Continuous Process Improvement

HANDS ON.

Introduction

- ► 25 years in process improvement & Six Sigma

- ► PACCAR, Gordon Trucking, Seattle Schools, Port of Seattle
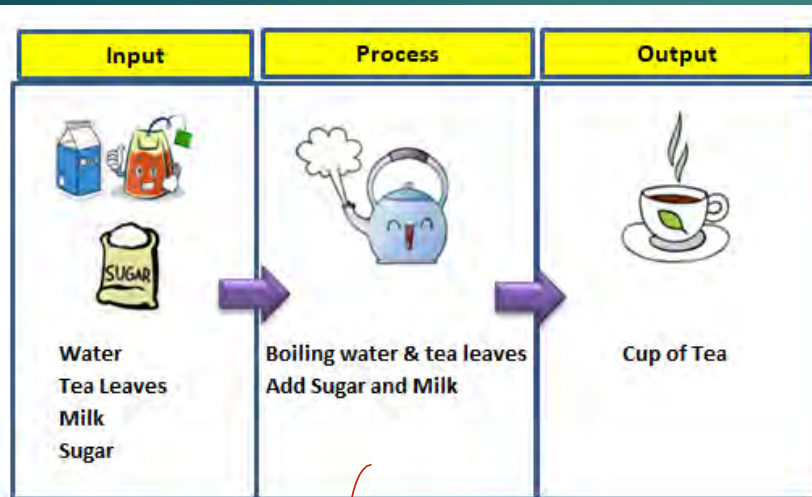
- ► Love to be outside

What is *Continuous Process Improvement

(*CPI here on out)

- ▶ PDCA - framework - heart of continuous process improvement
- ▶ The PDCA Cycle helps you in your efforts in continuous improvement

ADJUST • PLAN • DO • CHECK

Why do we do it?
- Increase **Value**
- Reduce **Waste**
- **Respect** People

What is Process?

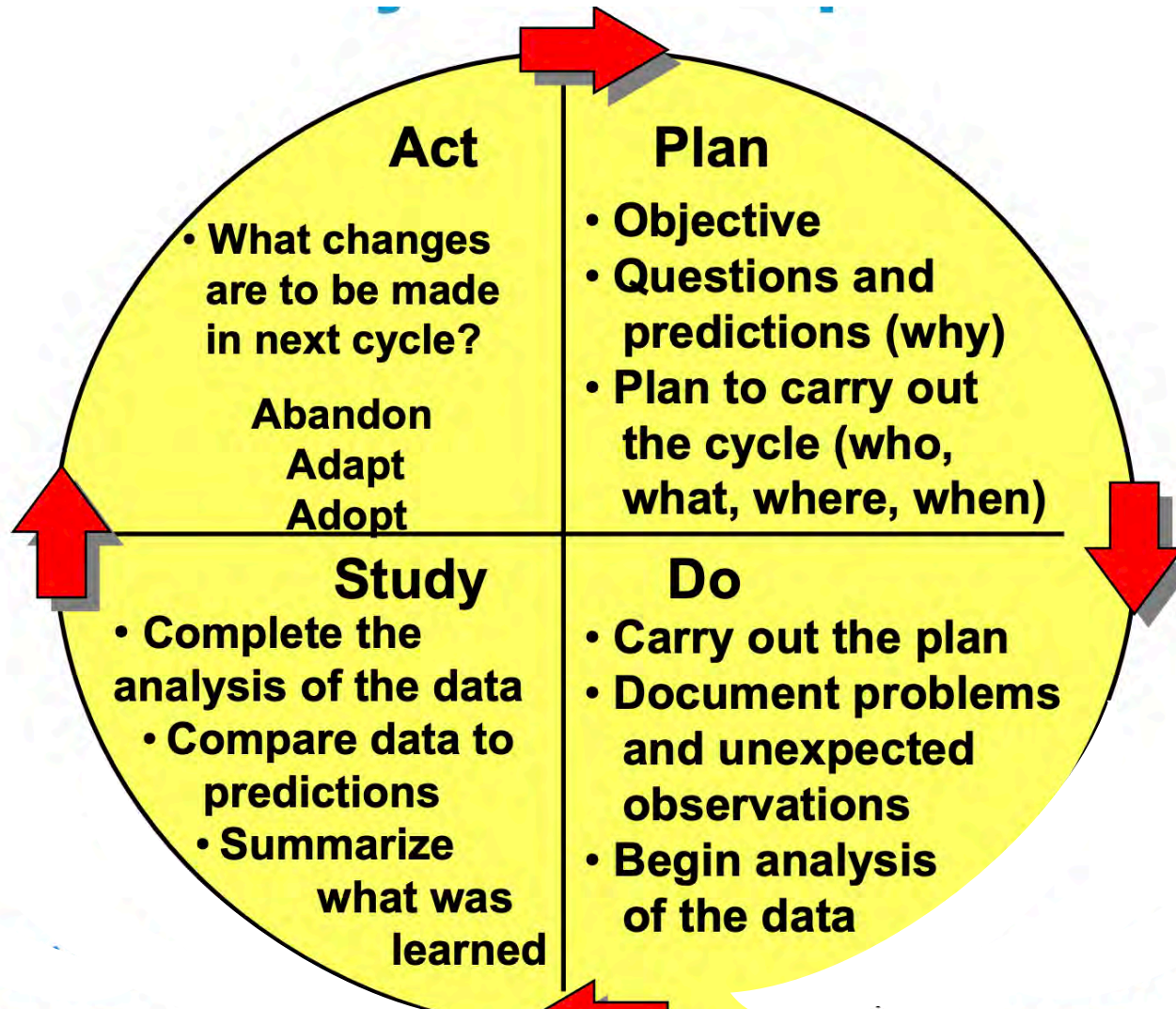| Input	Process	Output
Water Tea Leaves Milk Sugar	Boiling water & tea leaves Add Sugar and Milk	Cup of Tea

