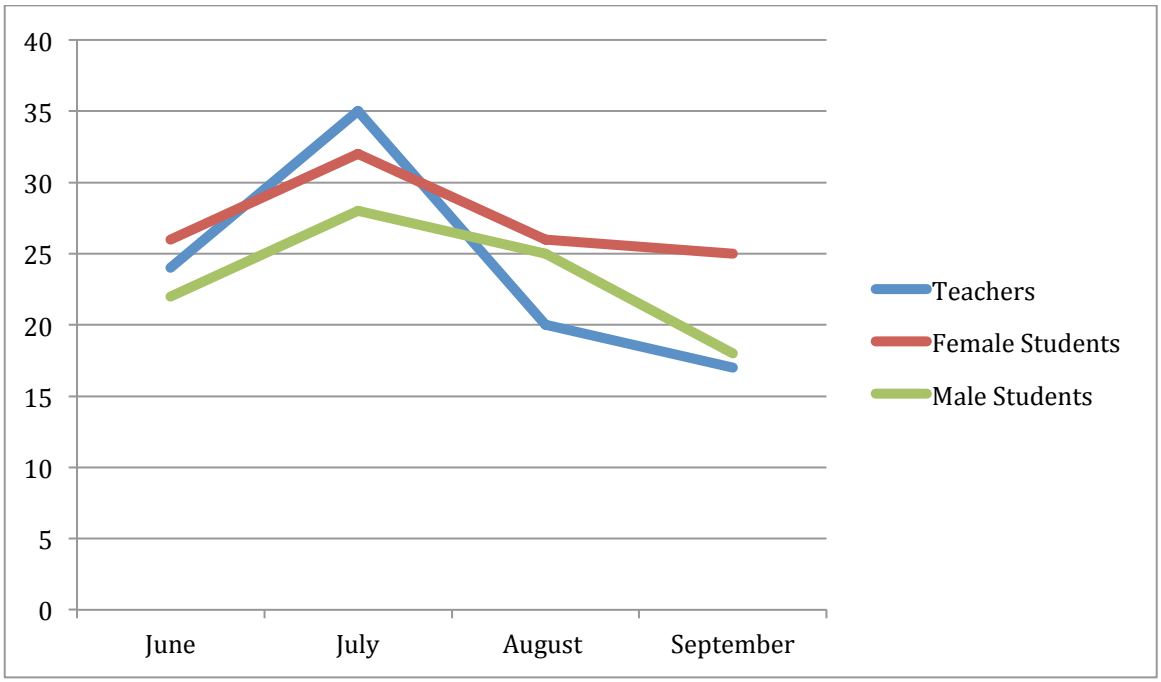
Panda Weasley's Experimental Design Practice Test

Station 1

A survey was done recently at a school about the number of books read over summer vacation. The data is shown on the graph below. Use the graph to answer the questions.



1. In which month was the most total number of books read?
2. In which month was the least total number of books read?
3. Which group read the most total books?
4. What is the range of the total books read from June to September?
5. What is the mean of the total books read from June to September?
6. How many total books did the students (male and female) read?
7. What could be a possible reason for the drop in books read between August and September?

Station 2

Sally is working on her science fair project about air resistance. To perform her experiment she is making five of the same basic glider out of balsa wood, but with varying wing lengths. Each length is 1 cm longer than the length before it. Based on the information given answer the below questions.

1. Write a statement of problem for Sally's experiment.
2. What would your hypothesis be based on this experiment?
3. List the _____ for this experiment. (6 points total)
    a. Independent Variable
    b. Dependent Variable
    c. Constant Variables (3 for full credit)
4. Create a Standard of Comparison for this experiment.
5. List 3 possible experimental errors.

Station 3

A group of students at Ento Trail Middle School are doing an experiment on the absorbency of the paper towels in the bathrooms. They are comparing the brown paper towels to several name brand paper towels. Make a materials list (6 points) and procedure (12 points) for this experiment.

Station 4

Ricky is completing an experiment on how the size of the loop of string used to make the bubbles affects the bubbles size. He started the experiment by mixing a solution of water, dish detergent, cornstarch, baking powder, and Glycerin. After several tries with different lengths of string the switched to a thicker string type. A few minutes later he added more dish detergent to the bubble solution.

1. What are possible experimental errors in Ricky's experiment? (One point for each error up to 6) Explain.
2. How might adding more dish detergent part way through the experiment affect the results?
3. List a practical application for this experiment and 3 recommendations for further experimentation. (5 points)

Station 5

How Ramp Length Affects the Distance a Ball Rolls (cm.)

Ramp Length (cm.)	Trial 1	Trial 2	Trial 3
2	8.7	7.9	8.7
4	13.4	14.8	14.5
6	22.7	21.9	22.5

Use this data to fill in the table on the answer sheet. (6 points)

1. What can you conclude from this data?
2. What is a practical application of this experiment?

Station 6

Tai loves to make miniature volcanoes. She want's to make one with a large reaction to go on top of her Dad's birthday cake. She has researched several ways to make a large reacting volcano, but decided that using the classic baking soda and vinegar volcano would be the best route. Now she want's to know which combination of the two ingredients would make the best volcano.

1. Write a statement of problem for this experiment.
2. What is your hypothesis for this experiment? (4 points)
3. Conduct the experiment and fill out the data table on the answer sheet. (6 points)
    - You may use only 3 of the provided cups for your experiment.
    - Dispose of any used cups where marked.
    - Clean up any messes you make.
4. What can you conclude from this experiment?

Station 7

Graph the following data: (12 points)

Mrs. Brown's 3rd Grade Class' Favorite Fruit

	Watermelon	**Apple**	**Pear**	**Peach**	**Banana**
Girls	7	4	6	6	2
Boys	5	7	4	6	3

1. What can you conclude from this data?

Station 8

When re-creating an experiment, it is important to follow the procedure exactly so that you get the same results as the person whose procedure you are using did. This station is to test your ability to follow instructions. You may only use **2** of the pieces of paper provided. If you mess up after using both pages, submit the best one. One point will be given for each correct step for a possible total of 13 points. Scoring stops when you incorrectly complete a task.

1. Turn the paper so that the short end is at the top, and the long end down the side (portrait).
2. Write your team name at the top left hand corner with the green marker.
3. Write your name(s) with the blue marker at the bottom right hand corner.
4. Draw a straight line with the red marker connecting the last letter of your team name with the first letter of your name(s).
5. Measure 2 in. down along the red line from the top. Make a mark with the black colored pencil.
6. Measure 2cm. up along the red line from the bottom. Make a mark with the black colored pencil.
7. Rotate the paper 90^{o} clockwise.
8. Draw a large circle with your pencil that intercepts the two points on the line.
9. Flip the paper over the bottom edge.
10. Draw a line with the green marker along the top edge of the paper.
11. Draw a line with the blue marker along the right edge of the paper with a 1in. offset.
12. Pierce the paper with your pencil at the intersection of the blue and green lines.
13. Attach the paper to your answer sheet with the stapler.