

NAME _____

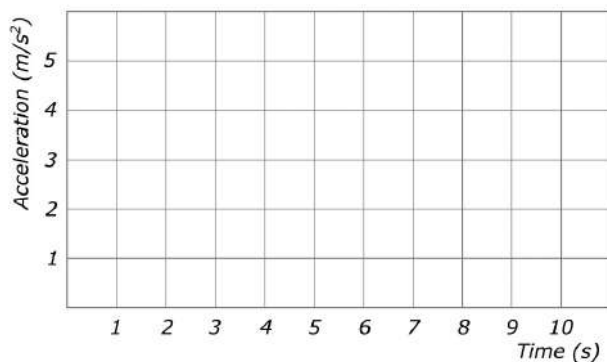
DATE _____

Scenario

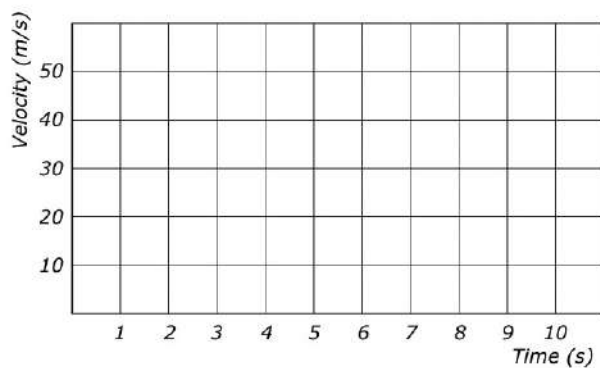
A rocket fires its engines to launch straight up from rest with an upward acceleration of 5 m/s^2 for 10 seconds. After this time, the engine shuts off, and the rocket freely falls straight down back to Earth's surface.

Using Representations

PART A: Sketch a graph of the acceleration as a function of time from $t = 0$ seconds to $t = 10$ seconds.



PART B: Sketch a graph of the velocity as a function of time from $t = 0$ seconds to $t = 10$ seconds.

**Data Analysis**

PART C: From the graph drawn in Part B, determine the velocity of the rocket after the initial 10 seconds of travel.

The velocity of the rocket at the end of 10 seconds is _____.

PART D: From the graph drawn in Part B, determine the height of the rocket after 10 seconds.

Height = _____

Argumentation

PART E: Make a claim about the numerical value of the acceleration of the rocket 10.1 seconds after firing when the rocket engines have been completely shut off. (Fill in the blanks.)

The acceleration of the rocket 10.1 seconds after it was launched is _____.

1.J Vertical Motion

Use the definition of free fall to explain your reasoning for your claim in Part E.

PART F: 10.1 seconds after the rocket was launched, indicate whether the rocket moving upward or downward.

_____ Upward _____ Downward

Choose one piece of evidence to support your claim and write it below.
