

NAME \_\_\_\_\_

DATE \_\_\_\_\_

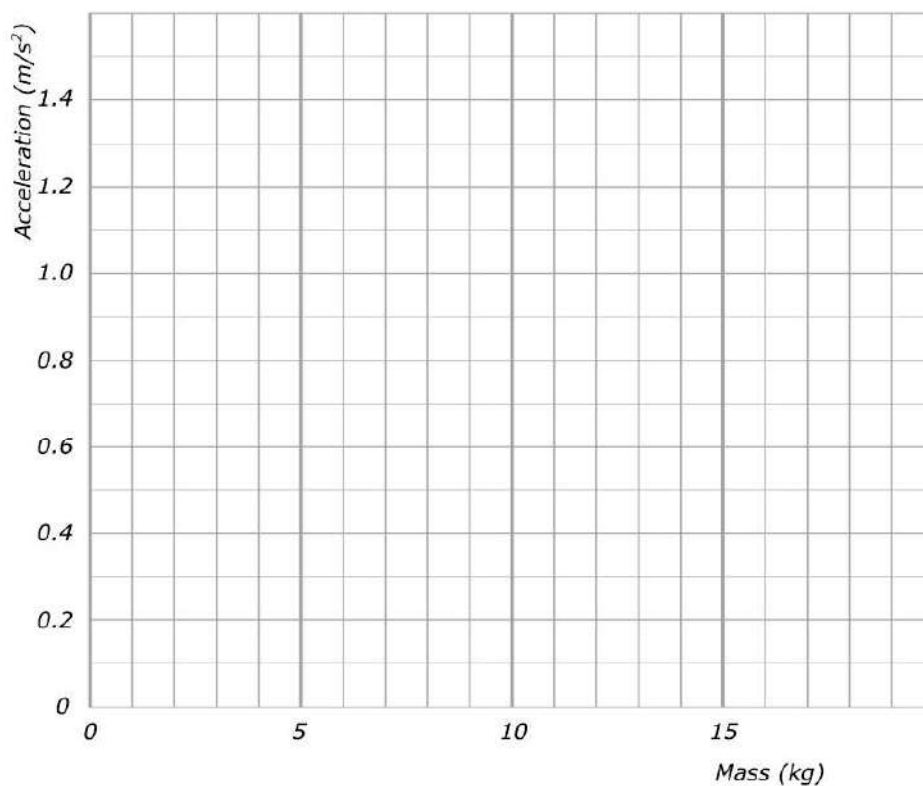
**Scenario**

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 <sup>2</sup>
2	4 kg	0.75 m/s <sup>2</sup>
3	5 kg	0.60 m/s <sup>2</sup>
4	7 kg	0.40 m/s <sup>2</sup>
5	12 kg	0.30 m/s <sup>2</sup>
6	15 kg	0.20 m/s <sup>2</sup>
7	18 kg	0.15 m/s <sup>2</sup>





**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 \_\_\_\_\_, acceleration \_\_\_\_\_. Therefore, acceleration is \_\_\_\_\_ 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?

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

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