

Name: _____

Number: _____

Date: ____/____/____

Unit 5: Newtonian Mechanics – Momentum

LAB: Qualitative Analysis of Collisions

Objective:

- Analyze qualitatively the behavior of elastic, inelastic, and totally inelastic collisions, paying specific attention to momentum and energy *transferring* from one object to the other (and vice versa.)

Background:

- Create a graphic organizer to define elastic, inelastic, and totally inelastic collisions in terms of the conservation of momentum, the conservation of kinetic energy, and the results of the collisions in terms of the motions of the objects (i.e., move separately or stick together.)

Equipment:

- Aluminum dynamics track
- Two PASCars

Procedure:

Part 1: Elastic Collisions

Put the dynamics cars on the track with magnetic sides facing each other and predict the outcomes:

- Red car moves fast toward stationary blue car
 - Prediction:

 - Rationale for prediction:

 - Observation:
- Red car moves fast toward slowly-moving blue car, both in the positive direction
 - Prediction:

 - Rationale for prediction:

 - Observation:
- Red car moves fast toward slowly-moving blue car, moving in opposite directions
 - Prediction:

 - Rationale for prediction:

 - Observation:
- Red car and blue car move toward each other with equal speeds
 - Prediction:

 - Rationale for prediction:

 - Observation:

Part 2: Inelastic Collisions

Put the dynamics cars on the track with the red car's magnetic side facing the blue car's Velcro side and predict the outcomes:

- Red car moves fast toward stationary blue car
 - Prediction:

 - Rationale for prediction:

 - Observation:

- Red car moves fast toward slowly-moving blue car, both in the positive direction
 - Prediction:

 - Rationale for prediction:

 - Observation:

- Red car moves fast toward slowly-moving blue car, moving in opposite directions
 - Prediction:

 - Rationale for prediction:

 - Observation:

- Red car and blue car move toward each other with equal speeds
 - Prediction:

 - Rationale for prediction:

 - Observation:

Part 3: Totally Inelastic Collisions

Put the dynamics cars on the track with both cars' Velcro sides facing each other and predict the outcomes:

- Red car moves fast toward stationary blue car
 - Prediction:

 - Rationale for prediction:

 - Observation:

- Red car moves fast toward slowly-moving blue car, both in the positive direction
 - Prediction:

 - Rationale for prediction:

 - Observation:

- Red car moves fast toward slowly-moving blue car, moving in opposite directions
 - Prediction:

 - Rationale for prediction:

 - Observation:

- Red car and blue car move toward each other with equal speeds
 - Prediction:

 - Rationale for prediction:

 - Observation: