

# **CFI Bootcamp**

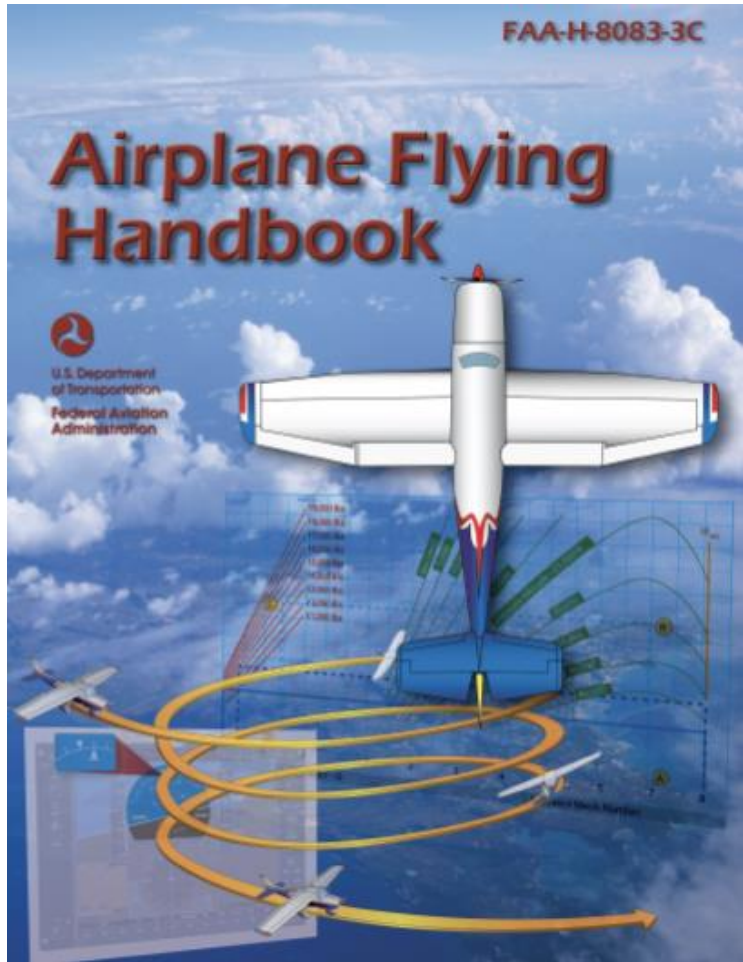
*Flight Instructor Training*

Maneuvers

# Teaching and Understanding Ground Reference Maneuvers

New and Old

# Teaching/Understanding Ground Reference Maneuvers



## Teaching/Understanding Ground Reference Maneuvers

**What is a ground reference maneuver?**

A maneuver that demonstrates the effect of wind drift and how to stop it

## Teaching/Understanding Ground Reference Maneuvers

**What altitudes are appropriate for ground reference maneuvers**

For most training airplanes – 600 to 1,000 AGL

## Teaching/Understanding Ground Reference Maneuvers

What altitudes are appropriate for ground reference maneuvers

The altitude must be low enough to see drift

## Teaching/Understanding Ground Reference Maneuvers

What speed is appropriate for ground reference maneuvers

Slow enough to see wind drift

## Teaching/Understanding Ground Reference Maneuvers

**What speed is appropriate for ground reference maneuvers**

From 75 to 90 kts usually works out for training airplanes



## Teaching/Understanding Ground Reference Maneuvers

Why does the wind affect the ground track?

Because the airplane is in the air, it will drift with the wind

## Teaching/Understanding Ground Reference Maneuvers

**Why does the wind affect the ground track?**

The amount of drift depends on the TAS and the wind direction relative to the airplanes desired track and the wind speed

## Teaching/Understanding Ground Reference Maneuvers

Why does the wind affect the ground track?

The wind drift can be calculated from...

## Teaching/Understanding Ground Reference Maneuvers

Why does the wind affect the ground track?

$$\text{Max Drift} = (60 * W / V) / \text{TAS}$$

## Teaching/Understanding Ground Reference Maneuvers

Why does the wind affect the ground track?

Example – 100 kts TAS, Wind 30 kts

## Teaching/Understanding Ground Reference Maneuvers

Why does the wind affect the ground track?

$$(60 * 30) / 100 = 18$$

## Teaching/Understanding Ground Reference Maneuvers

Why does the wind affect the ground track?

To eliminate drift – turn into the wind by the drift angle

## Teaching/Understanding Ground Reference Maneuvers

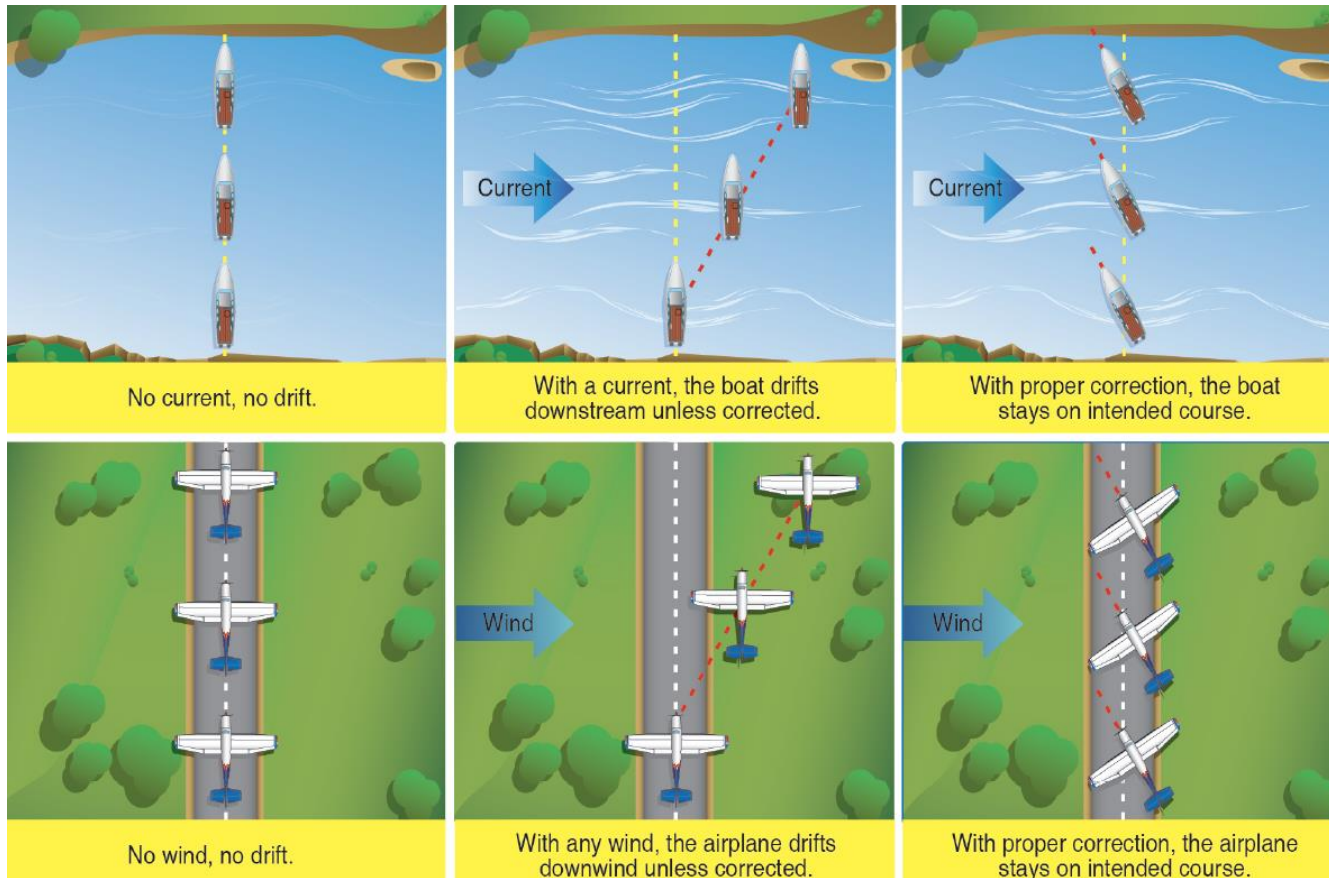
**Stop ticking boxes in a syllabus – Do your job!**

