**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per. \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_**

**Probability and the Punnett Square**

Directions: You are going to investigate the difference between the predicted outcomes of a Punnett square and the actual outcomes of crossing two heterozygous traits.

1. The Punnett Square: Complete the following Punnett Square and then calculate the percentage of outcomes for each of the offspring for Bb & Bb traits. (B is blue, b is white)

|  |  |
| --- | --- |
|  |  |
|  |  |

1. Based on the above Punnett Square, what percentage of the offspring will have a BLUE trait outcome?
2. Based on the above Punnett Square, what percentage of the offspring will have a WHITE trait outcome?
3. Actual Occurrence:
4. Draw one marble out of bag 1 and record the color below. Put it back. Draw one marble out of bag 2 and record the color. Put it back. Repeat these steps for a total of 12 times.
5. Complete the column for Outcomes – ONE or BOTH of the draws is a blue marble, write “blue” in the outcome column. If ONE or BOTH of the draws is a white marble, write “white” in the outcome column.

|  |  |  |  |
| --- | --- | --- | --- |
| Trial | Bag 1 | Bag 2 | Outcome |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |
| 6 |  |  |  |
| 7 |  |  |  |
| 8 |  |  |  |
| 9 |  |  |  |
| 10 |  |  |  |
| 11 |  |  |  |
| 12 |  |  |  |

1. iSense Project Data
   1. Open [www.isenseproject.org](http://www.isenseproject.org)
   2. Search for project “Probability and Genetics” or project 1393.
   3. Click on “Manual Entry” under “Contribute Data”
   4. The contributor key is dickey251
   5. Enter the OUTCOMES AND OCCURENCES ONLY. For example, if you had 7 outcomes of Blue, and five outcomes of white, enter that data.
2. Visualizations
   1. Choose Bar Graph. On the left, click “Group By” and choose “Trait”. How does this graph compare to your original predictions for outcomes?
   2. Choose Pie Graph. This graph will give you the actual percents of the two outcomes. Compare the actual percents to your Punnett square predictions. How close are they? Why?
3. Save and Print The Pie Graph. Attach to this lab packet and turn in.