

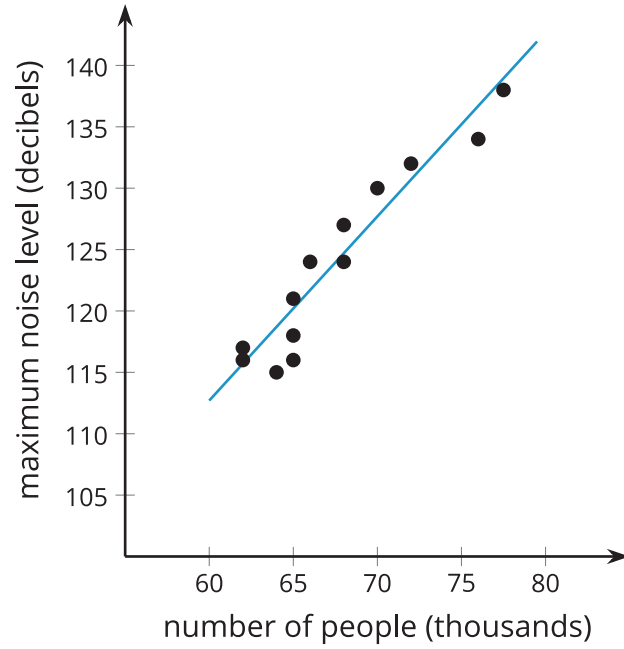
# Unit 3 Lesson 4: Linear Models

## 1 Notice and Wonder: Crowd Noise (Warm up)

### Student Task Statement

What do you notice? What do you wonder?

$$y = 1.5x + 22.7$$



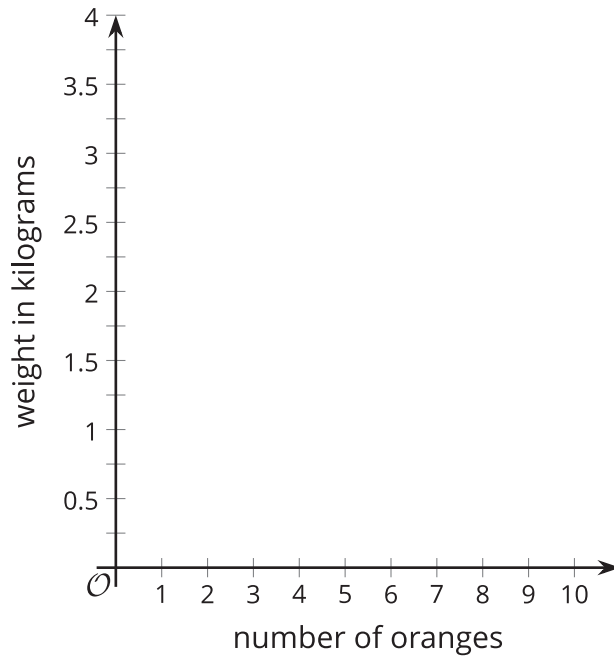
## 2 Orange You Glad We're Boxing Fruit?

### Student Task Statement

1. Watch the video and record the weight for the number of oranges in the box.

number of oranges	weight in kilograms
3	
4	
5	
6	
7	
8	
9	
10	

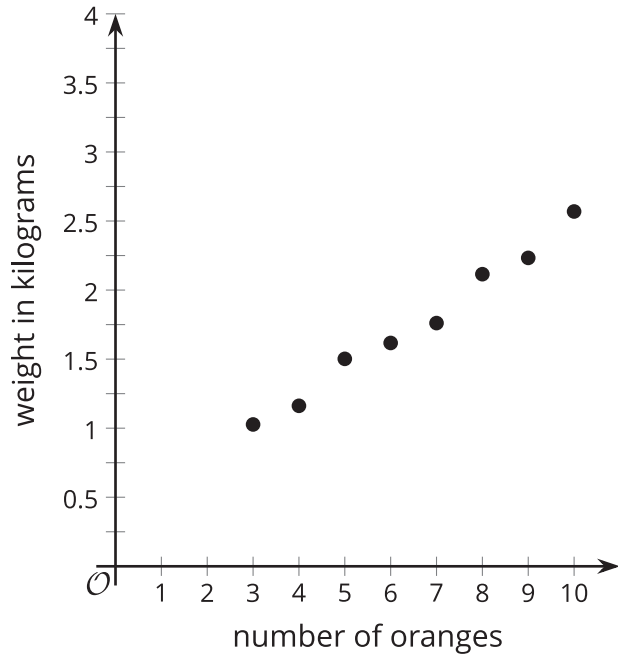
2. Create a scatter plot of the data.



