As you complete this scientific investigation, fill in ay needed information on this template. If you need more information about each section, please visit the Developmental Module.

**Title**

One Dimension Collisions Scientific Investigation

**Hypothesis**

Using the **Procedure and Data Collection** section of the scientific investigation, read through the procedural information for this scientific investigation. Based on your understanding of the procedure, develop your own hypothesis which describes your expected results. What is the relationship between mass, velocity, and momentum? Record your hypothesis below:

**Data**

**Data Collision Report**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mass 1** | **Mass 2** | **Initial Velocity 1** | **Initial Velocity 2** | **Initial Total Velocity** | **Initial Total Momentum** | **Initial Kinetic Energy** | **Final Velocity 1** | **Final Velocity 2** | **Final Total Velocity** | **Final Kinetic Energy** |
| **Trial 1** |  |  |  |  |  |  |  |  |  |  |  |
| **Trial 2** |  |  |  |  |  |  |  |  |  |  |  |
| **Trial 3** |  |  |  |  |  |  |  |  |  |  |  |
| **Trial 4** |  |  |  |  |  |  |  |  |  |  |  |
| **Trial 5** |  |  |  |  |  |  |  |  |  |  |  |
| **Trial 6** |  |  |  |  |  |  |  |  |  |  |  |
| **Trial 7** |  |  |  |  |  |  |  |  |  |  |  |
| **Trial 8** |  |  |  |  |  |  |  |  |  |  |  |

**Trial Vector Drawings**

|  |  |
| --- | --- |
| **Trial 1** | **Trial 2** |
| **Trial 3** | **Trial 4** |
| **Trial 5** | **Trial 6** |
| **Trial 8** | **Trial 8** |

**Data Analysis**

Once you have completed the Procedure and Data portions of the scientific investigation, provide responses to the following questions:

**Effect of Mass In One Dimension Collision**

1. Did you increase the mass of Ball 1? If so, what effect did increasing the mass of Ball 1 have?
2. Did you decrease the mass of Ball 1? If so, what effect did decreasing the mass of Ball 1 have?
3. Did you increase the mass of Ball 2? If so, what effect did increasing the mass of Ball 2 have?
4. Did you decrease the mass of Ball 2? If so, what effect did decreasing the mass of Ball 2 have?

**Effect of Velocity In One Dimension Collision**

1. Did you increase the velocity of Ball 1? If so, what effect did increasing the velocity of Ball 1 have?
2. Did you decrease the velocity of Ball 1? If so, what effect did decreasing the velocity of Ball 1 have?
3. Did you increase the velocity of Ball 2? If so, what effect did increasing the velocity of Ball 2 have?

**Conclusion**

Compose three to four sentences describing an overall conclusion about one dimension collision based on your data. Were your hypotheses true or false, and how do you know? Use the data and notes that you collected from your simulation experience to form your conclusion. Make sure that you include information that you gained from data analysis to support your conclusion.

**Experimental Sources of Error**

On your One Dimension Collisions Scientific Investigation Report, provide responses to the following questions: **Are there any sources of error? If so, what are they and what could be done to minimize error?**