Kick off Day 1 by mapping your mission goals.

Day 1 Morning Objectives

- 8:30 – 9:00 a.m. — Coaches check in, grab coffee, and add a coaching question to the wall chart.
- At your tables, chat with other coaches and add any topics you want to review to the chart!
- Follow us on Instagram and Facebook! @studentastro

STANDBY for LAUNCH

Please create a name tent that includes your name , division , and school .



MISSION CONTROL

Welcome to Student Astronaut Challenge 2027 Coach Training

Day 1 - October 17

Coach Training Timeline



SCHEDULE HIGHLIGHT • 9:00 AM – 9:20 AM

Simulator visit

Training Goals & Expectations

Workable Practice Plan Leave with an actionable, structured plan to guide your team's training effectively.

Clearer Picture of All 4 Challenges Gain deep insight into student and coach roles during Design, Engineering, Landing, and Flight Simulation tasks.

Locate essential manuals, rubrics, and checklists for your team.

ACTIVITY 9:20 – 9:45 a.m.

Coaches will navigate the website to find essential documentation, software, and contact info.



Key Documentation

- Coach Training Manual (v261013.01)
- Landing Challenge documentation
- Design Challenge information
- Technical Manual
- Mission Checklists - how many versions?

Downloads

- Data Panels - PowerPoints
- Orbiter
- Landing challenge scenarios

SESSION GOAL

Mark 1 (or more) Key Resource(s)

Identify and bookmark at least one critical resource during search to take back and use directly with your students.

Review flight roles, callouts, and confirmation for good communication.

01

09:45 – 10:30 A.M.

Communication is key!

Coach Manual, Pages 30 - 31

02

CREW & MISSION CONTROL

Coach Manual

Coaches will then annotate/make notes up to page 40, mapping out specific crew and mission control roles.

03

RISK MITIGATION

Trouble Spot Analysis

...while identifying likely trouble spots to anticipate during a real mission.

10:00 A.M. – 10:45 A.M.

Experience engineering challenge type teamwork!

Small teams will tackle a short materials & constraints problem during this intensive session.

We will compare this hands-on experience with the current engineering challenge guidance, helping you understand the process without previewing a live competition task.

*page 68 in coach manual



TIMELINE

INSTRUCTIONS
5 Minutes

ACTIVITY
15 Minutes

DEBRIEF
10 Minutes

5-STEPS

01 Plan
Analyze constraints and strategy.

02 Discuss
Determine how to communicate.

03 Build
Work together!

04 Revise
Iterate and improve design if possible.

05 Debrief

Design Studio

10:45 A.M. – 11:30 A.M.

Design Challenge 2027 - All new!

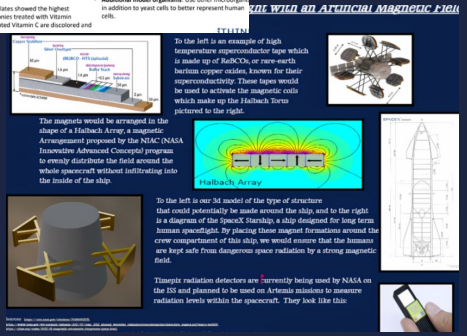
This year, Mercury and Apollo have the same challenge! It is less design and more research and proposal. There is still a presentation component.

Key Objectives:

- Understand the Lunar Greenhouse Challenge Overview Document
- Review additional resources available
- Key Dates and How to Submit
- Review Rubrics

EVALUATION • SAMPLE WORK





Rehearse callouts, actions, and confirmations in the checklist.

11:30 A.M.-12:30 P.M.

Explore the Checklist!

01 MODELING

Checklist Segment

Staff will model a short checklist segment - follow along in the classroom version of the checklist - blocks 32 -34

02 REHEARSAL

Group Execution

Mixed groups will then rehearse callouts, actions, and confirmations to capture common errors.



CRITICAL LANDING PROCEDURE FOCUS

Focus on Callouts, Actions, & Confirmations

Precision during the final approach relies on immediate callout response and deliberate, confirmed action steps between crew members.

MISSION CONTROL

Coach Training

Lunch

12:30 - 1:15

Landing Challenge

01

Checklists and Resources

Visit the Landing Challenge page on the website.

