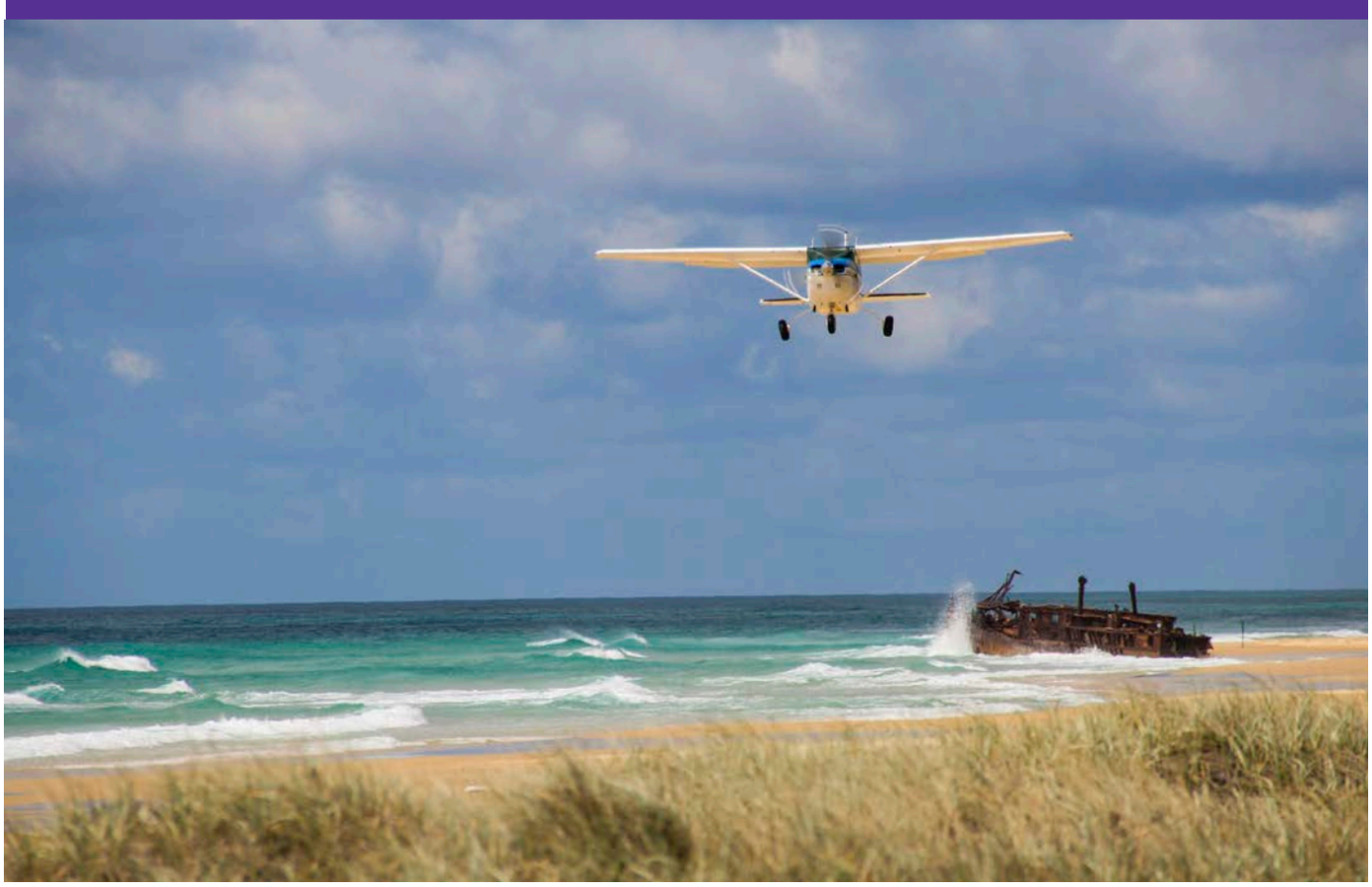
RECREATIONAL
AVIATION AUSTRALIA

CHAPTER SIX

Create A Lesson Plan

This chapter is intended to assist the new Instructor rating holder to create a standard briefing structure to suit their briefing style, ensuring consistent use of terminology on the ground and in the air and delivery of core elements of each lesson.



