
# Redbird GIFT Private Pilot

INSTRUCTOR GUIDE

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# General Information

Guided Independent Flight Training (GIFT) is an in-sim training asset intended to give student pilots practical flight training that compliments instruction from their CFI, and provides opportunities for practice.

It is recommended that the CFI accompany their student on their first several GIFT missions until the student has demonstrated the ability to:

- Maintain straight and level flight
- Return to straight and level flight from a shallow bank, climb, or descent

Students should be able to initiate new lessons without the presence of a CFI by no later than the successful completion of Module 3: Changing Power in Straight and Level Flight.

CFIs are encouraged to keep track of student performance scores via each student's online GIFT account. This allows CFIs the ability to identify a student's deficiencies and provide extra instruction and practice.

The final two modules, Cross Country 1 and 2, will require the student to plan cross country flights with the assistance of their instructor. Please be sure to read and understand the instructor content for these two missions before your student is ready to undertake these modules.

If you have questions, feedback, or would like guidance on any of the GIFT modules, please contact the Redbird GIFT team at gift@redbirdflight.com.

# Intro Flight

**LOCATION:** Vicinity of Hanalei Bay, Hawaii
**INITIAL CONDITION:** Straight and level flight, heading 060, wind calm
**OBJECTIVE:** Learn function of yoke, rudder pedals, throttle – basic maneuvering

The intro flight is akin to a Discovery Flight a prospective student might take. *It is recommended that the student fly this mission with a CFI.*

The first part of the in-flight lesson (called a "mission") teaches the student how to roll and pitch. The mission also asks the student to push the rudders left and right to see how they affect the airplane, explaining that rudder use will be explained in a future lesson.

The airplane is then automatically repositioned to a nearby location in straight and level flight with a virtual GIFT gate visible and directly in front of the airplane. The student's objective is to fly through the gate. Several more gates will appear, requiring the student to turn, climb, and descend to fly through them. When climbing and descending, the student will be instructed to manipulate the throttle. If the student misses any of the gates, they will be automatically repositioned back to the beginning of the gate course and allowed to try again.

Finally, the student is instructed to fly towards Hanalei Bay. The goal destination is marked with a tall green marker, appearing to float just above the bay. A compass with direction and distance info will appear in the upper left corner of the forward screen as well, assisting the student in locating the intended destination. Flying within the vicinity of the marker at any altitude will result in mission success.

As this is your student's first flight controlling an airplane, having a CFI or other pilot help manage the new student's throttle may be advantageous, at least the first time the new student flies this mission.

**SCORING:** This mission is not scored; however, the student must avoid extreme maneuvers and remain within normal operating envelope of the C172, or the airplane will be automatically repositioned to straight and level flight.

# Straight and Level Flight

**LOCATION**: Vicinity of Half Moon Bay, California
**INITIAL CONDITION:** Straight and level flight, heading 162, wind calm
**OBJECTIVE:** Learn use of elevator trim – practice scanning

The student will fly through a straight corridor of GIFT gates while trimming the airplane according to instructions from the virtual instructor. Near the end of the mission, the airplane will be automatically thrown out of trim, and the student will have to retrim the airplane to achieve straight and level flight.

The student should also begin employing a scanning technique during this and all future missions.

Make sure student is familiar with altitude indicator and how to read it.

**SCORING:** Maintain assigned altitude +/- 200 feet; Fly through each gate; Do not depart the practice area; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Changing Power in Straight and Level Flight

**LOCATION:** Vicinity of Half Moon Bay, California
**INITIAL CONDITION:** Straight and level flight, heading 162, wind calm
**OBJECTIVE:** Maintain straight & level flight during/after power change

The student will fly through a straight corridor of GIFT gates while changing power settings according to instructions from the virtual instructor. Student will need to retrim to maintain straight and level flight after each power change.

Make sure student is familiar with airspeed indicator and how to read it.

Make sure student is familiar with engine tachometer and how to read it.

**SCORING:** Maintain assigned altitude +/- 200 feet; Fly through each gate; Do not depart the practice area; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Normal Turn

**LOCATION:** Vicinity of Corona, California
**INITIAL CONDITION:** Straight and level flight, heading 174, wind calm
**OBJECTIVE:** Perform a 180° turn to the left, then to the right

The student will fly through a gate at which time they will begin a 20° left turn circumscribing 180° while maintaining airspeed and altitude. As they near their target heading, they will be prompted to begin rolling out. Repeat to the right.

Make sure student is familiar with heading indicator and how to read it.

Make sure student is familiar with attitude indicator (bank) and how to read it.

