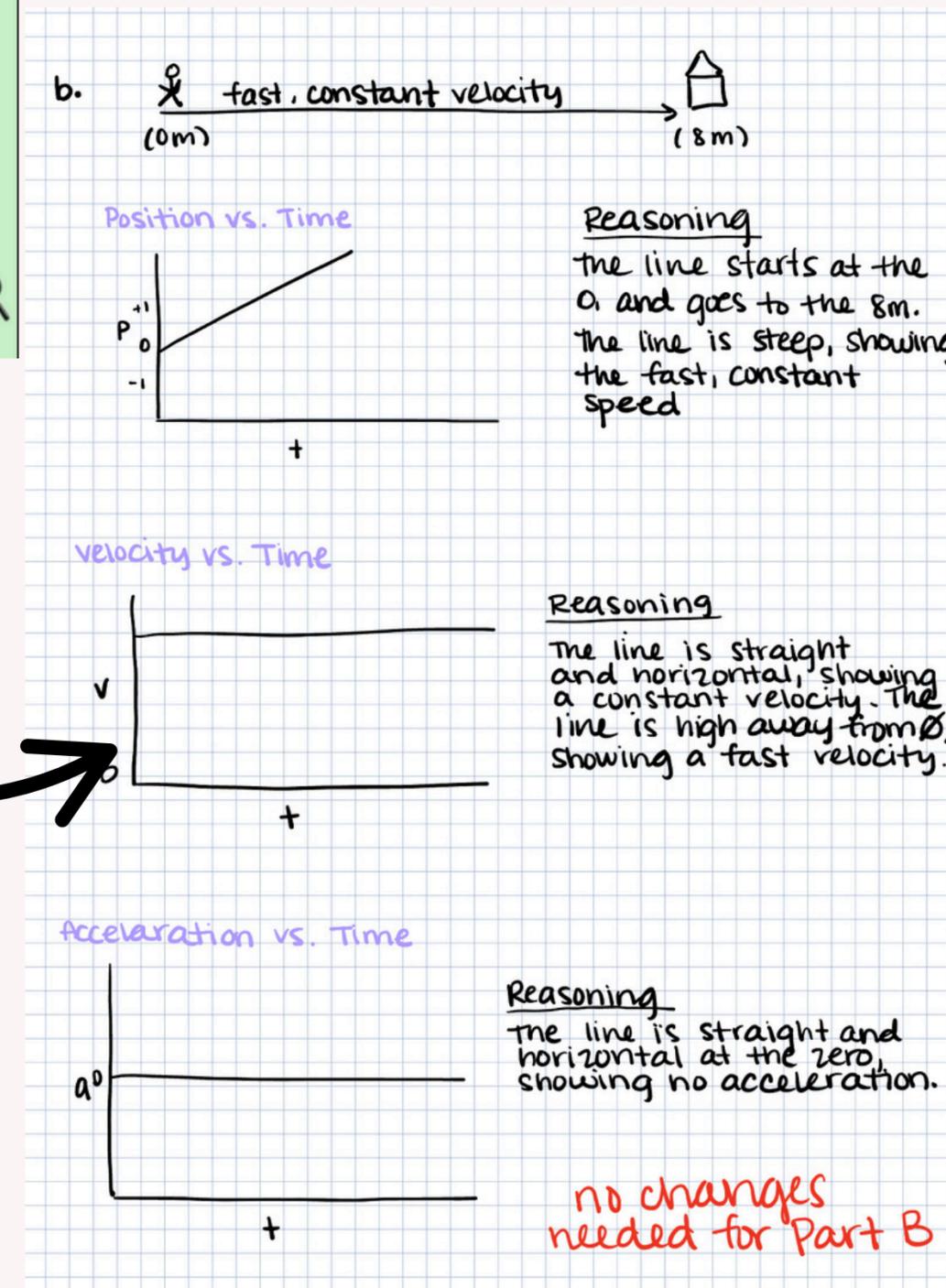


Graphs FROM Simulation

Graphs BEFORE Simulation

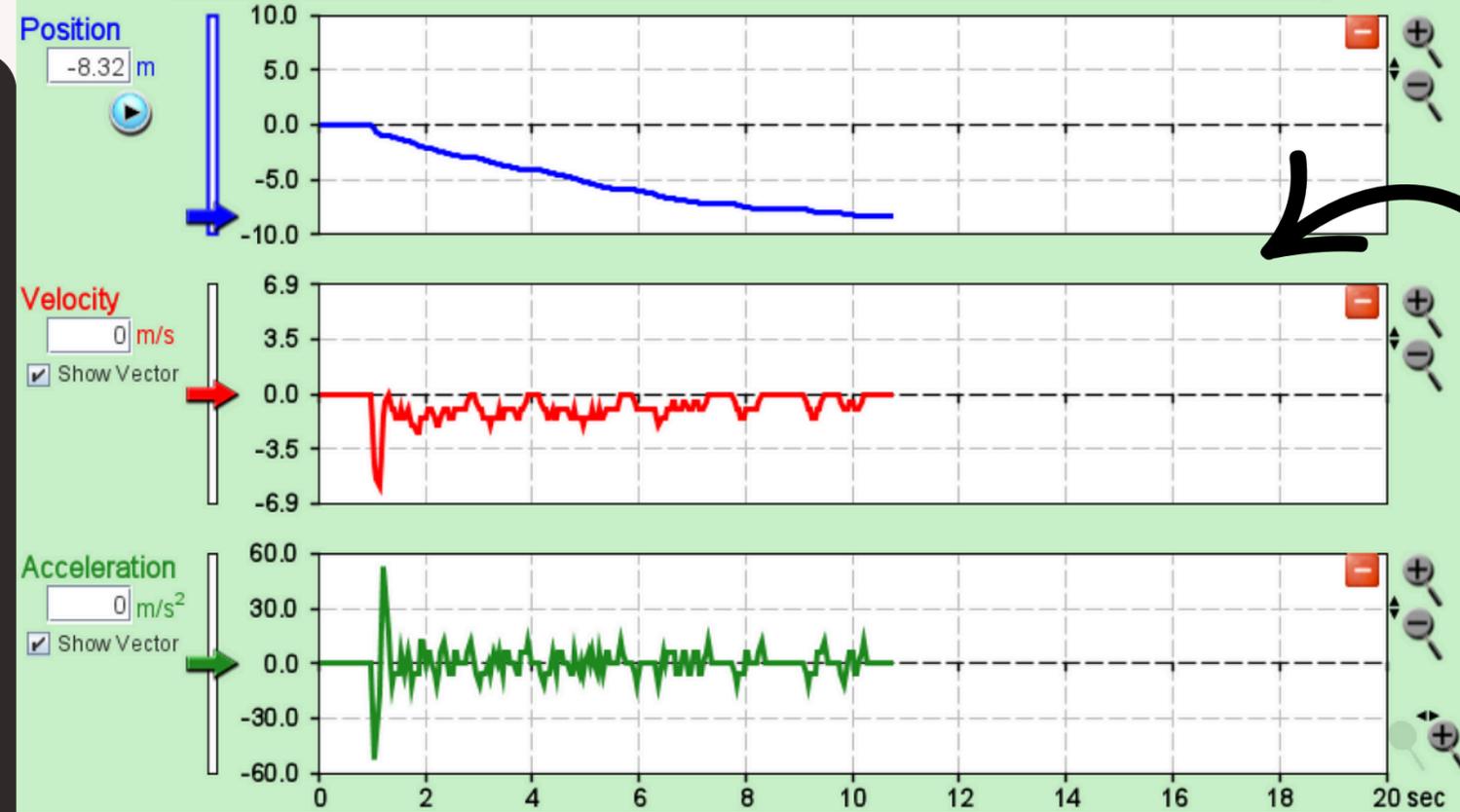


Graphs AFTER Simulation