* chapter 2 in the coach training manual

02

Groups of Two, Multiple Scenarios

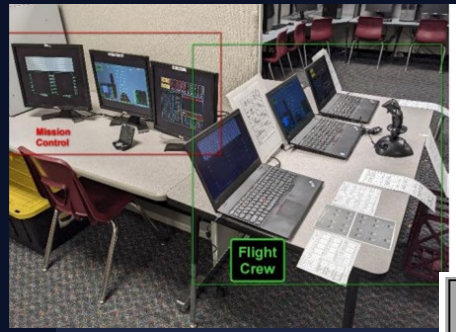
Roles:
6 Runs, everyone gets to be commander!
3 groups of 2 get 3 different scenarios (different for mercury and apollo - please check coach training manual)

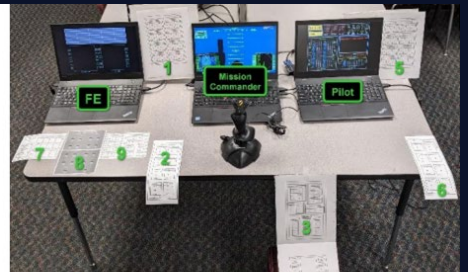
03

Landing Challenge Setup will be one of the stations you rotate through.



Classroom Simulator Setup







HARDWARE ARCHITECTURE MAP

Center PC: Orbiter 2010 Simulation Engine

Side PCs: PowerPoint Flight Roles & Timers

Peripherals: Joystick, Count -Up Timer & Switch Panels

SETUP STATIONS • 1:30 TO 2:30 P.M.

Coaches will learn to arrange the three computers and paired monitors according to mission specifications.

1. Software Placement

Place the Orbiter 2010 software on the center computer, and assign PowerPoint roles on the side computers.

2. Peripheral Integration

Arrange the joystick, count-up timer, and printed switch panels precisely on the setup map.

3. System Verification

Afterward, you will test a fully working system to ensure all hardware and software communications are operational.

Space Flight Simulator Rotations and Debrief

3:10-4:40 P.M.

START ROTATION @

Group 1 - landing
Group 2 - classroom (simple)
Group 3 - classroom (with panels)
Group 4 - Simulator

DAY 1 CLOSING DEBRIEF

01 **Practice**

With your group, share one thing you learned today you will share with your students next week.

02 **Questions?**

Submit any questions you still have for Day 2. If no questions, tell us something you liked today!

MISSION CONTROL

Student Astronaut Challenge 2027 Coach Training

Day 2 - October 18

Teamwork Takes Practice

Welcome Back!

Team Building Ideas:

- Name your orbiter
- Design a patch
- Design a team shirt
- Play games
- Lunchtime Landing

TODAY:

01 **Technical Manual**
Search for important systems

02 **Mission Milestones**
Deep dive and teach back

03 **Emergencies**
Checklists and Procedures

Teach back mission milestones.



Groups will then prepare two -minute teach -backs for key milestones like MECO, payload bay operations, zero up, the deorbit burn, or the gauntlet.

MECO & Gauntlet

Ascent completion and transition into weightlessness.

Key Focus Areas:

- Main Engine Cut-Off cues
- Gauntlet timing and comms format

Payload Bay Ops

Managing orbital assets and door mechanics.

Key Focus Areas:

- Door opening procedures
- Deployment sequence manual

Zero Up and Deorbit

Atmospheric entry and high-stress maneuvers.

Key Focus Areas:

- Deorbit timing & vectoring
- Prograde vs Retrograde

TEACH-BACK FRAMEWORK (2-MINUTE PRESENTATIONS)

Every group teach-back must explicitly cover four critical dimensions: Purpose (Why it matters), Cues (System triggers), Roles (Who executes), and Common Mistakes (What to avoid).

			(manual prograde)
28	Mission Dependent	PAYLOAD BAY POWER to ON PAYLOAD BAY DOOR to OPEN RADIATORS to DEPLOY Ku ANTENNA to DEPLOY	Advise: Go for payload bay door open program Announce: Confirm Payload Bay Doors are open Announce: Confirm Radiator Deployment Announce: Confirm KU Antenna Deployment Announce: Shuttle is correctly configured for the mission

Orbit Insertion Checklist (Post MECO)

COM	MET	Procedure	Mission Control Notes
17	T+00:09:00	FWD RCS He TANK ISOL (A/B) to OPEN AFT RCS LEFT He TANK ISOL (A/B) to OPEN AFT RCS RIGHT He TANK ISOL (A/B) to OPEN	Announce: Initialize External Tank Separation system
18	T+00:09:20	*Confirm* N_2 CNTRL VLV LEFT (1/2) are ENABLEd *Confirm* N_2 CNTRL VLV RIGHT (1/2) are ENABLEd	Announce: Standing by for Auto OMS1 Burn
19	T+00:09:30	FLT CNTRL PWR to INHIBIT ENGINE DAP to AUTO	
20	T+00:09:45	MAIN ENGINE POWER (LEFT/CENTER/RIGHT) to OFF	
21	T+00:10:00	HYD MAIN PUMP PRESSURE (1/2/3) to LOW APU SHUTDWN to ENABLE APU/HYDRAULICS (1/2/3) to OFF	

			are set to Computer Control
		O_2 VENT LINE to GPC	
		O_2 OUTBOARD VLV to GPC	
		O_2 INBOARD VLV to GPC	Announce: Liquid O_2 Fill & Drain Valves are set to Computer Control
		ENGINE DAP to MANUAL	