**SCORING:** Maintain 10°-30° bank during each turn; Roll out on target heading +/- 20°; Maintain assigned altitude +/- 200 feet; Maintain initial airspeed +/- 10kt; Do not leave the practice area; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Normal Climb

**LOCATION:** Vicinity of Lake Buchanan, Texas
**INITIAL CONDITION:** Straight and level flight, heading 170, wind calm
**OBJECTIVE:** Perform En Route Climb

The student will gain 1,500 feet performing an en route climb while maintaining heading.

Make sure student is familiar with attitude indicator (pitch) and how to read it.

Make sure student is familiar with vertical speed indicator and how to read it (including the fact that it lags behind actual aircraft performance).

**SCORING:** Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Best Angle of Climb

**LOCATION:** Vicinity of Lake Buchanan, Texas
**INITIAL CONDITION:** Straight and level flight, heading 170, wind calm
**OBJECTIVE:** Perform climb at Vx speed

The student will gain 1,500 feet performing a best angle climb while maintaining heading. This mission demonstrates the direct correlation between pitch angle and airspeed. It is important for the student to understand that climbing at Vx is best for clearing obstacles, even though it takes a longer amount of time to gain altitude compared to climbing at Vy.

This example makes sense to many students: Climbing at Vx is like climbing a ladder, while climbing at Vy is like climbing stairs. When you climb a ladder, your absolute speed isn't as fast as when you climb stairs, but your angle of climb is very steep, which allows you to get over tall objects well before you arrive at them.

**SCORING:** Climb at 62 kias at full throttle -5/+10kt; Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Best Rate of Climb

**LOCATION:** Vicinity of Lake Buchanan, Texas
**INITIAL CONDITION:** Straight and level flight, heading 170, wind calm
**OBJECTIVE:** Perform climb at Vy speed (75kt)

The student will gain 1,500 feet performing a best rate climb while maintaining heading. This mission demonstrates the direct correlation between pitch angle and airspeed. It is important for the student to understand that while climbing at Vy allows for the fastest *rate* of ascent, it is not the best speed at which to climb for obstacle avoidance.

**SCORING:** Climb at 75 kias at full throttle -5/+10kt; Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Descent

**LOCATION:** Vicinity of Lake Buchanan, Texas
**INITIAL CONDITION:** Straight and level flight, heading 170, wind calm
**OBJECTIVE:** Perform a 1,500 foot descent at 500 FPM

The student will descend 1,500 feet at 500 FPM. This mission demonstrates the direct correlation between power setting and rate of descent. During the mission, the student will be prompted to leave the trim setting where it is and simply reduce power to descend, then adjust power to achieve a descent rate of 500 FPM. To level off, just add power.

**SCORING:** Descend at 500 FPM; Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Basic Instrument Maneuvers

**LOCATION:** Vicinity of Gothenburg, Sweden
**INITIAL CONDITION:** Straight and level flight, heading 360, wind calm
**OBJECTIVE:** Perform precision climb, descent, and turns using instruments

While this module does not occur in IMC, the goal is to allow the student to focus on the instruments during these maneuvers, with an emphasis on precision flying. There is no other traffic in the sky, so it is acceptable for the student to concentrate on the instruments.

The student will perform a best rate climb, descent, and normal turns in each direction.

**SCORING:** Climb at 75 kias at full throttle; Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Descend; Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Perform left turn while maintaining assigned airspeed and altitude; Perform right turn while maintaining assigned airspeed and altitude; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Steep Turn

**LOCATION:** Several miles East of Mt. Hood, Oregon
**INITIAL CONDITION:** Straight and level flight, heading 250, wind calm
**OBJECTIVE:** Perform a 360° steep turn to the left, then to the right

The student will fly through a gate at which time they will begin a 45° left turn circumscribing 360° while maintaining airspeed and altitude. As they near their target heading of 270 degrees, they will be prompted to begin rolling out. Repeat to the right.

As an instructor, you're well aware that this is the most challenging mission the student has attempted so far. In this mission, the student will learn how small adjustments in bank angle can resolve gaining or losing altitude during this maneuver, as well as the necessity of applying back pressure to the yoke to maintain the turn, and adding power to maintain assigned airspeed.

The turn starts and stops headed straight toward Mt. Hood. The geographic location for this mission was chosen because Mt. Hood makes a great visual indicator for when it's time to end the turn. As Mt. Hood becomes visible to the student nearing the end of their turn, it's time to start rolling out.

Because things happen quickly in this mission, the coaching prompts during each turn are brief and to the point. Your student will hear quick phrases like, "more bank", "too low", and "speed up" as they perform this maneuver.