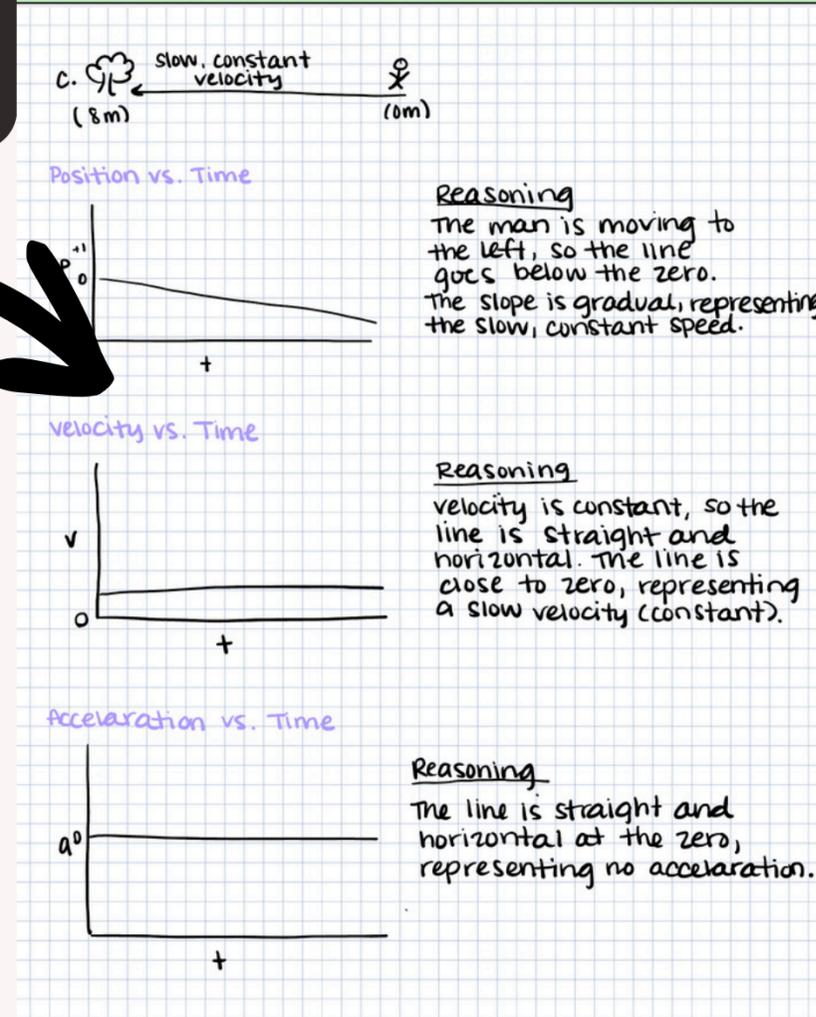
# Scenario c:

The man moves from the center of the screen (0m) to the tree (at 8m to the left) at a slow, constant velocity

