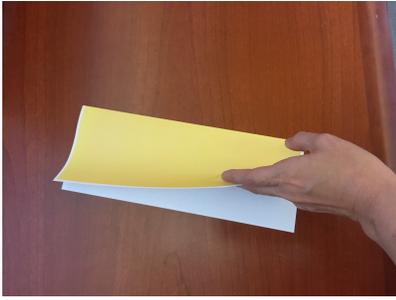


Paper Airplane Game Instructions

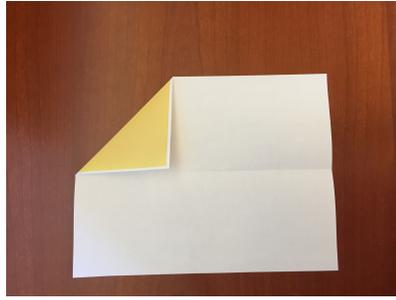
1. Bring colored paper and paper clips to your flight path zone.
2. Designate a data recorder.
 - Test one flight at a time. Data recorders note and share data for *each* flight.
 - In LZ, close, or far out.
 - Too left or too right
 - Flight distance: too close, right distance, too far
 - What other data do you want to collect?
 - Designate a testing recorder (different from data recorder)
 - From the second flight onward, record what change idea you are testing before you throw your plane.
 - What change idea are you testing?
 - What do you predict the plane will do?
 - Why do you think this?
 - Did prediction come true?

	Data Recorder: record data for indicators (1-4)	Testing Recorder:	Table Facilitators: record change ideas
Flight 1	<input type="checkbox"/> 1. Where in landing zone <input type="checkbox"/> 2. Too far Left or Right <input type="checkbox"/> 3. Flight distance <input type="checkbox"/> 4. (other indicator)?		
Flight 2 , etc.			<input type="checkbox"/> Change idea <input type="checkbox"/> Prediction <input type="checkbox"/> Rationale for prediction (theory) <input type="checkbox"/> Did prediction come true?

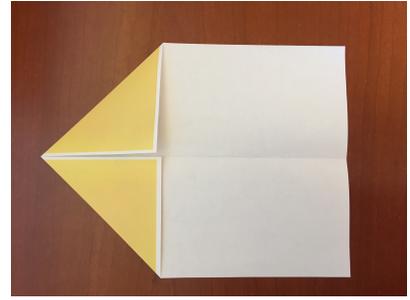
How to Fold a Paper Airplane



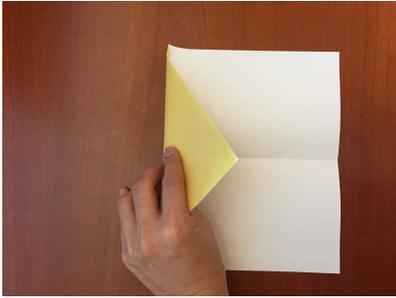
1. Fold in half lengthwise to create a crease



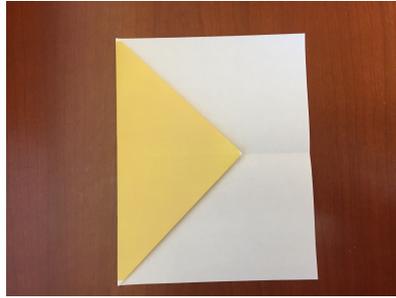
2. Bring down the top corner and align with the center crease



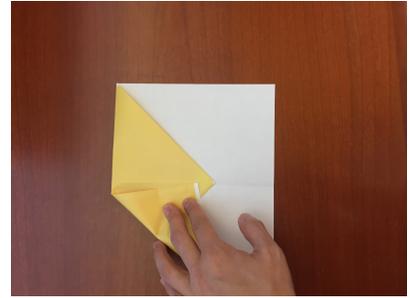
3. Same with the other top corner



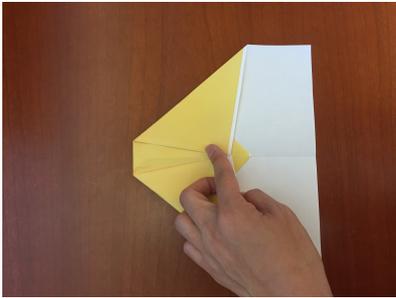
4. Bring the point down so the point touches the center crease



