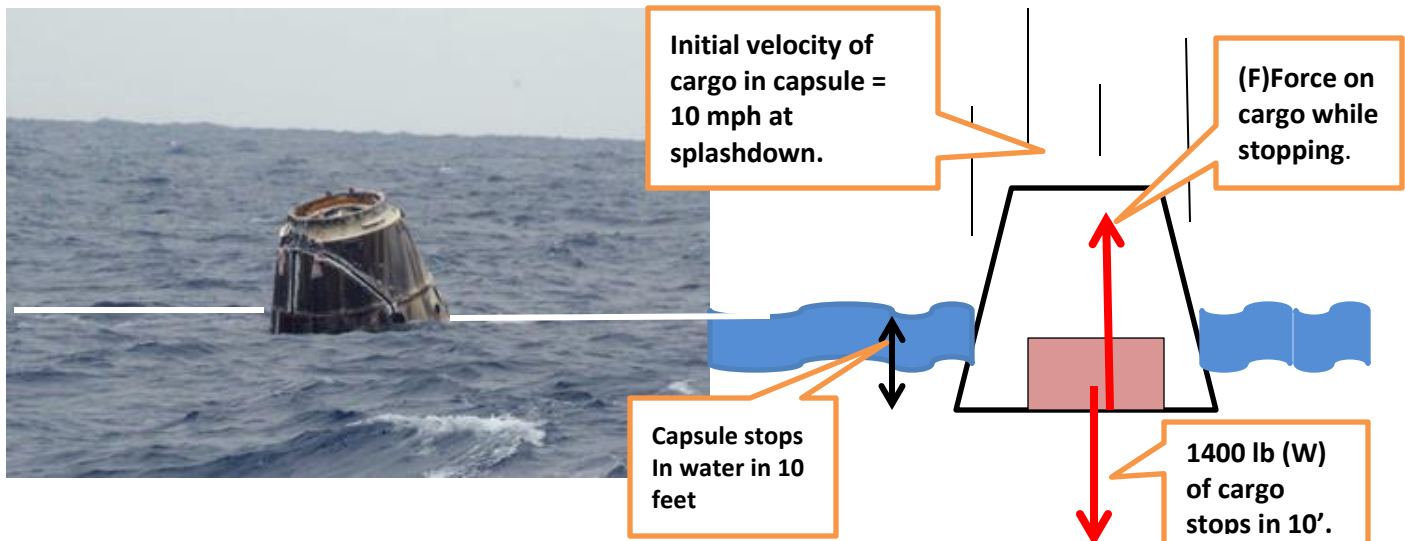


NEWTON'S 2ND LAW

Unit 6 & 7 Dr. John P. Cise, Professor of Physics,

Austin Community College, 1212 Rio Grande St., Austin Tx 78701 ajpcise@austincc.edu & NYTimes June 1, 2012 by H. Fountain



INTRODUCTION: The 1400 lb. of cargo in the dragon capsule at splashdown stops in 10 ft. Two forces are exerted on the 1400 lb. of cargo while stopping (see graphic above): F (force on cargo by capsule) and W (weight of cargo). **HINTS:** $60 \text{ mph} = 88 \text{ ft/s}$, $W = mg$, $v_{\text{initial}}^2 + 2ax = v_{\text{final}}^2$, $F_{\text{net}} = ma$

QUESTIONS: Convert 10 mph to ft/s?, (b) Find mass (in slugs) of 1400 lb of cargo?, (c) Find Cargo deceleration while stopping in 10 ft.?, (d) Find force (F) on cargo while stopping in 10 ft?

ANSWERS: (a) 14.67 ft/s, (b) 43.75 slugs, (c) 10.76 ft/s², (d) $F \approx 1871 \text{ lb}$.

Its First Mission Done, SpaceX Looks to More Private Flights

After a nearly flawless nine-day routine, the Dragon stuck the landing, too. The first commercial mission to ferry supplies into space ended successfully Thursday when a cargo capsule known as the Dragon fell to earth on target in the Pacific Ocean off Mexico, NASA officials said. **Tethered to three large parachutes**, the unmanned capsule, which had carried about 1,100 pounds of food, water, clothing and equipment to the International Space Station, **hit the water at the relatively gentle speed of about 10 miles an hour** at 8:42 a.m. local time. It came down about 560 miles west of Baja California, witnessed by technicians from the company that built and flew it, Space Exploration Technologies, or SpaceX. They were to load the capsule aboard a barge and haul it back to Long Beach, Calif. "This really couldn't have gone better," Elon Musk, the chief executive of SpaceX, said at a televised news conference from the company's headquarters in Hawthorne, Calif. "I'm overwhelmed with joy. It's been 10 years, and to have it go so well is incredibly satisfying." The remote-controlled Dragon had separated from the space station about seven hours before splashdown, eventually firing rockets to slow it enough so that it would descend through the atmosphere. Before separation, the station's **astronauts loaded it with about 1,400 pounds of used equipment, experiment samples and other items**.