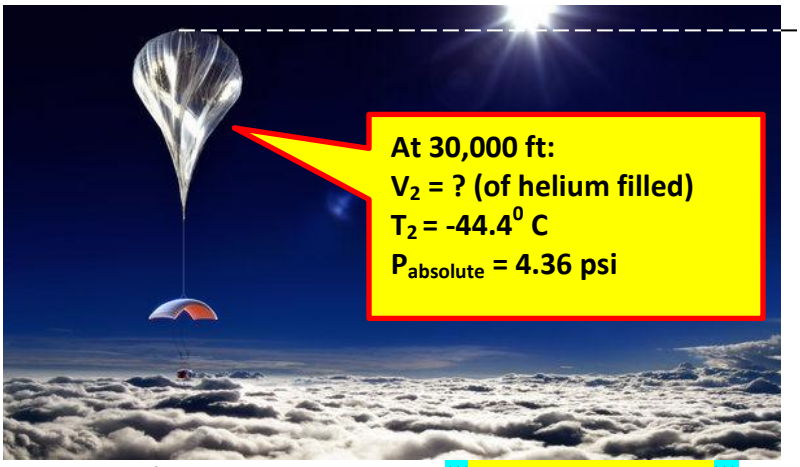
GAS LAW

Unit 18 Dr. John P. Cise, Professor of Physics, Austin Com. College, 1212 Rio Grande St. Austin Tx 78701 jpcise@austincc.edu & New York Times October 23, 2013 by Kenneth Chang

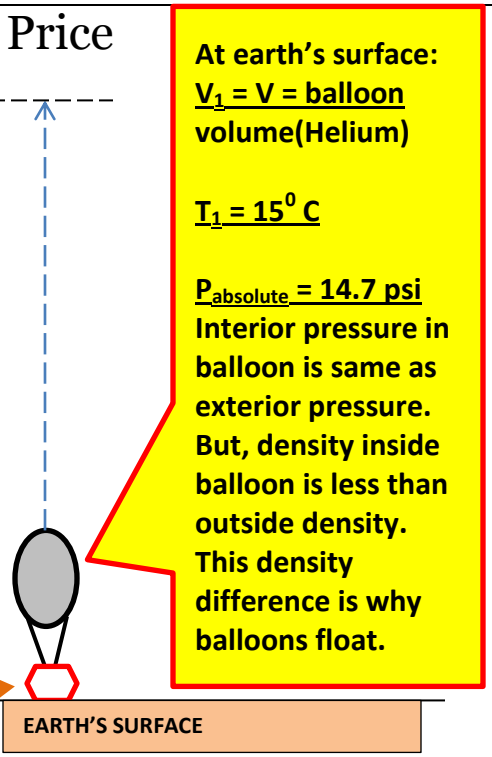
Balloon Ride to Offer Expansive View, for a Price



A rendering of the balloon, which would (((climb about 18.5 miles))) and stay up for a couple of hours before its promised gentle descent.

And now, a high-altitude adventure for the leisure class, people who do not want to be jostled as they sip Champagne and gaze down at Earth's curved blue surface.

A rendering of the capsule, which would carry six passengers and a crew of two.



INTRODUCTION: **Read the comments and initial and final conditions in above boxes. The ideal gas equation is obeyed here on earth's surface and at 30,000 ft. .**
PV = NkT where P = absolute pressure = $p_{gage} + B_{atmos}$
V = volume , N = # of molecules of gas, k = Boltzmann's constant
T = absolute temperature = t(degrees C) + 273. Since N is same on earth surface as at 30,000 ft……Nk = $P_1V_1/T_1 = P_2V_2/T_2$. We assume exterior air temperature is same as interior balloon helium temperature.

QUESTIONS: **(a) T_1 = ? , (b) T_2 = ? , (c) V_2 = ? (in terms of V)**

ANSWERS: **(a) 288 ^{0}K , (b) 228.6 ^{0}K , (c) 2.68 V**

NOTE: Balloons expand as they rise into the air and interior density Is always less than exterior air density.

A new space tourism company named World View unveiled its plans on Tuesday to loft passengers to the stratosphere **as early as 2015**, not by rocket but by giant balloon. Price: $75,000. (Drinks included.)

World View is led by the same people involved in Inspiration Mars, a private endeavor to launch two people in 2018 to a flyby of the red planet. "This is a very gentle flight that will last for hours aloft," said Jane Poynter, World View's chief executive. She said the**(((cabin would be about the size of that of a private jet, and would have a "superbly comfortable, luxurious interior where you can get up and stand upright and move around and go back to the bar and get a drink.")))**By contrast, World View's balloon and capsule, **with six passengers and two crew members**, would take about an hour and a half to reach altitude and then drift for a couple of hours before the balloon was jettisoned and the capsule would glide back to Earth beneath an inflated parasail. "We really think there is a market for being able to contemplate the view," said Taber MacCallum, the company's chief technology officer.