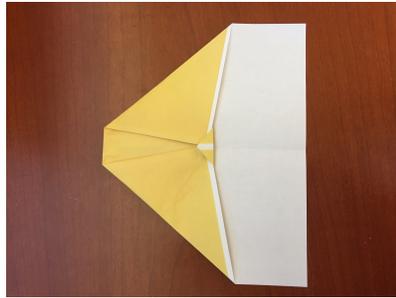
5. Fold down



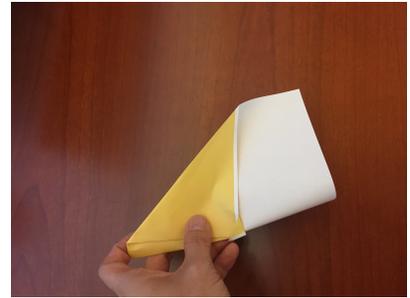
6. Bring in a top corner so that it touches the center line at an angle.



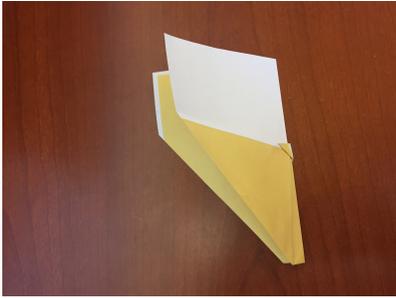
7. Same with other corner.



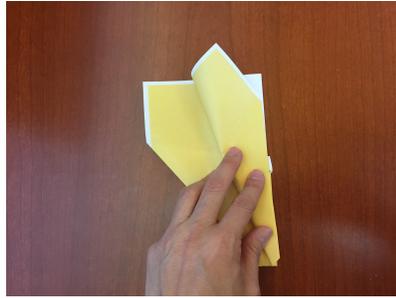
8. Fold up the little triangle.