If there is no wind, there is NO POINT!



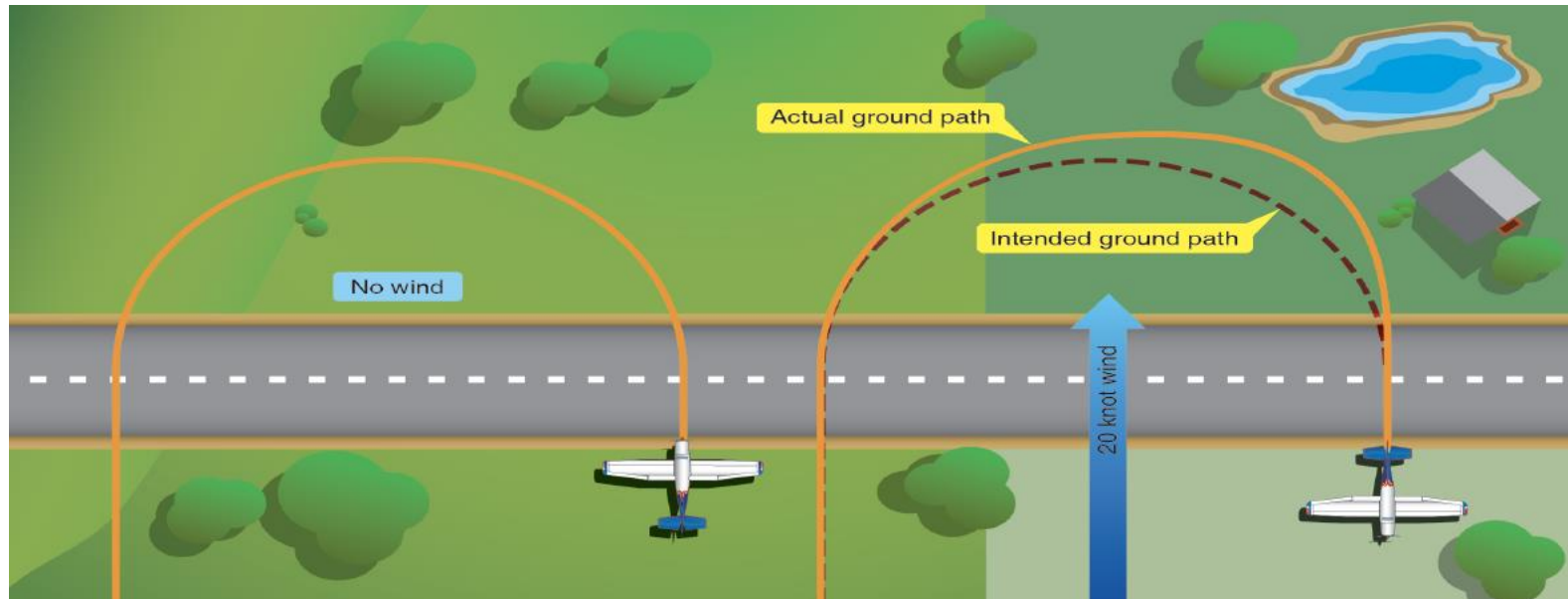
# Teaching/Understanding Ground Reference Maneuvers

## Why does the wind affect the ground track?



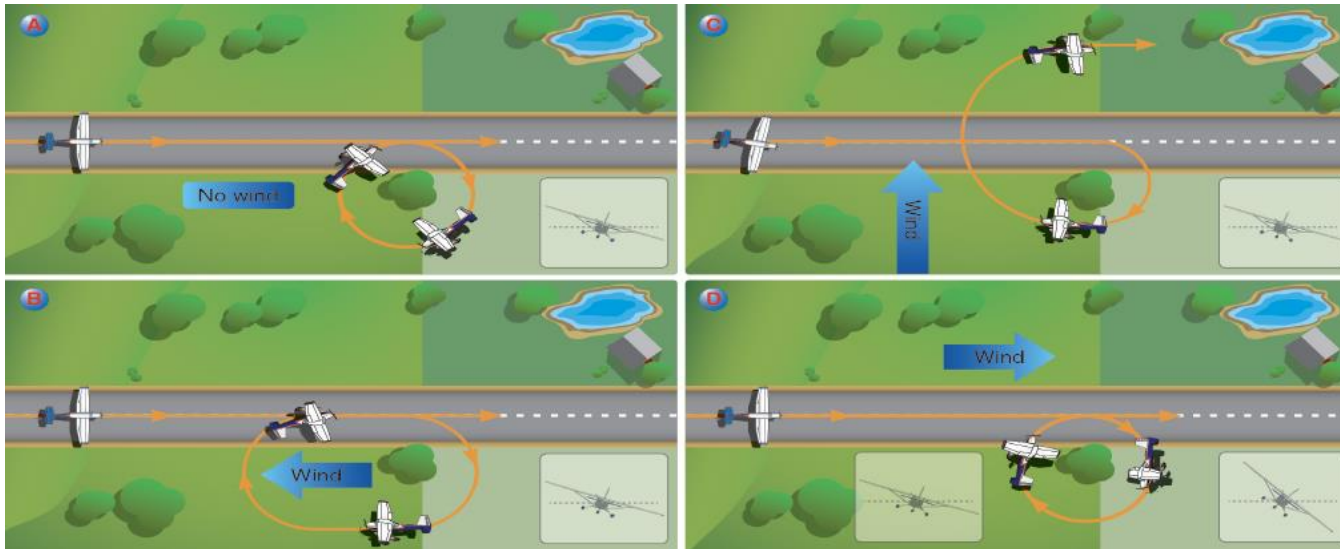
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Why does the wind affect the ground track?



