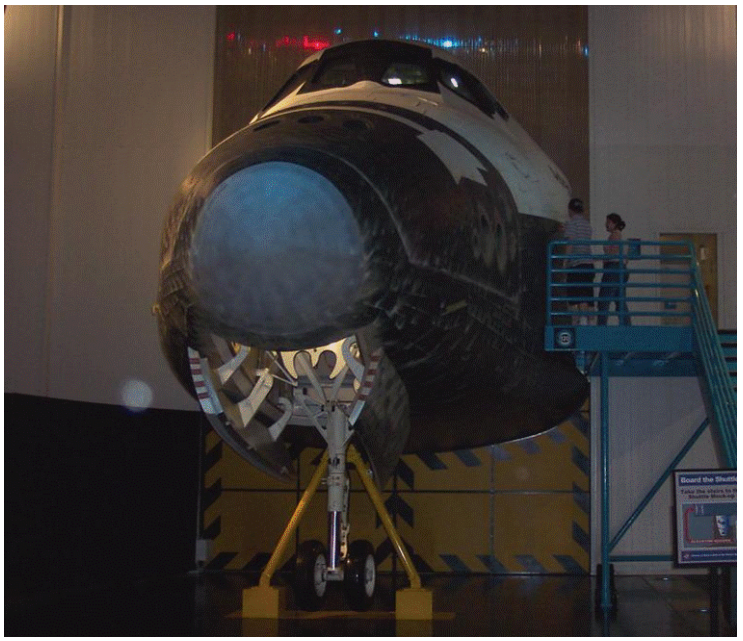
Space Shuttle Mock-up



When you enter Space Center Houston, one thing that your students are sure to notice is our life-size mock-up of the Space Shuttle nose, including the flight deck and mid-deck, which protrudes from the wall at the back of the center. This mock-up shows students what the inside of the flight deck and mid-deck of the space shuttle looked like. Astronaut Charles Bolden helped design this one-of-a-kind mock-up. Walking through it you will get a real idea of how Astronauts live on the space shuttle. Use the information in this hand-out to guide your students through the Space Shuttle Mock-up when you visit Space Center Houston. Before your trip have them label the parts of the shuttle (page 3) and put the shuttle "stack" together (page 4).

When you stand facing the shuttle, there are two tires…feel them. One of them is an actual tire that was used in landing tests. Can you tell which one? If you said the left one…you are right!

Above you are the doors to the landing gear. On the outside of the doors there are tiles. These tiles protect areas of the shuttle orbiter that heat up between 1,200 degrees and 1,275 degrees Fahrenheit. Feel the tiles. Can you feel the tiny hole in each of them? These holes are used to check for any damage that might have been done during the shuttle mission. Each tile is put on the shuttle one by one. They are also checked one by one after each mission.

At the top of the stairs, you will find the mid-deck of the shuttle. Before you go inside, feel the outside of the shuttle. These tiles are called, Reusable Nomex Felt Surface Insulation. They are also on the outside of the hatch, which is the 'door' of the shuttle. Astronauts come in and out of this door. Feel the small glass window in the middle of the door.

Once you are inside the shuttle, the first thing on your right is the restroom, or Waste Control System (WCS)! On the door, there are curtains the astronauts can use for privacy. You can feel them rolled up.

Space Shuttle Mock-up

Along the left side of the shuttle, is the hatch…you can feel the shape of the door from the inside of the shuttle. Continue to the front wall, where you will find storage cabinets and drawers. You can feel Velcro on some of the cabinets. The Velcro helps astronauts keep things from floating around in the shuttle. The two drawers you can open have Plexiglas covering them. On the actual shuttle, the drawers have a mesh covering that keeps their things from floating out.

Continuing on to the right is a wall lined with columns. Each column has Velcro so the astronauts can attach their sleeping bags to the wall. This keeps them from 'sleep-floating' instead of sleepwalking!

When you go up to the next floor, you are on the flight deck. On the wall to your left is the control board. There are two windows above the board, so the astronauts can look into the cargo bay. Feel the two joysticks. The one in the center controls the speed for docking on the International Space Station (ISS). The one on the right controls the robotic arm.

At the nose, or front, of the shuttle, there are two seats. The commander of the shuttle sits in the seat on the left, and the pilot sits on the right.

Parts of the Space Shuttle

Orbiter: The orbiters are reusable spacecrafts the carry the payload and the crew into orbit and return them safely to Earth. The orbiters are what people normally call the "Space Shuttle" when in reality the "Space Shuttle is the orbiter, SRB's and External Fuel Tank all assembled together.

Solid Rocket Boosters (SRB's): The Space Shuttle's twin SRB's provide the main thrust to get the space shuttle off the launch pad to an altitude of about 150,000 feet or 24 nautical miles (28 statute miles). Each booster has a thrust of 3,300,000 pounds at launch and provide 71.4 percent of the thrust at lift off and during the first stage of ascent. The SRB's are reusable and are recovered in the Atlantic ocean after launch. Each SRB weighs about 1,300,000 pounds at launch, 1,100,000 of which is fuel.