Airmanship elements common to every lesson

There are key airmanship elements including practical areas such as Aeronautical Decision Making (ADM), Situational Awareness (SA), Threat and Error Management (TEM) and Cockpit Resource Management (CRM). As a minimum, these areas should include the following considerations.

Lookout

The three core reasons for maintaining an effective lookout include; awareness and management of external threats, maintaining situational awareness in relation to the ground including position, and applying visual flight rule disciplines using the horizon as the primary reference.

Emphasise the lookout procedure during the briefing and reinforce this during the flight. Ensure the student holds their head at a natural and comfortable position, looking at the far horizon directly in front of the student rather than across to the propeller and referencing a convenient point such as a rivet or screw in the cockpit peripheral vision to ensure the attitude of the aircraft against the horizon reference.

One recommended scan procedure is to select a small segment of sky to the left, scan up and down, move to the next segment to the right and repeat until the scan is completed to the right. Finally, scan across relevant flight and engine instruments.

Managing control of the aircraft

Critical to student development is the gradual understanding of situational awareness or airmanship. The Instructor must ensure this vital aspect of safety forms the basis of every practical lesson.

A critical part of aimanship is ensuring clarity for who is in control of the aircraft at any point during the lesson. The use of one specific phrase is not critical provided consistent phrasing is applied at the school and they are clearly understood. For this manual, we will use “You have Control/ I have Control”.

When handing over control of the aircraft the Instructors aim is to not only ensure the student is aware of they have control of the aircraft, but that the student understands they are now In-Command. It should be emphasised that the student not only has command of the aircraft but is responsible, under the Instructors supervision, for the operation of the aircraft.

Ensure the student acknowledges ‘I have Control’ and has placed hands and ft on the controls. If the student does not acknowledge, the Instructor should hold the controls to prevent them moving and make the student acknowledge they have taken over reinforcing the importance of acknowledging who has control.

It also shows good discipline to formally use the words, You have Control/I have Control. Simply saying You got it or just gesturing as to who has control can indicate a lack of discipline on behalf of the Instructor, degrading the importance of the procedure.

The Instructor may also use the term follow me through intended for the student to lightly place hands and feet on the controls. The Instructors makes all inputs and controls the aircraft, however the intent of follow me through is to assist the student to gain an understanding of control inputs and practical motor skills for specific lessons. The Instructor must ensure the student does not attempt to make any inputs.

