

Effects of Space Flight

Microgravity

- In orbit objects are constantly falling and therefore experience microgravity (similar to no gravity)
- This means there is no constant force pulling things in any direction. This leads to several problems for people who are used to earth's gravity:
 - o *Bone and Muscle deterioration*
 - There is no force pushing on bones and resisting movement so your muscles and bones shrink like they would if you lay in bed for 6 months.
 - Astronauts combat this through weight training and cardiovascular exercise.
 - o *Blood pressure problems*
 - Blood is usually pulled towards your feet by gravity, without it the blood pressure in your head increases. This leads to headaches, and difficulty staying hydrated.
 - Astronauts combat this through the use of drugs.
 - o *Constant feeling of falling*
 - Since you constantly feel like you're falling, astronauts sometimes experience dizziness, disorientation, nausea, and difficulty sleeping
 - These symptoms are partially controlled with special drugs.

Considerations for Space Flight

- It is very costly to launch things into space so astronauts and engineers have to be very careful about what they bring with them. These things are tightly regulated in space:
 - o Food
 - Difficult to grow in space. Must be freeze dried to preserve for long periods.
 - o Oxygen
 - Needs to be brought from earth. Its use and concentration in the space craft is carefully tracked.
 - o CO₂
 - Can build up in the station and become toxic. Needs to be filtered out.
 - o Fuel
 - Very limited so the course of the station is changed only rarely.
 - o Electricity
 - Stored in onboard batteries, recharged from the sun using solar panels.
- The **psychological state** of astronauts is also important as they will be spending a lot of time with other astronauts in close quarters. It is therefore important to have free time, leisure activities, and good relationships among crew members.