▶ A process is a set of activities that interact with one another.

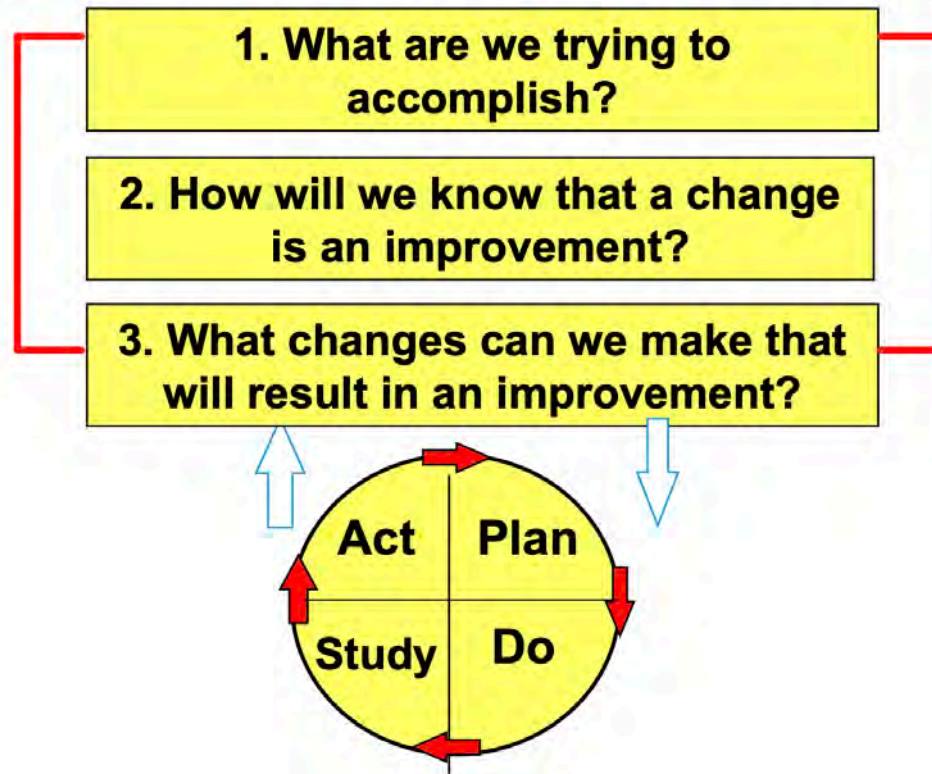▶ Often, the output of one process is the input for another process.

