



# Microgravity Orientation



## Particulates

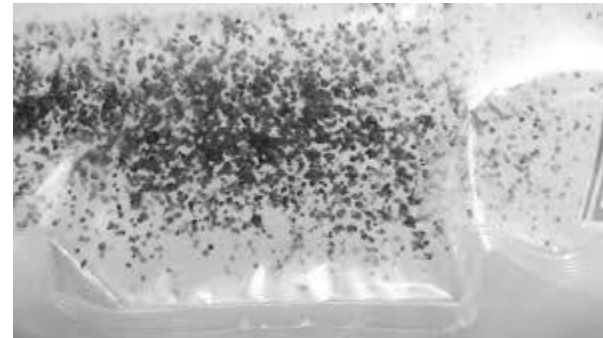
Microgravity is something most people are aware of in a superficial way, primarily through movies and television that depict space travel. Science educators, and students, can explain the concept of microgravity and free-fall using Newtonian physics. The purpose of this series is to increase your understanding of how microgravity effects the lives of astronauts during extended periods off the Earth, conducting science experiments, and working in space.

Particulates are any loose, solid objects, that detach or escape from a container and float freely in microgravity. For example, food particles like nuts or candy that drift away can find their way into electronics or machinery and potentially cause damage. Similarly, small items like screws, pieces of paper, tape pose the same problems. At the very least, free floating debris causes a distraction to astronauts and take time to track down.



Consider the following scenario. An astronaut needs to use a battery-operated device and discovers it is not working. When they open the

battery compartment, they see the battery has corroded. Their initial instinct is to take out the battery and blow the dried material (acid) off the terminals. This produces a cloud of toxic material that can be inhaled, or get into the eyes.



Another issue involving particulates is personal hygiene and detritus. Trimming fingernails and toenails, as well as combing hair produce copious amounts of floating material. The outer layer of skin cells (epidermis) is constantly being shed. During extended periods in space, especially with several crew members the amount of organic matter produced is significant. On Earth gravity pulls this material to the surface creating what we think of as dust. In microgravity this same material is moved about by laminar flow and often trapped by filters, but it can also end up being inhaled, ingested, or getting into the eyes.





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When designing hardware, or projects for HUNCH it is essential that we focus on avoiding situations where particulates are generated. Project designs must account for the lack of gravity that may assist movement, like pouring, and prevent the inconvenience and potential hazards associated with free floating material.

Washing hair in space

<https://www.youtube.com/watch?v=uIjNfZbUYu8>

Imagine what this would be like if it were pepper for your food or sand instead of water?

In space skin falls off your face (literally)

<https://www.youtube.com/watch?v=M9sF45rht-k>