I struggled out of the aircraft, to balance awkwardly on the wheel and step out of the Cessna. Hanging tightly onto the wing strut, I waited, staring nervously at the ground far below. Above the roar of the engine and wind came the command, "Go!" The air was sucked from my lungs as I let go and plummeted earthwards. Although I only did half of it, my first flight is one I will always remember.

~Author

UNIT 5

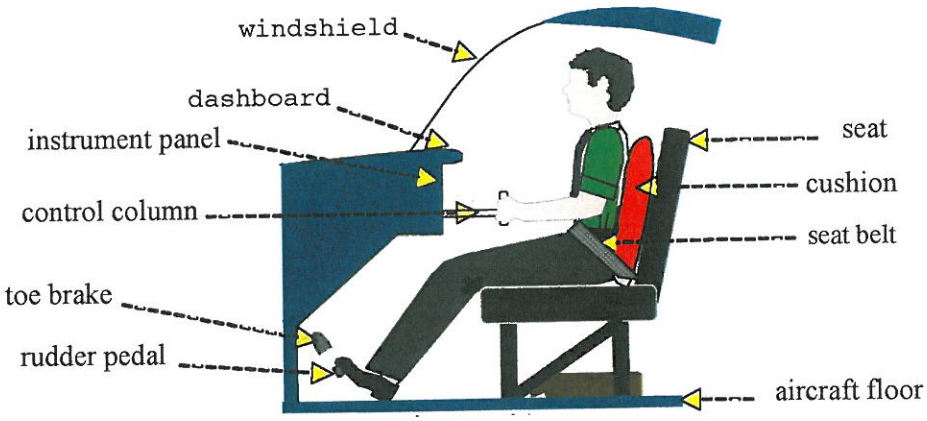
Let's Go Flying!

During early flight training, flight instructors will use many new words and phrases to explain what is happening both inside and outside the aircraft. This lesson explains the meanings of the vocabulary one needs to understand when learning about the effects of the controls during early flights in the training area. In this unit we will learn

- To describe position inside and outside the aircraft.
- What is meant by aircraft attitude.
- The names of basic flight instruments.
- The meanings of words and phrases used by instructors during early flight training.

Group discussion. Why is listening and understanding your instructor more difficult in flight than in the classroom? How can you help to overcome this problem?

Inside the Aircraft



Task 5.1: Describing position

Refer to the picture above. Write each word from the list below in one of the sentences below.

on	above	behind	on top of	around
through	in	next to	in the vicinity of	adjacent to
between	over	under	in front of	

Example: The pilot is sitting *in* the aircraft.

1. The pilot has put a cushion b___ ___ ___ ___ ___ his back.
2. The seat belt is fastened ___ ___ ___ ___ ___ ___ the pilot's hips.
3. The pilot has placed his feet ___ ___ the rudder pedals.
4. The pilot is looking out ___ ___ ___ ___ the dashboard (or dash) and ___ ___ ___ ___ ___ ___ ___ the windshield.
5. The instrument panel is ___ ___ ___ ___ ___ ___ ___ ___ ___ the pilot.
6. The dashboard is ___ ___ ___ ___ ___ ___ ___ the instrument panel
7. The cushion is ___ ___ ___ ___ ___ ___ ___ the seat and the pilot's back.
8. The pilot's flight bag is ___ ___ ___ ___ ___ the seat.

9. The flight instructor will sit ___ ___ ___ ___ ___ ___ the student pilot.

10. The toe brakes are ___ ___ ___ ___ ___ the rudder pedals.

11. The toe brakes are located i___ t___ ___ v___ ___ ___ ___ ___ ___ ___ o___ the rudder pedals.

12. One rudder pedal is a ___ ___ ___ ___ ___ ___ ___ t___ the other.

Task 5.2: More position words

Write words with the same meaning as:

near _____

next to _____

Outside the Aircraft

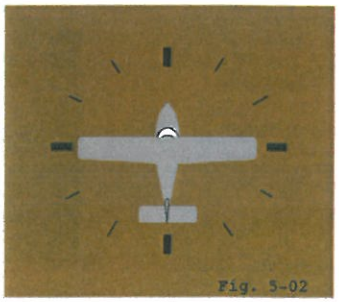
The Clock Position

Pilots and air traffic controllers describe the position of other traffic (aircraft) using the twelve-hour clock position. The pilot imagines the nose of his own aircraft to be in the twelve o'clock position, the tail to be at six o'clock, the starboard (right) wing at three o'clock, and the port (left) wing at nine o'clock.

