


Physics Quicksand Project

By Mackenna Ruffcorn and Rylie Reischauer,
Colo-NESCO High School

A dark blue diagonal gradient bar that starts from the bottom left corner and extends towards the top right corner, covering the bottom half of the page.

Problem



How do we make quicksand using only cornstarch and water? Will we be able to successfully make our hands sink?

Hypothesis

1. We think that our hands will sink.
2. We think it will be easier to move if we move our hand slow.
3. We think that it will be easier to take our hands out when they are relaxed.
4. We think the quicksand will stay put when we punch it.

Procedure

1. We will mix small amounts of water and cornstarch together (1 - $\frac{1}{4}$ cups of cornstarch to 1 cup of water)
2. Once mixture is made we will set our hands on top of the mixture to see if they sink
3. If it works we will move our hand really fast and really slow and see which is easier to move
4. Grab a handful of the mixture and pull it out slowly then relax your hand and pull it out slowly to see if there's a difference
5. Lastly we'll try punching the mixture to see if it splatters or stays put

Variables

Independent- the speed at which we move our hand

Dependent- how fast/if our hand sinks

Constant- Quicksand used

Control- plain water

MATERIALS NEEDED:



- Spoon
- Cornstarch
- Water
- Plastic mixing bowl

Results:

<https://www.youtube.com/watch?v=IExeK7EWwlc>

1. Our hands sunk when we placed them into the quicksand.
2. When we moved our hand fast there was more resistance than when we moved our hand slow.
3. It was hard to take our hand out of the mixture with our hand in a fist and our hand flat and relaxed.
4. When we punched the mixture it stayed flat and didn't splatter.

Conclusion:



1. Our hypothesis was right because our hands kind of sunk, but if the mixture would have been deeper, it would have sunk more noticeably.
2. Our hypothesis was right in that it was definitely easier to move our hands the slower we moved.
3. Our hypothesis was right because the quicksand stayed still when we punched it.
4. Lastly, our hypothesis was right because when we punched it, it didn't really move.

How it's Related to Physics

When limbs move beneath quicksand a vacuum pressure is created making the amount of effort need to move, greatly increase. The same vacuum effect is what causes certain consistencies of mud to pull shoes off of our feet. Quicksand is rarely deep enough for a whole person to submerge beneath it and it would be very hard for a person to do so considering our bodies are much more buoyant in quicksand than water.

Retest:

If we were to retest, we would make more of the mixture so that we could stick more of our arm into the mixture to see if it would sink. We also could have used a different recipe because the one we used kind of sucked and we had to wing it even though we figured it out.