**SCORING:** Maintain 35°-55° bank during each turn; Roll out on target heading +/- 20°; Maintain assigned altitude +/- 200 feet; Maintain initial airspeed +/- 10kt; Do not leave the practice area; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Slow Flight

**LOCATION:** Vicinity of The White Cliffs of Dover, England, United Kingdom
**INITIAL CONDITION:** Straight and level flight, heading 240, wind calm
**OBJECTIVE:** Enter and maintain slow flight; Perform turns in slow flight

From cruise flight, the student will incrementally configure the airplane to landing configuration and reduce speed to enter slow flight. This module follows the most recent guidance from the FAA regarding the definition of slow flight. While in slow flight, if the student hears the stall horn, they will be automatically coached to increase airspeed until the horn is silenced.

In this module, the student will begin in cruise flight, then receive coaching to incrementally enter slow flight. Once in slow flight for a few moments, the student will be instructed on how to return to cruise.

Next, the student will be instructed to return to cruise flight (without incremental coaching), then perform shallow turns in each direction.

Finally, the student will fly in slow flight for 30 seconds while maintaining their heading.

If your student is learning this module, but has not yet learned power off stalls, you are encouraged to explain that they may stall during this lesson. Performing a stall recovery with your student may help them understand how to recover and continue the Slow Flight module without having to restart it, should they experience frequent stalls. Nevertheless, should the student stall and lose sufficient altitude, this module will automatically reposition the student back to the beginning of the lesson and reset the scoring so that they may try again.

**SCORING:** Enter and maintain slow flight – airspeed just above stall horn speed; Maintain assigned altitude and heading during slow flight; Maintain altitude during turns; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Power Off Stall

**LOCATION:** 6 miles SSE of KFFA, Kill Devil Hills, NC
**INITIAL CONDITION:** Straight & level flight, heading 347, 5,000MSL, wind calm
**OBJECTIVE:** Perform a power off stall and recover; perform a power off stall while banked and recover

The mission starts 5,000 feet over the edge of the Outer Banks in North Carolina. The student will be instructed to progressively transition the airplane to landing configuration and initiate a 500FPM descent, simulating an approach to landing. Once these conditions are met, the student will be instructed to pull power and level the nose, increasing backpressure on the yoke as needed to maintain altitude. Once the airplane breaks into a stall, short and quick commands are given to recover by the virtual instructor.

The student will perform two stalls with wings level, and one stall in a shallow bank.

**NOTE:** It is important that the aircraft be *trimmed* for flight at 60kias in a 500fpm descent before attempting to enter a stall. GIFT detects that a stall has occurred by measuring the Angle of Attack. When the Critical Angle of Attack is exceeded, a true stall has been achieved and the student will hear dialog instructing them to recover. If the dialog never plays, a full stall was not achieved, even if the airplane “mushes” along near a stall.

**SCORING:** Stall the airplane within 30 seconds of command to initiate stall; For first and second stalls, maintain zero bank while inducing stall; Have zero bank angle at final moment of recovery; Maintain heading from moment of stall through recovery; Do not descend below 3,000MSL at any time; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Power On Stall

**LOCATION:** 6 miles SSE of KFFA, Kill Devil Hills, NC
**INITIAL CONDITION:** Straight & level flight, heading 347, 5,000MSL, wind calm
**OBJECTIVE:** Perform a power on stall and recover; perform a power on stall while banked and recover

The mission starts 5,000 feet over the edge of the Outer Banks in North Carolina. The student will be instructed to add full power and pitch up sharply as their airspeed bleeds off. Once the stall occurs, short and quick commands are given to recover by the virtual instructor.

The student will perform two stalls with wings level, and one stall in a shallow bank.

**NOTE:** GIFT detects that a stall has occurred by measuring the Angle of Attack. When the Critical Angle of Attack is exceeded, a true stall has been achieved and the student will hear dialog instructing them to recover. If the dialog never plays, a full stall was not achieved, even if the airplane "mushes" along near a stall.

**SCORING:** Stall the airplane within 30 seconds of command to initiate stall; Maintain zero bank while inducing stall; Have zero bank angle at final moment of recovery; Maintain heading from moment of stall through recovery; Do not descend below 3,000MSL at any time; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Rectangular Course

**LOCATION:** Western Iowa
**INITIAL CONDITION:** Straight and level flight, heading 360, wind calm
**OBJECTIVE:** Fly a rectangular pattern relative to rectangle on the ground without, then with, wind

This module is designed to give your student the opportunity not only to learn this classic maneuver, but to practice it often.