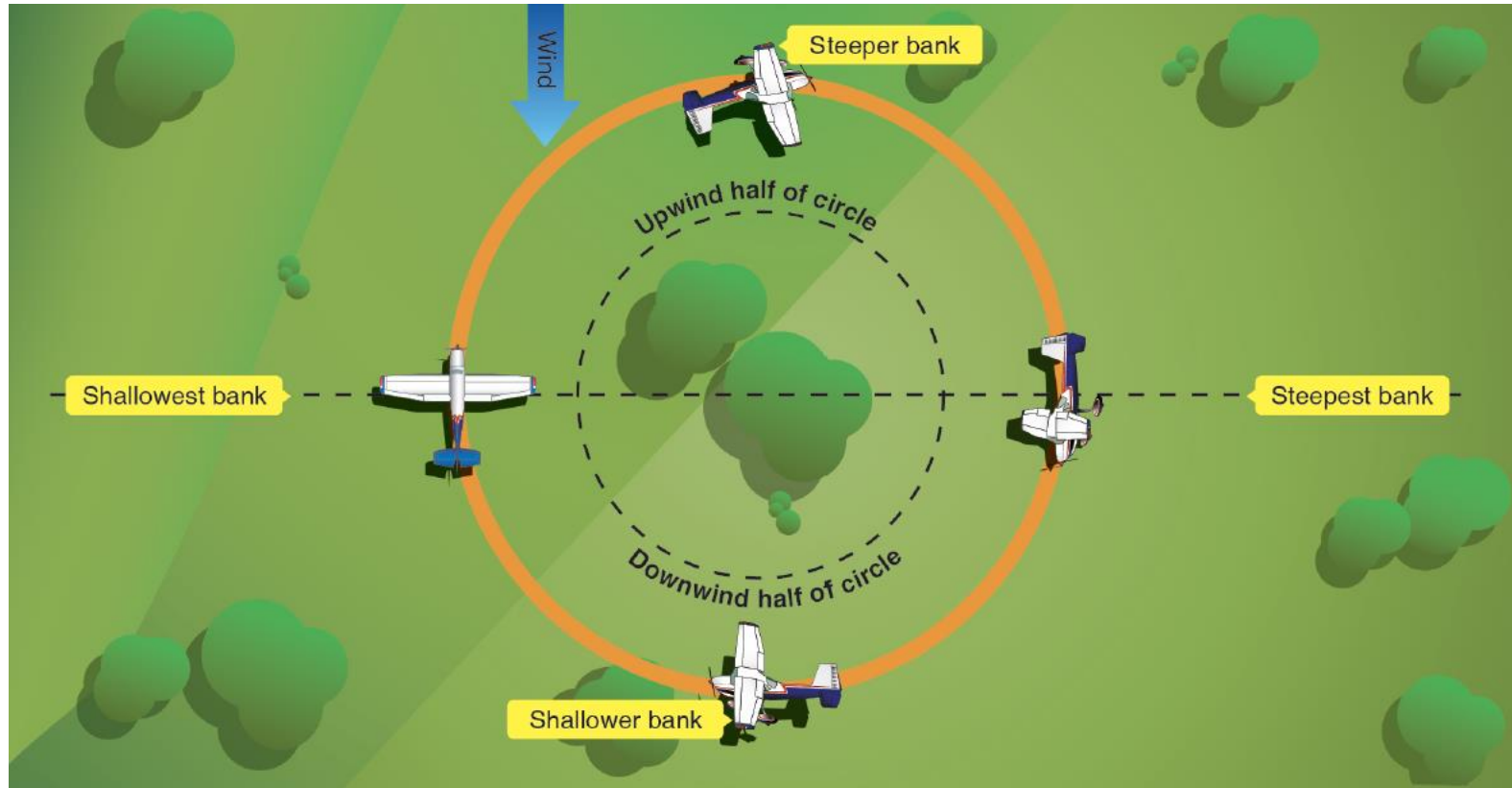
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Why does the wind affect the ground track?



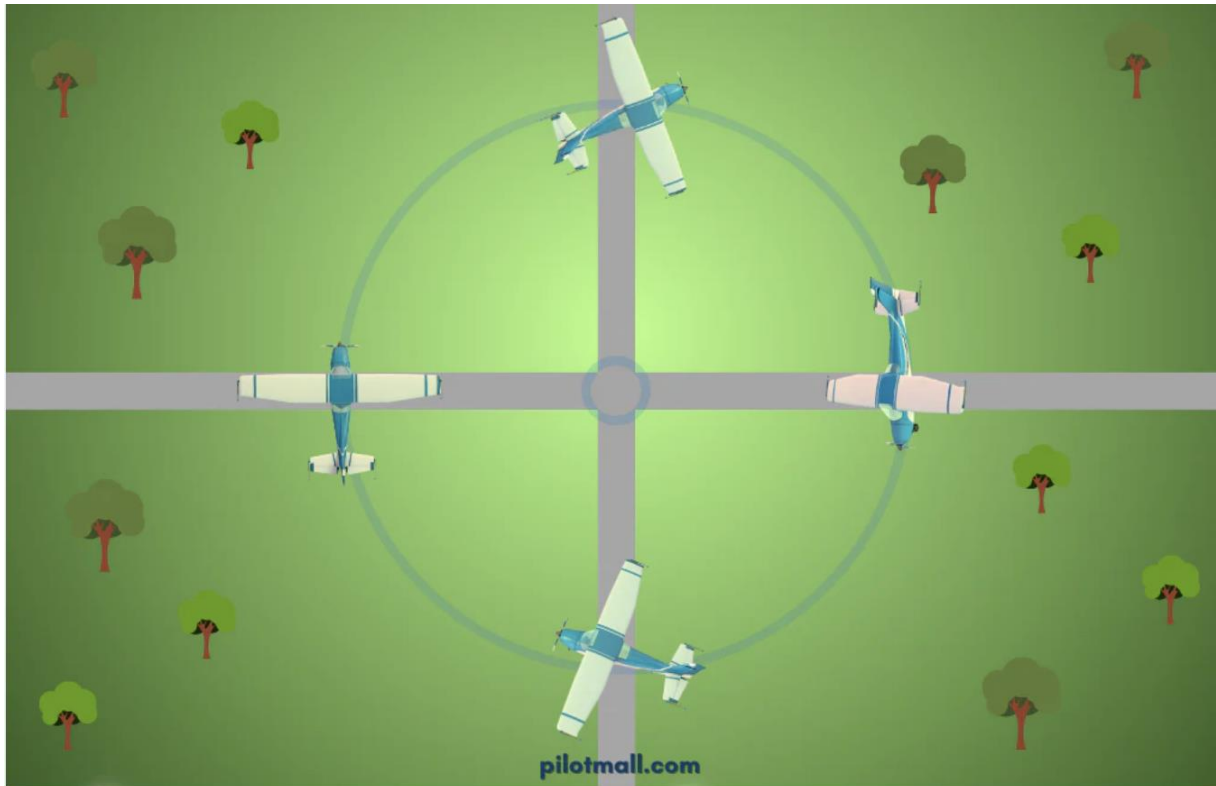
## Teaching/Understanding Ground Reference Maneuvers

