

1. Work in pairs and discuss the following question.

What are the 6 basic instruments that can be met in every aircraft and what are they used for?



**2. Look at the jumbled parts of sentences below. Put them in the correct order to make descriptions of the 6 basic flight instruments you have just discussed. Complete the gaps with appropriate flight instrument.**

1. above / that measures the height / the \_\_\_\_\_ / a given pressure level / is an instrument / of an aircraft  
\_\_\_\_\_
2. a) indicates whether / or in level flight / the \_\_\_\_\_ / a vertical velocity indicator (VVI) / descending / which is sometimes called / the aircraft is climbing/  
\_\_\_\_\_  
b) is indicated / climb or descent / in feet per minute (fpm) / the rate of  
\_\_\_\_\_  
c) calibrated / \_\_\_\_\_ / in level flight / if properly / indicates zero  
\_\_\_\_\_
3. a) the difference between / is a sensitive / that measures and / \_\_\_\_\_ / and static pressure / promptly indicates / pitot (impact/dynamic pressure) / differential pressure gauge /  
\_\_\_\_\_  
b) the airspeed pointer / in miles per hour / is registered by / on the face of the instrument / which is calibrated / the difference in pressure / or both / knots (nautical miles per hour)  
\_\_\_\_\_
4. a) shows the aircraft attitude / the horizon / also known as / \_\_\_\_\_ / relative to / an artificial horizon  
\_\_\_\_\_  
b) 3 colors / the instrument has / orange, blue and brown \_\_\_\_\_  
c) and the brown one / represents aircraft wings / the Earth / the orange line / is the sky / the blue one  
\_\_\_\_\_
5. a) easier to read / \_\_\_\_\_ / heading / than the magnetic compass / shows the aircraft / and it is  
\_\_\_\_\_  
b) and also checked / the magnetic compass / set before take-off / according to / it must be / during the flight  
\_\_\_\_\_
6. a) shows the rate of / as well as / \_\_\_\_\_ / roll / a turn / the slip / and the rate of  
\_\_\_\_\_  
b) inside the instrument / a coordinated flight / a black ball / indicates / being centered  
\_\_\_\_\_

**3. Before you watch a short video look at the following statements. Using your general knowledge of avionics and try to decide if they are true (T) or false (F). Justify your choice.**

1. The pitot-static system gathers its pressure from 3 different sources. T/F
2. The pitot-static system is connected to all 6 basic flight instruments. T/F
3. The pressure of the atmosphere increases the higher we go up. T/F
4. The pitot tube is designed to measure what's called RAM pressure. T/F
5. The pitot tube cannot be heated. T/F
6. The pitot tube and static port play 2 different functions in the airplane. T/F
7. All three pitot-static instruments connect both to the static port and the pitot tube. T/F
8. The altimeter is also called a sensitive altimeter. T/F
9. There are 6 types of altitudes that pilots interact with on a daily basis. T/F
10. Altimeters are susceptible to some errors. T/F
11. The face of airspeed indicator displays 5 color-coded speed ranges. T/F
12. There are various types of airspeed. T/F
13. The pitot tube and the static port cannot get blocked. T/F

**4. Now watch the video and compare your answers.**

5. **Read a passage explaining how the altimeter works. Complete the text with the prepositions from the list.**

until / from / on (x2) / of (x5) / to (x4) / in (x4) / out / through / down

Perhaps the most basic 1) \_\_\_\_ all the pitot-static instruments is the altimeter, which displays the airplane's altitude. The instrument contains a set 2) \_\_\_\_ aneroid wafers, which expand and contract based 3) \_\_\_\_ the pressure. The air inside the wafers is trapped, but the air 4) \_\_\_\_ the rest 5) \_\_\_\_ the case is able 6) \_\_\_\_ change 7) \_\_\_\_ match the pressure 8) \_\_\_\_ the static port. As we increase altitude, the static pressure goes 9) \_\_\_\_\_. This means that the air inside the case will escape 10) \_\_\_\_ the back, and result 11) \_\_\_\_ there being less air pressure 12) \_\_\_\_ the case compared 13) \_\_\_\_ the wafers. Because 14) \_\_\_\_ this, the wafers will expand 15) \_\_\_\_ both pressures are equal. Getting the wafers 16) \_\_\_\_ result 17) \_\_\_\_ an altitude readout is done 18) \_\_\_\_ a series of gears, pinions, arms and levers, also known as the mechanical linkages. These linkages will rotate the hands 19) \_\_\_\_ the face 20) \_\_\_\_ the instrument and show the airplane's altitude.

6. **Read a passage explaining how the VSI works. Complete the text with the words from the list.**

connection, display, hole, diaphragm, instantly, needle, rate, climbs, needle, constricted

Inside the VSI is a 1) \_\_\_\_\_ connected to some mechanical linkages that move the 2) \_\_\_\_\_ on the face of the instrument. The diaphragm has a direct 3) \_\_\_\_\_ to the static port, meaning that the pressure inside of it matches the 4) \_\_\_\_\_ atmospheric pressure from outside. The case of the instrument is also filled with static pressure, but the connection between the case and the static port is 5) \_\_\_\_\_ by, what's called, a Calibrated Leak. This calibrated leak is nothing more than a tiny 6) \_\_\_\_\_, which limits the 7) \_\_\_\_\_ at which the pressure of the case can change. When a plane 8) \_\_\_\_\_ or descends, the diaphragm pressure will change 9) \_\_\_\_\_, but the case pressure changes slowly. This results in two different pressures. The difference in pressure allows the instrument to 10) \_\_\_\_\_ the vertical speed.

7. **Work in pairs. Using the prompts tell each other what each and every type of airspeed is. Add as many words as you find necessary to make the description sound grammatically and logically correct.**

Indicated Airspeed – airspeed / read / directly / instrument.

Calibrated Airspeed – airspeed / take / indicated airspeed / correct for / installation or instrument error / to calculate / pilot / reference the charts / flight manuals.

Equivalent Airspeed – take / calibrated airspeed / correct for / potential compressibility / a factor / speeds / 200 kts / altitudes / 20,000 ft.

True Airspeed – actual airspeed / you travel / after / all corrections / made.

Mach – ratio / true airspeed / speed of sound. / if aircraft / go / Mach 0.74 / it / go / 74% / fast / sound travel. / speed of sound / vary / temperature / average / about / 600 kts.