**Cornstarch Goo**

Properties solid and liquid

Make squishy non-toxic goo that hardens in your hands when you squeeze it, but flows like a liquid when you pour it.

**Here's How:**

1. Empty the box of cornstarch into a bowl.
2. Add 1-1/2 cups of water.
3. Add about 15 drops of food coloring. It's fine without color, too.
4. Mix the goo with your hands.
5. Have fun!

**What You Need:**

* 16-oz box cornstarch
* water
* food coloring
* bowl

## **IMPORTANT - Read This!**

The cornstarch will not stay mixed with the water indefinitely. Over time, the grains of cornstarch will separate from the water and form a solid clump at the bottom of the plastic storage bag. It is for this reason that **you must not pour this mixture down the drain**. It will clog the pipes and stop up the drain. Pour the mixture into a zipper-lock bag and dispose of it in the garbage.

## **How Does It Work**

The cornstarch and water mixture acts like a solid sometimes and a liquid at other times. This concoction is an example of a **suspension** (a mixture of two substances), one of which is finely divided and dispersed in the other. In the case of the cornstarch quicksand, it’s a solid dispersed in a liquid.

When you slap the cornstarch quicksand, you force the long starch molecules closer together. The impact of this force traps the water between the starch chains to form a semirigid structure. When the pressure is released, the corn- starch flows again.
All fluids have a property known as **viscosity**—the measurable thickness or resistance to flow in a fluid. Honey and ketchup are liquids that have a high resistance to flow, or a high viscosity. Water has a low viscosity. Sir Isaac Newton said that viscosity is a function of temperature. So, if you heat honey, the viscosity is less than that of cold honey. The cornstarch-water mixture, and real quicksand, are both examples of **non-Newtonian** fluids because their viscosity changes when stress or a force is applied, not when heat is applied.

What is quicksand, really? Quicksand is nothing more than a soupy mixture of sand and water, where the sand is literally floating on water. Quicksand is just solid ground that has been liquefied by too much water, and the term “quick” refers to how easily the sand shifts in this solid-liquid state. Quicksand is created when water floods or saturates an area of loose sand and the sand begins to move around. When the water in the sandy soil cannot escape, it creates a liquid-like soil that can no longer support any weight. If an exces- sive amount of water flows through the sand, it forces the sand particles apart. This separation of particles causes the ground to loosen, and any weight placed on the sand will begin to sink through it.
The quicksand phenomenon can be caused by flowing underground water rising to the surface or even an earthquake that agitates the sand. You are likely to find quicksand around riverbanks, lake shorelines, marshes, beaches, near underground springs or any place where an uprising of water oversaturates and agitates the sand.

The next time you are standing barefoot on the beach, think about the properties of quicksand. Normally, the grains of wet sand are compressed together tightly and this firm ground easily supports your weight. The friction between grains of wet sand is strong enough to make it easy to build sand castles. However, when the sand on the beach is flooded with an excess amount of water, the agitated sand particles begin to move, separate, and quickly wash away right out from under your feet.

## **Take It Further**

Pour the mixture onto the cookie sheet or cake pan. Notice its unusual consistency when you are pouring it onto the pan. Stir it around with your finger, first slowly and then as fast as you can. Skim your finger across the top of the glop. What do you notice?
Try to roll the fluid between your palms to make a ball. You can even hold your hand flat over the top of the pan and slap the liquid glop as hard as you can. Most people will run for cover as you get ready to slap the liquid, fearing that it will splash everywhere.
According to theory, the mixture should stay in the pan. Yeah, right! If your cornstarch-water mixture inadvertently splatters everywhere, you will know to add more cornstarch. When you are finished, pour the glop into a large zipper-lock bag for later use.