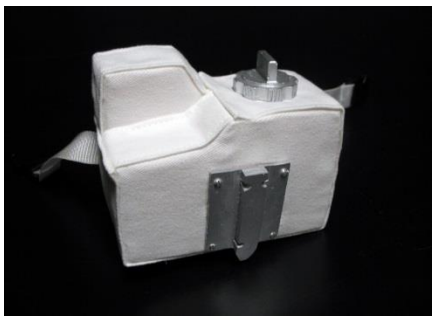
Hands-on Items

The Oklahomans and Space trunk has a variety of hands-on items, activities, and materials for classroom use. You may use any or all of the items.

Space Suit – While not a true replica, this space suit is meant to serve as an example of an Apollo space suit. Most space suits have many layers and interlocking parts so the astronaut is not exposed to the harsh and unlivable conditions of space. Space suits are white to reflect the heat of the sun off the astronaut. This space suit has "Stafford" written on the front, one of Oklahoma's astronauts who flew on both Gemini and Apollo missions.

Life Pack, or PLSS – This pack, worn like a backpack, is called the "Primary Life Support Subsystem." Astronauts wear it on space walks. The pack removes and stores carbon dioxide exhaled by the astronaut and provides oxygen to the astronaut through an oxygen tank. It also has a battery, two-way radio, a fan to circulate oxygen, and water-cooling equipment. The tubes connect to the suit and are called umbilicals. **There are two parts to the life pack in the trunk. The rectangular Styrofoam piece will Velcro into the top of the Life Pack.*



Display & Control Module – This is meant to imitate the module astronauts use to operate the systems in their Primary Life Support Subsystem. It is worn on the front of the suit on the astronaut's chest so he or she can reach the controls.

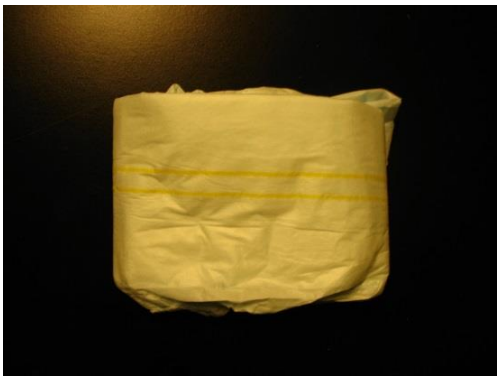
Helmet – Some helmets, like this one, have a gold-coated visor to filter harmful UV rays from the sun. The helmet protects the astronaut's head from the extreme conditions of space, while allowing him or her to see. A real space suit would have an interlocking part to connect the helmet to the body of the suit.

Gloves – Space suit gloves are designed to protect the astronaut from the extreme conditions of space while also allowing the astronaut to move his or her hands and fingers so they can make repairs and do other kinds of work. The actual space suits have an interlocking part to connect the glove to the suit to ensure the gloves do not come off.

Boots – Boots protect the astronaut's feet from space. The Apollo space suits are also designed so that the astronaut can walk on the moon!

Snoopy Cap or CCA– The Communications Carrier Assembly (CCA) is commonly called the "Snoopy Cap" because of its black sides that look like dog ears, resembling the famous *Peanuts* cartoon character. This cap is worn under the helmet and contains earphones and a microphone that allow the astronaut to communicate with other astronauts and mission control.

Long Johns – Astronauts wear long johns to keep warm. Later astronauts wore a Liquid Cooling Garment (LCG). This garment was a pair of long johns with plastic tubing that had water flowing through. The water would help keep the astronaut cool. The astronaut could control the water-flow rate to maintain a comfortable temperature.



Maximum Absorption Garment– Especially in earlier space suits, astronauts wore a maximum absorption garment, or adult diaper, under their space suits. They may be in their suit for long periods and early spacecraft did not have a restroom.

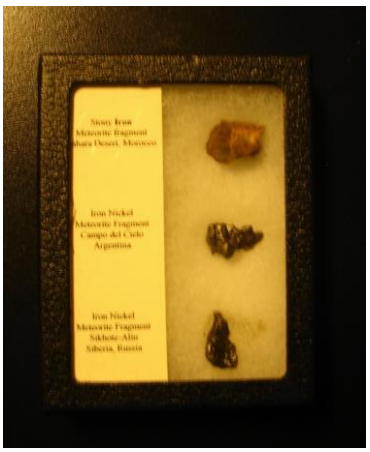
Flight Suit – A flight suit like this one is worn inside the spacecraft where the astronaut is already protected from space conditions.

