

Powder Glove

The Action

Putting your hand in water without getting it wet.

Grade Level

Grade 9 - Fluids and Pressure

Grade 10 - Water Quality

Materials

- A 1- or 2-Litre beaker
- shaker bottle or fine sieve
- water
- container of lycopodium powder
- eyedropper
- OPTION: Other powders such as talc, cornstarch or flour and containers for each additional powder

Instructions

- Fill the beaker 3/4 full of water. Use the sieve to evenly distribute a layer of lycopodium powder over the surface of the water.
- Push one finger straight down below the surface of the water and straight back up. Observe the dust on your finger and the fact that your finger is still dry. Now insert four fingers straight down into the water and observe, through the side of the beaker, the bubbles attracted to your hand.
- Carefully lift the powder off the surface of the water and notice that it has not changed in any way.
- Use an eyedropper to place several drops of water on top of the lycopodium powder. Gently move the container and observe the drops of water as they roll across the surface of the powder.
- OPTIONAL: Using different powders, follow through steps 1-4 and note the differences between them and the lycopodium powder.

Safety

Care must be taken in handling and utilizing the lycopodium powder. Avoid inhaling lycopodium powder dust as its effects in the respiratory tract are not known and some people (especially asthmatics) are allergic to airborne lycopodium. Be careful with the powder around open flames as the dust is very flammable. Note that it is safe to wash the residues from this activity down the drain.

Hints

A fairly thick layer of powder may be needed to immerse the entire hand. The lycopodium powder can be filtered after the activity and saved for reuse in the next demonstration.

Science Principle

Lycopodium powder floats on the surface of the water because of the high surface tension of water. If you try the other powders mentioned above you will find that the talc will float for a while, but in time, the water will become cloudy from it; flour and cornstarch are too soluble on water to float for a long period of time. Since there is no attraction between the lycopodium powder molecules and the water molecules, the powder is said to be hydrophobic (water hating). For this reason, the lycopodium powder molecules tend to stay together, repelling the water and forming a water-resistant "glove" around your hand.