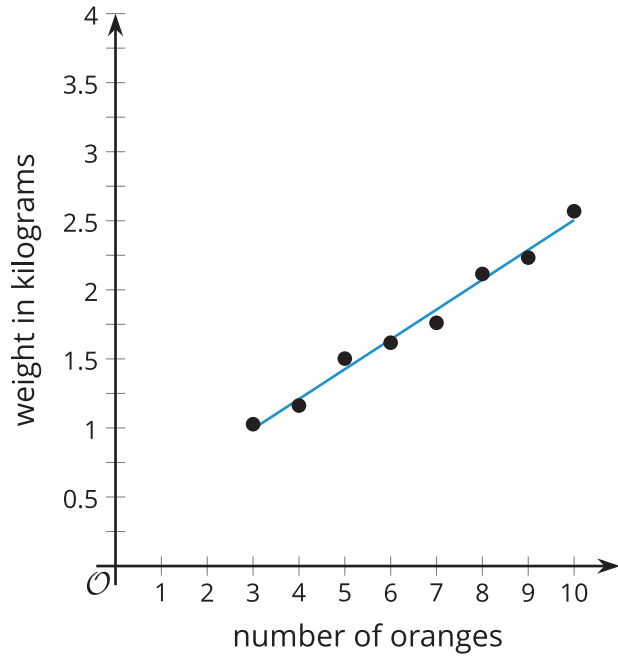
3. Draw a line through the data that fits the data well.

4. Estimate a value for the slope of the line that you drew. What does the value of the slope represent?
5. Estimate the weight of a box containing 11 oranges. Will this estimate be close to the actual value? Explain your reasoning.
6. Estimate the weight of a box containing 50 oranges. Will this estimate be close to the actual value? Explain your reasoning.
7. Estimate the coordinates for the vertical intercept of the line you drew. What might the  $y$ -coordinate for this point represent?
8. Which point(s) are best fit by your linear model? How did you decide?
9. Which point(s) are fit the least well by your linear model? How did you decide?

### Activity Synthesis



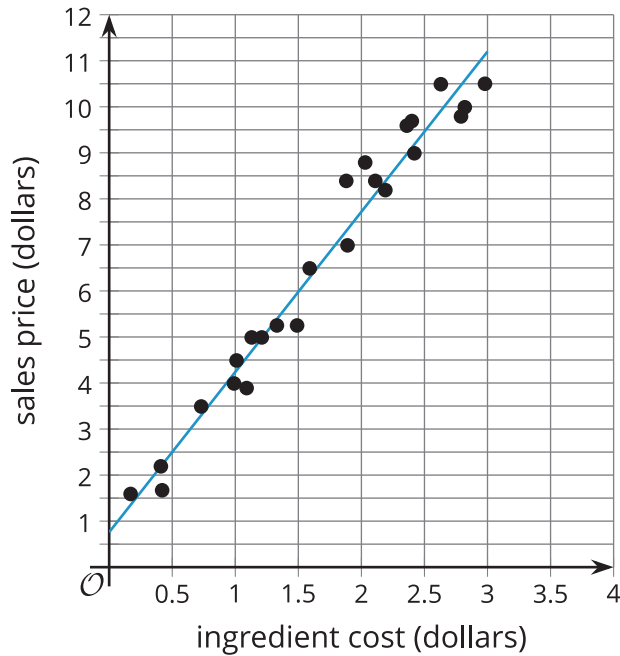
$$y = 0.216x + 0.345$$



### 3 Food Markup

#### Student Task Statement

The scatter plot shows the sale price of several food items,  $y$ , and the cost of the ingredients used to produce those items,  $x$ , as well as a line that models the data. The line is also represented by the equation  $y = 3.48x + 0.76$ .



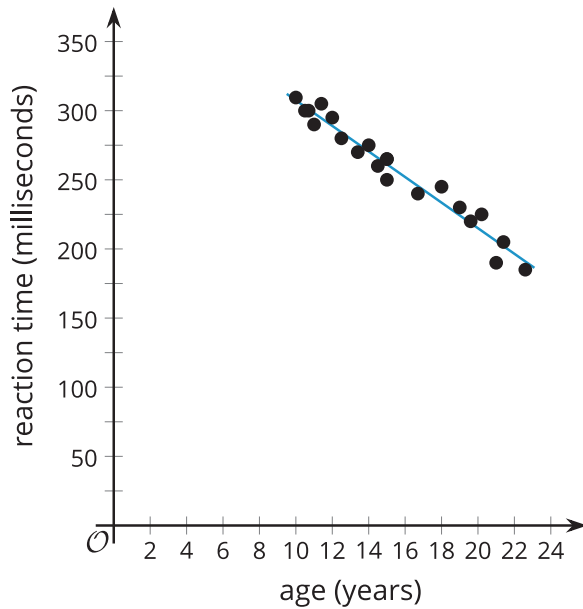
1. What is the predicted sale price of an item that has ingredients that cost \$1.50? Explain or show your reasoning.
2. What is the predicted ingredient cost of an item that has a sale price of \$7? Explain or show your reasoning.
3. What is the slope of the linear model? What does that mean in this situation?
4. What is the  $y$ -intercept of the linear model? What does this mean in this situation? Does this make sense?

