FLUIDS

Unit 18 , Dr. John P. Cise, Professor of Physics, Austin Com. College, Northridge Campus, Austin Tx., jpcise@austincc.edu & New York Times , May 18, 2017 by William Grimes

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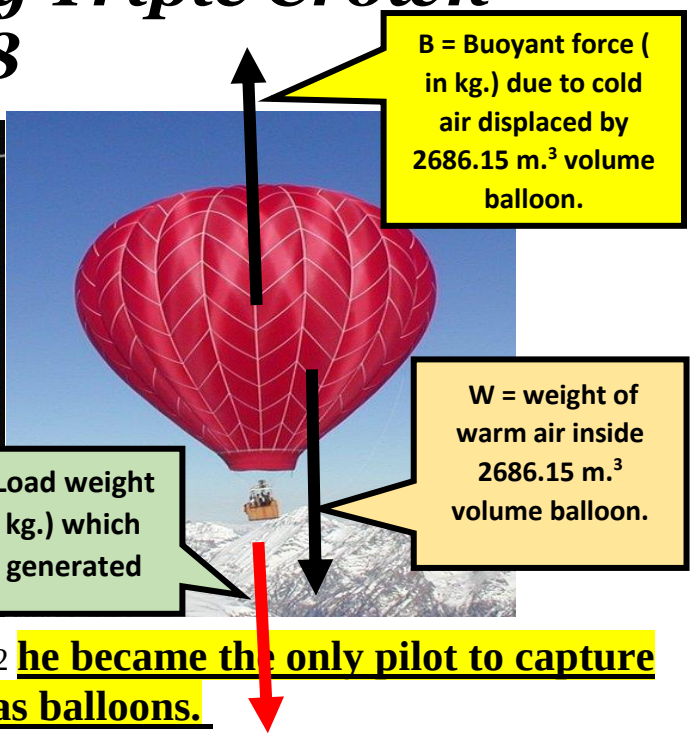
David Levin, the Only Triple Crown Balloonist, Dies at 68



David Levin in 2005 at a race in Albuquerque. In 1992 **he became the only pilot to capture world championships in hot-air and gas balloons.**

In 1975, for a diversion from his law studies at Boston University, David Levin hopped aboard a hot-air balloon and took a little ride. "It was fun, but I had no great aspirations as a balloonist," he told The Christian Science Monitor in 1985.

That would change. In the 10 years after stepping into a balloon basket for the first time, he became the first balloonist to soar over Pikes Peak in Colorado, reaching a height of more than 14,000 feet, and won the 1985 World Hot Air Balloon Championship in Battle Creek, Mich. The best was yet to come. In 1992, by winning the World Gas Balloon Championship in Obertraun, Austria, he became the only pilot to capture world championships in hot-air and gas balloons. Later that year, he completed ballooning's triple crown when he won the Gordon Bennett Cup in Stuttgart, Germany, a distance event in which he flew a little more than 964 miles in 44 ½ hours.In 25 years of competition, Mr. Levin racked up victories in numerous national and international contests, ascending to the highest of highs and descending to the lowest of lows.

INTRODUCTION: **Archimedes said objects are buoyed up by a force equivalent to weight of fluid displaced. In the case of hot air balloons the cold (more dense air at 20 degrees C, ρ_C = 1.2041 kg./m.^{3}) outside the balloon is displaced by the hot (less dense air at 100 degrees C, ρ_H = 0.9486 kg./m.^{3}) air inside the balloon. Thus, a net force (L) up is available to lift a load (like a basket and passengers). Thus, with the graphic above it is seen that:**

$$L = B - W \text{ . Since density } \rho = \text{mass/volume} , B = \rho_C V , W = \rho_H V$$

QUESTIONS: **(a) Find B in kg.?, (b) Find W in kg. ?, (c) Find L ? Load weight(in kg.) which lift generated. (d)Find L in pound units?**

HINTS: **2.21 lb. = 1 kg. ,**

ANSWERS: **(a) B = 3409.64 kg., (b) W = 2686.15 kg., (c) L = 723 kg., (d) L = ~ 1595 lb.**