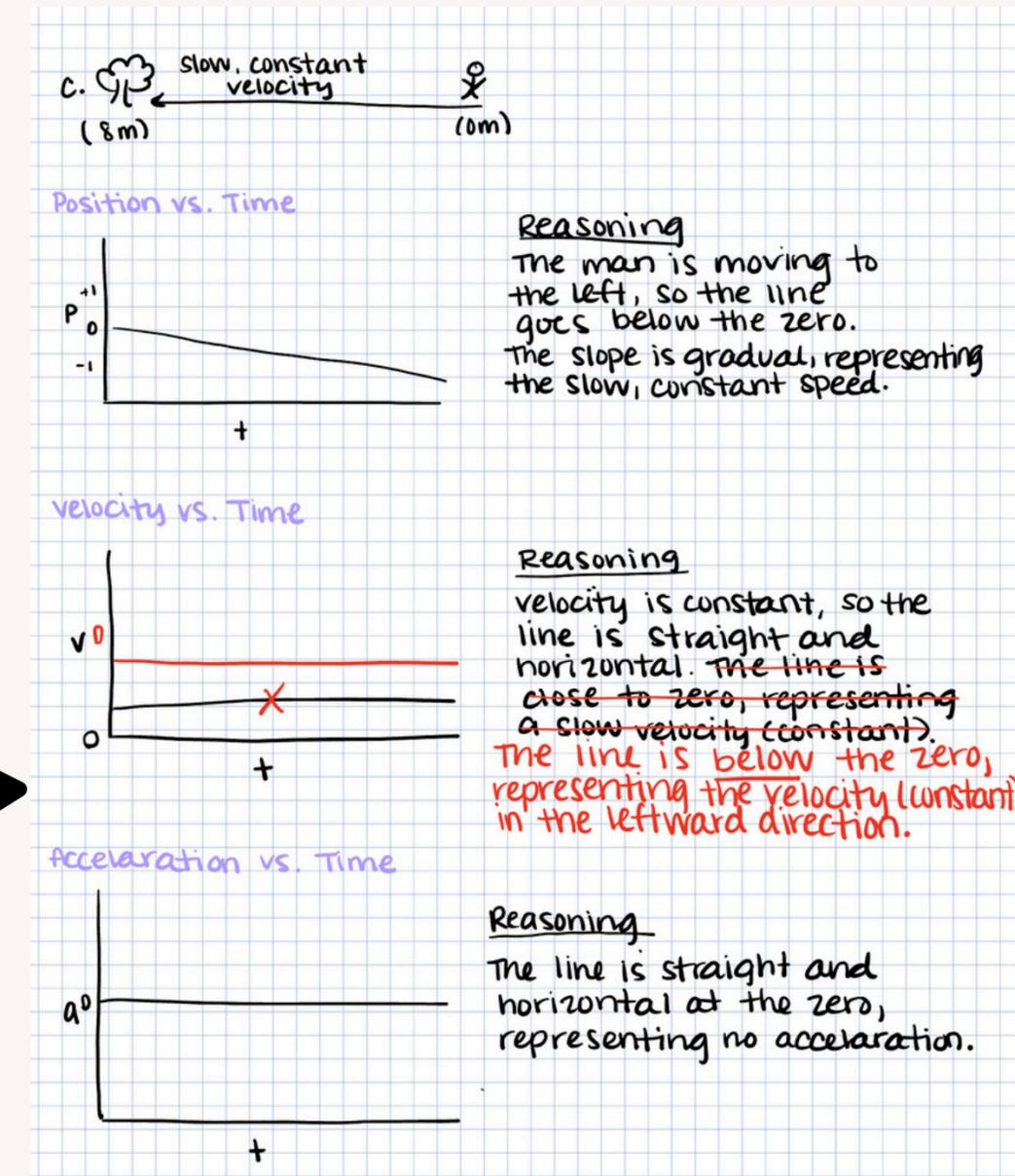


Graphs FROM Simulation

Graphs BEFORE Simulation



Graphs AFTER Simulation



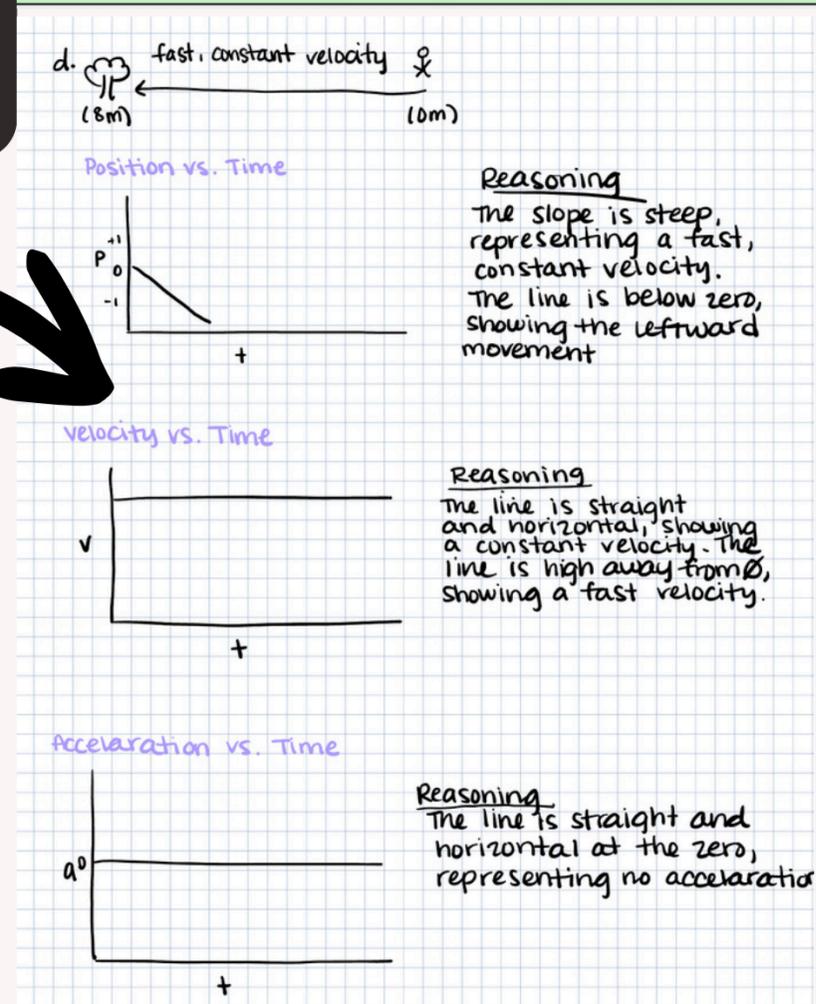
# Scenario d:

