

## Types of Speeds - Ground Lesson

### Schedule

Ground instruction – 10 minutes

### Reference Material

Boldmethod.com

### Material

#### Indicated Airspeed (IAS)

This one's pretty simple. It's read right off your airspeed indicator and is usually what you'll reference in the cockpit for speed changes. The speed limits of the sky, like not exceeding 250 knots below 10,000 feet MSL, are all written as indicated airspeed values.

#### True Airspeed (TAS)

True airspeed is the speed of your aircraft relative to the air it's flying through. As you climb, true airspeed is higher than your indicated airspeed. Pressure decreases with higher altitudes, so for any given true airspeed, as you climb, fewer and fewer air molecules will enter the pitot tube. Because of that, indicated airspeed will be less than true airspeed. In fact, for every thousand feet above sea level, true airspeed is about 2% higher than indicated airspeed. So at 10,000 feet, true airspeed is roughly 20% faster than what you read off your airspeed indicator.

Many aircraft, such as those with gas turbine engines, can reach a higher TAS at higher altitudes because their engines are more efficient at higher altitudes.



Of course the G1000 is smart enough to calculate TAS for you.

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### Groundspeed (GS)

The movement of your airplane relative to the ground is called groundspeed. It's true airspeed corrected for wind. With a true airspeed of 100 knots and a tailwind of 20 knots, you'd be flying a groundspeed of 120 knots.



### Calibrated Airspeed (CAS)

Calibrated airspeed is indicated airspeed corrected for instrument and positional errors. At certain airspeeds and with certain flap settings, the installation and instrument errors may total several knots. This error is generally greatest at low airspeeds, with nose high pitch attitudes.

When flying at sea level under International Standard Atmosphere (ISA) conditions (15 degrees Celsius, 29.92 inches of mercury, 0% humidity), calibrated airspeed is the same as true airspeed. If there is no wind it is also the same as ground speed.