MCj04238120000[1] Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Tongue Twister**

Students will say a selected tongue twister one at a time. In the first trial, only the first student will say the tongue twister; in the second trial, only the first and second students will say the tongue twister, etc. In each trial, one person will be added to the chain of tongue twisters and the total elapsed time will be recorded. Student 1 will be the timer.

Tongue twisters:

*A. Work will win when wishy-washy wishing won’t.*

*B. Picky people pick Peter Pan peanut butter it is the only peanut butter picky people pick.*

**Data Collection**

1. In the table below, record the class data for each Tongue Twister.

|  |  |  |
| --- | --- | --- |
| **Number of people** | **Tongue Twister A**  **(time, nearest tenth of a second)** | **Tongue Twister B**  **(time, nearest tenth of a second)** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |

**Graphing and Line of Best Fit**

2. Make a scatter plot using different colors for each tongue twister’s data. You will need to scale the time axis appropriately, according to your data.

What is your independent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is your dependent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Explain why you think the plotted points for each tongue twister do ***not*** form a straight line.

4. Should a dot-to-dot line be drawn to connect the data, or should a straight line be drawn through the sets of the data? Explain why.

5. Estimate and draw a line (in the matching color) which “fits” the plotted points the best for each tongue twister. This line is called the *line of best fit.*

6. Even though we did not measure the time required for 18 people to say the tongue twister, explain clearly how you can use the graph you drew in #2 to predict this time. Similarly explain clearly how you can use the graph to determine how many people could say the tongue twister in 70 seconds.

|  |  |
| --- | --- |
| **18 people**  Tongue Twister A  Tongue Twister B | **70 seconds**  Tongue Twister A  Tongue Twister B |

7. Explain why the slope of each line is different.

8. How long does each tongue twister take per person?

9. Use the line of best fit to calculate an equation that predicts how much time it would take for *x* number of people to say each tongue twister. (Remember to show all your work)

a.) Identify two points your line passes through. You can use two points from your graph, one point from your graph and xmean, ymean, or your two Q-points.

b.) Find the slope between the two points selected in part a.)

c.) Pick one point from a.) and the slope from b.) to substitute into y = mx + b, solve for b.

d.) Write the equation of your line in slope-intercept form (y = mx + b)

e.) Use your equation to estimate how long it will take 100 people to say each tongue twister. (nearest tenth)

|  |  |
| --- | --- |
| **Tongue Twister A**  a.)  b.)  c.)  d.)  e.) | **Tongue Twister B**  a.)  b.)  c.)  d.)  e.) |

**Graphing Calculator and Line of Best Fit**

10. Use your graphing calculator and your data to make a scatterplot calculate the line of best fit. Use the calculator directions to help.

a.) Write the equation of the line of best fit (LinReg) that predicts how much time it would take for *x* number of people to say each tongue twister. Round decimals to the nearest thousandth (3 places)

b.) Identify the correlation coefficient (r value) Round your answer to the nearest thousandth.

c.) What does the correlation coefficient tell you?

d.) Use your equation to estimate how long it will take 100 people to say each tongue twister. (nearest tenth)

|  |  |
| --- | --- |
| **Tongue Twister A**  a.)  b.)  c.)  d.) | **Tongue Twister B**  a.)  b.)  c.)  d.) |

12. Compare your equations that you calculated by hand and using the graphing calculator. What contributes to their similarities and differences?