Name _____ Date _____ Class _____

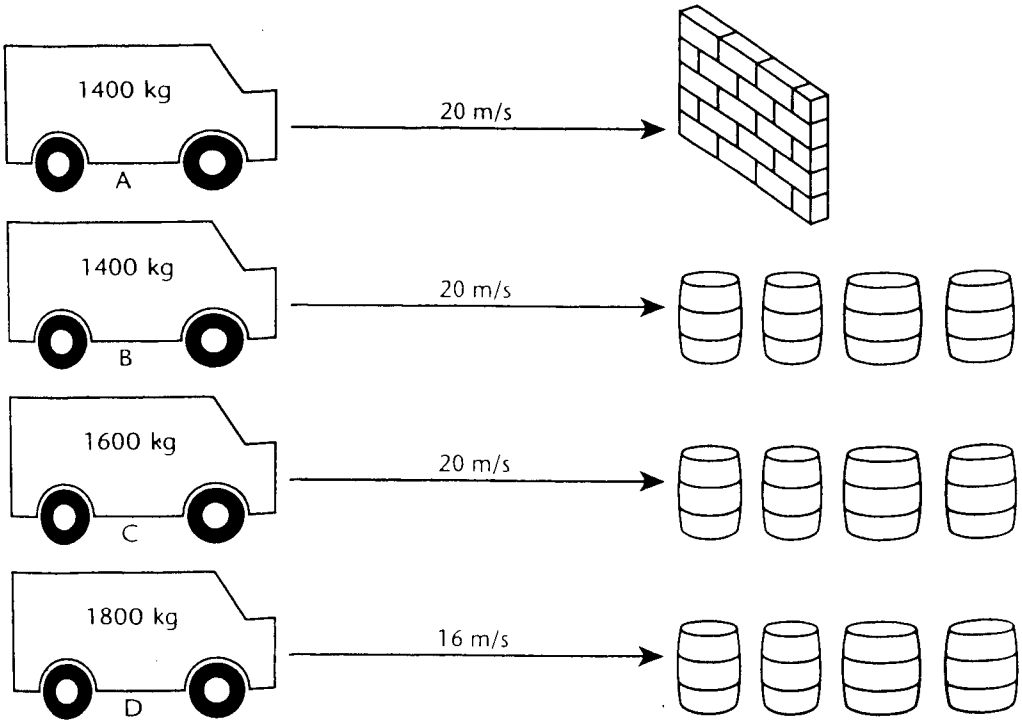
SECTION 2-4 **ENRICH**

Life-Saving Barrier

On January 14, 1998 a former racing car driver by the name of John Fitch received an award for "his life-long contributions in the field of roadside safety." Back in the late 1960s, Fitch had invented a device that is now used in all 50 states of the United States. The device is believed to have saved thousands of lives.

You've probably seen it—or, really, them—near the exit ramps of bridges and highways or other places where roadways divide. They are plastic, sand-filled barrels called Fitch Barriers. And their purpose is to slowly absorb the momentum of a vehicle that might otherwise be stopped dead by a solid wall or highway divider.

Study the drawings below. They show the mass and velocity of four different cars on a collision course with a concrete wall or Fitch Barriers.



Answer the following questions on a separate sheet of paper.

1. Which car has the greatest momentum? What is its momentum? C, $p = mv \rightarrow (1600\text{kg})(20\text{m/s}) = 32{,}000\text{kg-m/s}$
2. Of the cars that strike the Fitch Barriers, which will penetrate the least distance? Explain your answer. B - it has the least momentum
3. Compare the forces exerted by the wall and the Fitch Barriers on Cars A and B and describe differences, if any about how those forces are applied. The force exerted by the wall is applied over a shorter time than the force exerted by the barriers
4. Write a comparison of the effects of a crash on people in cars A and B. Explain the causes of the differences of the effects.

Fitch barriers absorb the momentum more slowly than the concrete wall

B - Less injury