27 Cont.		FLT CNTRL POWER to ENABLE	
		RATE GYRO ASSEMBLY (RG1/RG2-3/RG4) to OFF	Advise: Go for Initiating Manual Zero Attitude Correction
		Orient the shuttle to a zero attitude while using the Kill Rotation command (**key 4**) to stabilize the maneuver.	Announce: Confirm Shuttle in zero attitude (manual prograde)

MISSION OBJECTIVE

Practice emergency procedures, communication, and checklists. Chapter 1.8!

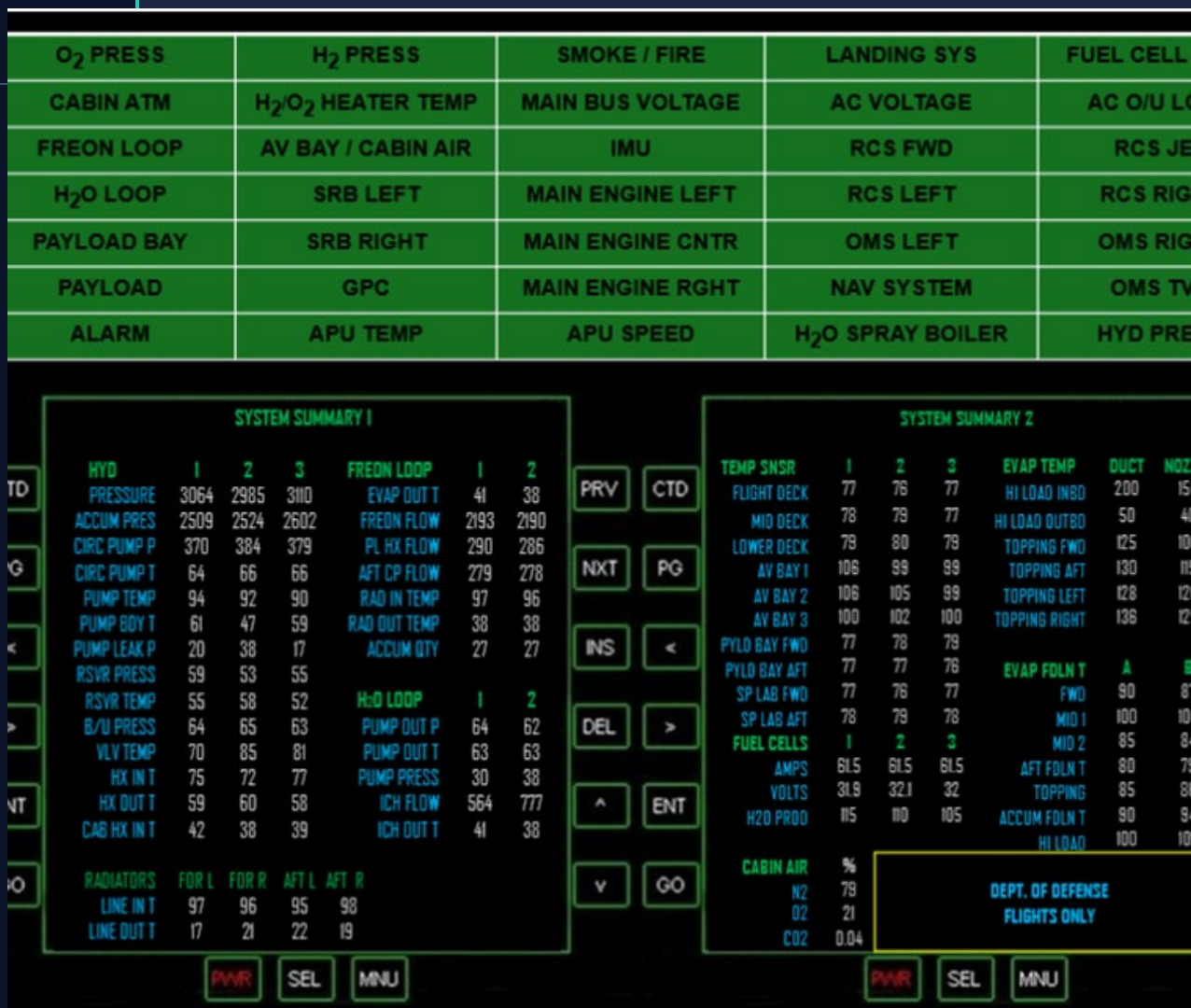
01 / EMERGENCY PROCEDURES

Communicate.
Identify.
Isolate.
Troubleshoot.
Determine next steps.

