

Teacher Guide

Momentum in an Elastic Collision Simulation overview

The simulation that is available is a visualization of an actual MCAS question taken from the Massachusetts Introductory Physics exam. The simulation shows two marbles colliding in a perfect elastic collision. This simulation shows how momentum is conserved. It uses labels to see the moment in time when the momentum of the first (red) marble is transferred to the second (yellow) marble. The basis for this simulation is to give students a visual representation of this MCAS problem. Also, they can see the effects of changing the mass or velocity of either marble. The simulation shows the marbles colliding as well as a graphic representation of the change in momentum and velocity over time.

Uses of the simulation

This simulation can be used in various different ways: students can be assigned to groups of 2-3 and share laptops to run the simulation or a laptop can be connected to a projector and the to the class can view the simulation as a whole group.

Worksheet for students

Each student should be provided with a copy of the MCAS prep packet. The packet should include:

MCAS Checklist- Answering an Open Response Question

MCAS Question

MCAS Question Response Sheet

Formula Sheet

Student Answer Sheets – Example of

Score of 4

Score of 3

Score of 2

Score of 1

Student Evaluation of Answer Sheets

Methods of delivery

-Students can view the simulation as a whole group first, then they can be provided with the MCAS prep packet and can complete this individually or in small groups

-Students can complete the MCAS prep packet initially, then watch the simulation.

-Students can work in small groups to complete the packet, then they can explore the simulation remaining in small groups

-Students can read over the MCAS Question, read and evaluate the student answer sheets, and then watch the simulation. (this can be done as a whole group or in small groups.