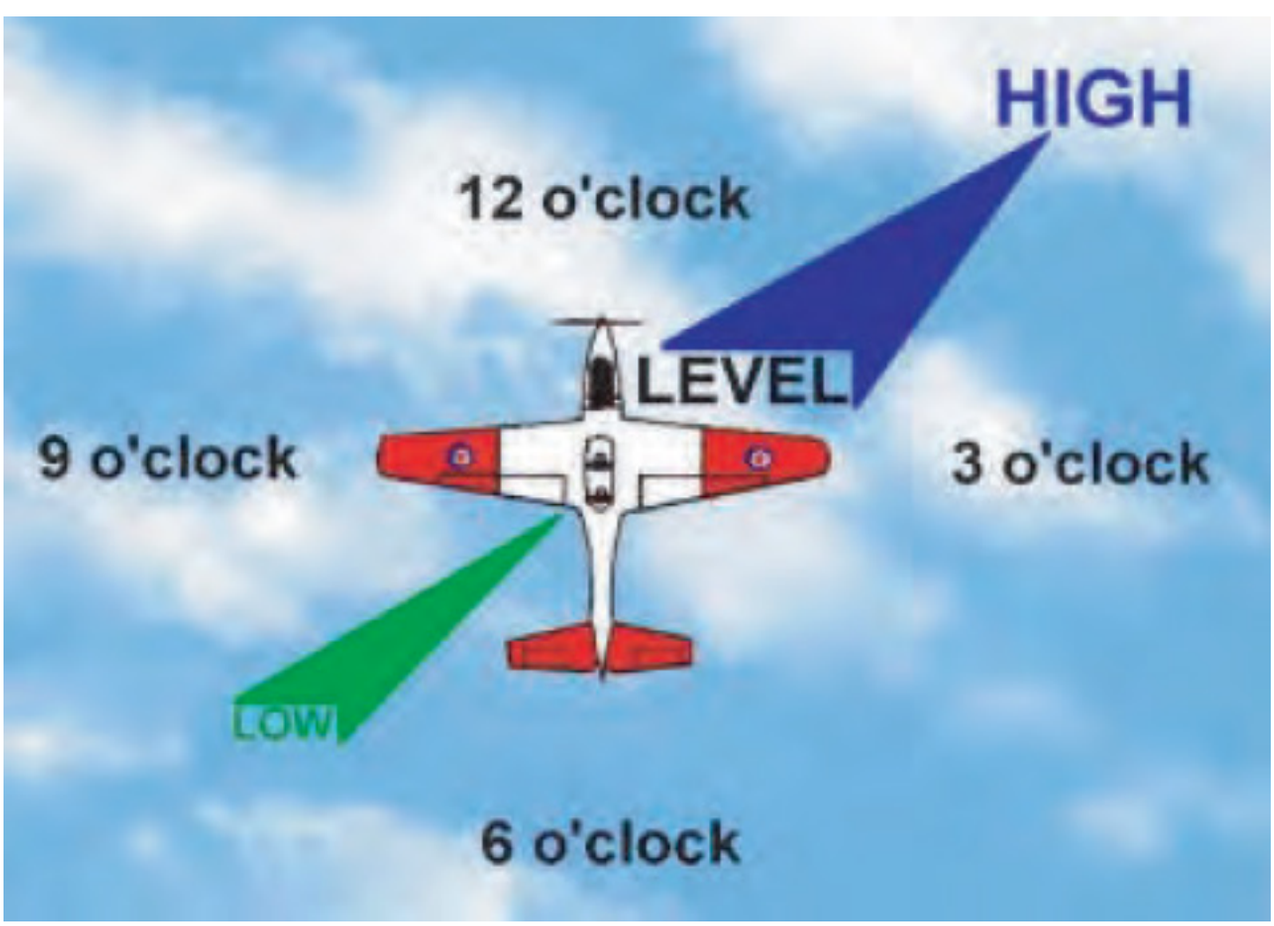
Situational Awareness

Airmanship, while currently out of vogue as a phrase, refers to a fundamental behaviour to be emphasised throughout the training period and any subsequent review. As an example, during the Trial Instructional Flight (TIF) it is sufficient to simply patter and indicate the lookout procedure used. Lookout technique, along with use of the CLOCKCODE should be emphasised during subsequent lessons.

The CLOCKCODE

This simple procedure for referencing a position relative to the aircraft must be included as part of the preliminary lessons. The picture below depicts the aircraft at the centre of a flat plan view of the clock face. The nose of the aircraft is 12 o'clock, the left wingtip 9 o'clock, the right wingtip 3 o'clock and the tail 6 o'clock. If another aircraft or object is sighted by it should be relayed to other aircraft occupants as being in one of these clock positions.

Additionally, the object is reported as being high, level or low relative to the aircrafts position. Further, when giving information about your aircraft relative positions to the pilot of another aircraft, describe your aircraft relative to a clock code which is centred on the other aircraft. In this case the observer must visualise the other aircraft as being in the centre of the clock and report the position of your aircraft relative to the other aircraft.