The module contains three primary parts:

1. Flying along a straight line on the ground without/with wind
2. Flying a rectangle without wind
3. Flying a rectangle with wind

Part 1: The student is flying alongside a straight road and given time to fine tune their airplane to maintain straight and level flight while maintaining the same distance from the road. The module then tells them that wind is about to appear. While in flight, a gentle but perceptible crosswind is added, causing the plane to weathervane. The student is instructed to maneuver such that they maintain their distance from the road while noticing that the nose is slightly canted into the wind.

Part 2: The wind is calm again. the student is automatically repositioned such that they are entering the downwind leg of a rectangular course. A rectangular road is easily visible on the ground, and the student is instructed to fly a left pattern around the outside of the rectangle, all while maintaining the same distance from the road.

Part 3: Upon flying all the way around the rectangle, the student is instructed to do so again, but with a moderate breeze present. The breeze is perfectly aligned with the upwind/downwind legs of the rectangle.

**SCORING:** Maintain same distance from rectangular road while flying around it, as well as altitude and airspeed; Both circuits of the rectangle are scored…without and with wind; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Turns Around a Point

**LOCATION:** Western Iowa
**INITIAL CONDITION:** Straight and level flight, heading 360, wind calm
**OBJECTIVE:** Fly around a point while maintaining the same distance from it; without then with wind

This module is designed to give your student the opportunity not only to learn this classic maneuver, but to practice it often.

A well-marked point to the right of the student is visible at the beginning of this module. The student is instructed to proceed through a gate ahead of them, then fly a complete circle to the right around the point (about 1nm distant). Upon completion, the student repeats the exercise with wind.

**SCORING:** Maintain same distance from point while flying around it, as well as maintaining altitude and airspeed; Both circuits of the point are scored…without and with wind; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# S-Turns

**LOCATION:** Western Iowa
**INITIAL CONDITION:** Straight and level flight, heading 090, wind calm
**OBJECTIVE:** Perform an S turn over a straight road, without then with wind

This module is designed to give your student the opportunity not only to learn this classic maneuver, but to practice it often.

The module begins with the student flying toward a gate directly over a road. The road runs perpendicular to the student's flight path. A marker is visible to the left representing the center point of the semi-circle the student will fly as they begin an S turn to the left upon flying through the gate, which is directly over the road.

When the student has turned 180°, they should cross the road with wings level and parallel to the road, then immediately begin the second half of the S turn to the right. Another marker representing the center point of the next semi-circle will appear. To finish, the student flies over the road, wings level and parallel to the road.

Repeat with wind.

**SCORING:** Maintain same distance from point of each semi-circle while flying around them, as well as maintaining altitude and airspeed; heading at moment the plane crosses over the road half way through the S turn, and at the end of the S turn, are scored; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Taxi

**LOCATION:** Bremerton National Airport, Bremerton, Washington
**INITIAL CONDITION:** Parked, engine at idle, parking brake set, wind calm
**OBJECTIVE:** Taxi the airplane safely and precisely

The student will follow the virtual instructor's commands to taxi to the runway and line up on the center line.

First, the student will be prompted to begin taxiing forward, then immediately test the brakes by coming to a stop. Thereafter, the student will be directed to follow a path of green dots on the ground. If they get too far off the taxi line or make a wrong turn, they'll be repositioned back to the beginning of the mission.

Although there is no exact speed limit for taxiing, we used our best judgement as to when to trigger coaching prompts telling the student that they're taxiing too fast. If the student exceeds 18kt ground speed, they will receive instructions on how to slow down. If the student continues exceeding 18kt, a progression of instructions teaching them how to slow down and the best way to control speed will be played as needed. After 4 instances of excessive speed, the student will be repositioned back to the beginning of the mission.

One of the taxiways the student must navigate is quite long. This is where most of their score will come from. If they keep their nosewheel within several feet of the centerline during that long roll, they'll pass (provided they didn't doing anything egregious, like make a wrong turn or exit the taxiway onto the grass).

At the end of the long taxiway, the student will be required to pull off into a run up area, stop, then resume their taxi toward the runway. They will also be prompted to come to a complete stop at the stop and wait line at the runway.

Make sure the student is familiar with the toe brakes and how to use them.

**SCORING:** Keep nosewheel within 10 feet of taxiway centerline during roll along the long taxiway; Automatic failing grades will be applied to wrong turns, collisions, exiting onto the grass, repeated excessive speed, and failure to stop at the stop and wait line next to the runway; void extreme maneuvers and remain within normal operating envelope of the C172 (which should be easy as the plane won't be leaving the ground)

# Normal Takeoff

**LOCATION:** Sugarland Regional Airport, Sugarland, Texas
**INITIAL CONDITION:** Engine idle, lined up on runway 17, flaps at 0°, wind calm
**OBJECTIVE:** Perform a normal take off and climb to 1,500MSL

The student will be instructed to apply full throttle, add right rudder as needed, rotate at 55kt, and climb at 75kt (Vy) to an altitude of 1,500MSL.

