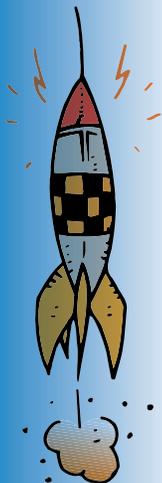




Lying Down on the Job



Doing research during space flight is not always possible - for lots of reasons. One of the ways to learn about how the body adapts during weightlessness is to use ground analogs - situations or environments on Earth that simulate the effects of space flight. **An analog is something that is similar to another thing.**

One of the most common analogs for the effects of space flight in humans is bed rest. Subjects volunteer to participate, and can spend anywhere from a few days to several months in bed! During bed rest, your body doesn't use muscles and bones for their usual functions (working against gravity and helping you stand up and move around). Subjects are in bed throughout the entire study - they eat and read in bed, and even use bed pans to go to the bathroom. They can take sponge baths, or if it is available, use a facility that lets a person shower while lying down.

During bed rest, subjects lose muscle and bone - just like astronauts, although the rate of loss is slower during bed rest. This is probably because we still experience gravity while in bed. Bed rest studies help scientists study changes that occur in space, and test ways to counteract the changes.

We are working with scientists at many institutions to conduct bed rest studies to study bone and muscle loss. Current studies are a 28-day bed rest study in Boston, Massachusetts, a 60-day study in Toulouse, France, and a 90-day study in Galveston, Texas. Can you point out these locations on a map? These studies require a great deal of work and many people. A lot of teamwork is involved to make sure everything gets done exactly as planned. These studies are difficult, but you can study more subjects, and collect more data, than is usually possible during real space flight.

The fact that we use bed rest as a way to study changes in bone and muscle and other body systems should show you just how important physical activity is to be sure you stay healthy. Sitting in front of a TV or computer for too long will cause your bones and muscles to start breaking down too!

Space Nutrition



Thea's Corner..

Now that you've learned about one of the analogs we use to study the effects of space flight on the body, let's think about other types of analogs. Can you think of other analogs of space flight? We'll be talking about other analogs in further issues. Here is a model of another kind - one you can make!



Cassini (cass-ee-nee) is an unmanned spacecraft that is studying Saturn and its moons. Here is a website where you can print out instructions and make a model of the Cassini spacecraft:

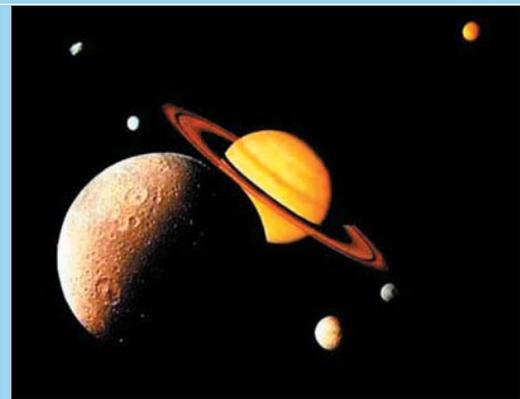
<http://saturn.jpl.nasa.gov/kids/models/pprmdl.pdf>

The model includes the Huygens probe, the remote sensing platform (which contains the imaging instruments or "cameras"), the fields and particles platform, and the Cosmic Dust Analyzer. Assembly requires only scissors and tape or glue (and some patience!). Assembly takes 3 to 6 hours. Good luck! Please email us pictures of the finished product when you are done!

Did You Know?



- The last 90-day bed rest study in Galveston was stopped earlier than planned, and just about everything at the Johnson Space Center was shut down for several days in September when we evacuated for hurricane Rita. This has been an active hurricane season for the Gulf Coast. Check out the web links for pictures of hurricanes taken from the International Space Station (ISS).
- November 2005 marks 5 years of continuous human presence in space. On November 2, 2000, the first ISS Expedition crew opened the hatch and set up a home away from home. The Expedition 12 crew will be on board for this milestone. Currently, the International Space Station weighs more than 404,069 pounds, and is 146 feet long and 90 feet high!
- Since 1961, more than 400 humans have traveled into space!



Word of the Month

buoyant

Can you guess what this word means? Look it up in the dictionary and see if you were right. We'll have more on this next month!

Web Challenge: Learn how and why the first American woman in space is helping kids design new toys, and other cool things at one of the web sites below:

<http://www.nasakids.com/>
http://www.nasa.gov/vision/earth/lookingatearth/hurricane_2005.html
<http://www.nasa.gov/audience/forkids/home/index.html>
<http://www.nasa.gov/audience/forstudents/5-8/features/index.html>



Check out Thea's Bonus Page, experiments you can try, and even stuff you may have done at our website:

http://haco.jsc.nasa.gov/resources/kid_zone.htm

email: Space.Nutrition.Newsletter@nasa.gov