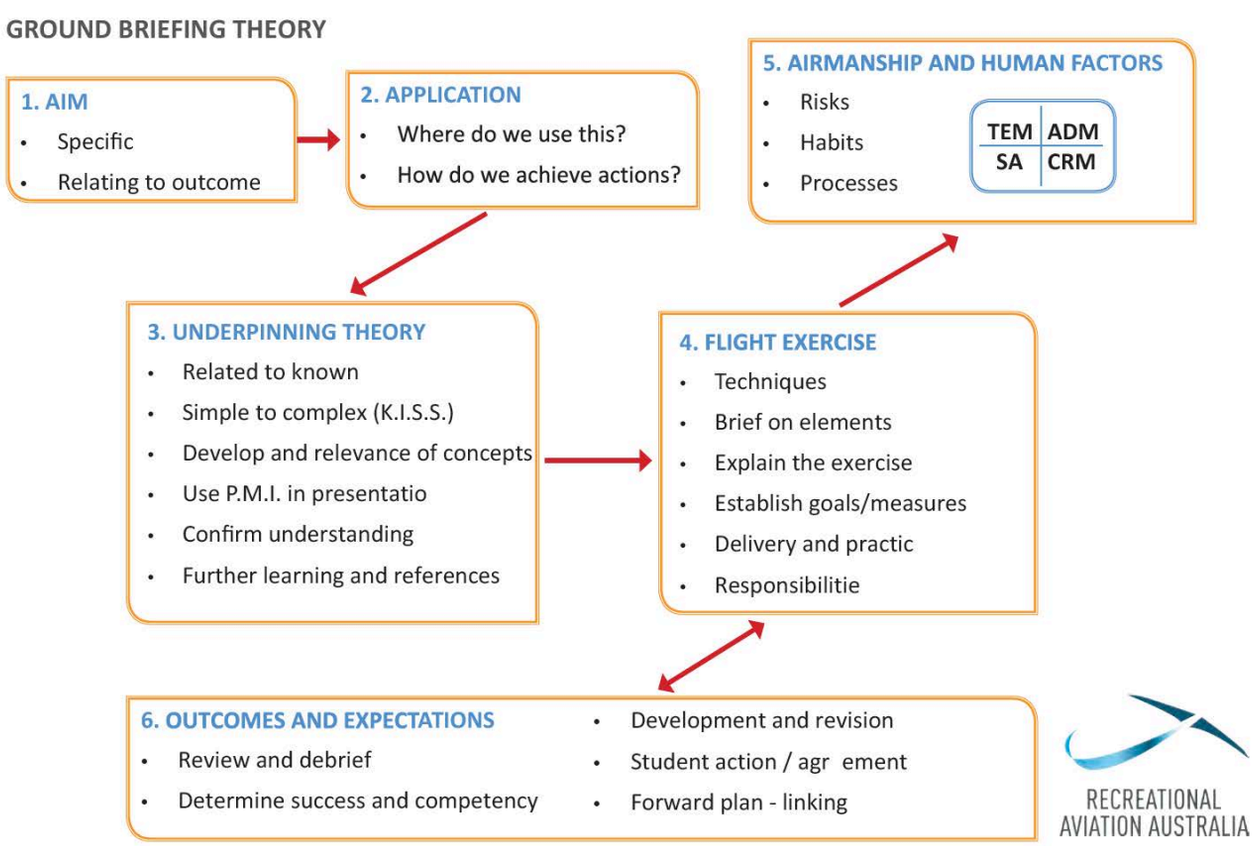
Standard ground briefing template

Title
The title of the subject and lesson being delivered. This should be consistent with the briefing samples and RAAus Syllabus of Flight Training.

Aim
This is the intended objective of the lesson. At the completion of this lesson it is expected that the student will be able to...*"Operate the controls correctly and identify and correct for any secondary or further effects as required."*

"Climb or descend the aircraft to a predetermined height at any desired airspeed or rate"

The aim should be clear and concise and relate specifically to the skills and operations to be introduced and practiced in the lesson.



Application. Where will the student expect to use this skill and how does it relate to other flight sequences? What is the significance of this element and what safety and further implications does it have in the pilots development?

Airmanship and Human Factors. Talk about this vital subject early and often. Airmanship can be directly related to applied skills, judgement and Human Factor elements. It also reflects practices and behaviours based on the right "attitude" to flight and the need for underpinning safety at all times. The instructor should help the student develop confidence to interact with them in assessment and judgement in all situations and develop threat recognition such as good "see and avoid practices" and situational awareness.

First briefing item - Underpinning theory or aeronautical knowledge. Construction of content with explanations, appropriate level of underpinning theory, diagrams and analogies. Correct use of standard terms, accurate diagrams or representation of flight modes and simple to complex development are key factors.

Pictures tell a thousand words. If you are not good at drawing use photos, cut outs etc. Use analogies relevant to the students' life experiences and practical expertise to assist understanding.

Second briefing item - Flight exercise. The flight exercise takes the underpinning theory and application of the briefing and provides the framework for the flight lesson component. This part of the briefing represents the drills, processes and applied skills that will be developed in the air to meet the aim and expand on the student's developments. This is what the instructor will demonstrate, monitor and coach.

Further elements. These can be introduced if required, but Instructors must be wary of going off topic or on tangents, creating confusion and wasting time. Develop a series of short explanations or phrases e.g.

"The manufacturer has designed the aircraft to behave in that manner, for more information you can read the POH or in the BAK book."

Outcomes and Expectations. A brief over view of the content with reference to the aim. So long as the aim was accurate this will prompt you to confirm that everything has been delivered. Relate the outcomes back to the initial aim and cross reference these in any debrief. These can be used as a basis for student records and continued training in this area in agreement with the student.