5-7 min

1 2 3 4

We are the Acme Plane Company

PDSA Cycle

Act
- What changes are to be made in next cycle?

Abandon
Adapt
Adopt

Plan
- Objective
- Questions and predictions (why)
- Plan to carry out the cycle (who, what, where, when)

Study
- Complete the analysis of the data
- Compare data to predictions
- Summarize what was learned

Do
- Carry out the plan
- Document problems and unexpected observations
- Begin analysis of the data

Model for Improvement

1. What are we trying to accomplish?

2. How will we know that a change is an improvement?

3. What changes can we make that will result in an improvement?

Act | Plan

Study | Do
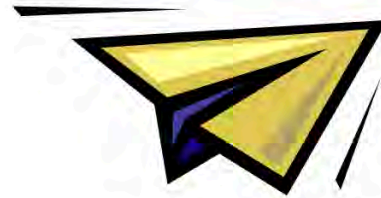
PDSA

Our Plan

- AIM
  - Improve the performance of a paper airplane to maximize the distance it flies and the accuracy of the flight

- Measures
  - Distance in feet
  - Accuracy of the landing (total landing points)

Room Setup

 4 Stations
- **PLAN**   Table for planning your changes
- **DO**   Table with supplies to make your changes & runway to fly plane
- **STUDY** Charts for plotting your measures
- **ACT**   Table to determine if you abandon, adapt, or adopt your changes

Simple Rules

- Only one design change per PDSA cycle
- All planes must have wings and be able to glide
- Each design must be flown by three different test pilots
- A flight is in the runway band if it touches the tape
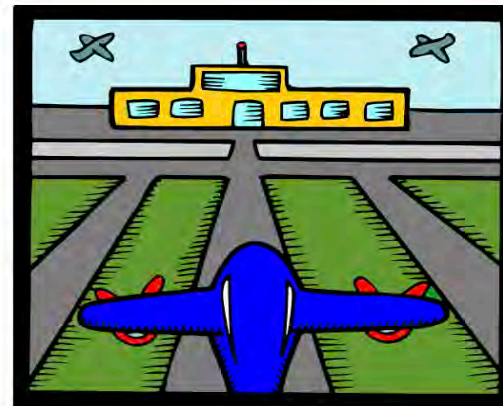
Getting Started

- **Form into teams**
- **Designate:**
  - Team leader
  - Data person to track and record the PDSA cycles
  - 3 test pilots
  - Additional people can help and take turns as pilots
- **Each team should have:**
  - Change package
  - 2 PDSA worksheets
  - Paper for your first, baseline plane
  - Graphs for measuring distance & accuracy

