Objectives: Short field Takeoff and Landing

Upon completion of this lesson, the student will:

- Be able to safely perform short field takeoffs and maximum performance climbs.
- Be able to safely perform short field approaches and landings.

Note: Some experience needed with normal takeoffs and landings prior to attempting short field operations.

Equipment:

- POH and/or appropriate checklists for aircraft to be flown.
- Chalkboard and or model for demonstration of techniques.

Elements:

1. Ground - Pre-flight briefing
   - Describe reasons for learning short field techniques.
   - Discuss procedures for short field takeoffs (see Student Actions - 3)
   - Discuss procedures for short field landings (see Student Actions - 4)
   - Review slipping and crabbing approaches if there is a crosswind.

2. Flight - Short Field Takeoff Procedures
   - Demonstrate the procedure.
   - Use proper use of flight controls while taxiing and during takeoff roll.
   - Have student use all available runway for takeoff.
   - Use appropriate flap setting for short field takeoff as specified in the POH for the aircraft being used.
   - Ensure student checks engine gauges after smoothly applying power (oil pressure, temperature and RPM) while holding airplane with brakes.
   - Ensure student re-checks engine gauges and airspeed while beginning roll.
   - Holding the centerline during takeoff roll and to rotate at the appropriate airspeed.
   - Climbing at VX until reaching an altitude of 100 feet and then transitioning to a VY climb and holding runway heading or complying with applicable noise abatement procedures.
   - Use the post departure checklist for the aircraft (gear up, flaps up, fuel pump, prop setting, etc.).

3. Flight - Short Field Landing Procedure
   - Demonstrate the procedure.
   - Use of flaps during the approach.
   - Use of maximum performance approach airspeed.
   - Stabilizes the final approach at maximum performance approach airspeed.
   - Use of slip or crab on final, and transition from crab to slip just before touchdown.
   - Use proper flare technique and visual references during the flare. (Note flare will be quicker than normal due to low airspeed).
   - Use of flaps and braking immediately after touchdown to reduce roll out as prescribed in the POH for the aircraft being used.
   - Use proper use of flight controls after landing.

Completion Standards:

This lesson will be completed when the student is able to:

- Perform safe short field takeoffs and landings.
- Is able to touchdown within 200 feet of a specified point (Private pilot standard), or within 100 feet of a specified point (Commercial standard).
- Establish and maintain climb and approach speeds +10 / - 5 Knots (Private pilot standard) or +/- 5 Knots (Commercial standard).

Common Errors:

- Short Field takeoffs
    - -Not using all available runway.
    - -Fails to align nosewheel with the runway.
    - -Abrupt power application.
    - -Trying to pull the airplane off too soon
    - -Picking up excessive airspeed after takeoff; not initiating climb at VX.

- Short Field Landings
    - -Failure to maintain maximum performance approach speed on final.
    - -Unstable approach.
    - -Landing too fast.
    - -Doesnt pull back hard enough in the flare.
    - -Poor braking technique.

References:

POH For airplane used.
FTH; Pages 91 - 93, 110 - 113
Jeppesen PP Maneuvers: 7-2 to 7-5
PP-ASEL PTS Areas of Operation II, III, IV Tasks C, D, E, F
Comm-ASEL PTS Areas of Operation II, III, IV Tasks C, D, E, F

Possible Review Questions:

1. When performing a short-field takeoff, we use _____ _____ runway.
2. What is VX? What is VX for the airplane (being used)?
3. When performing a short-field takeoff, we initially climb at VX. After clearing any obstacles, we then transition to a climb at ____.
4. What is VY for the airplane (being used)?