### Instructions

1. Under the “When Green Flag Clicked” block, Initialize DeltaT to 0.1, position and velocity to 0, acceleration to 4, and include the block that starts the simulation.
2. Under the “simulation\_step” block, update position and velocity each simulation step using the “Change by” blocks and kinematic equations.
3. Once velocity exceeds 15 m/s, stop accelerating.
4. You can test your model and visualize the truck’s motion by clicking the Green Flag button at the top right of the screen.
5. If your model is correct, your truck should go off screen to the right while cruising at a constant velocity!
6. Use Copa, this sheet, and the graph and table tools to help you!

### Copa

Copa is designed to work *with* you, not *for* you. It will guide you along, but it’s up to you to answer, evaluate, and implement its questions and ideas. Copa may not always be right, but it can see what you’re doing inside C2STEM!

The more information you provide Copa, the more helpful it will be! Just like working with a human collaborator!

When you first ask Copa for information, Copa retrieves information you might need based on what you ask it and how you’re progressing in C2STEM. Copa only does this once, so make the first interaction count!

**Only use appropriate language with Copa, and stay on task! Researchers and teachers will see what you write!**

### Kinematic Equations

There are several ways the kinematics equations can be written. Your job is to figure out which variables in each equation correspond to each block in C2STEM! Here are some examples:

Updating Velocity

vx = v0x + a x Δt

velocityfinal = velocityinitial + acceleration x change in time

In computer code: x\_velocity += acceleration \* DeltaT

Updating Position

px = p0x + vx x Δt

positionfinal = positioninitial + velocity x change in time

In computer code: x\_position += velocity \* DeltaT

### Blocks

All blocks can be found on the left side of the screen under the “Control,” “Simulation,” and “Operators,” tabs at the top left of the screen. **You can ask Copa where specific blocks are as well!**

### Tools

“Graph” and “Table” tools are available on the right side of the screen in the middle horizontal bar to help you visualize how variables change over time.

These will help you debug and better understand your code!

To ensure that a variable is tracked on the screen and via the graph and table, be sure to check each variable’s checkbox that you want to track (left side of the screen) **before** running your model via the Green Flag button.