The man moves from the center of the screen (0m) to the tree (at 8m to the left) at a fast, constant velocity

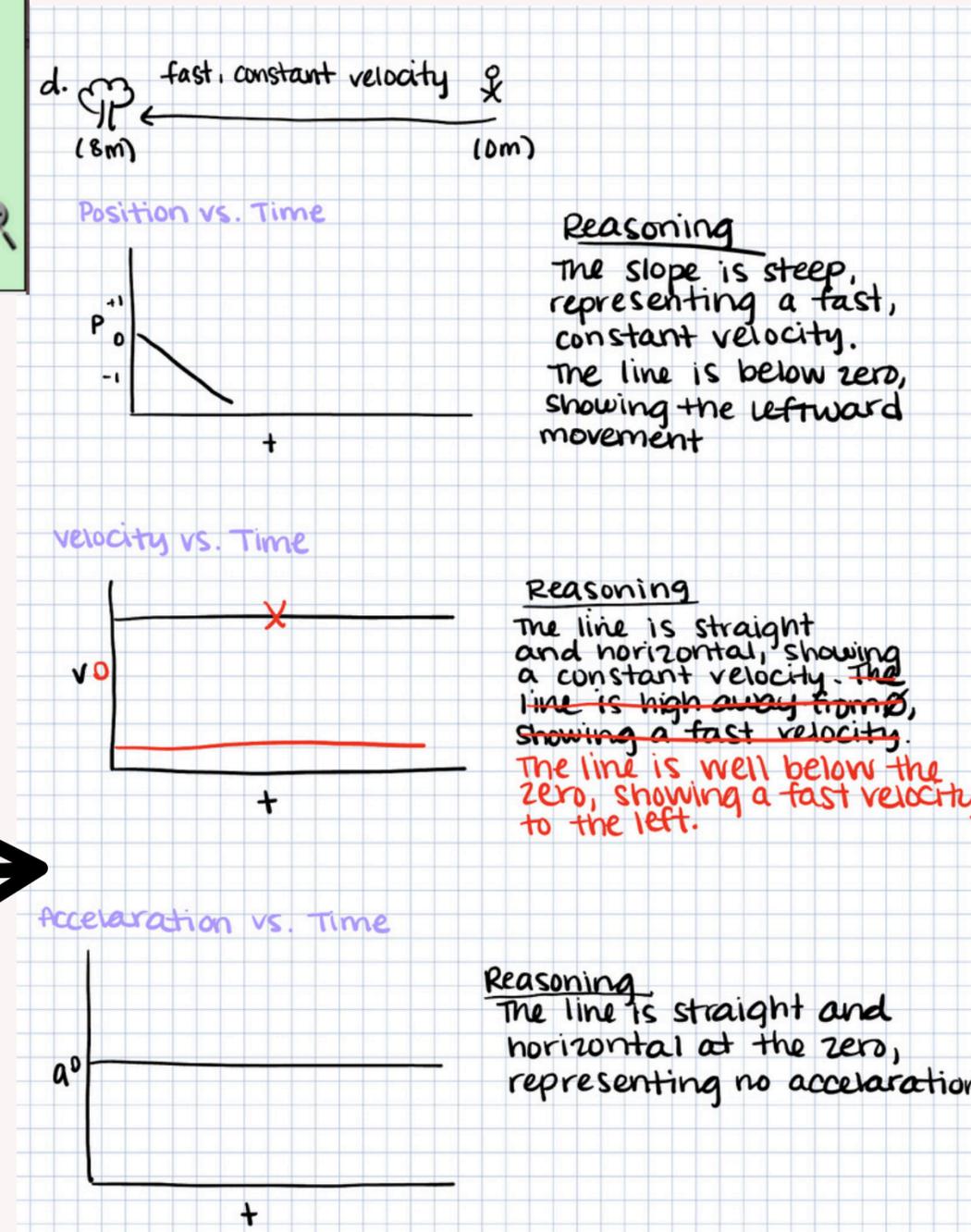


Graphs FROM Simulation

Graphs BEFORE Simulation



Graphs AFTER Simulation



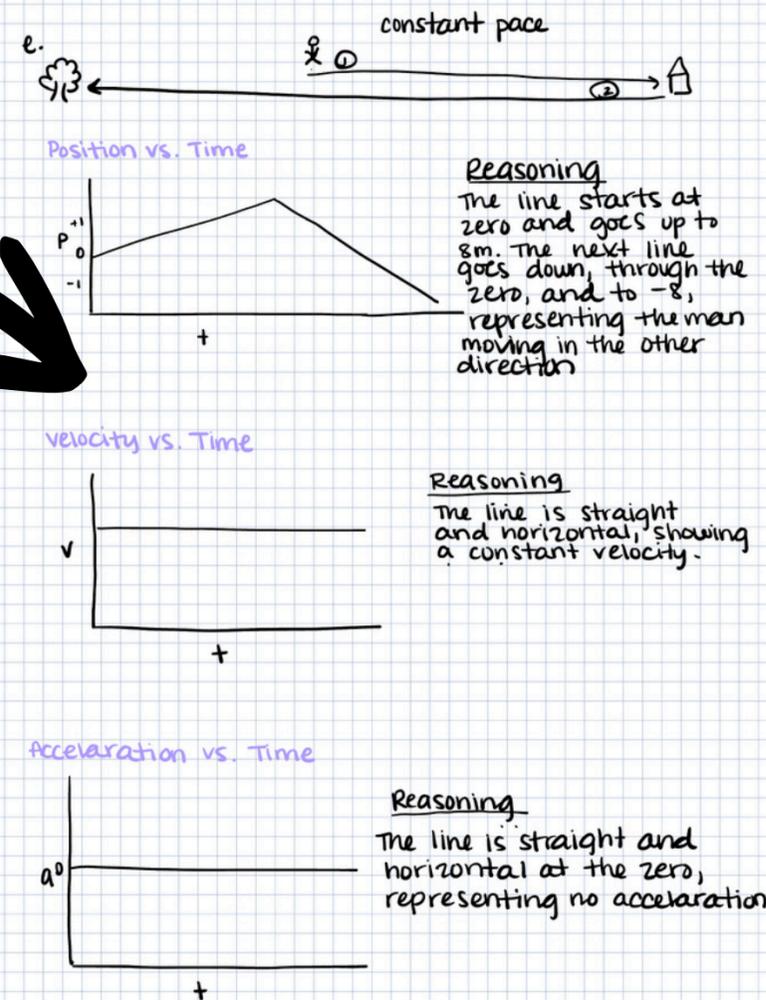
# Scenario e:

