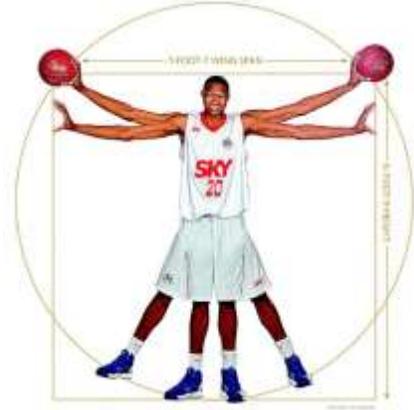




From observation to experiment: Mr. Fireng read a really cool article about the wingspan of NBA basketball players. He read that many of the players had wingspans that were way longer than their height. He started to wonder if some of his students had the same trait. He went home that night and measured his kid's height and wingspan and based on that evidence, he thought; I bet there is a relationship between height and wingspan. He decided he would test this by having his students measure their height and wingspan and to see if there was a relationship. He thought of the experimental question; how does the height affect the wingspan of Perry high school students? He believed that if the height increased, then wingspan will increase because of the genetic relationship between the two. For the control group, he used the average height of 1.80 M and the average wingspan of 1.84 M.



Part one: Identifying the parts of an Experiment (25 points)

1. What was the observation that lead to the investigation?
2. What evidence did Mr. Fireng use?
3. What was the informal question?
4. What was the inference (informal hypothesis)?
5. How was he going to test the question?
6. What is the dependent variable?
7. What is the independent variable?
8. Mr. Fireng's Experimental Question?
9. What was the hypothesis?



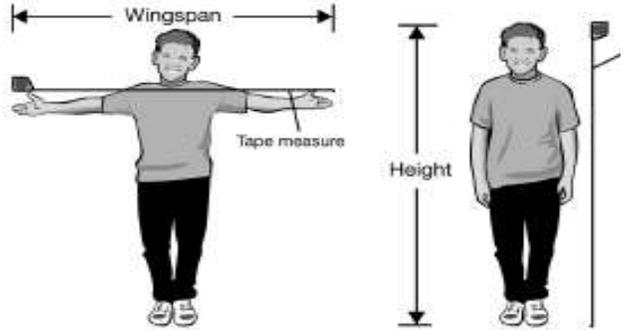
Part two: Data Collection (25 points)

Materials:

Metric Ruler

To measure wingspan:

- Stand with your back to a wall arms straight out to the sides (your arms should not be touching the wall when you measure with your back against it) and have someone mark where the ends of your middle fingers touch the wall. Then measure the distance between those two marks in Meters. Record measurements in Table 1



To measure height:

- Take off your shoes. Stand with your back to a wall. Place a book or a ruler flat on the head, measure the distance from the floor to the book in Meters. Record measurements in Table 1

Data Table:

|             | Wingspan (M) | Height (M) |             | Wingspan (M) | Height (M) |
|-------------|--------------|------------|-------------|--------------|------------|
| Student #1  |              |            | Student #18 |              |            |
| Student #2  |              |            | Student #19 |              |            |
| Student #3  |              |            | Student #20 |              |            |
| Student #4  |              |            | Student #21 |              |            |
| Student #5  |              |            | Student #22 |              |            |
| Student #6  |              |            | Student #23 |              |            |
| Student #7  |              |            | Student #24 |              |            |
| Student #8  |              |            | Student #25 |              |            |
| Student #9  |              |            | Student #26 |              |            |
| Student #10 |              |            | Student #27 |              |            |
| Student #11 |              |            | Student #28 |              |            |
| Student #12 |              |            | Student #29 |              |            |
| Student #13 |              |            | Student #30 |              |            |
| Student #14 |              |            | Student #31 |              |            |
| Student #15 |              |            | Student #33 |              |            |
| Student #16 |              |            | Student #34 |              |            |
| Student #17 |              |            | Average     |              |            |

Part three: Graphing skills (50 points)

Graphing skill #1: Choosing the right type of graph:

- What type of graph should be used? Why (see choosing the correct graph handout)?

Graphing skill #2: Labeling Axes:

- What would be the correct labels for the graph including units?