The current airplane flying handbook is **WRONG**



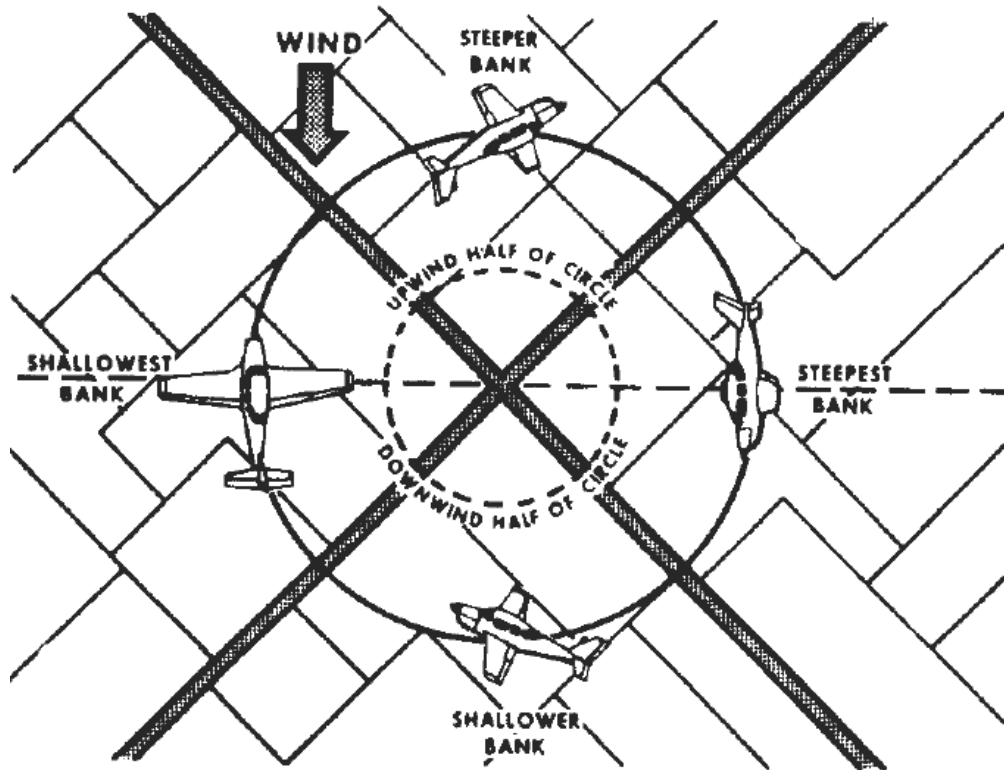
# Teaching/Understanding Ground Reference Maneuvers

This is Right



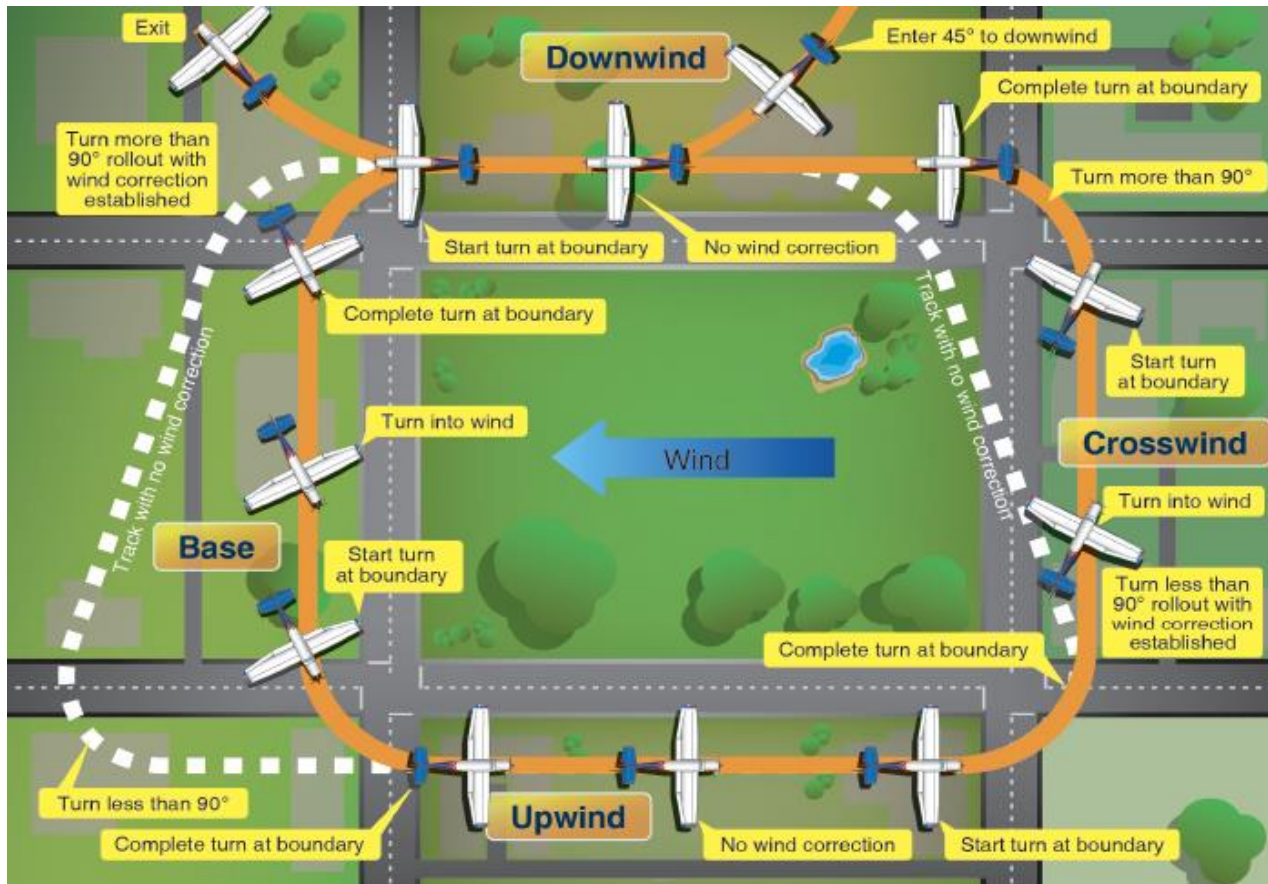
# Teaching/Understanding Ground Reference Maneuvers

This is Right



# Teaching/Understanding Ground Reference Maneuvers

Can you figure this out?

