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Private Pilot Research - Weather Theory (Atmospheric Pressure)

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While air molecules are invisible, they do have weight, which is what causes atmospheric pressure. Although standard atmospheric pressure at sea level is known as 1 atmosphere (atm), it can be expressed using a variety of other units, including the following: 14.7 psi (pounds per square inch), 29.92 inHg (inches of mercury), 1013.2 hPa (hectoPascals), 1013.2 mb (millibars), or 760 mmHg (millimeters of mercury). However, the most common and important unit for standard atmospheric pressure to remember is 29.92 inHg. When calculating atmospheric pressure on a standard day for a specific altitude, it is important to remember that atmospheric pressure decreases at a rate of approximately 1 inHg for every 1,000 ft.

Furthermore, it is also important to understand why the perceived altitude of an aircraft can be different from the true altitude because of atmospheric pressure. When the pressure or even temperature changes outside, the perceived altitude must be corrected to ensure the aircraft performs at the safest altitude. This is because a lower pressure at sea level will cause the aircraft to have a lower maximum safe altitude than if the pressure at sea level were to be higher than standard. We use the standard day to calculate these perceived altitudes, which helps maintain a safe and efficient flight.