The man walks at a constant pace to the house then to the tree

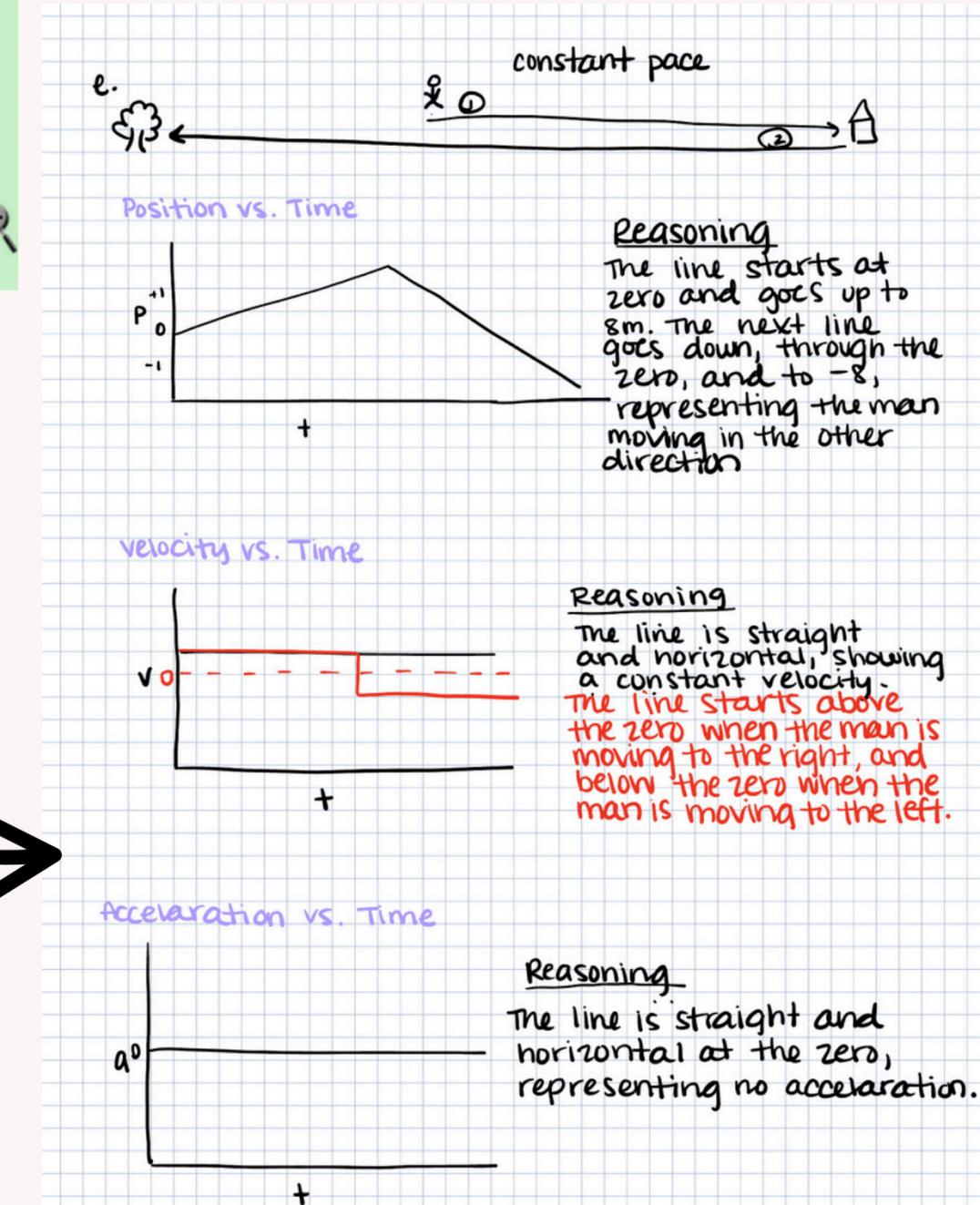


Graphs FROM Simulation

Graphs BEFORE Simulation



Graphs AFTER Simulation

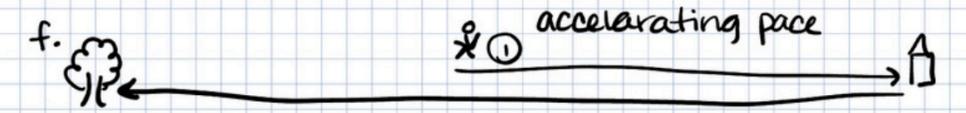


# Scenario f:

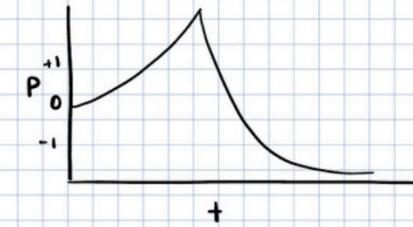
The man walks with an accelerating pace from the house then to the tree.