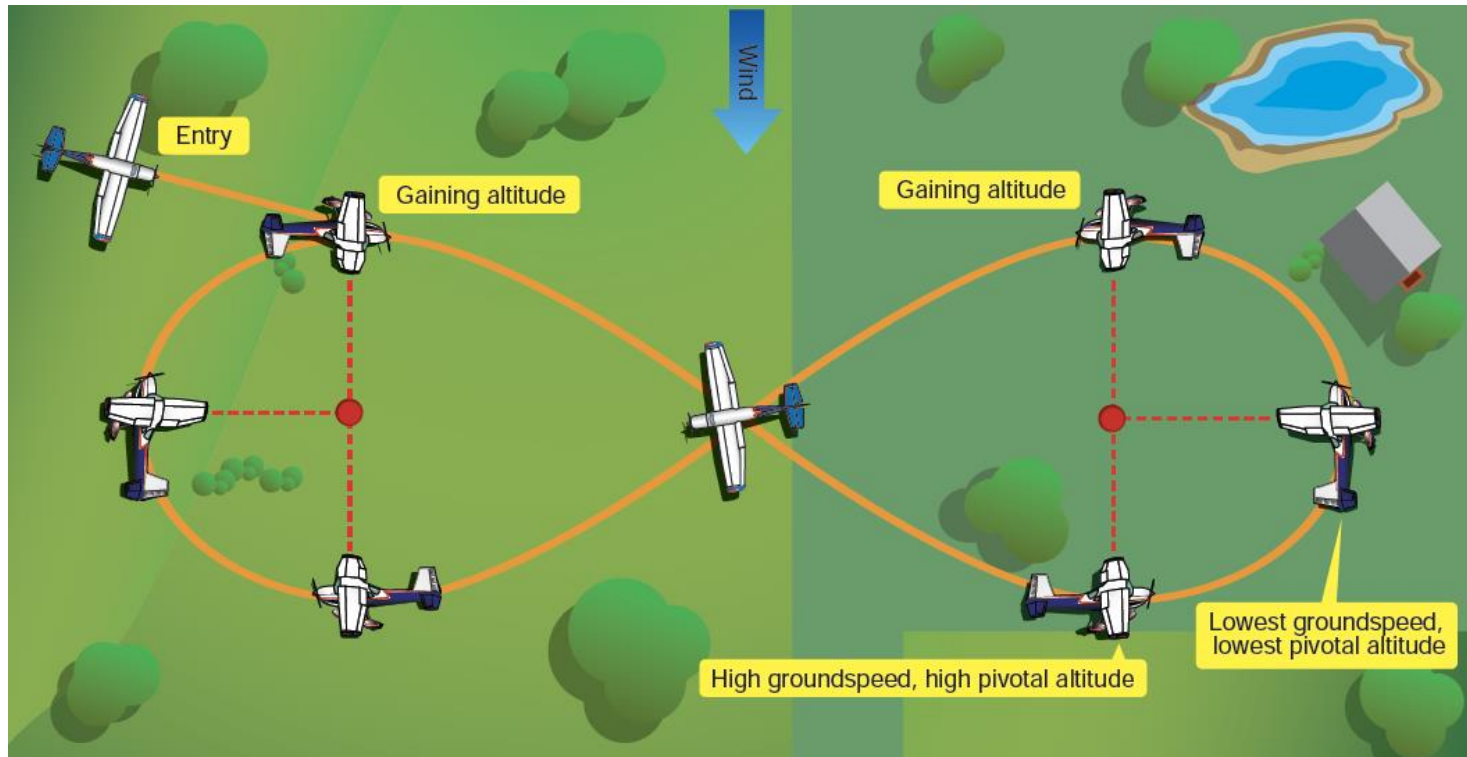






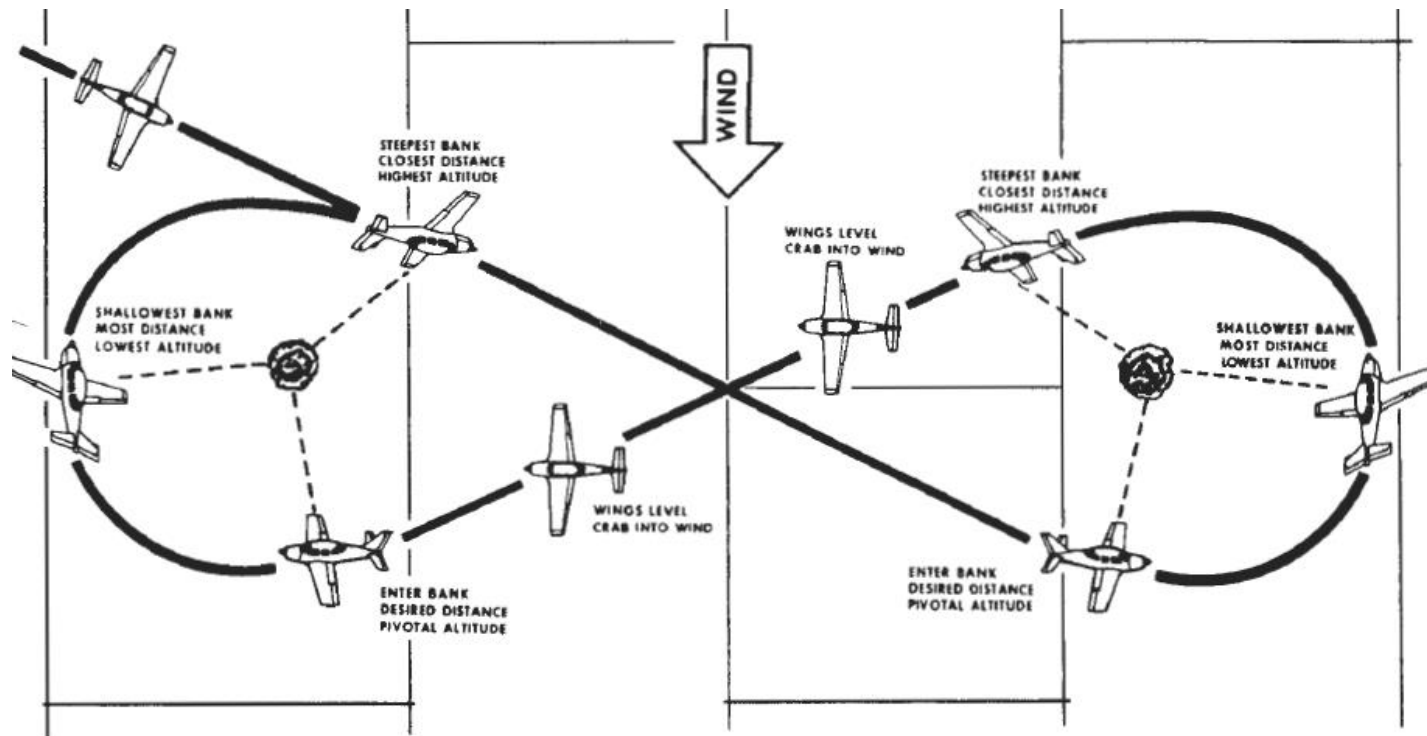
# Teaching/Understanding Ground Reference Maneuvers

