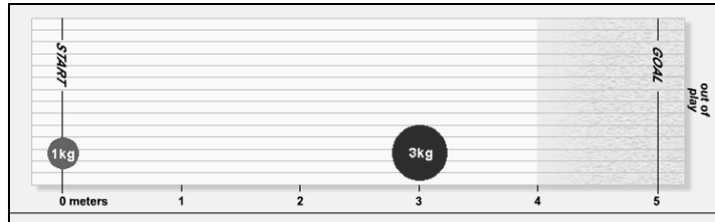


During this interactive you are going to investigate elastic collisions.

1. What is true about all elastic collisions and not true about other types of collisions?

Open the shortcut “**IL EC 1**” on one of the lab stations.

Open the simulation contained in this section. **Do Not follow the directions in the simulation follow these instructions.**



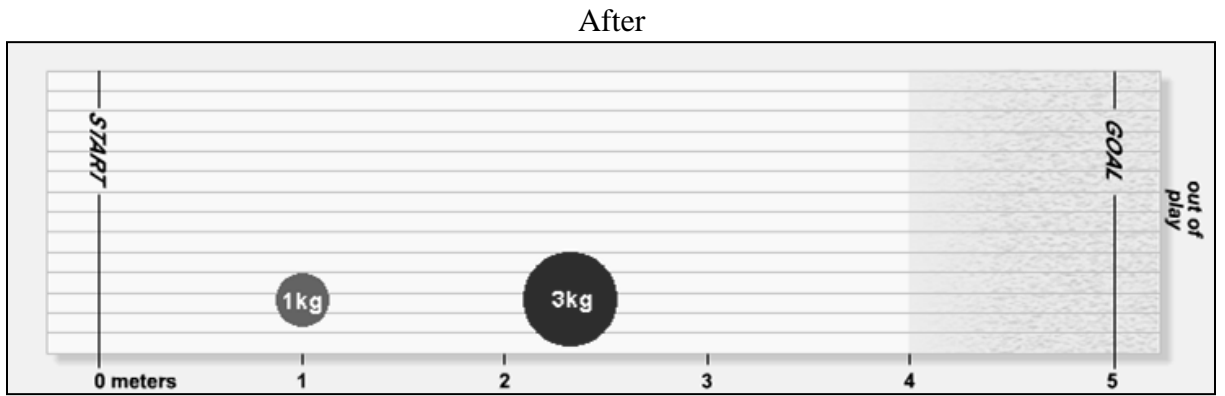
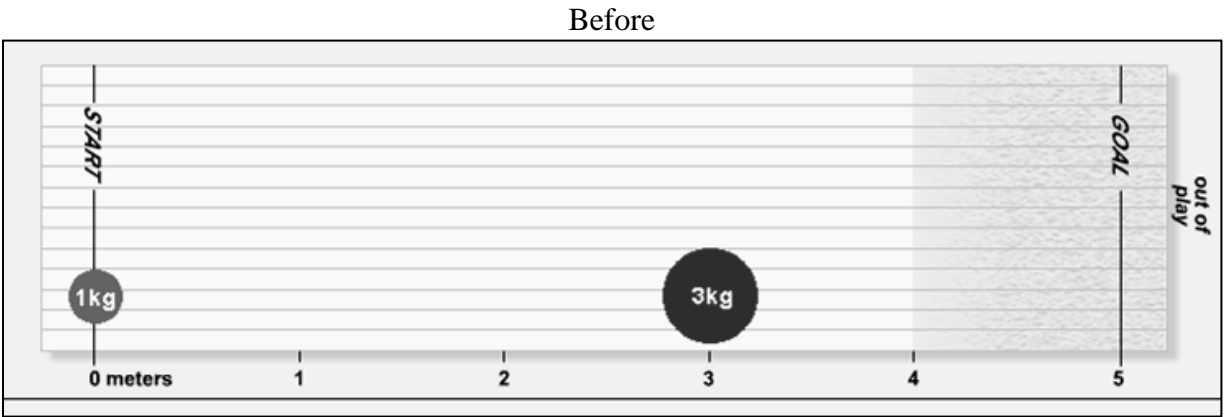
Using the simulation and the information given below experiment and find the initial velocity of the blue puck so that after the two pucks collide head on in an elastic collision, the red puck moves with a velocity of +2.0 m/s. This will cause the red puck to stop at the scoring line, since the friction in the green area on the right side of the surface will cause it to slow down and perhaps stop.

The red puck has an initial velocity of -2.0 m/s. The blue puck has a mass of 1.0 kilograms. The red puck’s mass is 3.0 kilograms.

2. What initial velocity of the blue puck solved the simulation? _____ m/s

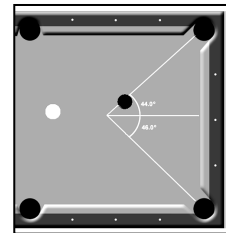
3. Using what you know of elastic collisions to prove that your answer for the simulation is correct. Start with the information you knew at the beginning of the simulation and find the initial velocity you discovered using the simulation. **Show all work including substitution with units.**

4. Draw the momentum vectors before and after the collision.



Open the shortcut “**IL EC 2**” on one of the lab stations.

Open the simulation contained in this section. **Do Not follow the directions in the simulation follow these instructions.**



In the simulation you want to strike the stationary eight ball with the white cue ball so that it goes into the corner pocket. The cue ball will travel horizontally and strike the eight ball in an elastic collision, and then both balls will move in directions defined by the angles shown on the simulation. The friction on the table will slow the balls slightly. You set what the speed of the cue ball will be at the instant it collides with the eight ball. You need to be careful about the resulting speed of the eight ball. It must travel fast enough to reach the pocket and sink, but if it is too fast, the cue ball will travel faster too, and you will scratch (sink the cue ball). The eight ball’s speed is displayed on a gauge in the simulation.

Name _____

Block _____

You want the speed of the eight ball immediately after the collision to be 1.00 m/s. The two balls have the same inertia.

Using the simulation and the information given find the initial velocity of the cue ball so that you make the shot but do not scratch.

5. What initial velocity of the cue ball made the shot? _____ m/s

6. Using what you know of elastic collisions to prove that your answer for the simulation is correct. Start with the information you knew at the beginning of the simulation and find the initial velocity you discovered using the simulation. **Show all work including substitution with units.**

7. Draw the momentum vectors before and after the collision.