9. Fold the plane in half.



10. Nearly there!



11. Fold down the wing.



12. You could consider this done!



13. Or you can make one more fold. Bring the bottom of the wing up.



14. Put a crease in the wing on both sides. This plane glides less.

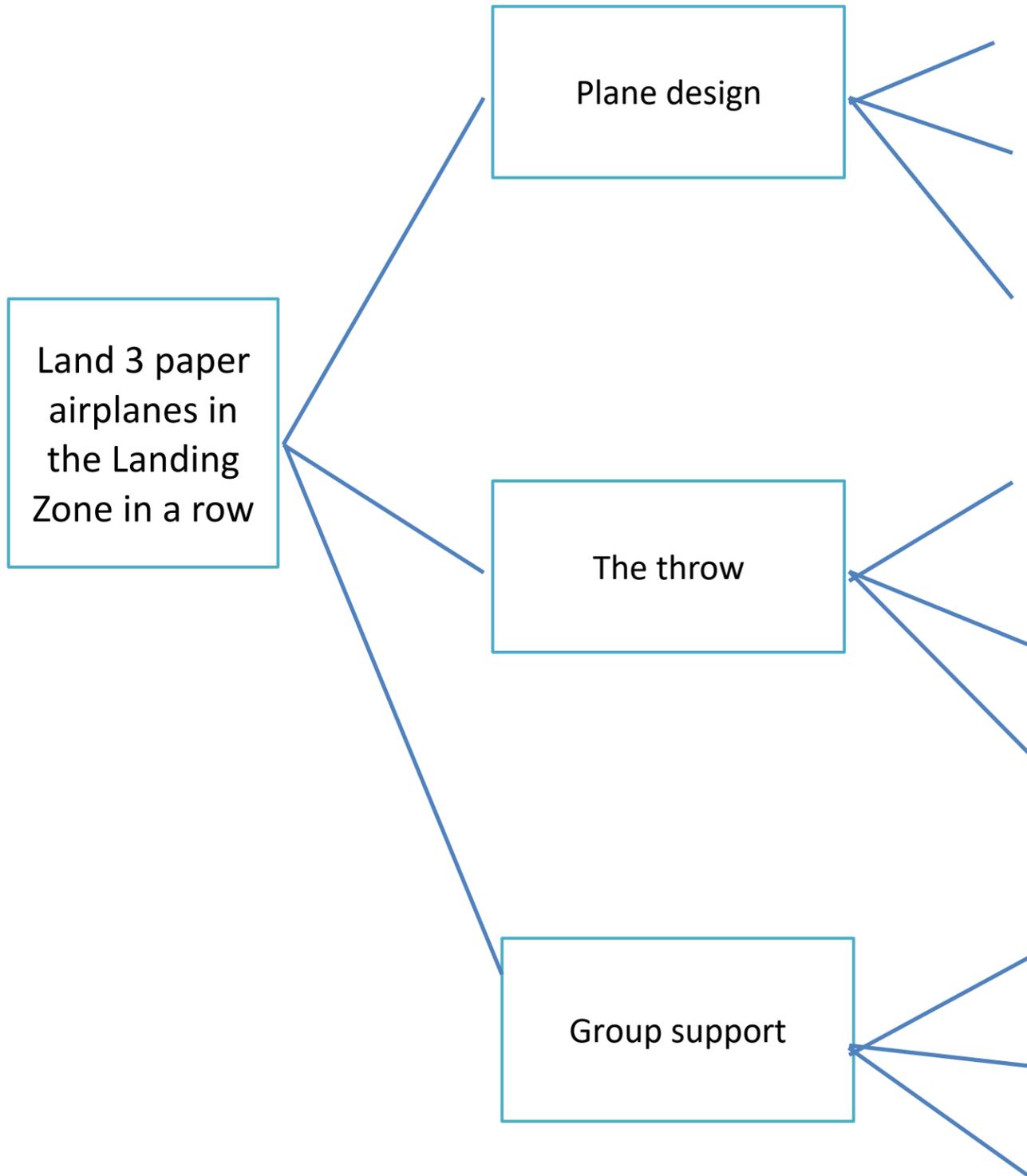
Directions: Record change ideas for how to land the plane in the landing zone.