Wrong again



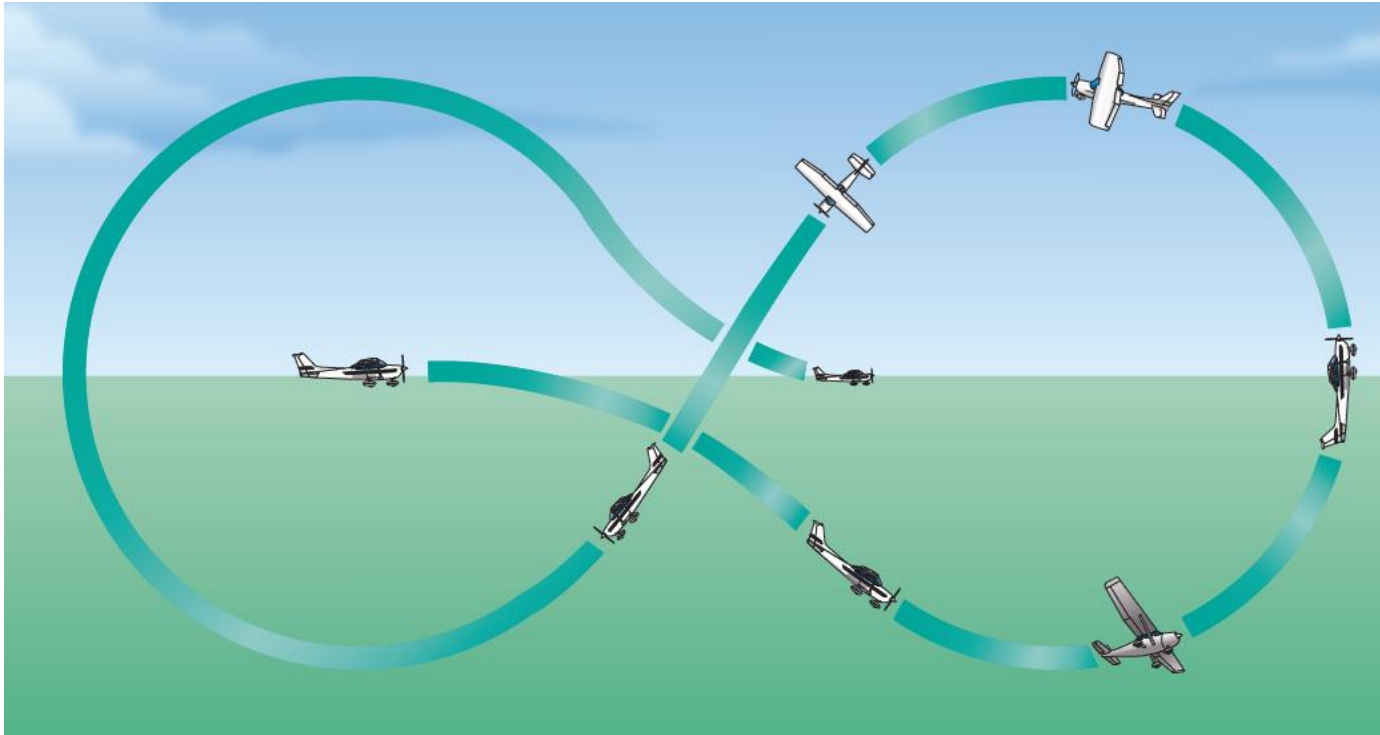
# Teaching/Understanding Ground Reference Maneuvers

## Mostly Right – 1980 - 2004



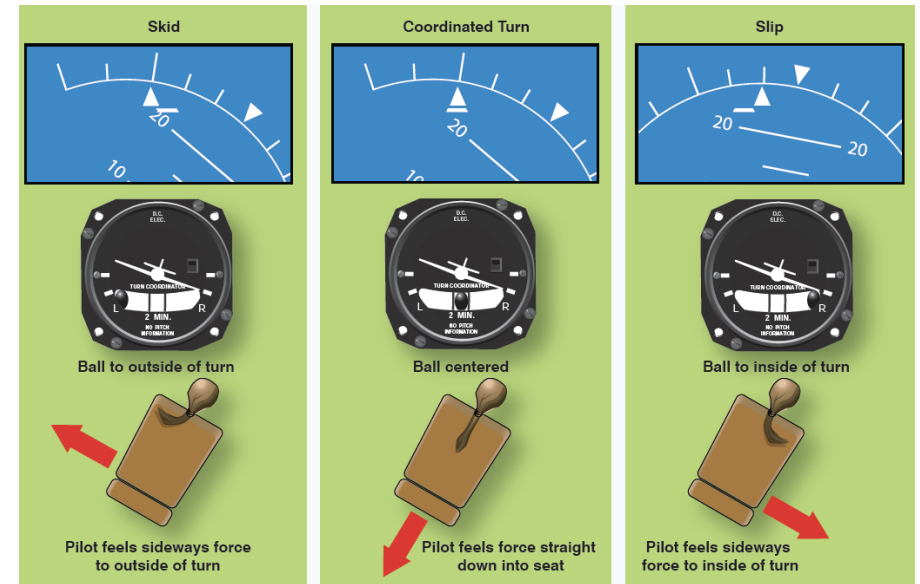
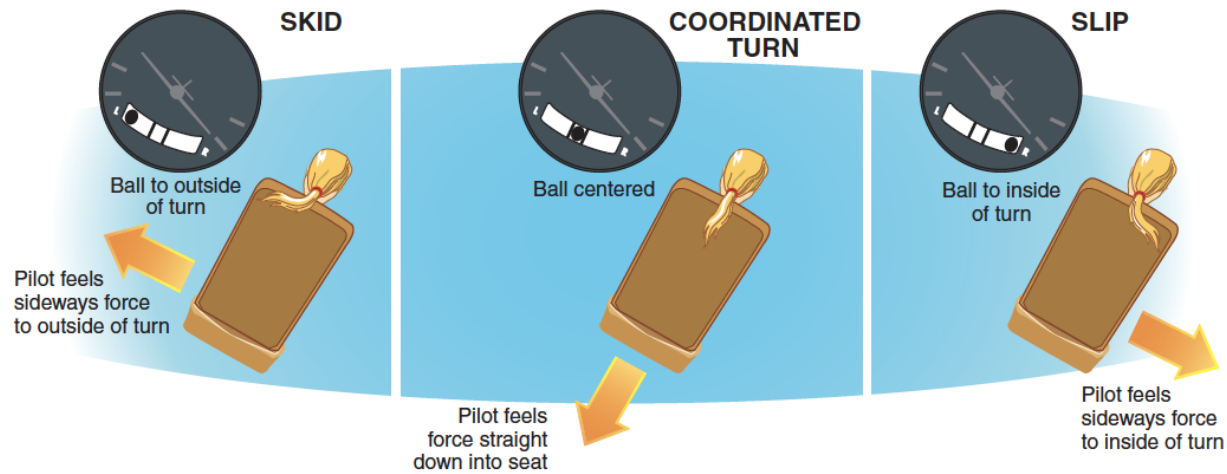
## Teaching/Understanding Ground Reference Maneuvers

Sometimes they Really Get it Wrong!



