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DATE _____

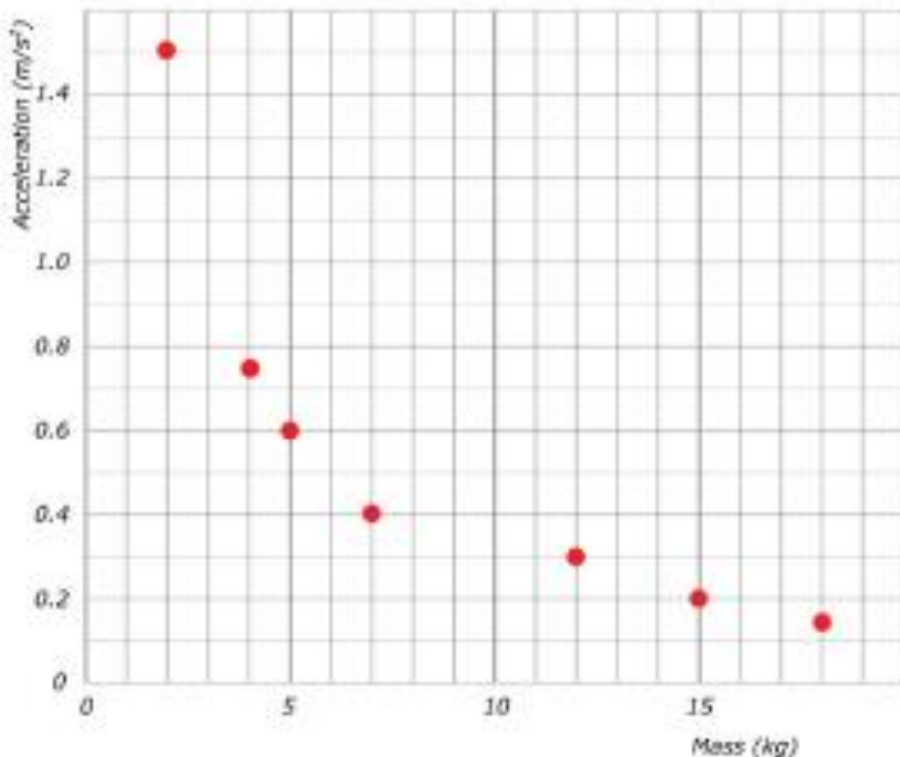
Scenario

Carlos and Dominique collect the following data from an experiment where they exerted the same force, F , to identical sized boxes with different masses and recorded the acceleration.

Trial	Mass	Acceleration
1	2 kg	1.5 m/s ²
2	4 kg	0.75 m/s ²
3	5 kg	0.60 m/s ²
4	7 kg	0.40 m/s ²
5	12 kg	0.30 m/s ²
6	15 kg	0.20 m/s ²
7	18 kg	0.15 m/s ²

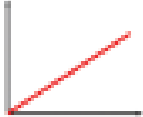
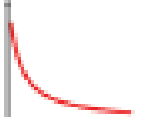
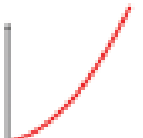
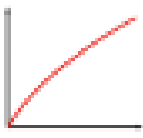
Using Representations

PART A: Plot the acceleration of the boxes versus the mass of each box.



2.A Relationship Between Force and Acceleration

Data Analysis

Graph	Relationship
	As x increases, y increases proportionally. y is directly proportional to x .
	As x increases, y decreases. y is inversely proportional to x .
	y is proportional to the square of x .
	The square of y is proportional to x .

PART B: Based on the graph you created in Part A, identify the correct relationship between the acceleration and mass of an object. Fill in the blanks.

As mass *increases*, acceleration *decreases*. Therefore, acceleration is *inversely proportional* to mass.

PART C: Based on your analysis in Part B, what could be graphed instead of mass and acceleration that would lead to a linear relationship?

Acceleration vs. 1/mass or mass vs. 1/acceleration

PART D: What is the physical meaning of the slope of the linearized graph suggested in Part C?

Either net external force (if acceleration were graphed vs. 1/mass) or 1/force (if mass were graphed vs. 1/acceleration)