

## Twizzlers Linear Regression Pre-Activity & Worksheet

### Answer Key

#### Procedure

1. Obtain a Twizzler from your teacher.
2. Use a ruler to measure the Twizzler length in centimeters (cm). Record in the data table below.
3. Take a small bite out of the Twizzler.
4. Measure the new length of the Twizzler in cm and record below.
5. Continue steps 3-4 until the Twizzler is gone.
6. Answer the analysis questions.

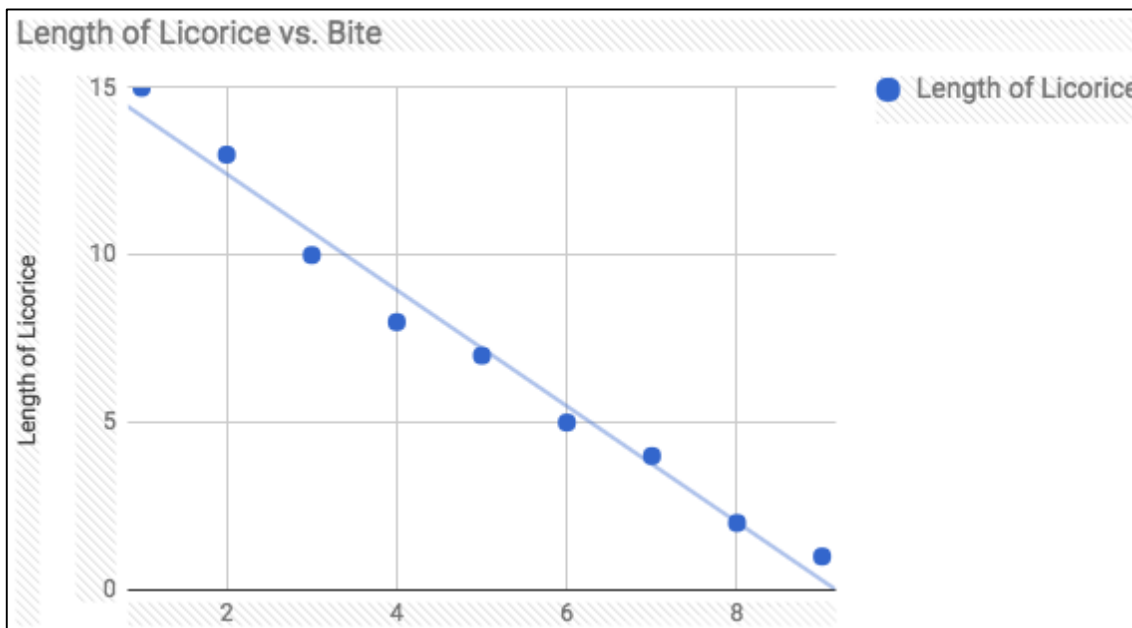


Bite Number	Licorice Candy Length (cm)
0	Measurements will vary
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

#### Analysis Questions

1. What is the independent variable? (We will graph this on the x-axis.)  
Bite number
2. What is the dependent variable? (We will graph this on the y-axis.)  
Licorice length
3. Did the length of the Twizzler bite change between bite 1 and bite 2?  
Answers may vary; most likely yes
4. Did the length of the Twizzler bite change between bite 3 and bite 4?  
Answers may vary; most likely yes
5. Would you expect all bites to be the same length? Why or why not?  
No, because it seems impossible to make each bite the same without a using a ruler and marking it

6. On a piece of graph paper, create a scatter plot.  
Put bite number on the x-axis and Twizzler length on the y-axis.



7. Does the relationship appear to be linear? Why?  
Yes, the relationship appears to be linear because it seems to be decreasing in similar intervals after each bite.
8. Is the relationship increasing or decreasing? How do you know?  
The relationship is decreasing because the length of the licorice is getting smaller with each bite.
9. Whether the relationship appears to be linear or not, perform a linear regression of the form  $y = mx + b$ . Write the regression equation below.  
 $y = -1.7x + 15.9$  If done by hand, may be  $y = -2x + 16$
10. The value of  $b$  represents the  $y$ -intercept of the regression equation.  
What is your  $b$  value? Be sure to include units!  
15.9 cm
11. What does the  $y$ -intercept tell you in this situation?  
The length of the Twizzler before a bite was taken out of it.
12. What would you expect the  $y$ -intercept of your graph to be? What variables could account for this difference in the expected  $y$ -intercept and the actual  $y$ -intercept of your regression equation?  
I would expect it to be 16.5 cm. The line of best fit may not have been drawn perfectly.
13. The value of  $m$  represents the slope (or rate of change) of the regression equation.  
What is your  $m$  value? Be sure to include units!  
slope is -1.7 cm/bite
14. Use the regression equation to predict the number of bites it would take you to eat 5 cm of licorice.  
6 bites
15. Use the regression equation to determine the amount of licorice you could eat in 7 bites.  
About 11 cm