NOTE: Numbers are spoken in group form for clock positions. For example, ten o'clock, eleven o'clock, and twelve o'clock.

Task 5.3: Clock position

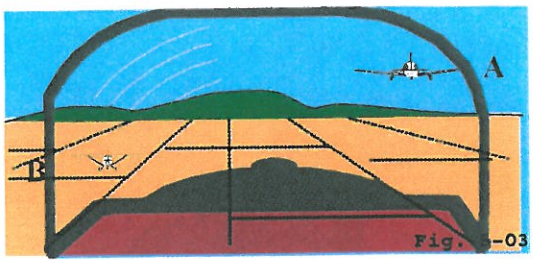
Write the clock position around the aircraft.



In addition, traffic may be described as *high* (above the horizon) or *low* (below the horizon).

Task 5.4: Describing clock position

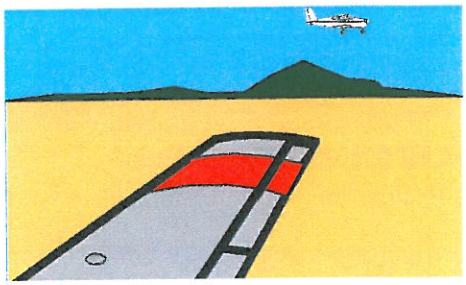
Describe the positions of aircraft A and B.



Aircraft A (The Cherokee) is _____ o'clock _____

Aircraft B (The Cessna) is _____ o'clock _____

Abeam



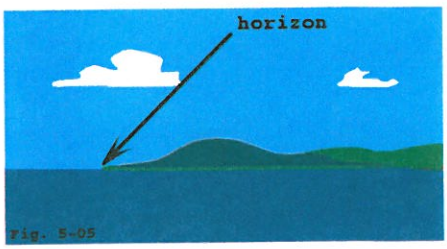
The aircraft in the picture above is *abeam* traffic, passing in the opposite direction. Both aircraft are passing abeam the mountain.

Task 5.5: Abeam

Finish the sentence. Fill in the missing words.

Abeam means in the _____ o'clock or _____ o'clock position.

Aircraft Attitude



The *horizon* is where the sky meets the surface of the land or water. *Attitude* is the position of the aircraft in relation to (compared with) the earth's horizon.

The *level* attitude. 

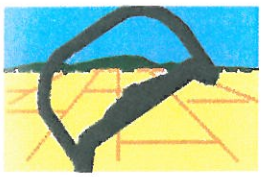
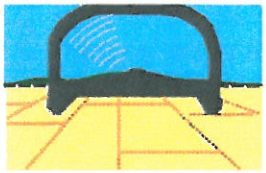
A *nose-high* attitude.
The nose of the aircraft is above the level attitude. 

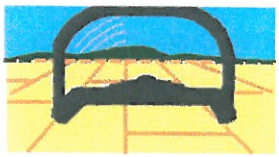
A *nose-low* attitude.
The nose of the aircraft is below the level attitude. 

This aircraft is in a *banked* attitude
(at an angle to the horizon). 

Task 5.6: Aircraft attitude

The four pictures below show what a pilot would see when looking forward through the windshield. Refer to the descriptions above and write the attitude below each picture.