What every student needs from their instructor

Keep It Simple Stupid (K.I.S.S)
You know what we mean. The student wants it as simple as you can make it without loss of what they need to know. This can be achieved by the following steps.

Consistent language
English words can have several meanings. Students should tell you when misunderstood (apologise, dont make the student feel bad at this point as this was a fault of the instructor).

"Did you see the nose drop?"
One student will respond with yes, the next will be quiet as he ponders where did the nose drop off to or go. And if we use this term, what would be the opposite term? "Drop up?" or maybe "Rise up?"

The student in this scenario now has to learn two new terms instead of one. Nose pitches down/Nose pitched up. And of course in the air the action should be timed with the input for maximum absorption by the student. And most importantly of all during the demonstration, where should the student be looking? The horizon!

Prior to each demonstration make a point of focusing the student's attention on the horizon. For the student, it can be likened to learning to dance. All you want to do is look at your feet. Likewise the student will gain no benefit from looking at the control column or instruments at that vital moment.

You may think this is pedantic at this point but when there are moments that the student will hesitate in order to process ambiguous language. The lesson takes longer and the student could feel embarrassed because they don't understand. This behaviour, along with demeanour can be a significant insight into why some students prefer one instructor to another. If the school has multiple Instructors, it is vital there are no differences or inconsistencies with terms used.

Delivery of content and the why

Keep the 'why' basic. The Instructor is responsible for controlling the level and complexity of the 'why', otherwise the briefing can go on for hours. The lesson needs to be kept as short as practical. Long complex briefs can confuse the student and make them think that it is all too hard. This may translate in the air to the student being vague or distant. Only deliver the content required for the demonstration of that flight. If the information is not practically useful for the student whilst in the air for that lesson then don t introduce it in that lesson. Provide theory information without flights for subjects like aerodynamics.

Direct correlation between content delivered, demonstrated and practiced
A student will learn with more focussed attention and correlation between the briefing and the upper air patter. This provides kinesthetic reinforcement of the briefing and the flight exercise.

Q&A time

Instructional delivery and the new flight concepts that are inevitably and being practiced will require consolidation development for thorough understanding of the exercise. This is critically important to the student's true learning as a pilot and prevents only rote learning, developing true understanding in the application of any flight skill.

Questioning is the cement that builds these foundations.

Students should be encouraged to actively consider areas for discussion after review and given time to reflect on any lesson. Preparation of key questions firstly by the student and prompted by the instructor is an important interactive process that allows the student to probe and confirm their understanding. This also gives the instructor confidence that what is being taught is being correctly absorbed. The instructor must ensure the student understands that ***"there are no dumb questions"*** and an inquisitive mind is the hallmark of a good pilot. Clearly this is best done after any flight, due to the workload whilst airborne, but with careful attention some questions can be effectively answered in the air for maximum understanding. As an example *"What happens if I don't relax back pressure at the onset of a stall?"* can be effectively answered by demonstration; but "How does a variable pitch propeller work?" is best answered on the ground. Questioning by both student and instructor is a key part of the rapport building relationship that ensures teaching is properly transitioned to understanding in the learning process.

Separate theory lessons from flights

The pre-flight briefing and disciplined self-study may not be sufficient to ensure the appropriate level of knowledge is gained in all the training sequences. Additionally if we are observing learning and attention principles from our Principles and Methods of Instruction (PMI), a preflight briefing that exceeds as little as 20 minutes may see many recreational pilots defocussing and losing attention to important concepts that must be understood.

These reasons create an important opportunity to consider different scheduling for the traditional long brief and also any additional briefings that are better conducted outside of the normal flight booking slot. While these can place additional demands on both instructors and flight school operations, the aim should always remain to ensure all students have a suitable level of knowledge that is supported by tailored briefing sessions. There are also advantages in conducting these in small group formats where shared learning can occur. Examples for this type of briefing include HF training, radio procedures, air legislation, pilot duties and responsibilities and even simply how to fill out a logbook.

Young mind vs Mature mind

The purpose of this subject is not to delve into the psychological and physiological differences of the developing or mature brain, but to give practical insight as to how differing age profiles adapt to the concepts of learning to fly and underpinning knowledge. The collective experience of recreational flight Instructors has provided ample evidence there can be substantial difference in successful training approaches when applied to differing ages and maturity of any student.