Mission Patches – Mission patches are sewn onto the astronaut suit, flight suit, and other clothing. The patches identify the mission and the astronauts flying on that mission. Often patch designs use symbolism to describe the goals of the mission.

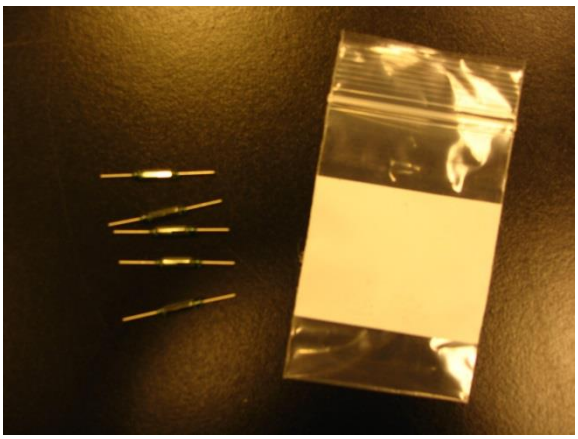
Space Food – Astronaut food cannot take up a lot of room, and cannot produce crumbs that will float around and get caught in controls or other equipment. Often the food, like this, is dehydrated. Water is added to the dehydrated food to make it more like regular food. For more information on food, see page 63.

Moon Globe – The official portraits of many astronauts include a moon globe as a prop. You can take your official astronaut portrait with this globe! This moon globe includes the landing sites of Apollo 11, 12, and 14. Can you find them? Hint: They are close to the equator.

Meteorite Fragments – Meteorites are meteors that landed on earth's surface. These meteorites were found in Morocco, Argentina, and Russia. **Please do not remove the meteorites from the box.*



Slide Rule – Pilots and astronauts used slide rules to make calculations before there were computers. Slide rules help with multiplication, division, and calculus equations. This slide rule comes in a case with a manual.



Reed Switches (in bag) – Reed switches are electrical switches that operate by magnetic forces. H.S.I. Sensing, a company in Chickasha, Oklahoma, manufactures these reed switches. NASA uses these switches produced by H.S.I. Sensing in astronaut suits. This is an example of Oklahoma's leading role in the aeronautics industry. Companies like North American in Tulsa and Dorsett Electronics in Norman manufactured products for NASA and helped build Oklahoma's economy. Many companies in Oklahoma, like H.S.I. Sensing, continue to produce items for NASA. **These are fragile! Please keep inside the bag.*

Space Blanket – NASA developed this material used as a thin insulation for rockets. It was first used on the base of the Apollo lunar landing vehicles. It was designed to be lightweight but also make the spacecraft safe from the extreme temperatures in space. Today, space blankets like this one are sold for use in first aid kits to prevent hypothermia. This is an example of a NASA innovation that has contributed to new knowledge and products used here on Earth.

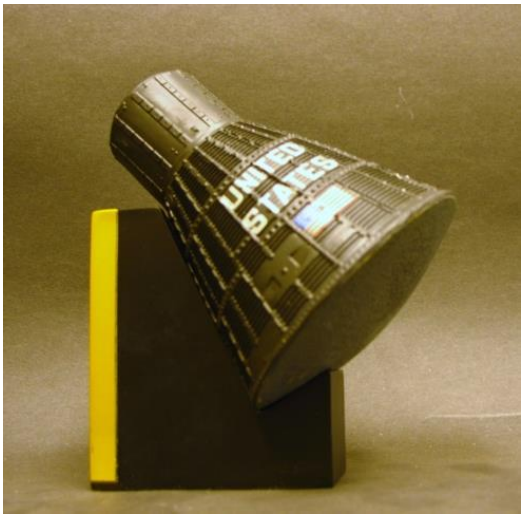
Harmonica – Harmonicas like these are small items astronauts carry with them to entertain themselves.

Jingle Bells on a cord: Thomas Stafford and Walter Schirra were in space on Christmas Eve and day, 1965. While talking to mission control, they played the harmonica and jingle bells tied around a cord like this and they played the song "Jingle Bells" over the mission control radio. You can hear this on the included CD, *To the Moon*, on Track 3.