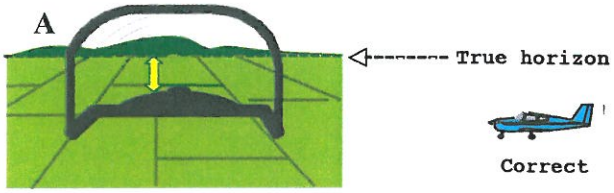



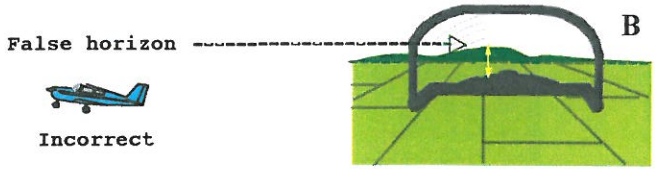


A. _____ B. _____ C. _____ D. _____

False Horizon

A pilot judges the pitch attitude of the aircraft by comparing the nose position with the horizon. It is easy to set an incorrect attitude when flying toward hills or mountains. The correct attitude should be set from the true horizon, not from the tops of the hills.





B is called a *false horizon*

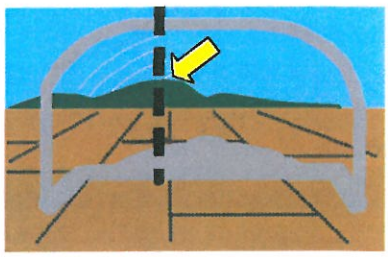
Task 5.7: Nose attitude

Look at the pictures on the previous page. Pilots A and B both think they have placed the nose of the aircraft in the correct attitude for level flight. Complete the sentence below to explain why one pilot is not staying level.

The pilot of aircraft ___ would c___ ___ ___b, because the nose attitude of the aircraft is too h___ ___h.

Additional Terms and Vocabulary

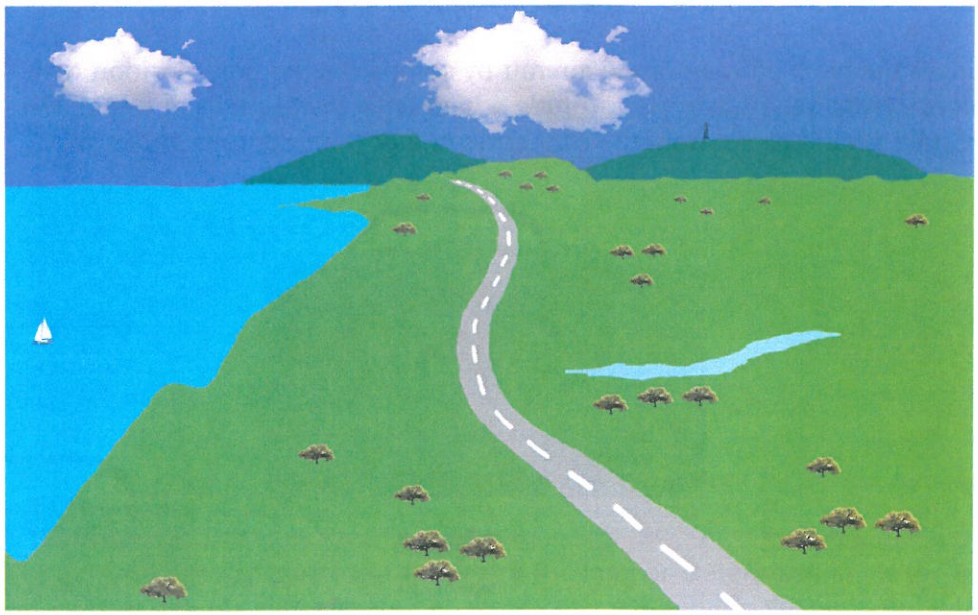
Reference Point



The pilot uses a *reference point* to help fly the aircraft in a straight line. Any fixed or stationary object in the distance (a long way ahead of the aircraft), even a distant cloud, may be used as a reference point. In the picture, the pilot is using the top of a distant mountain as a reference point. Provided it stays in the same position in the windshield, the pilot is flying the airplane in a straight line.

Task 5.8: Reference points

Look at the picture below. What could a pilot use as a reference point?