## Graphs FROM Simulation



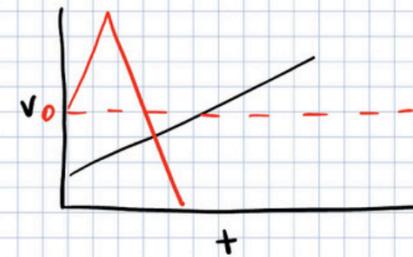
Position vs. Time



### Reasoning

The lines are curved, representing an accelerating pace. The line starts at zero and goes up to 8m. The next line goes down, through the zero, and to -8, representing the man moving in the other direction.

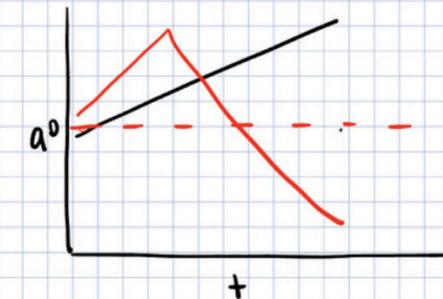
velocity vs. Time



### Reasoning

Since the velocity is increasing, the line is showing a positive relationship between v and t, when the man is moving to the right. The line is an indirect relationship when the man is moving to the left.

Acceleration vs. Time

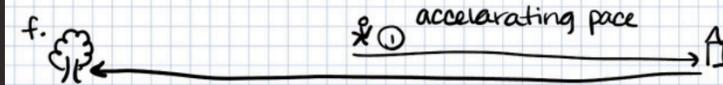


### Reasoning

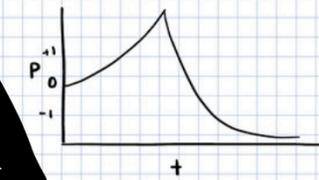
The pace is accelerating, so the line is showing a positive relationship, where a increases as t increases when the man is moving to the right. The line is an indirect relationship when the man is moving to the left.

## Graphs AFTER Simulation

## Graphs BEFORE Simulation



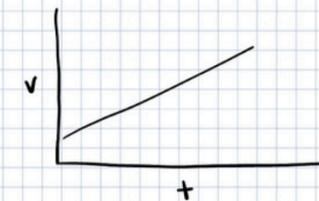
Position vs. Time



### Reasoning

The lines are curved, representing an accelerating pace. The line starts at zero and goes up to 8m. The next line goes down, through the zero, and to -8, representing the man moving in the other direction.

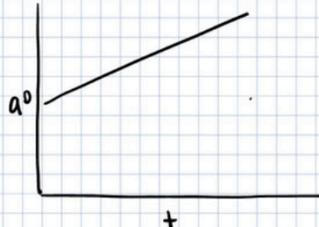
velocity vs. Time



### Reasoning

Since the velocity is increasing, the line is showing a positive relationship between v and t.