For example; the young mind will often not question, all you may get is a constant “yep, yep” and then action. The mature mind will question, and occasionally no action can be carried out until the ‘why’ is understood. Students who have limited life experiences to work from or those who feel overwhelmed or threatened by the Instructors perceived authority may retreat into partially developed rote learning only.

Superficially they may appear to be progressing well, further they may take instruction quite literally and do exactly as they are told without understanding the ‘why’. This is why it is important as Instructors we consider the terms used and the requests made, carefully in light of their experience, not just ours. All the more reason to stay true to terms.

Another area that may be observed in the young student is fear indifference; that is, they don't yet know what can hurt them! They may have never been involved in an accident or seen the consquence of tragedy and the aviation environment is a cruel teacher in this regard- giving the test first and the lesson later!

Conversely, mature students may challenge instruction, or with well developed social skills operate agreeably to new concepts, masking the fact that they haven't truly acquired understanding. In teaching "an old dog new tricks" we need to be mindful of strongly developed primacies, whether this reflects in how they hold a control or operate a mechanism to deeply ingrained beliefs.

The more mature student is also likely to have had degrees of success and development in their lives that may be challenged when attempting to learn new skills in a three dimensional environment. These and many other idiosyncrasies of the mature student may lead to a degree of expectation bias in regards to their training progress. This need to be recognised by the astute instructor both initially and throughout the students progress.

Finally unlike the young student, the mature pilot may be "fear averse" which is sometimes misconstrued by the instructor as "safe" and may therefore not be effectively addressed in training development. Older pilots often need to be mentored to extend their learning experiences whilst under instruction in order to develop confidence and understanding as part of their training development. A classic example of this can be seen in the landing phase where fear often masks effective pitch control in the flare, or an over exuberance to "just get her down".

By no means is this a comprehensive break down of the many nuances of training across various age groups. Younger students learn with varying degrees of absorption of information whereas older students will assimilate knowledge based on known experiences. Given the wide scope of recreational pilot candidates it offers some areas for consideration for all Instructors.

Syllabus instruction guide

The table provided below is intended to assist Instructors in the **effective delivery of the RAAus Syllabus of Flight Training.** In all cases, it is recommended that the Instructor reference the RAAus Syllabus of Flight Training to ensure all required for practical and theoretical elements are delivered as part of each specific lesson. More importantly, the student achievement of competency of these skills must be confirmed during subsequent lessons.

Lesson	Core elements demonstrated, practiced and understood
1. Trial Introductory Flight (TIF) 0.5-1.0 hours	Student is introduced to aircraft discussion on aspirations, and basic overview of RAAus, syllabus and how RA fits into aviation landscape (if required) and basic introduction to control concepts mixed with fun to allow student and instructor to evaluate the desire and motivations to continue. Flight geared towards customer expectations. Emphasis on enjoyment, professionalism and safety.
2. Effects of Controls 1-2 hours	Introduce the fundamental control inputs and their primary, secondary and further effects and build on the airborne environment/classroom for the student. This lesson builds rapport and establishes a good student and teacher relationship and set's guidelines for behaviour attention protocols and the demonstration replication process in the cockpit. This is without doubt one of the most important basic lessons and should not be rushed.
3. Straight & Level 1 hour	Lesson reinforces and builds on horizon as primary focus, and builds students understanding and awareness of visual stimulus and correctly correlated control reactions in all three planes. The concept of infinite solutions for level flight at any airspeed within normal envelope is introduced and may need a follow up lesson aft r C&D to tie together effectively. Also, introduces the important concepts of lookout. Student needs to be given longer periods of control authority and the instructor can begin assessing the student's progress in this new environment.
4. Climbing & Descending 1 hour	The concept of power as control for vertical movement and correct sequencing is introduced with drill acronyms to be used with ROTE reinforcement to build a thorough understanding of protection of airspeed in a low inertia environment. Instructor should immediately recognise any signs where attitude is not used for primary airspeed management. Revisiting secondary and further effects of power and slipstream is important at this stage. Where possible descent profile referencing should be explored.
5. Turning 1 hour	Aft r a thorough briefing on the forces at play, this lesson is the first that calls for all three primary controls to be bought together for one control exercise. The student should clearly understand the differential lift and drag bought about through roll input and the importance of 'stick & rudder' for effective turning. Adverse yaw should be identified at the start of the turning demonstration with the student correctly relating rudder as primary to overcome. Accuracy with height, Lookout PRIOR to turning and then with focus forward throughout the turn are imperative behaviours to be practiced. Turns in level, climbing and descending flight should be introduced if time allows and turning accurately to a point if student is advanced. Particular vigilance by the instructor needs to be adopted in relation to balanced use of controls and this lesson oft n can be broken into two parts.
6. Consolidation -	This lesson should not be overlooked in spite of the relative progress of the student and the instructor should be satisfied the student easily and accurately can operate the aircraft in all phases of flight with clear verbalized actions of sequences to cement the students basic aircraft handling prior to circuit introduction. This lesson presents an ideal opportunity to revisit effect of controls and explore flight in all phases at various airspeeds and high level rectangular exercises in the t/a can be employed in readiness for circuit work. The instructor should "test" these foundations by provoking and exploring various scenario's as better done before further workload is introduced.
7. Stalling 1-2 hour	An important lesson to associate a well presented brief highlighting the dangers of stalling and the lesson goal is not to teach you how to stall but recognise the numerous symptoms and implement an immediate and appropriate recovery should one occur. A significant amount of time should be spent focusing on the pre-stall condition and the scenarios likely to occur. The student will oft n struggle to affect the full stall so the instructor may need to assist at this point to ensure the student understands the appropriate behaviours the aircraft can exhibit. Use of rudder and the importance of the recover attitude before power application are also highlighted areas of focus. Repetition is again the key to building effective recognition and recovery habits in this significant lesson.
8. Circuit Introduction 0.6-1.0 hours	Two-part brief process over selected lessons. Simplified format and leg process introduction at first. Align the sequence to skills already practiced. Instructor to subtly manage all peripheral requirements. Focus should be on horizontal referencing features not airfield and vigilance for good lookout and attitudinal references, particularly in turning phases. The student may easily feel intimidated at the volume of workload in early circuit sequences and the instructor needs to manage this effectively to ensure progress not regression in previous learned techniques. Good airspeed management and transitions, systematic operations of ancillary control without loss of focus on external referencing, and accurate Power/Height management are the expected goals and outcomes in these early lessons.