Paper Airplane Game Driver Diagram

AIM

PRIMARY DRIVERS

CHANGE IDEAS

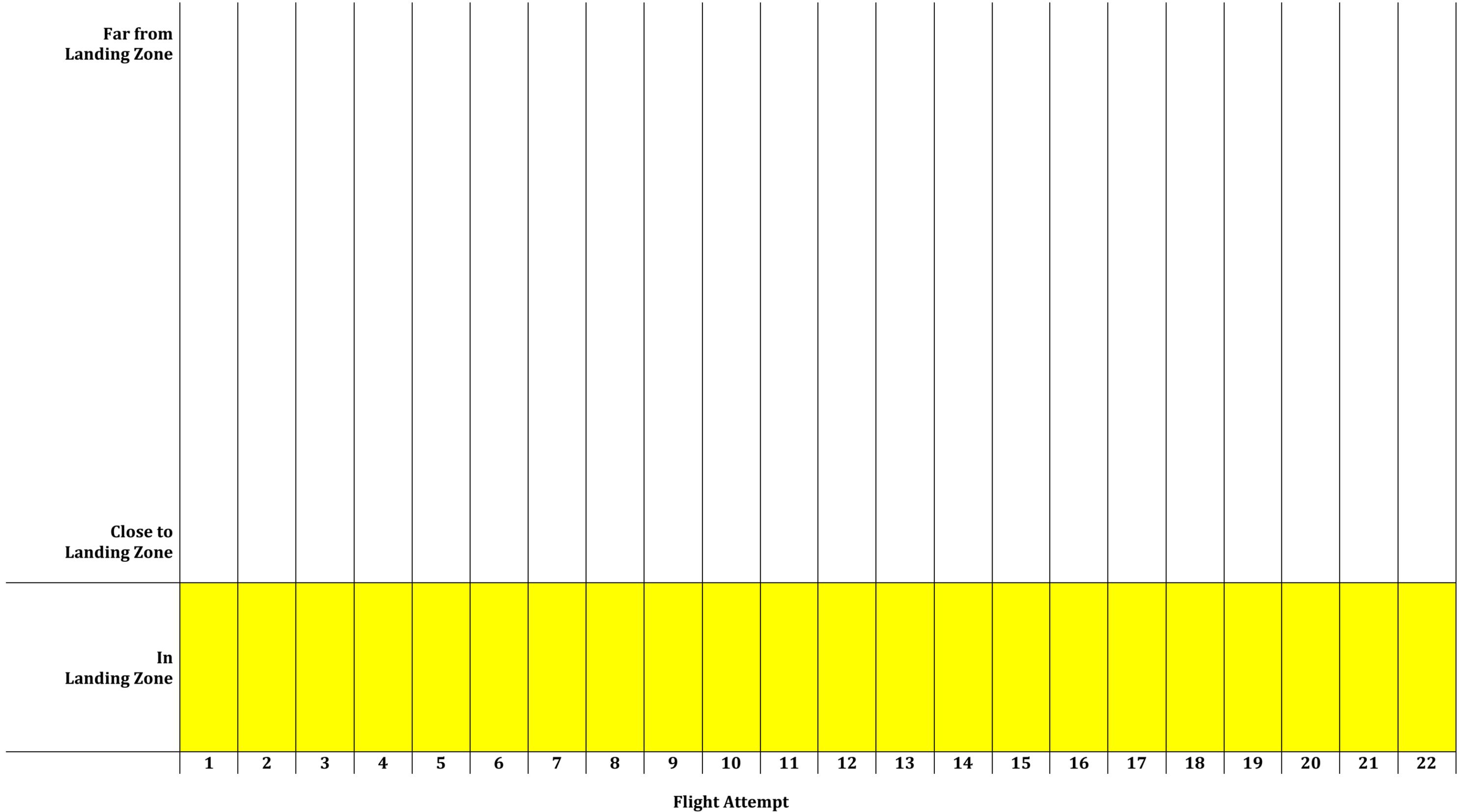


Directions: Record the change idea you are testing and predictions prior to each attempt. Following the test, compare predictions to outcomes.