Airplane Change Package & Measures

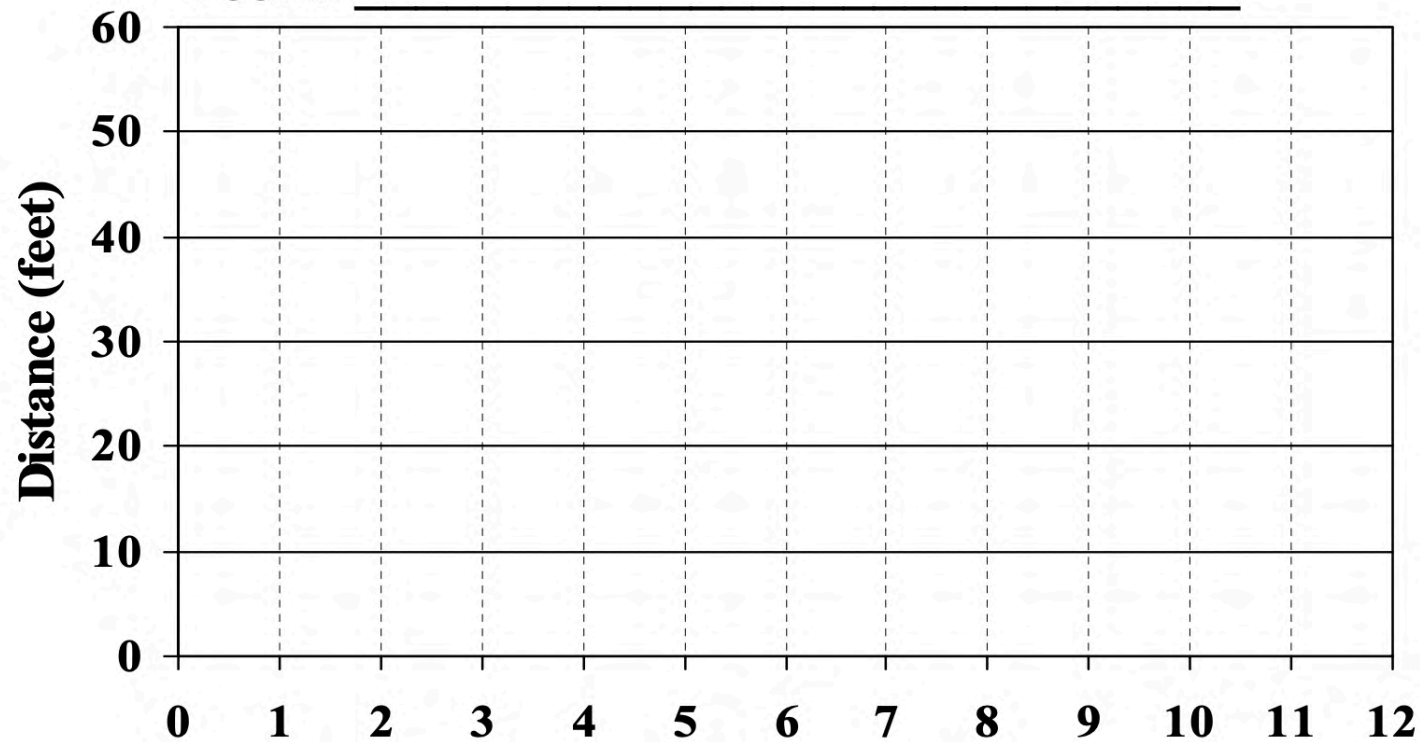| Problem	Changes	Measures
Short Flight Distances	•Use heavier paper •Change launch	•Flight distance on straight line
Nose Dives	•Add tape weight to rear to prevent	•Percent nose dives
Wanders Off-Target	•Reinforce plane body with staple	•Distance from straight path

PDSA Worksheet

PLAN	DO	STUDY	ACT
Theory you want to test:	**Results:**	What happened? What worked? What didn't? What did you Learn?	What will you keep doing? What will you stop doing? What will you change, do more of or do less of?

DO — Results:

#	Distance (feet)	On Runway
1		
2		
3		
Total		
Average		

PLAN:

What and How:

Predicted Results:

10/17/22

Accuracy Data

Paper Plane Accuracy

Team: _____

A blank graph with the x-axis labeled 0 through 12 and the y-axis labeled "Total Landing Points" from 0 to 9.
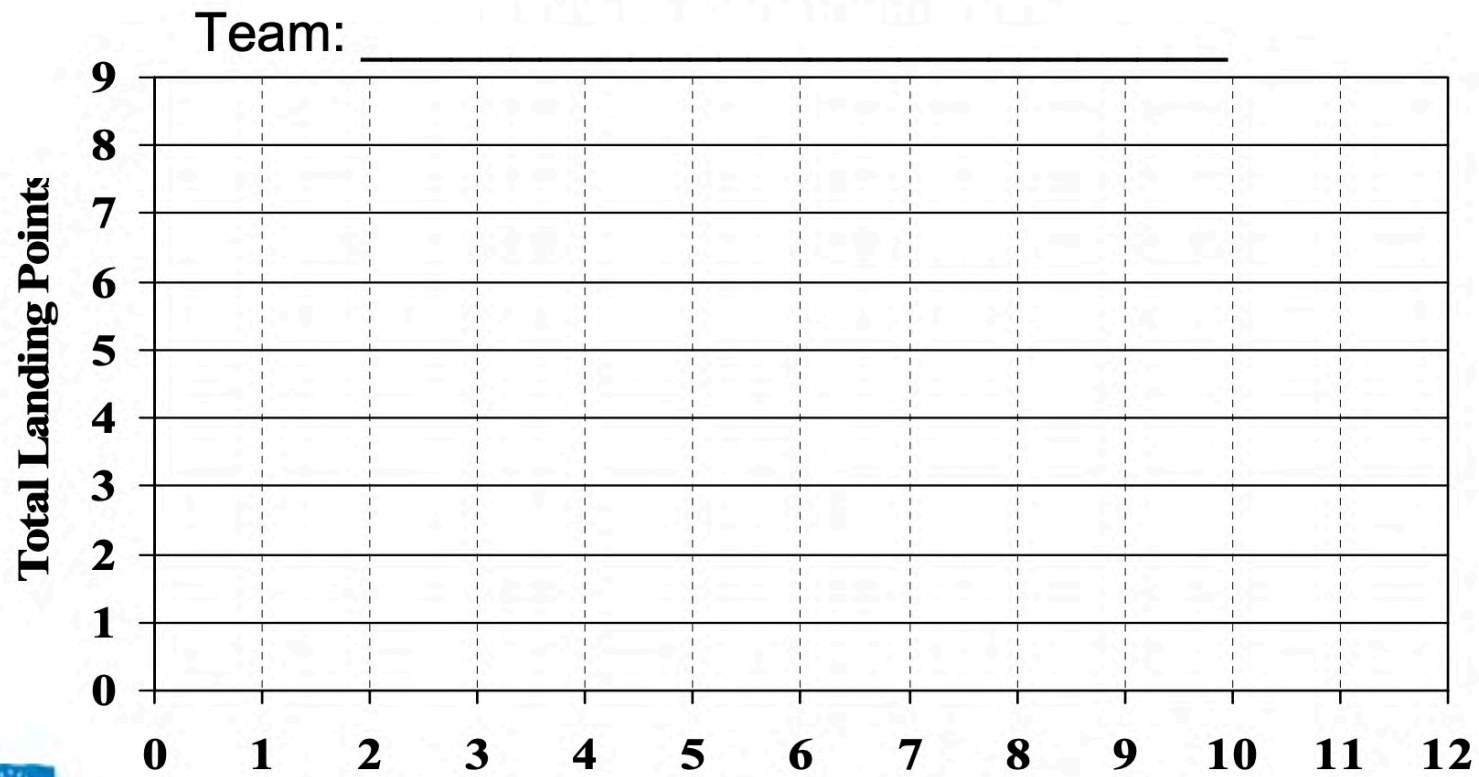
What to DO at Each Station

1. Plan
1. Record what theory or hunch you are going to test
2. Record what you are going to do and how
3. Predict your results (not just accuracy and distance, also consider other characteristics)

2. Do
1. Create the plane
2. Fly it 3 times, with 3 different pilots
3. Record the distance of each flight
4. Record the runway band that each flight landed in

3. Study
1. Compute the average distance and plot it on the graph
2. Compute the total runway landing band points and plot it on the accuracy graph
3. Discuss the results and what you have learned