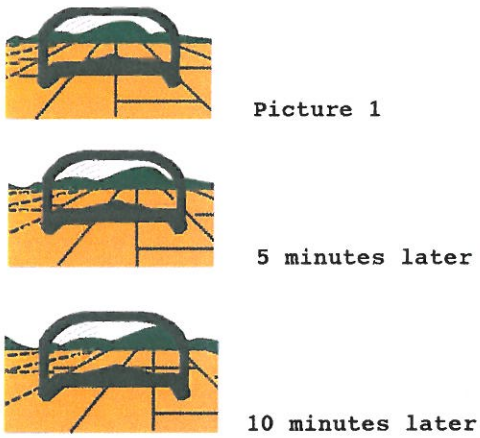


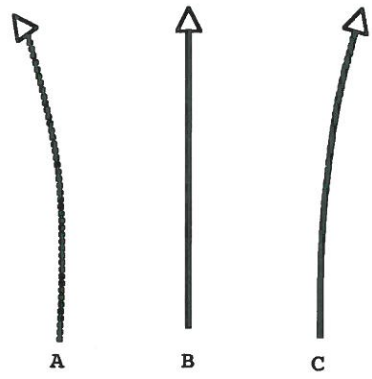
Which features would not make a suitable reference point?

1. _____
2. _____
3. _____
4. _____
5. _____

Task 5.9: Using reference points

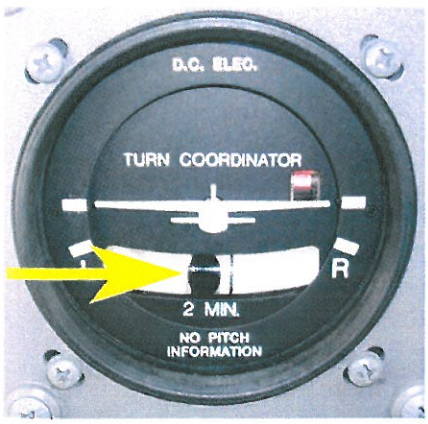
Look at the sequence of pictures. The reference point (the mountain top) has moved across the aircraft windscreen. Can you work out which path the aircraft is flying? A, B, or C?





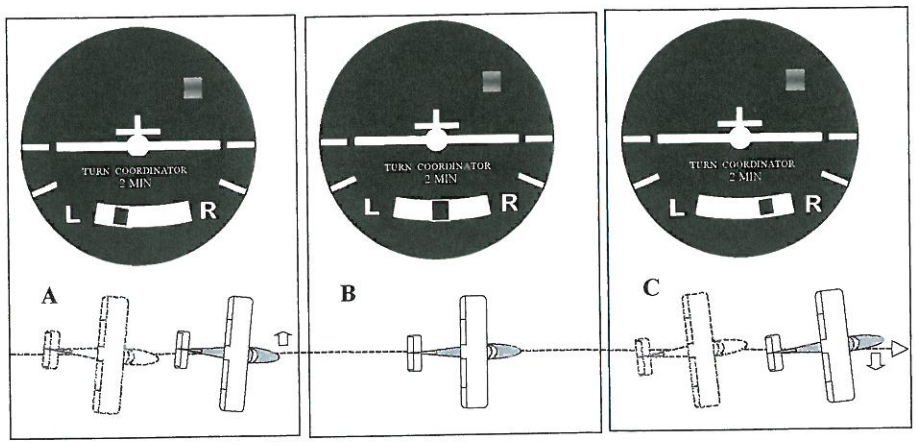
Path of aircraft = _____

Balance



The turn coordinator. The yellow arrow is pointing to the ball in the center.

Aircraft should be flown balanced. Balance is shown by the turn coordinator or the turn and bank indicator. When the aircraft is balanced, the black ball will be in the middle of the instrument. If the ball is to the right of center, the pilot must push on the right rudder to return it to the middle. Left rudder is needed to correct if the ball is displaced to the left.



Task 5.10: Balance

Refer to the pictures above. Fill in the missing letters or words in the sentences below.

1. Aircraft _____ is in balanced flight.

2. Aircraft _____ and _____ are not balanced. The ball is not in the center.

3. In aircraft A, the ball is a little out to the left, so the pilot will have to push on the l___ ___ ___ rudder pedal to balance the aircraft again.

