

# **Space Academy**

## **Lesson Overviews**

### **FY-2018**

#### **Apollo History**

Covering the Apollo Program from its origins to its completion, this briefing shows the progression that took America to the moon. Both the United States and Soviet Union were reaching for the moon. While the Soviet Union focused on continuing their many achievements, the United States worked on perfecting methods. This perfecting applied to not only to astronaut training and modifying current technology but developing new technology for the sole purpose of landing on the moon. The Apollo Program is the perfect example of modern America's determination to set a goal and achieve it.

#### **Astrobiobound**

Astrobiobound engages trainees through participation in a space mission that will introduce the engineering challenges of mass, power, scientific payload, and financial considerations involved in spaceflight, while investigating significant astrobiology targets of interest.

#### **Astronomy Night – Planet Watch**

This presentation is a basic introduction to the five visible planets and constellations in the night sky. Trainees will be engaged through a guided tour of celestial objects. Emphasis will be on the planets and constellations visible in the night sky. In addition, they will make telescope observations of select planets and the moon.

#### **Astronomy Show**

The objective of Astronomy Show is to teach the basics of the evolution of stars, composition of the Sun, formation of planets, and navigation of the night sky. In addition, a live preview of "What's Up" in the night sky this week will be provided via Stellarium.

#### **Commercial Space Flight**

The purpose of this presentation is to introduce trainees to commercial space through fascinating stories from a few of the major players in commercial space, today. In addition, it is intended to engage and stimulate the imagination of young minds and to inspire them to become the innovators of commercial space in the future.

## **Explore the Universe**

Trainees will discuss how humans have learned about the universe from ancient times to the present. After learning about Earth and space-based observations and unmanned missions to objects in our solar system, trainees will conduct their own planetary explorations of a previously unexplored planet and its moons.

## **Gemini History**

This briefing details the story of unmanned and manned space flight during the United States' Gemini Program.

## **Heat Shield Design Challenge**

Trainees are introduced to the concept of thermal stress on spacecraft. They will look back through history and see how the different NASA programs dealt with this issue and then they will get the opportunity to design and test their own heat shield.

## **Intro to ISS (Full Steam Ahead!)**

Through the use of storytelling by connecting early to future explorers, trainees will understand how the ISS was developed and constructed through international cooperation and the participation of private companies. They will also discuss how this type of cooperation will be vital to future exploration, as well.

## **Mercury History**

This briefing details the story of unmanned and manned space flight during the United States' Mercury Program.

## **Mission Patch**

Each mission crew, beginning in the Gemini program, was tasked with creating a mission patch that represented them as a crew, individuals, and that also represented the mission they were undertaking. In this activity, trainees will work together to come up with ideas for a mission patch that represents themselves as a team, what's important to the trainees on the team, and their week at camp together.

## **Octo-ACCESS**

Octo-ACCESS is a water activity designed to help trainees understand the concept of neutral buoyancy and to promote teamwork and communication skills in Space Academy trainees.

## **Model Rockets**

This engineering challenge is focused on the design of a model rocket capable of launch and safely returning from a designated altitude.

## **Rocketry & Propulsion**

This briefing explains the progression into the Space Race. It begins during World War II and talks about the great minds in rocket building and design. Crew Trainers will point out and talk about different parts of a rocket and talk about how the design changed as we ventured out into space. The first satellites and space animals are highlighted along with a brief discussion of the missions of each type of rocket in Rocket Park.

## **Science of Spaceflight**

This presentation will use demonstrations and videos to illustrate Newton's Three Laws of Motion. Students will observe how these laws relate to spaceflight.

## **Science on Orbit**

This presentation will provide an introduction to Science on Orbit exhibit. Trainees will discuss USSRC's relationship with MSFC; MSFC's role in the ISS, specifically the POIC; the agencies/ countries involved in the ISS; living and working on the ISS; ISS's Earth observations and experiments; and STEM careers associated with space exploration.

## **SLS/Orion**

The Space Launch System (SLS), along with the Orion capsule, is the next step in NASA's plan for space exploration. With the completion of the International Space Station, NASA is changing its focus back to the Moon, then to Mars, and beyond.

## **Space Shuttle History**

With 135 flights over 30 years, the Space Transportation System (STS), or space shuttle, was the longest running American space program. This history briefing will highlight the achievements, contributions, tragedies, and lessons learned during this era of U.S. spaceflight history.

## **Spacesuits**

Spacesuits for Space Academy will review the reasons that spacefarers must wear spacesuits; provide a brief history of spacesuits; and introduce spacesuits being developed which will allow humans to go farther into space. Through years of research and development, designers are now building safer, more comfortable, and more pliable spacesuits. Spacesuit gloves have always been an obstacle for designers and the astronauts wearing them. Academy trainees will test gloves made of different materials by putting them through four challenges based on SPORT.

**Space Weather**

In this challenge, trainees will investigate the magnetic fields of the earth and the sun, discuss the solar phenomena that result, and then apply what they learn to build a magnetic shield.

**Station Build**

International cooperation is an important aspect of future spaceflight. Through designing and building a model of a Mars habitat, trainees will explore the different components of life on a Long Duration Mission to another world.