

# 7.1 Inverse Variation



Learning Standards  
HSA-CED.A.1  
HSA-CED.A.2  
HSA-CED.A.3

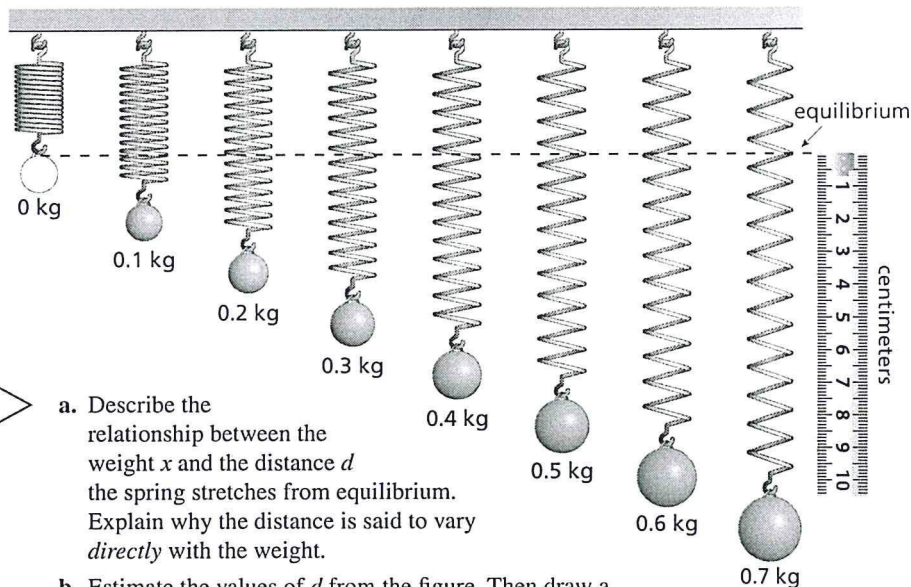
**Essential Question** How can you recognize when two quantities vary directly or inversely?

## EXPLORATION 1 Recognizing Direct Variation

**Work with a partner.** You hang different weights from the same spring.

### REASONING QUANTITATIVELY

To be proficient in math, you need to make sense of quantities and their relationships in problem situations.

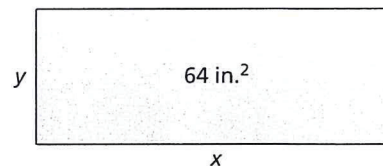


- Describe the relationship between the weight  $x$  and the distance  $d$  the spring stretches from equilibrium. Explain why the distance is said to vary *directly* with the weight.
- Estimate the values of  $d$  from the figure. Then draw a scatter plot of the data. What are the characteristics of the graph?
- Write an equation that represents  $d$  as a function of  $x$ .
- In physics, the relationship between  $d$  and  $x$  is described by *Hooke's Law*. How would you describe Hooke's Law?

## EXPLORATION 2 Recognizing Inverse Variation

**Work with a partner.** The table shows the length  $x$  (in inches) and the width  $y$  (in inches) of a rectangle. The area of each rectangle is 64 square inches.

$x$	$y$
1	
2	
4	
8	
16	
32	
64	



- Copy and complete the table.
- Describe the relationship between  $x$  and  $y$ . Explain why  $y$  is said to vary *inversely* with  $x$ .
- Draw a scatter plot of the data. What are the characteristics of the graph?
- Write an equation that represents  $y$  as a function of  $x$ .

### Communicate Your Answer

- How can you recognize when two quantities vary directly or inversely?
- Does the flapping rate of the wings of a bird vary directly or inversely with the length of its wings? Explain your reasoning.