4. In aircraft C, the ball is out to the _____, so the pilot will have to _____ to balance the aircraft.

The Scan

A *scan* is the pattern of actions the pilot repeats again and again.

- The pilot uses the flight controls to place the aircraft in the correct attitude.
- The pilot looks out for other traffic all around the aircraft.
- The pilot checks performance of the aircraft by checking certain instruments to see what the aircraft is doing. For example, to stay level, the pilot checks the altimeter to make sure that the aircraft is remaining at the same height. To fly at a particular speed, the pilot checks the value shown by the airspeed indicator (ASI).

A pilot should maintain a continuous scan of all these areas.

Basic Cockpit Instruments

Instruments are divided into two categories: control instruments and performance instruments. The pilot controls an aircraft by setting the correct engine power and aircraft attitude (the nose position of the aircraft compared with the horizon). Instruments indicating engine power settings and aircraft attitude are called *control instruments*. *Performance instruments* indicate what the aircraft is doing. They show such things as how high the aircraft is flying, its speed and direction, whether or not it is climbing or descending, and if it is in balanced flight.

Task 5.11: The aircraft instrument panel

TRACK 14

Refer to audio CD Track 14: Unit 5 Listening Exercise 1. Listen to the description of an aircraft instrument panel. As you listen, write the correct letters A through F from the list below to identify each instrument.

A. airspeed indicator (ASI)

B. altimeter

C. vertical speed indicator (VSI)

D. turn and bank indicator (T&B) or turn coordinator

E. attitude indicator or artificial horizon

F. directional gyro (DG) or directional indicator (DI)

Task 5.12: Instrument functions

Refer to audio CD Track 15: Unit 5 Listening Exercise 2. Listen again. Write the name of each instrument in the right-hand column, as in the example. Which instrument shows:

the airspeed of the aircraft?	airspeed indicator (ASI)
the rate of climb or descent of the aircraft?	
the aircraft's pitch-and-roll attitudes in relation to or compared with the earth's horizon?	
the heading of the aircraft?	
how high the aircraft is flying?	
if the aircraft is in balanced flight?	

Instructor Talk

Handing Over and Taking Over

For safety reasons, you and your instructor must know at all times who is flying the aircraft. When your instructor wants you to fly, she will say, "You have control." You should answer, "I have control." When your instructor needs to take over the controls again, she will say, "I have control," and your reply should be, "You have control."

Task 5.13: Pairs work—speaking

Imagine you are an instructor and your partner is the student.

1. Hand over control of the aircraft.
2. Take control of the aircraft again.
3. Change roles and practice again.

Follow Along with Me

Often when demonstrating a maneuver, your instructor will say, "Follow along with me" or "Follow through with me." Your instructor is still the pilot flying; however, you should lightly place your hands on the controls and feel the movements that are being made while your instructor demonstrates.

VERBS

Listed below are some verbs that are commonly used during basic flight instruction.

Task 5.14: Pairs work—asking questions

Student A, look at this page. Student B, look at the ***next page***.

Student A Exercise

Work with a partner (Student B) to complete the following table. Do not look at your partner's page. Practice asking each other questions, such as:

- "What is the definition of *move*?" or "What's the meaning of *move*?"
- "What does *take over* mean?"

Write your answers in the right-hand column.

Verb	Definition
adjust	alter something slightly
move	
ease	move carefully or gradually
raise	
lower	move down
push	
pull	move an object toward you with a steady force
look out	
relax	become less tense
hold	
jerk	make abrupt movement
rest	
place	put
follow through or follow along	
hand over	pass control of the aircraft to the other pilot
take over	
check	make sure something is correct

Student B Exercise

Work with a partner (Student A) to complete the following table. Do not look at your partner's page. Practice asking each other questions, such as:

- "What is the definition of *ease*?" or "What's the meaning of *ease*?"
- "What does *hand over* mean?"

Write your answers in the right-hand column.