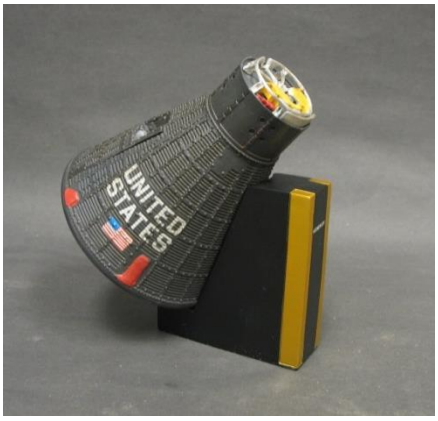
Deck of Playing Cards – Astronauts bring small items like playing cards to pass the time.

Miniature Oklahoma Flag – Thomas Stafford carried a miniature Oklahoma flag like this one with him on Apollo 10. It was the first state flag flown around the moon. Afterward, anytime one state flag is carried on board, all state flags must be taken into space.

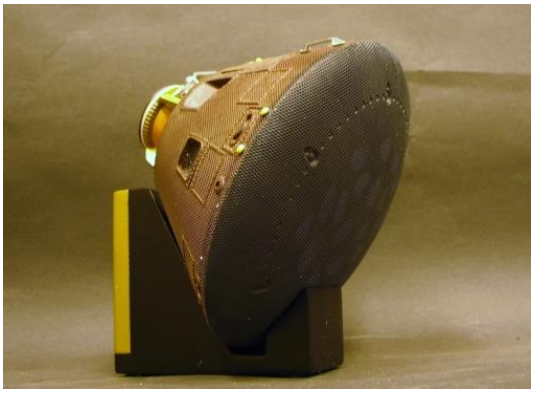
Mercury Friendship 7 Space Capsule Model – This is a 1/25 scale model of one of the Mercury space capsules. This one is a model of the one flown by John Glenn. Each Mercury astronaut named his own capsule and included the number 7 to symbolize the seven astronauts selected for the Mercury program. Leroy Gordon Cooper, from Oklahoma, named his capsule Faith 7. The Faith 7 is similar to this model capsule. All of the Mercury capsules carried only one person. **This item is fragile! Please handle with care.*



Redstone Rocket Model – This is a 1/72 scale model of the Redstone Rocket that carried two of the Mercury space capsules into space. **This item is fragile! Please handle with care.*



Gemini IV Capsule Model – This is a 1/25 scale model of the Gemini IV space capsule. Notice the difference between the Mercury model and the Gemini model. The Gemini model carried two astronauts instead of one. The Gemini IV capsule was flown by James McDivitt and Edward White. Oklahoma astronaut Thomas Stafford flew in the Gemini VIA, a space capsule similar to this model, with fellow astronaut Walter Schirra. You can visit the actual Gemini VIA on exhibit at the Oklahoma History Center! **This item is fragile! Please handle with care.*



Apollo 11 Command Module Model – This is a 1/25 scale model of the Apollo 11 Command Module. The Command Module (CM) separates from the Lunar Module (LM) and orbits the moon while the LM lands on the moon. During normal space

flight to or from the moon, the Command Module holds the flight crew, operation systems, and reentry equipment. Stuart A. Roosa, an Oklahoma astronaut, served as the Command Module Pilot for Apollo 14, which is similar to this Apollo 11 model. **This item is fragile. Please handle with care.*

Saturn V Rocket Model – This is the 1/200 scale model of the Saturn V. The Saturn V rocket was used during the Apollo missions. The real Saturn V was as tall as 36 story building and weighed the same as about 400 elephants! Thomas Stafford, Fred Haise, and Stuart Roosa, all from Oklahoma, were astronauts on Apollo missions. **This item is fragile. Please handle with care.*

Space Shuttle Discovery Model – This is a 1/200 scale model of the Space Shuttle Discovery. Shannon Lucid, an Oklahoma astronaut, travelled to space in the Space Shuttle Discovery STS-51G. **This item is fragile. Please handle with care.*

Inflatable Solar System - Please use the provided air pump to inflate the objects. Please fully deflate before returning. See page 53 for more information on the solar system.

Other Items:

This trunk also contains several books, DVDs, and CDs. These are just a few of the items included:

Audio CD - *Excerpts from "To The Moon"* – This includes five tracks of excerpts from "To The Moon," an audio program that follows the U.S. space program through the moon landing. It includes actual audio from inside the space craft and communications with mission control. The five tracks feature Oklahoma astronauts Leroy Gordon Cooper and Thomas Stafford.

Audio CD – *The Planets* – Use this as background music during student's individual work time or with the activity on page 87.

DVD - *NASA: The 25th Year* – Made in 1994 and 55 minutes long, this video was developed by NASA about the history of the United States space program from the 1950s to the 1990s.