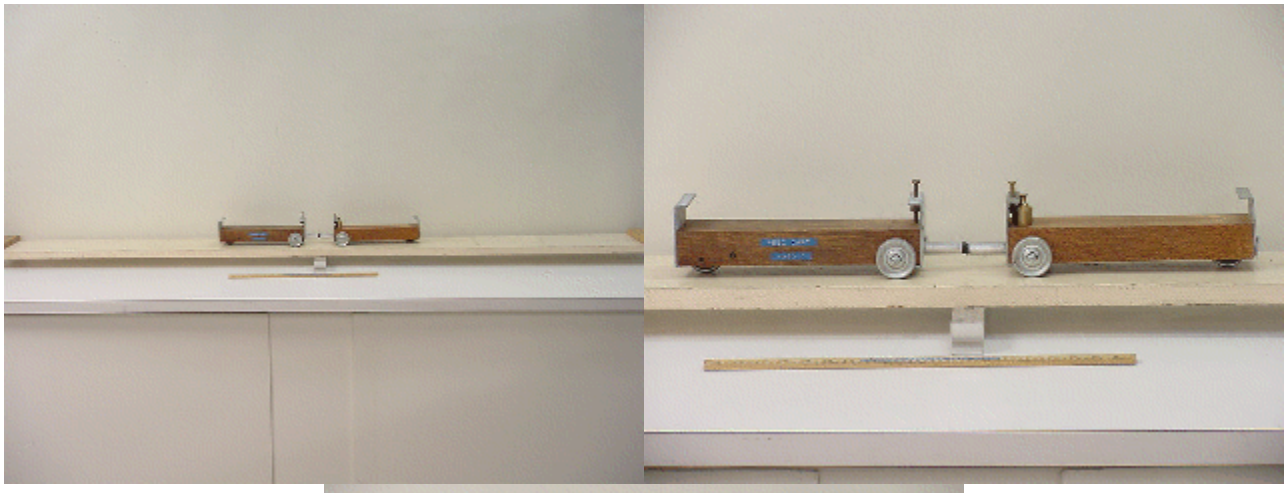
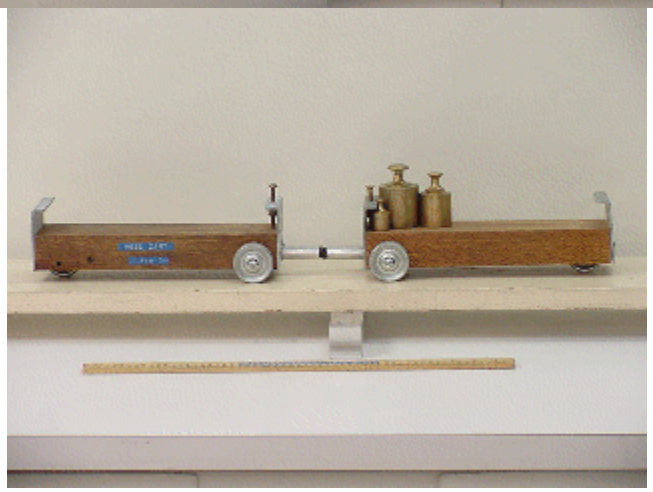
Question #188

The photograph at the left below shows an eight-foot long board carefully balanced at its center of mass on a one-inch square aluminum bar. Two carts with approximately the same mass (1500 grams) are positioned at the center. Actually, the one on the right has 100 grams less mass, so it has a 100 gram mass at the left end of its bed, as seen in the photograph at the center. When Dan hits the connecting rods with a meter stick springs in the carts are tripped, pushing them apart, as seen in an mpeg video by clicking your mouse on the center photograph.





According to Newton's third law, the carts push on each other with equal and opposite forces, so because they are equal in mass they move apart with the same speeds. The center of mass of the cart/board system remains above the aluminum bar, and the system remains in balance as the carts move away from each other.

In the photograph at the right an additional 1500 grams has been added to the bed of the cart on the right and the carts have been moved a small distance to the left on the balance board to compensate. The experiment will now be repeated by Dan tripping the springs so the carts move apart. What will happen?

As the carts move apart but *before either cart hits the end of the board*,

- (a) the left side of the balance board will move down.

- (b) the right side of the balance board will move down.
- (c) the balance board will remain balanced.

Click here for Answer #188 after May 17, 2004.

Question of the Week

Outreach Index Page

Lecture-Demonstration Home Page

For questions and comments regarding the *Question of the Week* contact Dr. Richard E. Berg by e-mail or using phone number or regular mail address given on the Lecture-Demonstration Home Page.