Acceleration vs. Time

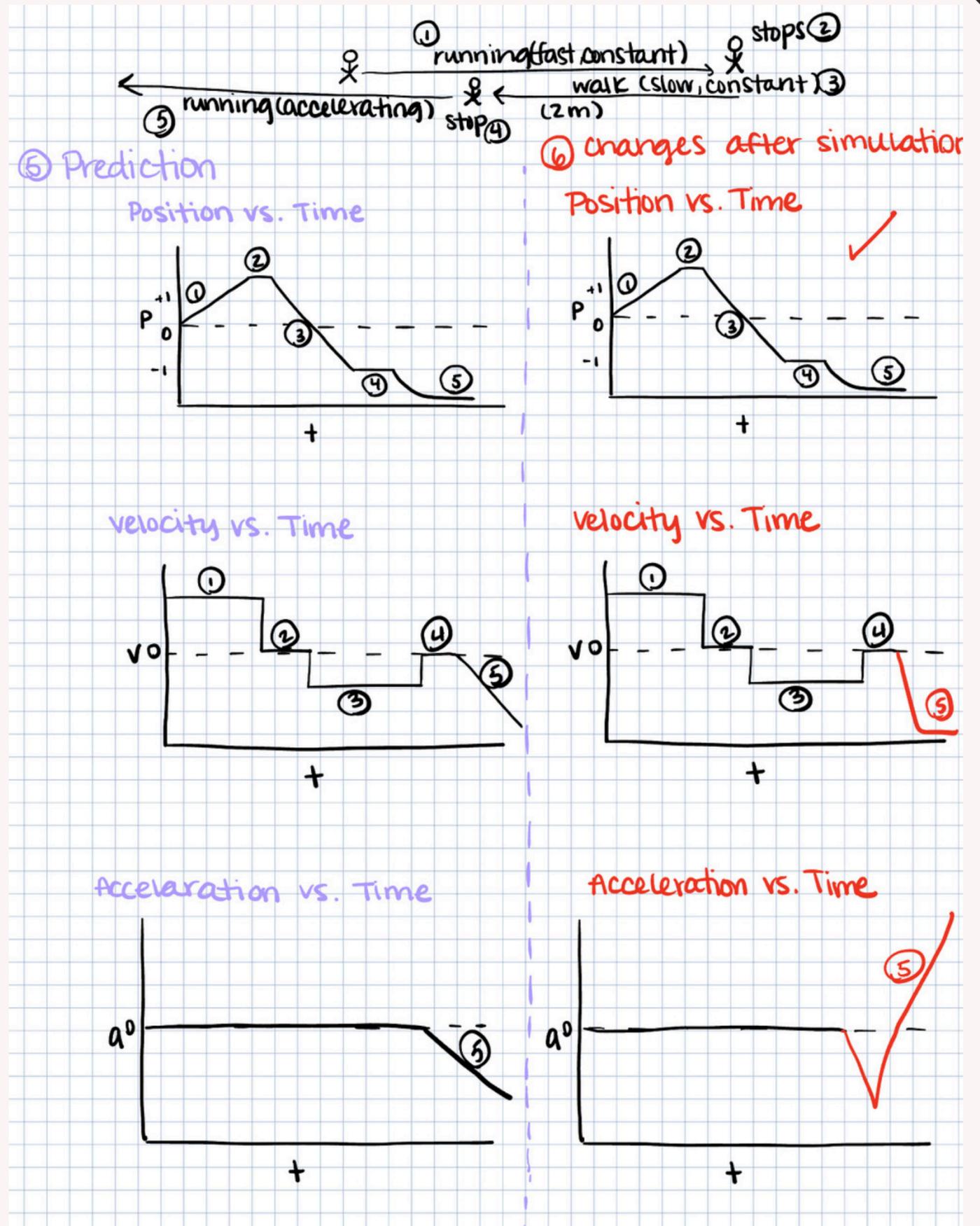


### Reasoning

The pace is accelerating, so the line is showing a positive relationship, where a increases as t increases.

# Question 5 Scenario:

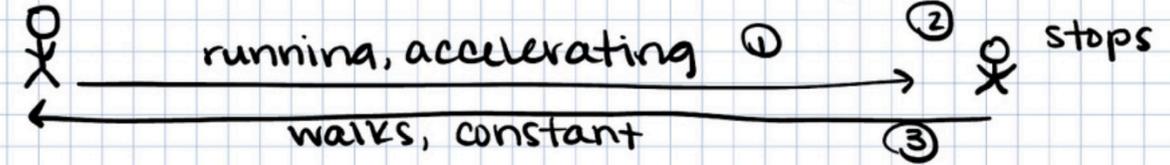
A man is running down the street. He stops to pick up a dollar bill he sees laying on the pavement. He turns around and begins walking home. He stops after 2 meters to tie his shoe. Then stands up and again runs the remainder of the way home, accelerating the entire way.



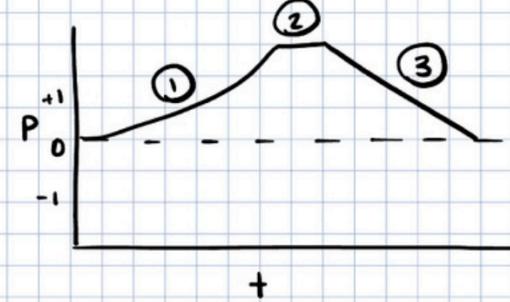
# My Own Scenario:

A man accelerates, then stops, and walks at a constant speed back to the starting location.

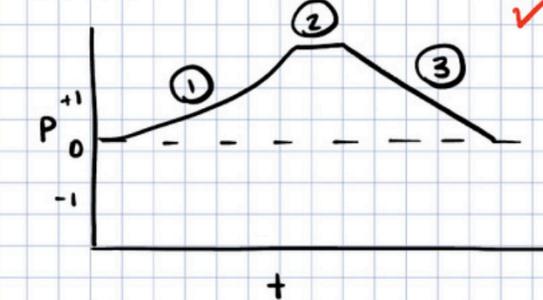
⑦ A man accelerates, then stops, and walks at a constant speed back to the starting location.