The audio instruction from the virtual instructor will coach the student before and during the takeoff and climb. Real time coaching will be provided should the student's airspeed deviate too much from Vy, or if they are drifting off the extended centerline. Likewise, positive coaching stating that the student is performing well will be played during the climb as long as the climb remains within the correct parameters.

**SCORING:** Maintain centerline during ground roll; Maintain extended centerline during climb; Maintain 75kt during climb; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Crosswind Takeoff

**LOCATION:** Sugarland Regional Airport, Sugarland, Texas
**INITIAL CONDITION:** Engine idle, lined up on runway 17, flaps at 0°, wind 7kt crosswind
**OBJECTIVE:** Perform a crosswind take off and climb to 1,500MSL

This mission is nearly identical to Normal Takeoff, but with a crosswind.

The student will be instructed to apply full throttle, add corrective rudder and aileron as needed, rotate at 55kt, and climb at 75kt to an altitude of 1,500MSL.

The audio instructions from the virtual instructor will coach the student before and during the takeoff and climb. Real time coaching will be provided should the student's airspeed deviate too far from Vy, or if they are drifting off the extended centerline. Likewise, positive coaching stating that the student is performing well will be played during the climb as long as the climb remains within the correct parameters.

Having the student understand the proper corrections necessary for a crosswind takeoff before they attempt this mission is especially important. Be sure the student watches and understands the prebrief video for this lesson before attempting to fly the mission.

Also, consider using the Free Flight mode in Redbird Navigator to set up your own varying crosswind conditions, thus providing additional practice opportunities for your student.

**SCORING:** Maintain centerline during ground roll; Maintain extended centerline during climb; Maintain 75kt during climb; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Normal Landing

**LOCATION:** Lined up with RWY 16 several miles from KBLI, Bellingham, Washington
**INITIAL CONDITION:** Straight & level flight, heading 162, at pattern altitude, flaps at 0°, wind calm
**OBJECTIVE:** Perform a normal landing

The student will perform a long final approach and land on a long runway (RWY16) at Bellingham Int'l.

The mission starts with the student in straight and level flight headed toward a series of descending gates that represent an ideal glideslope to landing on RWY16.

As the student flies through each gate, progressive instructions about flap settings and airspeed targets will be given. Since gates are used as visual indicators, it should be easy for the student to judge if they're on target just by keeping their eyes outside the airplane (essentially, the gates provide synthetic vision). Quick glances at the airspeed indicator are the only info they really need from instruments.

At the first gate, the student will be prompted to put down 10° flaps and slow to 80 kt. Second gate, 20° and slow to 70kt. Third gate, 30° and slow to 60kt.

As the airplane nears field elevation over the runway, the student will be coached to flare (level the nose) and cut power. Upon touchdown, they will be coached to maintain the centerline, and once they've slowed a bit, coached to apply gentle braking.

Students enjoy this mission quite a bit, so don't be surprised if you find them practicing a lot of landings. This mission is also great for some "friendly competitions" between students (and the crosswind landing mission even more so).

**SCORING:** Maintain extended centerline during approach (tolerance for deviation tightens as the airplane approaches the airfield); Achieve and maintain assigned airspeeds during approach; land safely on the runway; Be on runway heading at moment of touchdown; Maintain centerline during rollout; Do not exit runway after touchdown; Come to a complete stop; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Crosswind Landing

**LOCATION:** Lined up with RWY 16 several miles from KBLI, Bellingham, Washington
**INITIAL CONDITION:** Straight & level flight, heading 162, at pattern altitude, flaps at 0°, wind 090@10
**OBJECTIVE:** Perform a crosswind landing

This mission is essentially identical to the Normal Landing mission, but with a crosswind. Only the difference between Normal Landing and Crosswind Landing missions are written here.

At the first gate, the student will be prompted to put down 10° flaps and slow to 80 kt. Second gate, 20° and slow to 70kt. Third gate (over the fence) slow to 60kt. The student will not be instructed to put down 30° of flaps.

A note on method: The student is expected to cross-control during landing, so that the upwind main gear touches down first, and the airplane's heading at touchdown matches runway heading. The student will be taught "nose with your toes" and to cross-control with the ailerons to move laterally as needed.

