



## Non-Sensor Lessons

[Momentum Bashing 1](#): Use inclined ruler ramps to explore how mass affects a marble's "bashing power." Students will determine if increasing an object's mass increases its momentum and explain how two vehicles of different masses can achieve the same momentum. Time: 40 min

[Momentum Bashing 2](#): Students will conduct an experiment to determine if increasing an object's velocity increases its momentum. Time: 40 min

[Pain in the Neck](#): Use tennis balls to explore inertia and how to prevent whiplash injuries in rear-end crashes. Time: 40 - 50 min

[Penny for Your Thoughts on Inertia](#): Use pennies and index cards to explore inertia and the well-known magician's table cloth trick. Time: 30 - 40 min

[Egg Crash! Designing a Collision Safety Device](#): Build a paper landing-pad for a dropped egg to explore how airbags reduce crash forces. Time: 50 min

[Conservation: It's the Law!](#) Students will apply Newton's third law of motion to describe how changing initial crash factors affects impact forces. Time: 50 min

[Ball of Energy](#): Throw a tennis ball into the air and collect data to determine impact speed. Time: 50 min

[Twirling Penny](#): Twirl a penny on a hanger to explore circular motion and how seatbelts and banked roadways protect occupants during turns. Time: 50 min

[Think Fast, Act Fast](#): Practice catching rulers to calculate reaction time and how far a car travels during a given reaction time. Time: 30 - 50 min

[Distracted Driving Dangers](#): Explore how different distractions affect the time it takes to complete a numbered finger maze. Time: one or two 50-minute class periods (depending on the numbers of trials completed for each distraction type)

[Stressing Silly Putty](#): Conduct stretch-tests on homemade silly putty to explore how engineers design more realistic crash test dummies. Time: 50 min

[Stressing over Pencil Pressure](#): As a culminating activity option, design, build, and crash an egg-carrying paper car to determine the most crashworthy design. Time: 50 min

[Paper Car Crash](#): As a culminating activity option, design, build, and crash an egg-carrying paper car to determine the most crashworthy design. Time: two 50-minute class periods