Lesson	Core elements demonstrated, practiced and understood
9. Circuit development 0.6-1.0 hours	As lesson 8 skills are gained the instructor should begin to expand the understanding of turning reference points, the 45 degree intersections, and appropriate glide profile position in the circuit. A supplementary brief should be conducted at this stage to introduce pre-landing checks, required radio, and modifying the circuit for differing wind conditions and traffic. Listening watch, Lookout and good airmanship should all be re-enforced in this stage. The take-off and landing phases should be becoming developed at this stage, recognition of flare heights, drift ballooning and bouncing should be covered and "mini" briefs and lessons may need to be introduced to ensure circuit development is consistent across all phases of the circuit process.
10. Modified circuits 0.6-10 hours	In this series, the student is tested to confirm their fundamental understanding of Attitude (Airspeed) – Power (Climb/Descend), and power for profile understanding. The instructor should allow the student to conduct normal circuits at first then take over repositioning and profiling the aircraft outside of expected parameters. The first response on handover back to student should be the student's recognition of the incorrect position/profile. Then a reaction that is appropriate to repair the situation created by instructor. The instructor should be looking at correct primacies in PAT/APT and appropriate countering of secondary/further effects as required.
11. Crosswind/downwind circuit techniques 1 hour +	Assessment criteria for judging/calculating x-wind, discussion on techniques and uses and aircraft limitations. Introduction of forward slip, and crab techniques. Explain benefits of "protecting" into the wind wing. This will most likely be the students first extended use of "crossed controls" and the instructor should clearly demonstrate, and articulate the fixed rate of slip with bank and directional control with rudder. Downwind circuit should be included to confirm the students understanding of airspeed/groundspeed and the changed glide profiles and adjustments for aiming points and take off climb angles.
12. Engine failures in circuit 1 hour +	Having demonstrated competency in all of the above areas, introduction of circuit emergency procedures should be introduced with a thorough briefing. The briefing not only presents the cornerstones of aircraft performance, decision planning and execution, but most importantly the disciplines of attitude and human factors in these situations. Exercises should be clearly demonstrated in separate and distinct parts of the circuit, starting with downwind and moving back towards x-wind leg and initial leg failures. Correct and immediate attitude action is paramount before venturing to EFATO areas of the circuit. The student's judgement of glide angle should be developed and any tendencies to deviate from controlled, balanced manoeuvres should be checked. Slipping turns, S turn profiling, sideslip technique and need to be introduced, demonstrated and practiced in conjunction with EFIC sequences. The instructor should caution against and be vigilant for excessive manoeuvring close to ground, the skidding turn, overbanking, extending the glide and delayed decision monitoring. The take-off decision point, rejected take-off criteria, climb performance, splay options, Take-off Safety Speed (TOSS), adoption of safe airspeed attitude, braking, stopping and developed emergency stopping strategies and more should all be covered and explored with the student, again being reviewed and assessed with student as part of EFATO. NB: Suggested school training policy – no EFATO simulations under 300'AGL.
13. Missed approached & non-standard circuits 1 hour	In these later procedures the instructor is assisting in developing judgement, ADM, and airmanship principles as well as knowledge of published "missed approach (go around)" procedures. Low Level, extended legs, power assisted leg, collision avoidance and separation strategies should be demonstrated and developed by the student with instructor adopting a "devil's advocate" style as a catalyst for the student to extend awareness, learning and adaptability in busy, or altered environments.
14. Solo assessment & administration -	At this stage the student should have developed self-discipline, unprompted decision making, accurate, smooth and vigilant flying attributes, and importantly being able to correctly recognise, react & repair any anomalies in their own flying with little or no prompting from the instructor. The instructor should be able to "load" the student and they able to prioritise, act and re-assess in any flight situation or non-standard procedure the instructor may choose to introduce. All pre-solo ground exams, legal requirements, documentation and records should be checked, agreed with student, and jointly signed off as completed prior to assessed solo flight.

