Let's Talk Dive Physics

Exclusively for NAUI Instructors

Why Physics?

When you dive under the surface of the water, whether for shallow snorkeling excursions or deeper scuba dives, the increased pressure under water affects your body in many different ways.

Dive physics is used to calculate the effects of diving on pressure, volume, and buoyancy.

This sheet gives you useful constants for dive physics calculations.

Abbreviations:

ATA: atmosphere(s) absolute pressure

psia: pounds per square inch absolute

psig or psi: pounds per square inch gauge

psig = psia - 14.7 psi

Remember:

When doing diving calculations, always remember to account for the one atmosphere (**14.7** psi) contributed by the air at sea level.

Water Weighs...

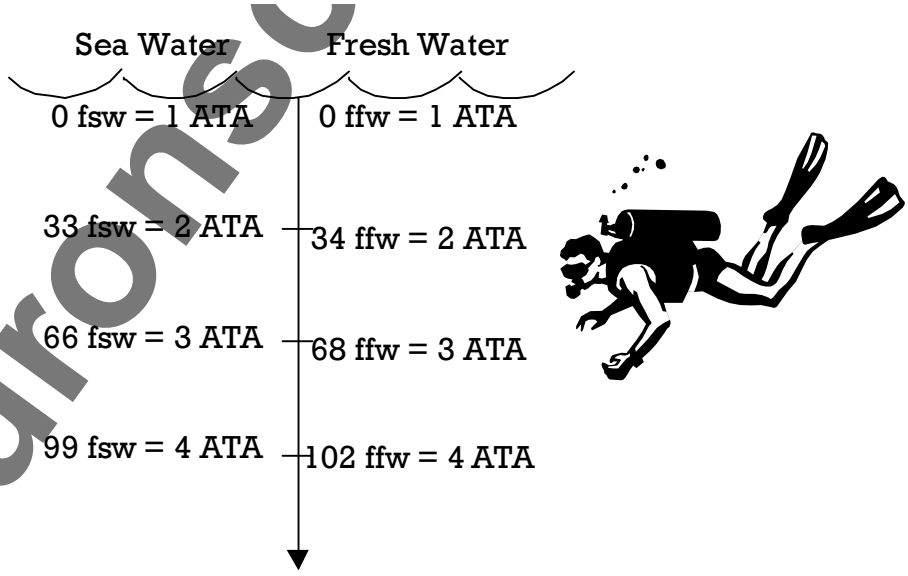
A one foot high, one inch square column of sea water weighs **0.445** pounds. 144 of these make a cubic foot of sea water that weighs **64** pounds.

Fresh water is less dense. A one foot high, one inch square column weighs **0.432** pounds; a cubic foot of fresh water weighs **62.4** pounds.

Air Weighs Too!

At sea level, air is at atmospheric pressure. One atmosphere (1 ATA) equals **14.7** psia.

A cubic foot of air at 1 ATA weighs **0.08** pounds. So, a full 80 cubic foot aluminum scuba tank holds **6.4** pounds of air.



Feel the Pressure...

The pressure at the bottom of a stack of 33 one foot high columns of sea water is 14.7 psi (1 ATA). Therefore, for each **33 feet** we descend in sea water, we add one atmosphere to the pressure around us. Each foot we descend adds **0.445** psi.

It takes a stack of 34 one foot high columns of fresh water to produce the same 1 ATA of pressure, because it's less dense than seawater. So, for each **34 feet** we descend in fresh water, we add 1 ATA to the pressure around us. Each foot we descend adds **0.432** psi.