

PROBLEM 3.10. MOMENTUM

Name: _____

1. Jason is walking down the street at 1.5 km/hr . If he has a mass of 75 kg , what is his momentum?
(Caution: watch units!)

2. How fast must a 10 kg child be moving on the bicycle to have the same momentum as a $1.25 \times 10^4 \text{ kg}$ car traveling at 1.8 km/hr ?

3. On April 12, 1954, the *Lusitania* broke apart three weeks after running into an iceberg.

By what momentum would the 5.1 ton ($1 \text{ ton} = 2000 \text{ kg}$) ship have imparted to the iceberg if it had hit with a speed of 13 km/hr ? (In reality, it was a glancing blow.)

By what impulse of the ship had upon the iceberg, assuming a head-on collision, would the ship have imparted to the iceberg, assuming it had hit with the same speed?

4. Auto companies frequently test the safety of automobiles by putting them through crash tests to determine the integrity of the passenger compartment. If a 1800 kg car is sent toward a concrete wall with a speed of 10 km/hr , and the impact stops the car in 0.15 s , and after force was brought to rest?