02 / EMERGENCY DECISION MAKING

What would you do?

- APUs




O2 PRESS
H2 PRESS
SMOKE / FIRE
LANDING SYS
FUEL CELL TEMP
CABIN ATM
H2/O2 HEATER TEMP
AC VOLTAGE
AC O/U LOAD
FREON LOOP
AV BAY / CABIN AIR
IMU
RCS FWD
RCS JET
H2O LOOP
SRB LEFT
MAIN ENGINE LEFT
RCS LEFT
RCS RIGHT
PAYLOAD BAY
SRB RIGHT
MAIN ENGINE CNTR
OMS LEFT
OMS RIGHT
GPC
MAIN ENGINE RGHT
NAV SYSTEM
OMS TVC
ALARM
APU TEMP
APU SPEED
H2O SPRAY BOILER
HYD PRESS
SYSTEM SUMMARY 1
HYD 1 2 3
PRESSURE 3064 2985 3110
ACCUM PRES 2509 2524 2602
CIRC PUMP P 370 384 379
CIRC PUMP T 64 66 66
PUMP TEMP 94 92 90
PUMP BDY T 61 47 59
PUMP LEAK P 20 38 17
RSVR PRESS 59 53 55
RSVR TEMP 55 58 52
B/U PRESS 64 65 63
VLV TEMP 70 85 81
HX IN T 75 72 77
HX OUT T 59 60 58
CAB HX IN T 42 38 39
FREON LOOP 1 2
EVAP OUT T 41 38
FREON FLOW 2193 2190
PL HX FLOW 290 286
AFT CP FLOW 279 278
RAD IN TEMP 97 96
RAD OUT TEMP 38 38
ACCUM QTY 27 27
H2O LOOP 1 2
PUMP OUT P 64 62
PUMP OUT T 63 63
PUMP PRESS 30 38
ICH FLOW 564 777
ICH OUT T 41 38
RADIATORS FOR L FOR R AFT L AFT R
LINE IN T 97 96 95 98
LINE OUT T 17 21 22 19
CTD
PG
<
>
ENT
GO
PRV
NXT
INS
DEL
^
v
PWR
SEL
MNU
SYSTEM SUMMARY 2
TEMP SNSR 1 2 3
FLIGHT DECK 77 76 77
MID DECK 78 79 77
AV BAY 1 210 199 206
AV BAY 2 106 105 99
AV BAY 3 199 202 200
PYLD BAY FWD 77 78
PYLD BAY AFT 77 76
SP LAB FWD 77 76 77
SP LAB AFT 78 79 78
FUEL CELLS 1 2 3
AMPS 61.5 61.5 61.5
VOLTS 31.9 32.1 32
H2O PROD 115 110 105
CABIN AIR %
N2 78
O2 21
CO2 0.04
EVAP TEMP DUCT NOZZLE
HI LOAD INBD 200 150
HI LOAD OUTBD 50 40
TOPPING FWD 125 100
TOPPING AFT 130 115
TOPPING LEFT 128 120
TOPPING RIGHT 136 125
EVAP FDLN T A B
FWD 90 87
MID 1 100 103
MID 2 85 84
AFT FDLN T 80 79
TOPPING 85 86
ACCUM FDLN T 90 94
HI LOAD 100 102
DEPT. OF DEFENSE
FLIGHTS ONLY

Draft a First -Month Practice Trajectory

01 / CURRICULUM

Suggested foundational requirements:

- All 4 Competition Events
- Simulator Practice Time
- Student Simulator Role Assignments
- Identify Student Leaders for each challenge
- Timeline for Design Challenge

02 / EXECUTION

Returning Coaches: Share proven curriculum examples, timelines, and past successes.

New Coaches: Adapt plans to match unique facility, hardware, and schedule constraints.

03 / OUTREACH

Communication with Families and Leadership

Strategize effective methods to convey the plans and competition information with parents.

—

Align expectations, highlight key milestones, and set clear attendance standards early.

IMPORTANT UPCOMING COACH ACTION ITEMS

Hotel Reservations. Tickets. Transportation. Field Trip Guidelines. Share the website and social media with students and families!

See you at KSC in February!

SOCIAL MEDIA

Tag us:
#studentastronautchallenge2027

@ studentastro

T-106 days to the Mercury Competition!
T-109 days to the Apollo Competition!



DEPARTURE CHECKLIST/EXIT TICKET

We'd love your feedback! Feel free to leave us a post it with ideas for next year!