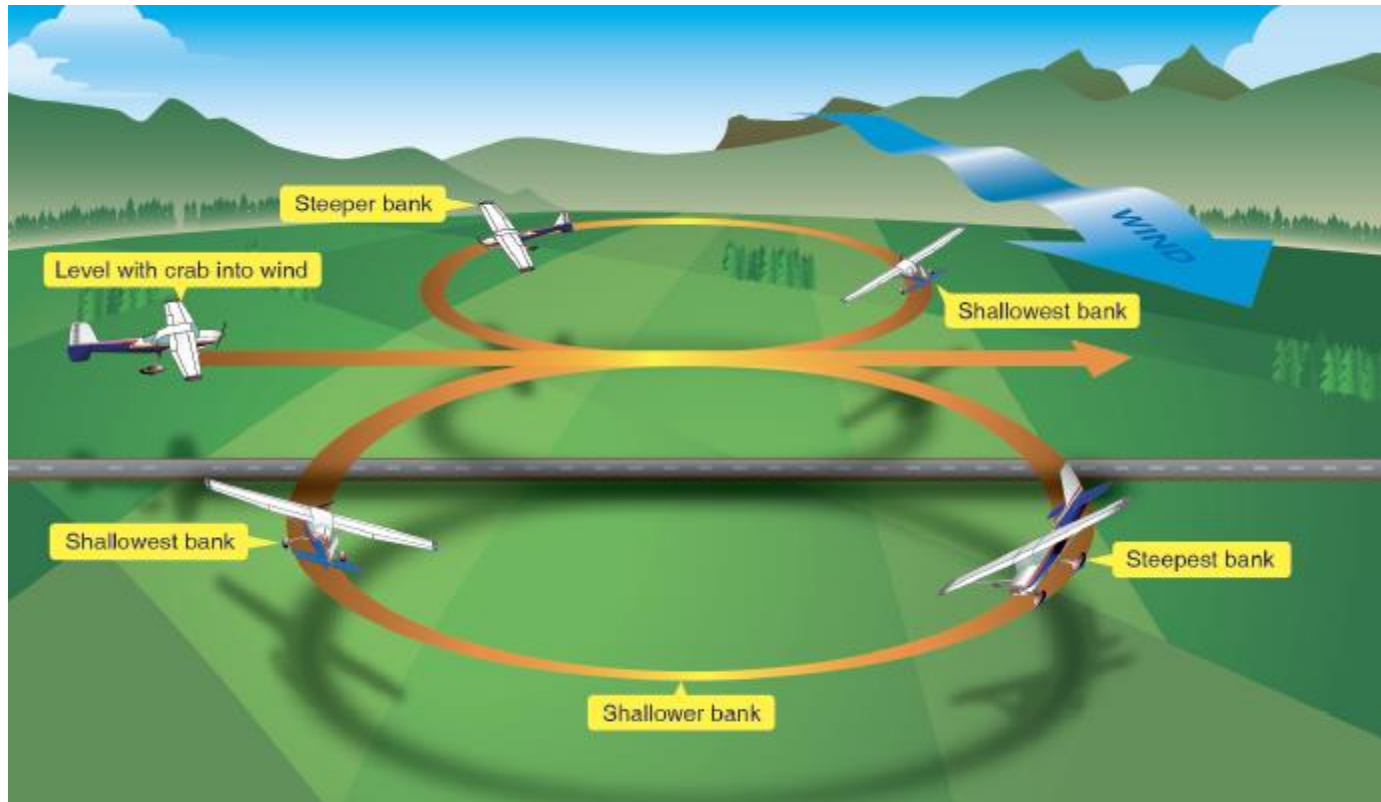
# Teaching/Understanding Ground Reference Maneuvers

## Right in 2004 – Confusing in 2016



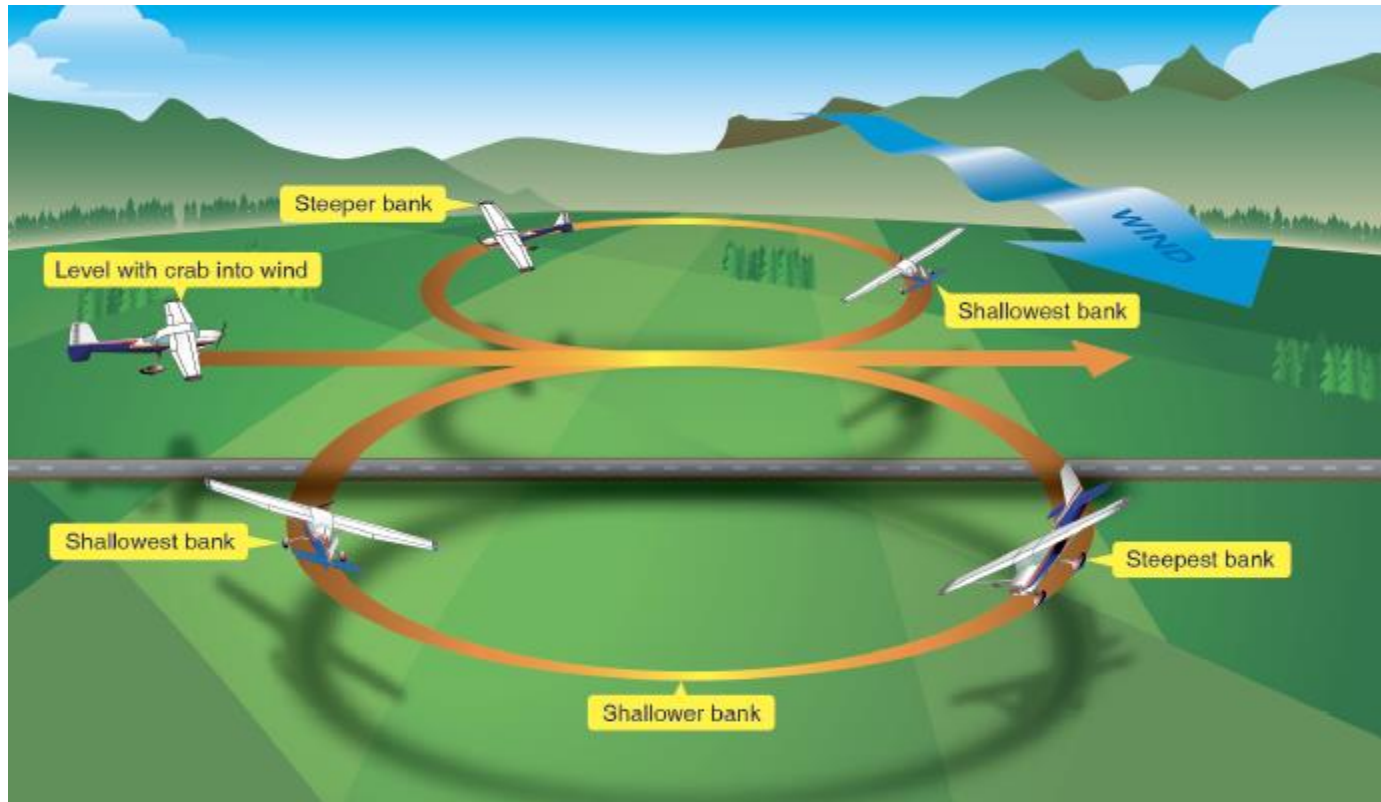
## Teaching/Understanding Ground Reference Maneuvers