4. Act
1. Decide what to do for the next PDSA cycle
2. What will you abandon, what will you adapt, what will you adopt
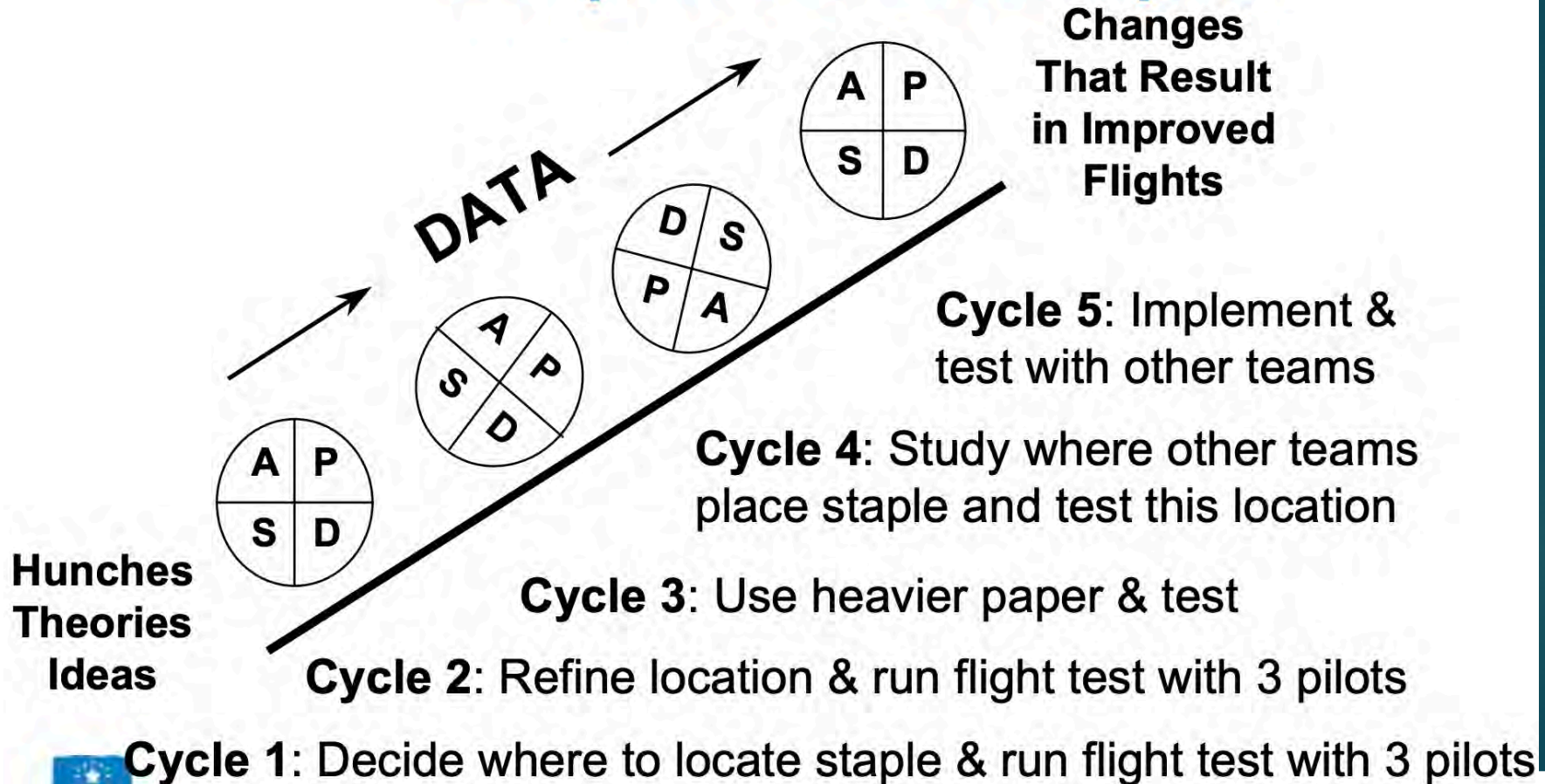
Have Fun
&
Fly Safe!!!

CAUTION!!!

- **Violations will be assessed for:**
  - Teams "Planning" at the "Do" station, "Studying" at the "Act" station, etc.!
  - Teams practicing flights off the runway!
  - Teams making more than one change in each PDSA cycle!
  - AND - Any other violations the Air Traffic Controllers feel like assessing

So…………………………….

Airplane Example

Changes That Result in Improved Flights

Hunches Theories Ideas

DATA

Cycle 5: Implement & test with other teams

Cycle 4: Study where other teams place staple and test this location

Cycle 3: Use heavier paper & test

Cycle 2: Refine location & run flight test with 3 pilots

Cycle 1: Decide where to locate staple & run flight test with 3 pilots

Results?

What Did You Learn?

What Does it all Mean?

Why do we do it?
- Increase **Value**
- Reduce **Waste**
- **Respect** People

ADJUST · PLAN · DO · CHECK

- Improvement is continuous
- Respect for people is #1
- Improvements are happening all around you
- Walk, learn, listen, ask
- Capture process
- Monitor goals
- HAVE FUN!

Questions?

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