**SCORING:** Maintain extended centerline during approach (tolerance for deviation tightens as the airplane approaches the airfield); Achieve and maintain assigned airspeeds during approach; land safely on the runway; Be on runway heading at moment of touchdown; Maintain centerline during rollout; Do not exit runway after touchdown; Come to a complete stop; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Traffic Pattern

**LOCATION:** Vicinity of F49 - Slaton Municipal Airport, Slaton, Texas
**INITIAL CONDITION:** Straight and level flight, wind calm
**OBJECTIVE:** Enter the downwind leg at 45° at pattern altitude, then proceed around pattern as if landing

This module provides two opportunities to enter then precisely fly the pattern.

Upon starting the flight, the student is already established on the 45 for the left downwind on RWY36 at F49. The student is instructed to descend to pattern altitude (4,100 MSL) and slow down to 90 kts by the time they arrive at the downwind leg. A 500FPM descent will get the student to pattern altitude well before they arrive at the turn to downwind.

Upon turning downwind, the student will be prompted to put down 10° flaps and slow to 80kt when they are abeam the numbers. Once the approach end of the runway is 45° behind the student's left shoulder, they will be prompted to put down 20° flaps, low to 70kt, and turn base. A moment later, they will be prompted to put down 30° flaps. Slow to 60kt, and turn final.

Once the student crosses the fence, they will be repositioned to enter the pattern again, but from a different location this time.

On their second pattern entry, the student is placed generally Northeast of the airfield and prompted to fly around to the right to properly enter the downwind leg at a 45° angle. Otherwise, the coaching and scoring is the same as it was with the first pattern exercise.

**SCORING:** Enter the downwind leg of RWY36 at a 45° angle while at pattern altitude and 90 knots; Maintain correct distance from runway on each leg; Make turns around the pattern at the correct distances from the runway; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Short Field Takeoff

**LOCATION:** KBLI, Bellingham, Washington
**INITIAL CONDITION:** Engine idle, heading 162, on taxiway near RWY16, flaps at 0°, wind calm
**OBJECTIVE:** Perform a short field takeoff and climb to 1,000MSL

The student will be instructed to put down 10° flaps, taxi to the far end of the runway to maximize available runway (so much so that the tail should be hanging over the grass off the end of the runway), run up full power with the brakes on, and perform a short field takeoff.

The audio instruction from the virtual instructor will coach the student before and during the takeoff and climb for the specific short field takeoff procedures. The student must not lift off until they have reached 62kt.

**SCORING:** Maintain centerline during ground roll; Maintain extended centerline during climb; Maintain 62kt during climb; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Soft Field Takeoff

**LOCATION:** KBLI, Bellingham, Washington
**INITIAL CONDITION:** Engine idle, heading 162, on taxiway near RWY16, flaps at 0°, wind calm
**OBJECTIVE:** Perform a soft field takeoff and climb to 1,000MSL

The student will be instructed to put down 10° flaps, begin taxiing without stopping, hold the yoke all the way back, and perform a soft field takeoff.

The audio instruction from the virtual instructor will coach the student before and during the takeoff and climb for the specific soft field takeoff procedures. The student must not stop after beginning their taxi, hold the yoke back to get the nose off the ground (preferably avoiding a tail strike), level off in ground effect after liftoff, and accelerate to 62kt (Vx) before climbing more than 25 feet AGL.

**SCORING:** Do not stop after initial motion; Do not let the landing gears touch the ground again after lifting off; Do not exceed 25AGL before achieving at least 62kt; Maintain centerline during ground roll; Maintain extended centerline during climb; Maintain 62kt during climb; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Short Field Landing

**LOCATION:** KBLI, Bellingham, Washington
**INITIAL CONDITION:** Long Final, heading 162, flaps at 0°, wind calm
**OBJECTIVE:** Perform a short field landing

The student will be instructed to get into landing configuration incrementally, then perform a short field landing.

The coaching heard by the student is like that of a normal landing. Where it differs is that the student will be instructed to approach from a steeper angle while flying a bit slower than normal over the runway. Upon nearing the touchdown point, the student is instructed to cut power and "plant" the airplane firmly on the runway at or just a little beyond the desired point of touchdown, but not before. Upon touchdown, use heavy braking and retract the flaps at once.

**SCORING:** Airspeeds and deviation from the extended centerline during approach; Distance from touchdown target point (landing in front of target is an automatic fail); heading and deviation from centerline at instant of touchdown; deviation from centerline during rollout; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Soft Field Landing

**LOCATION:** KBLI, Bellingham, Washington
**INITIAL CONDITION:** Long Final, heading 162, flaps at 0°, wind calm
**OBJECTIVE:** Perform a soft field landing

The student will be instructed to get into landing configuration incrementally, then perform a soft field (gentle) landing.