Verb	Definition
adjust	
move	change place or position
ease	
raise	lift up
lower	
push	move an object away from you with a steady force
pull	
look out	watch what is going on outside the aircraft
relax	
hold	place hands around and support
jerk	
rest	put or place hands or feet against a control
place	
follow through	place hands and feet on the controls while the instructor is demonstrating
hand over	
take over	take control of the aircraft from the other pilot
check	

What Did My Instructor Mean?

Task 5.15: Group discussion

Sometimes your instructor may use unusual or colloquial (informal) language. Discuss the following instructions with others in your group. Match the expression on the left with a meaning on the right by writing the appropriate number in the answer column, as in the example.

Instruction	Answer	Meaning
Keep your eyes outside the cockpit.	5	1. Can you see the other aircraft?
You were behind the aircraft then.		2. Raise the flaps (and landing gear in a retractable aircraft).
Have you got the traffic in sight?		3. It is your turn to try the maneuver.
You must not use power against brake.		4. Move the throttle until the engine rpm is correct.
Clean the aircraft up.		5. Do not look at the instruments so much. Look outside most of the time.
Did you get that?		6. Look at both wing tips and make sure they are the same distance above or below the horizon.
I want you to have a go now.		7. When taxiing, do not use the brakes until after you have closed the throttle.
Check the wings are level.		8. Check the aircraft is in balanced flight.
Set the power.		9. You were thinking and acting too slowly.
Make sure the ball is in the center.		10. Did you hear that? Did you understand?

Task 5.16: Listening practice

TRACK 16

Refer to audio CD Track 16: Unit 5 Listening Exercise 3. Listen to an instructor teaching straight and level flight. As you listen, fill in the missing words.

"Well, today we're going to practice flying straight and level. We'll do this exercise at 3500 feet. The first thing we do is we pick a ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ out in front of the airplane so we can fly towards it. Then we set the correct nose ___ ___ ___ ___ ___ ___ ___ ___ for straight and level flight. See? That's it there! I am now trimming the aircraft. I move the trim wheel ___ ___ ___ ___ ___ ___ until the attitude remains the same with no pressure required on the control wheel.

"Next, we set the power. In this aircraft that's 2500 ___ ___ ___. And we have to check the wings are level. This is a low-wing aircraft, so we look to see both wings are the same distance below the ___ ___ ___ ___ ___ ___ ___. If the wings are not level, the aircraft will turn.

"Lastly, let's check the performance. There are ___ ___ ___ ___ ___ things we need to check.

"One, are we keeping ___ ___ ___ ___ ___ ___ ___ ___? Look at your reference point, and see if it has ___ ___ ___ ___ ___. No, it's still in the same place in the windshield.

"Two, are we maintaining level flight? We check the ___ ___ ___ ___ ___ ___ ___ ___ ___, and we are still at 3500 ___ ___ ___ ___.

"Three, is the aircraft ___ ___ ___ ___ ___ ___ ___ ___? Make sure the ___ ___ ___ ___ is in the center of the ___ ___ ___ ___ coordinator.

"To maintain straight and level, we need to keep our ___ ___ ___ ___ going. That's ___ ___ ___ ___ ___ ___ ___ ___, ___ ___ ___ ___ ___, ___ ___ ___ ___ ___ ___ ___ ___ .

"Ok, we've ___ ___ ___ the correct attitude.

"Now we must have a very good lookout. Look all ___ ___ ___ ___ ___ ___ the aircraft, starting behind you on one side and turning your head to look right past my head to the other. Make sure you look both ___ ___ ___ ___ ___ and ___ ___ ___ ___ ___ the horizon. You must keep your eyes outside the cockpit 90% of the time and 10% inside, OK? Have you got the traffic sighted, low ___ ___ ___ ___ ___ ___ ___ ___ ___, ___ ___ ___ ___ ___ position?

"How's our performance? Looking good! We are flying straight, our altitude is still 3500, and is the aircraft ___ ___ ___ ___ ___ ___ ___ ___? No, the ball's a little out to the

___ ___ ___ ___ ___, so we need to maintain a slight pressure of right rudder. We will repeat the scan again and again as we fly along.