# 4 The Slope is the Thing

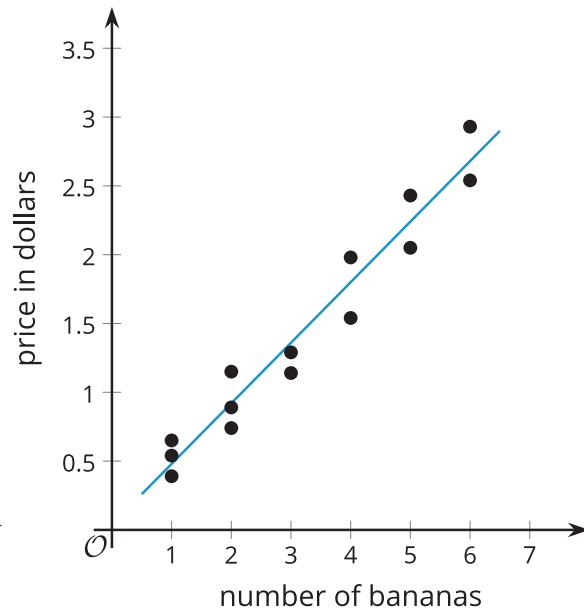
## Student Task Statement

1. Here are several scatter plots.

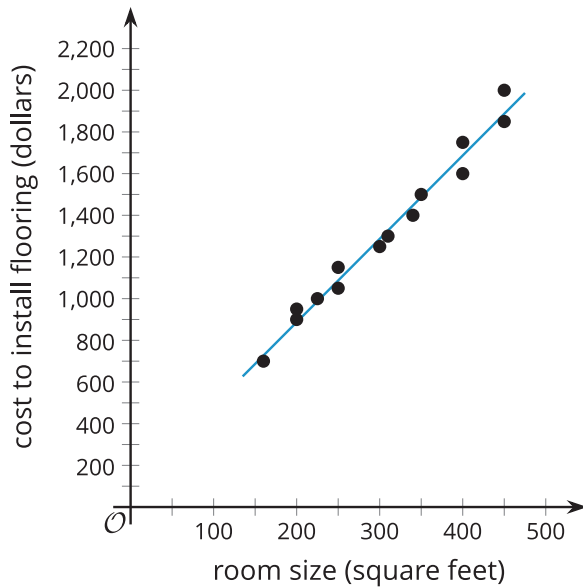
A.  $y = -9.25x + 400$



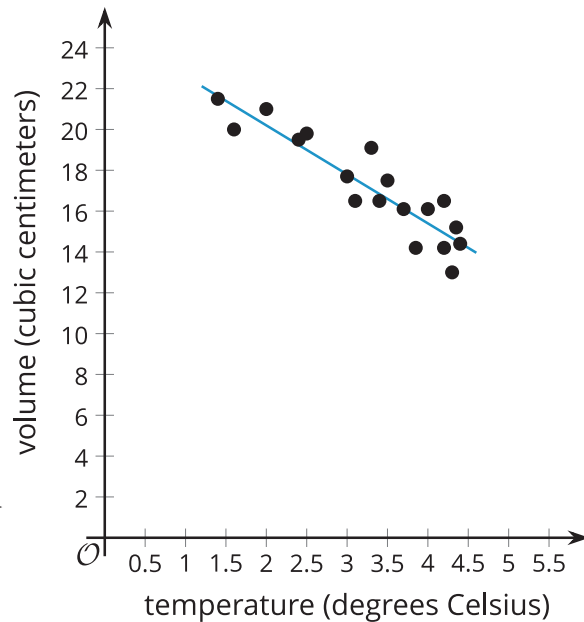
B.  $y = 0.44x + 0.04$



C.  $y = 4x + 87$



D.  $y = -2.4x + 25.0$



- a. Using the horizontal axis for  $x$  and the vertical axis for  $y$ , interpret the slope of each linear model in the situations shown in the scatter plots.

b. If the linear relationship continues to hold for each of these situations, interpret the  $y$ -intercept of each linear model in the situations provided.