The coaching heard by the student is like that of a normal landing. Where it differs is that the student will be instructed to leave a little power in as they cross the numbers, and keep the nose wheel up after the main wheels touch down, keeping backpressure on the yoke throughout the rollout. The student will also be instructed to come to a complete stop, but without the use of brakes.

**SCORING:** Airspeeds and deviation from the extended centerline during approach; heading and deviation from centerline at instant of touchdown; deviation from centerline during rollout; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Go Around

**LOCATION:** I69, Clermont County Airport, Batavia, Ohio
**INITIAL CONDITION:** Long Final, heading 043, flaps at 0°, wind calm
**OBJECTIVE:** Identify runway hazard, abort landing, and go around safely

The first of two go arounds will not come as a surprise to the student. The student will be on final, and will be coached through going around step by step.

Upon completing the first go around, the student will be repositioned on final and told to go around if required (which, of course, it will be).

A fuel truck will pull onto the far end of the runway. At that moment, the student must execute a go around.

**SCORING:** The student will pass if they don't land; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Rejected Takeoff

**LOCATION:** I69, Clermont County Airport, Batavia, Ohio
**INITIAL CONDITION:** Lined up on runway, heading 043, engine idle, wind calm
**OBJECTIVE:** Identify runway hazard, abort takeoff, and come to a complete stop without hitting any obstacles

The first of two rejected takeoffs will not come as a surprise to the student. The student will be instructed to begin their takeoff roll, then coached through rejecting the takeoff.

Upon completing the first rejected takeoff, the student will be repositioned and instructed to take off while keeping an eye out for runway incursions.

A fuel truck will pull onto the far end of the runway. At that moment, the student must execute a rejected takeoff.

**SCORING:** The student will pass if they don't take off, don't depart into the grass, and don't hit obstacles; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Emergency Approach

**LOCATION:** Vicinity of Maul, Hawaii
**INITIAL CONDITION:** Cruise flight over the water, heading 360, very near the island of Maui, wind 090@8, altitude 4,500MSL
**OBJECTIVE:** Perform a safe off-field landing after engine failure

Within seconds of the beginning of this flight, the engine will fail. Fortunately, the airplane will have more than enough altitude to reach a suitable landing site.

Having the student watch the instructional video before attempting this flight is essential to success. The video instructs the student what areas are and are not acceptable for an emergency landing.

Upon engine failure, the student will see a mountain to their left, a city to the right, and fields directly ahead of them. That's where they should land if they follow proper procedure.

There are two "plausible distractor" choices that students may try to land on:

1. There is a long road slightly to the left of the airplane's flight path
2. There is an airport in the distance just off the right end of the nose

Neither of these landing zones are acceptable. The preflight briefing video instructs the student to avoid roads due to power lines, and the airport in the distance, while visible, is beyond gliding range.

Ideally, the student will fly to the nearby fields directly ahead or slightly to the right of the airplane and land heading roughly 090, which is into the wind.

Although the fields are mostly acceptable for this emergency landing scenario, note that the students, just like in a real engine out scenario, must avoid the few trees and ravines that are present in this landing zone.

**SCORING:** Don't crash; land in the fields ahead of or slightly to the right of the airplane when the engine fails; land generally 090; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Instrument Maneuvers

**LOCATION:** Southern Louisiana
**INITIAL CONDITION:** Straight and level flight, heading 090, wind calm, changing to IMC
**OBJECTIVE:** Perform precision climb, descent, and turns using instruments in IMC

The student will perform a best rate climb, descent, and coordinated turns in each direction in solid IMC.

**SCORING:** Climb at 75 kias at full throttle; Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Descend; Maintain initial heading +/- 20°; Level off at assigned altitude +/- 200 feet; Perform left turn while maintaining assigned airspeed and altitude; Perform right turn while maintaining assigned airspeed and altitude; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Unusual Attitude Recovery

**LOCATION:** Southern Louisiana
**INITIAL CONDITION:** Straight and level flight, heading 360, wind calm, solid IMC
**OBJECTIVE:** Recover from unusual attitudes using only instruments

The student will return to straight and level flight after being thrown into three unusual attitudes.

The first two unusual attitudes each include a moderate bank and nose-high or -low attitude.

The final unusual attitude is intended to simulate a departure stall. The student will find themselves in a wings-level nose-high attitude at or near maximum power, quickly running out of airspeed.

