

Sand Hand Fact Sheet

The sand hand demonstrates the basic properties of sand and other granular materials when placed in a vacuum.

COOL FACTS

- Sand behaves like a liquid. This is why it can be poured into containers of different shapes, always taking the shape of the container.
- It also demonstrates properties of solids, as we can walk on the beach without sinking.
- Sand is made up of rocks and shells that have been ground into tiny pieces by nature. Most sand, including the sand in the sand hand, is made up mainly of quartz.
- The grains of sand are not spherical, but have many flat sides and pointy corners, which allows them to rest against each other.
- When heated to about 2500 °F (1371 °C), quartz sand becomes glass.

Replace the box above with a picture. Write a two or three line caption for picture.

FAQ's

Q: How do you make sure that there is no air in the glove?

A: The vacuum hose is hooked up to the glove and the vacuum pump is left on continuously to make sure that all of the air has been removed.

Q: Why doesn't the glove return to its original shape after it is stretched?

A: When the glove is stretched, the sand rearranges itself to fill the new shape of the glove. There also is no space left for the sand to move back into.

Q: Why doesn't the glove burst when stretched?

A: The glove is made out of a stretchy material called latex. Latex is strong and does not tear when stretched reasonably.

Q: Why does the glove feel soft when there's air in it, but hard when there's no air?

A: Sand demonstrates properties of both a liquid and a solid. When there's air present in the glove, the liquid properties of sand allow the grains to flow over each other. When there's no air in the glove, the grains cannot move and are packed tightly together, so the glove feels hard.

RELEVANCE TO OUR LIVES: Sand and other granular materials are found all around us, both in our everyday lives and in industry. Understanding the properties of these materials is important in designing silos for farms. Granular materials are also found in all cements, concretes and blacktops, which are all used in building roads, parking lots and playgrounds.

RESOURCES:

The Basic Principles of Granular Flow:

<http://microgravity.grc.nasa.gov/6712/comflu/granularbasics.html>

Using Space for a Better Foundation on Earth – Mechanics of Granular Materials:

http://virtualastronaut.jsc.nasa.gov/va/teacherportal/pdfs/Mechanics.of.Granular.Materials.5_8.pdf

Mechanics of Granular Materials: <http://mgm.msfc.nasa.gov/mgm.html>

The International Sand Collector's Society: <http://www.sandcollectors.org>