"OK? I want you to have a go now at flying straight and level. You have ___ ___ ___ ___ ___ ___ ___."

Reread the expressions listed in Task 5.15. Listen again and underline any of those phrases you heard the instructor use during the demonstration.

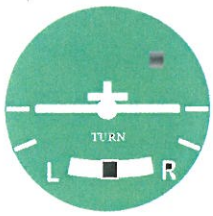
TRACK 16

Unit 5 Review

Test your knowledge.

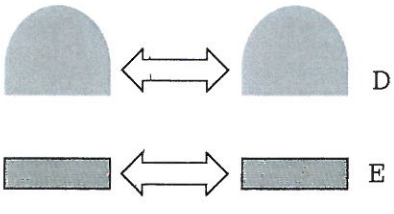
1. Write the names of the objects under each picture.

A)_____



B)_____

C)_____

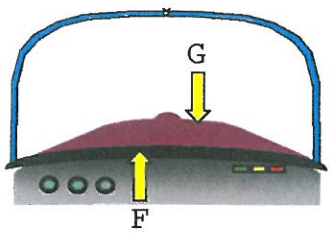


D

E

D) t _ _ b _ _ _ _ _

E) r _ _ _ _ _ p _ _ _ _ _



F) d _ _ _ b _ _ _ d

G) n _ _ _

Circle the correct answer, true (T) or false (F).

2. If the ball on the turn coordinator is right, you should apply right rudder to correct it. T F

3. *Adjacent to* and *in the vicinity of* mean the same thing. T F

4. *Abeam* means in your six o'clock or twelve o'clock position. T F

5. *Follow me through* means the same as *you have control.* T F

6. If the reference point is moving to the left in the windscreen, the aircraft is moving to the left. T F

7. An aircraft visible on your starboard wing would be in your three o'clock position. T F

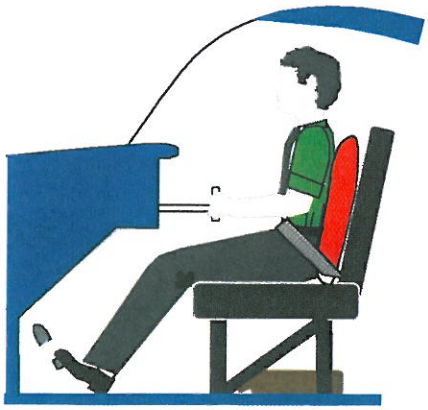
8. Setting the level attitude from a false horizon will cause the aircraft to lose height and descend. T F

9. Write the words that mean the same as:

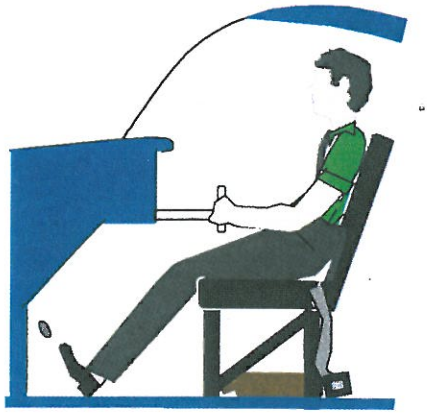
A. compared with i___ r___ ___ ___ ___ ___ ___ ___ t___

B. near i___ t___ ___ v___ ___ ___ ___ ___ ___ ___ o___

C. next to a___ ___ ___ ___ ___ ___ ___ t___



First Lesson



Second Lesson

10. The picture on the right shows Mark sitting in the aircraft waiting to begin his second flying lesson. What are two important things he has forgotten to do?

A. _____

B. _____

11. What units of measurement are used to describe:

A. airspeed _____

B. rate of climb or descent_____

12. Indicate which of the following are part of the pitot-static system? (Y = yes; N = no)

A. ASI _____ B. artificial horizon _____ C. VSI _____

D. turn coordinator _____ E. altimeter _____ F. DG _____

Check your answers in the Answer Key at the end of this unit.