**SCORING:** Don't crash; return to straight and level flight within 30 seconds of onset of the unusual attitude; Avoid extreme maneuvers and remain within normal operating envelope of the C172

# Cross Country 1

*NOTE: You are discouraged from showing this page to your student as some information needs to be figured out by the student on their own.*

**LOCATION:** Hollister Municipal Airport, California
**INITIAL CONDITION:** Parked on ramp, engine at idle
**OBJECTIVE:** Plan and execute a simple cross-country flight

Read all the information below, then assist your student in planning the cross country flight as described. Cross Country 1 is intended to be an easy one-leg flight.

- The flight is from Hollister Municipal Airport to Half Moon Bay Airport in Northern California. Hollister's ICAO designator is KCVH, but was recently 3O7. It appears as 3O7 in the simulator.
- WX at both airports and en route is all the same: METAR KCVH 0000Z 3308G11KT SKC 10SM 15/5 A2992. Above 2,000MSL, the wind is 330@8 with no gusts.
- The flight should be planned so that your student avoids all Bravo and Charlie airspace. In fact, they will receive a failing score if they penetrate Bravo or Charlie airspace.
- We've found that an ideal route departs Hollister and heads West towards Santa Cruz. Once there, fly a route that roughly follows the coast until reaching KHAF.
- Cruise altitude should be 4,500 – we're not recommending that you share this information outright with your student as they plan their flight, but if they don't select that altitude on their own during their planning, consider encouraging them to think through an ideal cruising altitude again until they select 4,500.
- Note that your student's approach to KHAF will take them under Bravo airspace surrounding KSFO. They'll need to plan to descend in time to be below 4,000 before they reach the 4,000-10,000 Bravo ring.
- The flight is scored based on maintaining a cruise altitude of 4,500 during the first two-thirds of their cruise. Most of the scoring is based on the student not doing anything obviously incorrect. The following will result in a failing score:
    - Taking off on the wrong runway
    - Penetrating B or C airspace
    - Exceeding the normal operating envelope of the airplane, or performing extreme maneuvers
- While performing this flight is an important step for your student, this lesson is more about the process of planning than flying. In the end, your judgement of the student's flight planning and execution is the most important scoring metric.

# Cross Country 2

*NOTE: You are discouraged from showing this page to your student as some information needs to be figured out by the student on their own.*

**LOCATION:** Chico Municipal Airport, California
**INITIAL CONDITION:** Parked on ramp, engine at idle
**OBJECTIVE:** Plan and execute a cross-country flight with diversion

Read all the information below, then assist your student plan a cross country flight as described. Cross Country 2 is intended to test your student's planning and decision-making with an unplanned diversion.

- The flight is from Chico Municipal Airport (KCIC) to Yolo Airport (KDWA) in Northern California, but the pilot will be prompted to divert well before reaching Yolo County (a "brushfire" near the Yolo County airport forces them to close until further notice).
- WX at both airports and en route is all the same: METAR KCIC 0000Z 1808G10KT FEW046 10SM 15/5 A2992. Above 2,000MSL, the wind is 180@8 with no gusts.
- The flight should be planned so that your student avoids all Bravo and Charlie airspace. In fact, they will receive a failing score if they penetrate Bravo or Charlie airspace.
- The route is easy…almost straight South through uncontrolled airspace. This seemingly easy route may make your student suspicious that they should research airports along their route…as well they should. Also, the pre-brief video for this lesson all but says that they will be diverted.
- Cruise altitude should be 4,500 – we're not recommending that you share this information outright with your student as they plan their flight, but if they don't select that altitude on their own during their planning, consider encouraging them to think through an ideal cruising altitude again until they select 4,500.
- When the "divert" prompt is delivered during the flight (delivered the moment the student flies South of LAT N39° 21' 43.24"), the pilot will be instructed to divert to a nearby *public* airport. Several private airports will be closer, but landing there (or anywhere except a nearby public airport) will result in a failing grade. Here are the diversion airports and runways that will result in success:
    - KOVE – RWY 19 or 12
    - O08 – RWY 13
    - O52 – RWY 17
    - KMYV – RWY 14
    - KWLW – RWY 16
    - If your student lands at O52 or KMYV, they'll need to be careful to fly under the Class C for Beale AFB on their approach.
- The flight is scored based on maintaining a cruise altitude of 4,500 starting once they arrive at 4,500 feet and ending the moment they're instructed to divert. Most of the scoring is based on the student not doing anything obviously incorrect. The following will result in a failing score:
    - Taking off on the wrong runway
    - Penetrating Class B or C airspace
    - Exceeding the normal operating envelope of the airplane, or performing extreme maneuvers

    - Landing anywhere except an approved diversion airport as listed above
- While performing this flight is an important step for your student, this lesson is more about the process of planning the flight and decision-making during the diversion. In the end, your judgement of the student's flight planning and execution is the most important scoring metric.