Label for X-axis \_\_\_\_\_ Label for Y-axis \_\_\_\_\_



Graphing skill #3: Scaling Axes:

1. What number will you go by on the X-axis? **Show your work.**

X-Axis

Largest #: \_\_\_\_\_

Smallest #: \_\_\_\_\_

Range = \_\_\_\_\_

# of intervals = \_\_\_\_\_

2. What number will you go by on the Y-axis? **Show your work.**

Y-Axis

Largest #: \_\_\_\_\_

Smallest #: \_\_\_\_\_

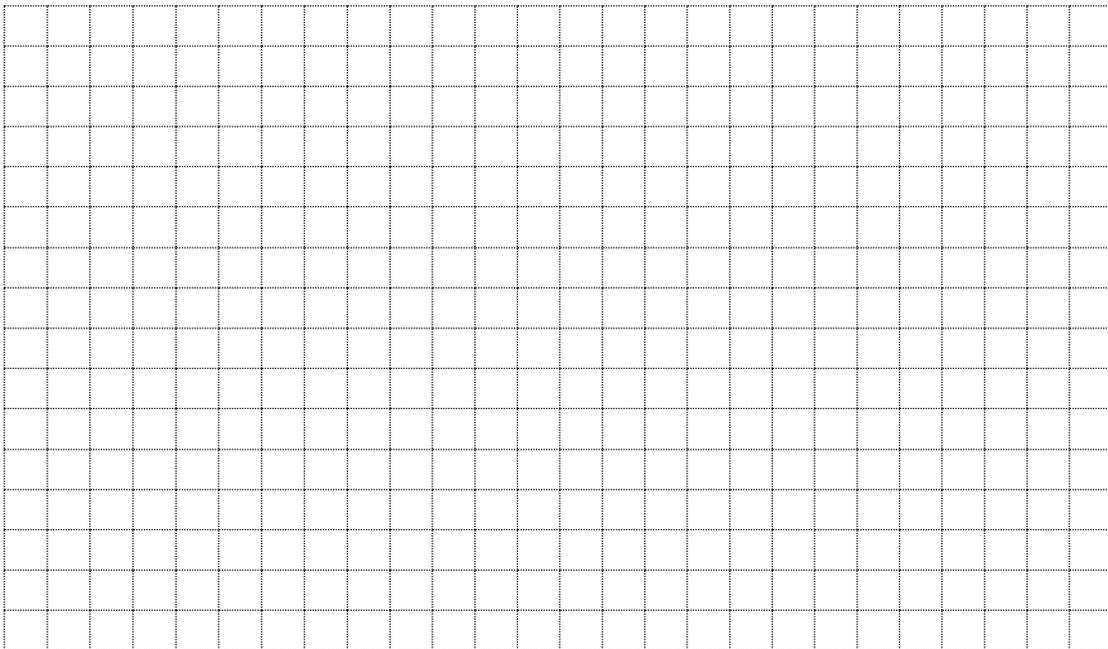
Range = \_\_\_\_\_

# of intervals = \_\_\_\_\_

Graphing skill #4 choosing a title

1. What would be a good title for the graph?

Title \_\_\_\_\_



Graphing skill #7 Graphing Correlations

1. Does the graph show a positive correlation, negative correlation or no correlation? How do you know?
  
2. Is the correlation strong, moderate or weak? Explain your answer.



**Part four: Data analysis/ Conclusion:** Complete sentences, paragraph form, no personal pronouns. Use the wording in the previous experiment as a guide: Use a separate sheet of paper if needed.

Required components: **Sentence starter...** (*instructions on what to write*)

Data analysis:

- Summarize the data: **The data tables and graphs show...** (*Describe the data in words*).
- Restate hypothesis: **The hypothesis...** (*restate hypothesis*).
- Explain if your hypothesis was supported by the data or was disproven: **...was (supported or refuted) ...by the data because.. (use the data to support this).**

Conclusion:

- Restate the experimental question: **The problem being studied in this experiment was...** (*write the experimental question*).
- Restate the hypothesis: **It was proposed that if..** (*restate hypothesis*)
- What would the results be IF the hypothesis was supported? **If the hypothesis is supported by the data, the results SHOULD..** (*say what the results should look like*)
- Describe actual results: **The data in this experiment ACTUALLY showed that...** (*describe actual results*)
- Describe Error: **Although the experiment was controlled, there were still some possible sources of error. Sources of error in this experiment include...** (*What could have changed your data? What variables were not controlled or could not be controlled? Was your experimental setup successful and effective? Why or why not?*)
- How to avoid error: **These errors could be avoided in the future by...** (*How can you improve your procedure so that you don't make the same mistakes and/or how could you better control your variables?*)
- Future Research: **Some future research that could be conducted is:** (*what other questions could you explore?*)

.....  
Data Analysis:

Conclusion