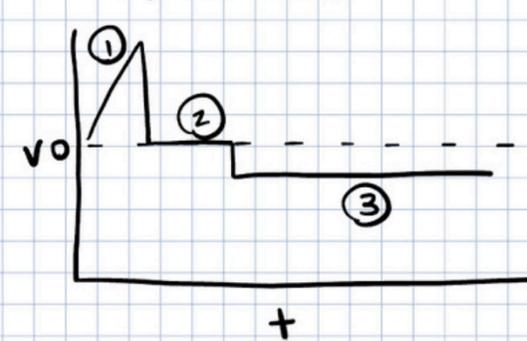
Position vs. Time



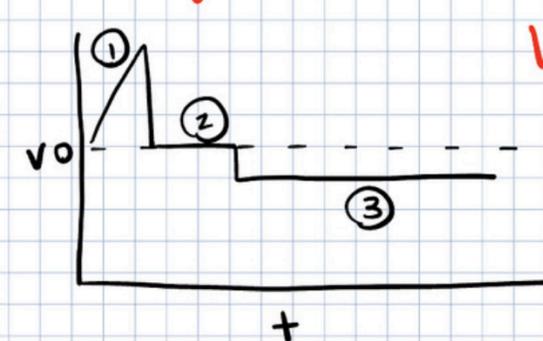
Position vs. Time



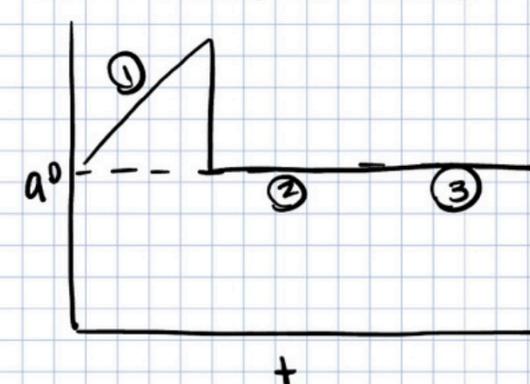
velocity vs. Time



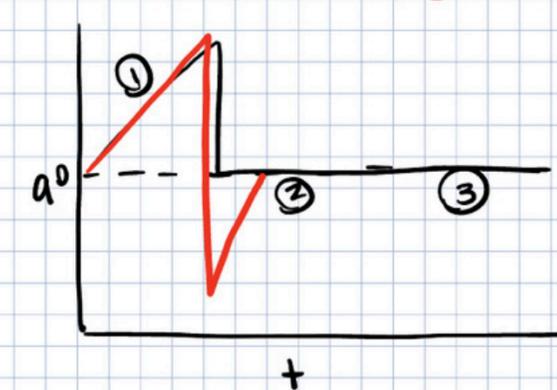
velocity vs. Time

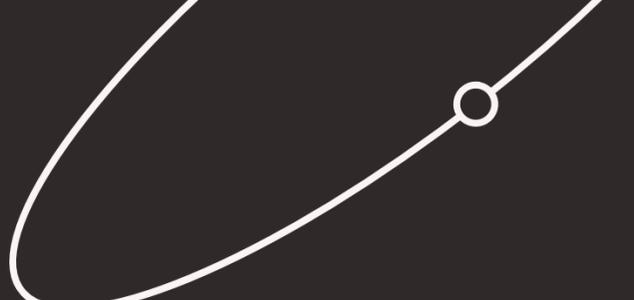


Acceleration vs. Time



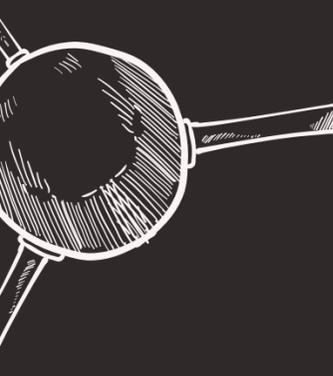
Acceleration vs. Time





# How does this activity connect to the physics student learning outcomes?

In a successful physics program, students will learn how to think like a scientist: “developing strong problem-solving and critical-thinking skills, understanding fundamental physical principles, and gaining practical experience with experimental design and data analysis” (Carnegie Mellon University, n.d.)



In this activity, students are gaining understanding through data analysis. Students are reading a scenario and predicting what the graphs would look like for position vs. time, velocity vs. time and acceleration vs. time. Students then test the scenario using the “Walking Man” simulation and collecting data and analyzing the graphs that are produced. Students are then able to compare the graphs they made on their own to the graph that the simulation created. Students then make changes to their original graph, followed by their reasoning/explanation.

This is directly connected to the physics student learning outcomes because students are practicing analyzing data and creating graphs. Students then use what they learn in the first few scenarios and then are able to create their own graphs based on a more complex scenario.

# Teacher Reflection

I really enjoyed this activity and this would be beneficial to use in a high school physics classroom. I loved how students were asked to create the graphs on their own first AND explain their reasoning behind the graph. This forced students to work through their thinking first, before relying on the simulation. Students then had the opportunity to use the simulation to create the actual graphs, and compare to their original. This allowed students to discover on their own how the simulation and data related to the graphs being produced, giving the students a deeper understanding of the physics content.

One change I would make is ask the students to complete one scenario at a time (graph on your own then simulation). The lab asks students to create all graphs for all scenarios first and then check them all with the simulation. There are a lot of similarities between the scenarios, so if students made a mistake in the first scenario, they probably made that mistake for the rest of the graphs. By doing each scenario individually, students would be able to apply what they learned to each scenario, before the more complex scenario later in the activity.

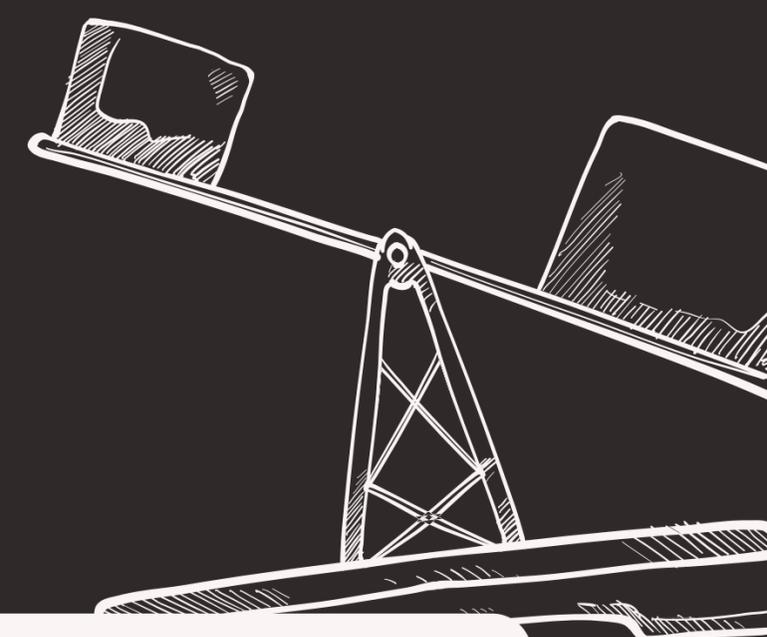


# Teacher Reflection Continued



I thought that this activity was appropriate for a high school physics class of 11th/12<sup>th</sup> graders. The activity required both independent and group work, and required students to access prior knowledge, as well as apply new knowledge to complex scenarios. Students also need to be mature enough to reflect on their own work and learn from their mistakes. This can be a difficult skill, especially if students are self-conscious about their academic abilities.





# Materials and References...

## References

Carnegie Mellon University. (n.d.). Learning outcomes – department of physics – Mellon college of science – Carnegie Mellon university. Cmu.edu. Retrieved October 14, 2025, from <https://www.cmu.edu/physics/undergrad-program/learning-outcomes.html>

## Materials

PHeT Simulation – Website [HERE](#)

Activity Worksheet – Link [HERE](#)

