**Flying Functions**

Predictions

1. Make a prediction about the speed(s) at which your arrow will fly. Write your answer using three different units: feet/sec, yards/sec, and miles/hour. Make sure that your conversions are correct.

\_\_\_\_\_\_\_ ft/sec

\_\_\_\_\_\_\_ yds/sec

\_\_\_\_\_\_\_ mi/hr

1. When an arrow flys, the nock of the arrow can be modeled by a function. Make a prediction as to which type of function would best model the flight of the arrow. For example, it is a linear, quadratic, exponential, cubic, quartic, quantic, etc.? Explain why you think that function is the best fit.

Activity

Directions: After you have made your predictions, the class will go outside and I will film each of you shooting your arrow. Use your video and Logger Pro to answer the following questions.

1. Record the speed of your arrow as it initially left your bow and the speed of your arrow as it hit the target.

Initial speed: Ending speed:



\_\_\_\_\_\_\_ ft/sec \_\_\_\_\_\_\_ ft/sec

\_\_\_\_\_\_\_ yds/sec \_\_\_\_\_\_\_ yds/sec

\_\_\_\_\_\_\_ mi/hr \_\_\_\_\_\_\_ mi/hr

1. Use the “Curve Fit” button on Logger Pro to find the function that best fits the flight of your arrow. Record the function below.
2. Compare the best fit function with the function that you originally predicted.
3. Discuss your best fit function with a partner, what is similar and what is different? Why do you think that they are different?
4. What do you think the red graph means? What about the blue graph? Why do you think that?
5. What does RMSE stand for? What does it mean and why is it important?