Lesson	Core elements demonstrated, practiced and understood
15. Post solo review & development -	Aft r 3rd solo lesson and with a joint discussion on the conditions as appropriate the student should be assessed and allowed to conduct solo from departure point and return aircraft to parking unassisted with supervision and observation by the appropriate instructor. Key elements are good ground behaviour and procedures, observed consistency and airmanship, and decision making, with radio listened to as required.
16. Inbound / Outbound / Rejoining procedures 1.0-1.5 hours	A thorough brief & awareness of CAAP 166 (X) should be discussed and the various joining options at non-towered circuit areas should be discussed. The pertinence of this lesson at early solo also gives the student the option to exit/rejoin the circuit appropriately should the need arise due traffic conflicts, wind direction changes or in relation to other user types (e.g. gliding/parachuting) or an airfield emergency. An area familiarization should be conducted with the appropriate area chart on board to highlight key features and distances in the local training area and the concept of orientation should be introduced.
17. Practiced forced landings & precautionary searches 1.0-1.5 hours	The appropriate brief should be given and this should be "interactive" at this stage of the student development. Demonstrated emphasis should be two fold – ALWAYS be pre selecting during any flight & ALWAYS fly and maintain control of the aircraft at all times. The powered "precautionary search & landing" should be covered to re-enforce the evaluation of a suitable landing area and to check the students familiarization with circuit process overlayed on a foreign landing location. This concept can then be developed to the Engine Failure scenario and the importance of correct choice and glide capabilities and limitations, particulary in relation to the prevailing wind / air conditions. Correct orientation of a "high key" (Upwind) and "low key" (abeam aiming) point is paramount to this sequence. Clarity of delivery by the instructor and correct aiming point management within a "safe glide angle circuit" should be consistently executed by the developed student, with the appropriate use of drag devices and height loss configurations (sideslipping) S-turns etc. where required to effect an appropriate final approach. NB: Restart procedures and emergency radio and make-safe procedures whilst all important should never be enforced at the expense of safe flight and good developed glide judgement. Various locations should be practiced with only approved LZ's used to ground level and all other exercise area's practiced to no lower than 500'AGL and with respect to all CAR's/CAO's.
18. Standardised procedures -	- All pre-flights to be checked by instructor. - All starts – instructor to confirm student's responsibility for throttle. - No students to taxi with doors open (instructor discretion on type). - Hand throttle/Hand brake for taxi with legs supporting control column as a/c type requires. - Run ups in designated run-up area's only. - Always stop/look at threshold markers. - Stop at 45 degrees facing approach to clear before entering for line up. - No EFATO sequences under 200'AGL. - No deliberate bouncing of aircraft ever. - Radio calls in circuit call (base) unless for avoidance. - Student to complete pre/post activity & record flight details in log.