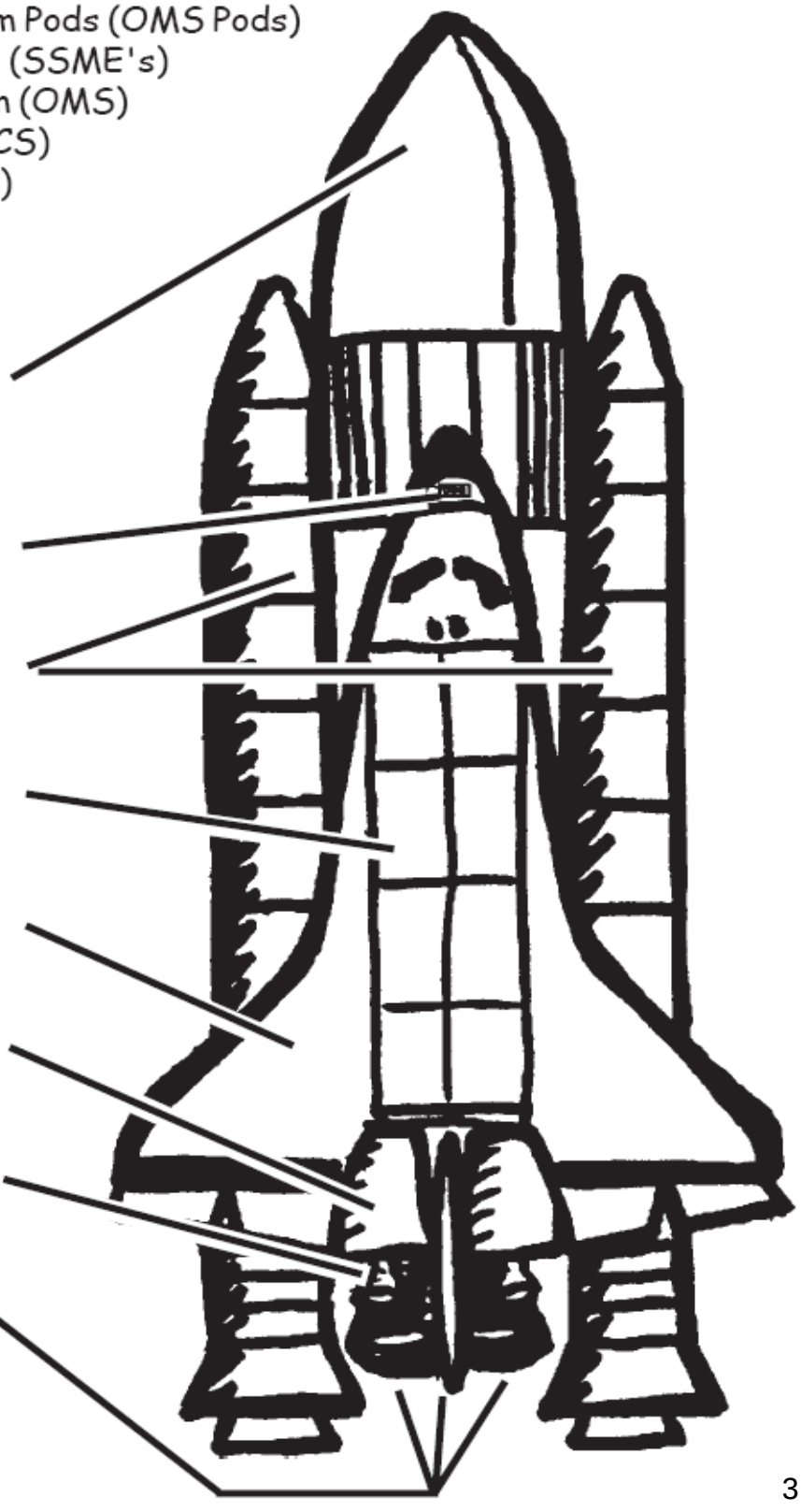
External Fuel Tank: The external fuel tank contains liquid hydrogen and liquid oxygen and powers the Space Shuttle Main Engines during lift-off and ascent. Once orbiter reaches orbit and main engine cutoff occurs, the ET is jettisoned from the orbiter at approximately 70 miles above Earth and falls back to Earth where it breaks up in the atmosphere before the remaining parts fall into the Indian Ocean. It is not reused or recovered.

SPACE SHUTTLE PARTS

TERMS

Orbital Maneuvering System Pods (OMS Pods)
Space Shuttle Main Engines (SSME's)
Orbital Manuevering System (OMS)
Reaction Control System (RCS)
Solid Rocket Boosters (SRB)
External Tank (ET)
Orbiter
Wings

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____



Space Shuttle Stack Construction

1. Color your space shuttle parts.
2. Cut them out
3. Put them together into the space shuttle “stack” on a piece of construction paper.