Testing Change Ideas: Recording Sheet

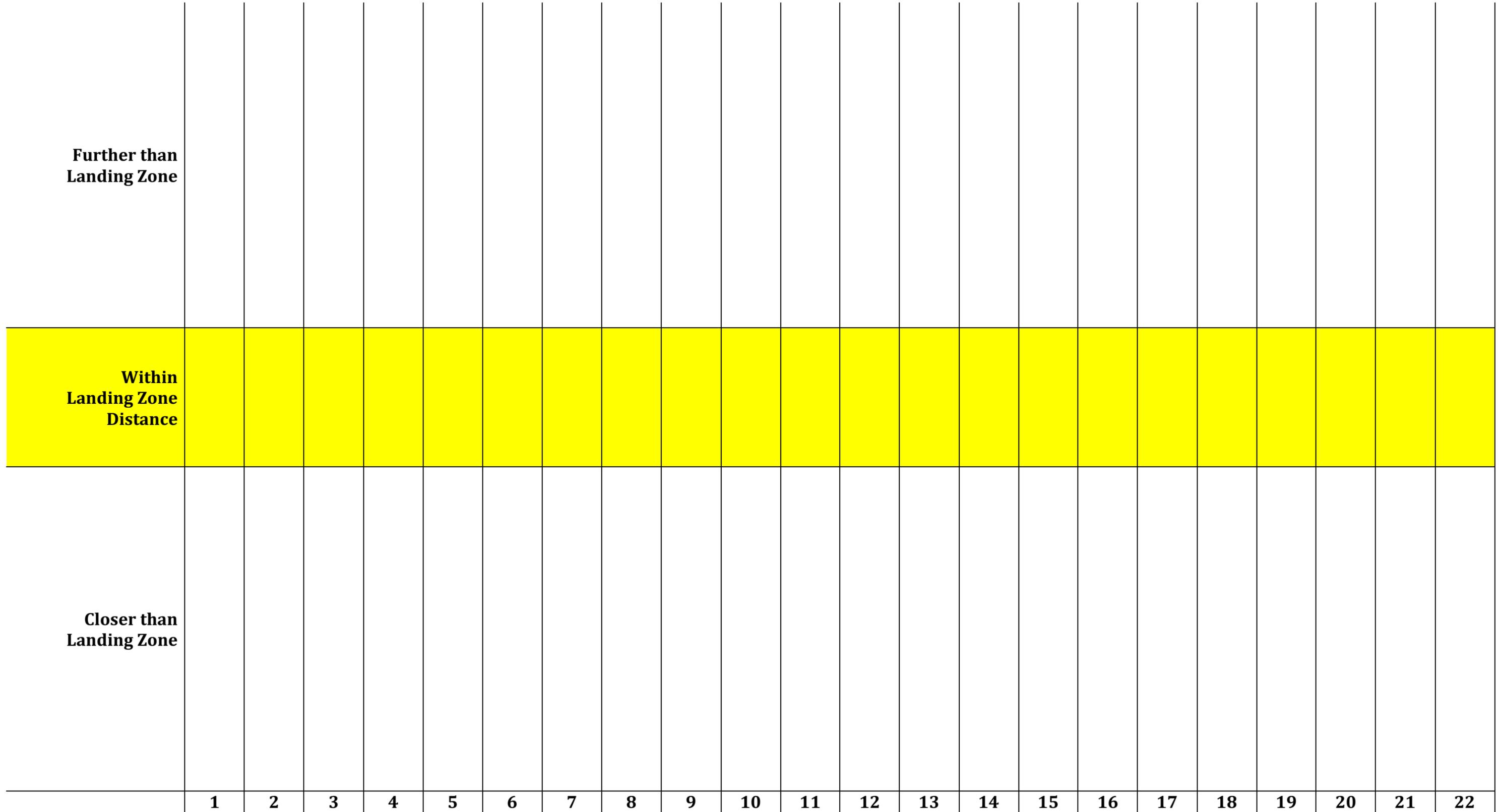
Flight	What change idea are you testing?	What's a prediction you have about what the plane will do? Why do you think this?	Did predicted outcome happen as expected?
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Landing (Overall)



Directions: Draw Xs to indicate how far your plane lands from the landing zone for each test.

Landing (Distance)



Further than
Landing Zone

Within
Landing Zone
Distance

Closer than
Landing Zone

Flight Attempt

Directions: Draw Xs to indicate how far your plane travels compared to the landing zone.

Landing (Left/Right)

Further Left than Landing Zone																						
Centered in Landing Zone Path																						
Further Right than Landing Zone																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

Flight Attempt

Directions: Draw Xs to indicate how centered your plane is along the landing zone path.

Additional Measure: _____

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

Flight Attempt

Directions: Determine an additional measure to track and record results.

PAPER AIRPLANE TIPS

I. Design

a. General

- i. Concentrate weight in nose by folding the tip
 1. Helps with crashes, aircraft stability, and control
- ii. Maintain even and balanced folds on both sides
- iii. Create tight creases
- iv. Trim the plane to correct any problems. Keep in mind the smallest bend, fold, or tear can make a big difference!



b. Troubleshooting

- i. Plane veers right
 1. Bend left side of tail up and right side down
- ii. Plane veers left
 1. Bend right side of tail up and left side down
- iii. Plane flies too low
 1. Make wings wider
- iv. Plane stalls (rises first, then stops and falls)
 1. Bend both tail sides down towards level and add weight to nose
- v. Plane dives directly into the ground
 1. bend up the back of the wings. A little bend goes a long way



II. Throw

a. General

- i. Keep throw level
 1. Helps plane quickly catch air current
- ii. Short planes with fat wings
 1. Throw hard
- iii. Long planes with thin wings
 1. Position hand up high



b. Troubleshooting

- i. Plane flies too low
 1. Throw up (within 10 degrees of vertical for maximum height)
 2. Throw plane as fast as possible
- ii. Plane flies too far
 1. Throw plane straight up to decrease distance
- iii. Plane glides
 1. Throw plane straight down to force nosedive