### The Elementary Eights – New to you – Not new to the Handbooks



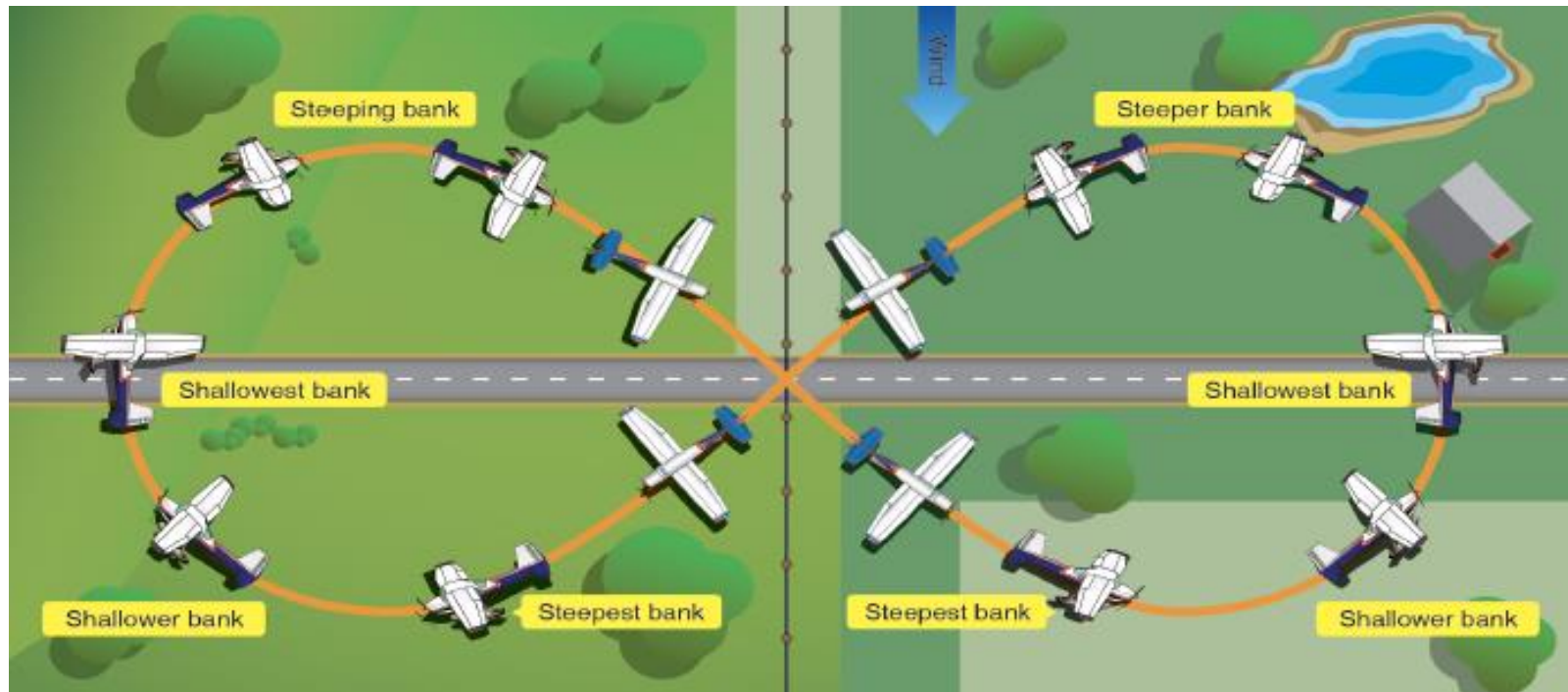
# Teaching/Understanding Ground Reference Maneuvers

## Eights Along a Road



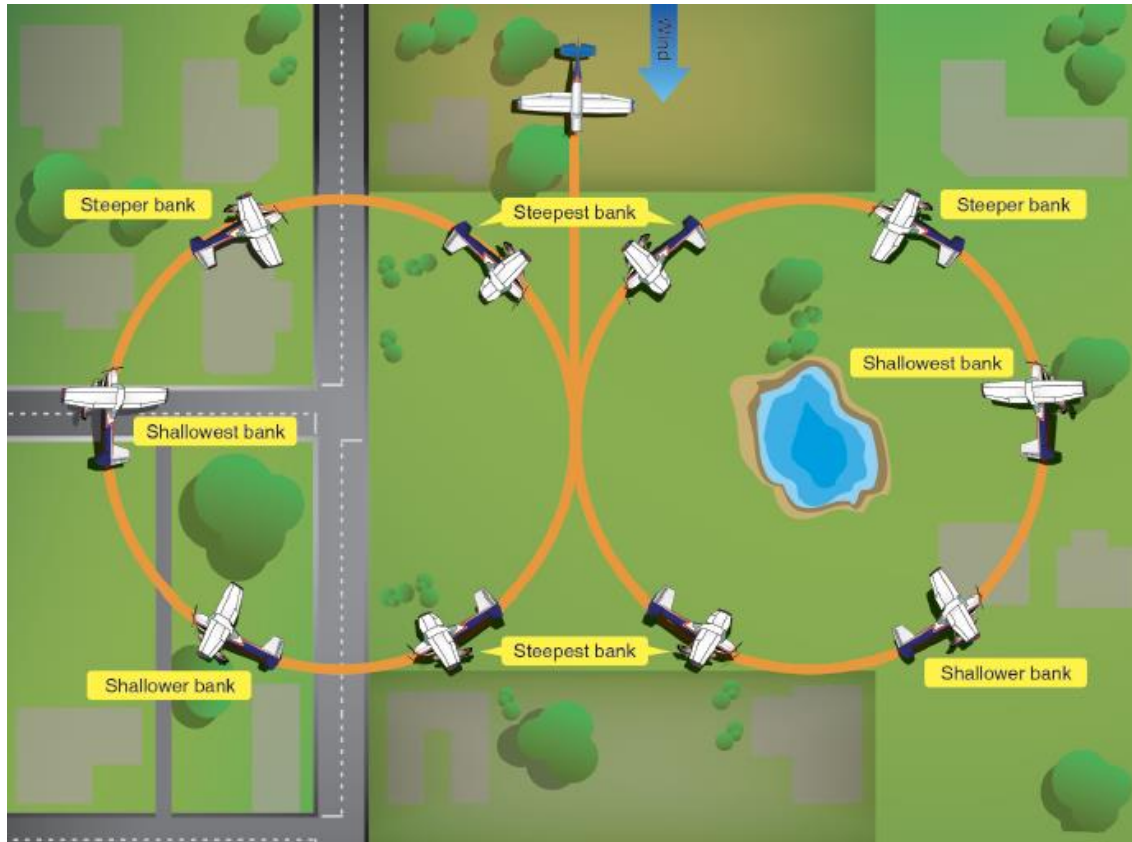
# Teaching/Understanding Ground Reference Maneuvers

## Eights Across a Road



# Teaching/Understanding Ground Reference Maneuvers

## Eights Around Pylons





## Teaching/Understanding Ground Reference Maneuvers

After all of this –

Why do pilots still not recognize drift in the pattern?



## Teaching/Understanding Ground Reference Maneuvers

It's because we are teaching "maneuvers based training"



## Teaching/Understanding Ground Reference Maneuvers

Ticking boxes with no correlation to why we are doing it

