

Non-Newtonian Fluids

Sir Isaac Newton declared that all liquids have a constant viscosity. Therefore a Newtonian fluid is one whose viscosity does not change with the rate of flow. An example of this would be water.

The mixture that will be studied today, however, is known as a non-Newtonian fluid, in that it doesn't have the same properties that most other fluids do. All non-Newtonian fluids share a common characteristic, their viscosity changes in response to pressure.

1. Describe the appearance of the cornstarch and water mixture.
2. Hold a spoon **vertically** and push it into the mixture. **Stop** if you notice any resistance.
3. Let the spoon slowly sink into the mixture about **an inch** deep under its own weight.
4. Now that the spoon is about an inch into the mix, will it stay standing up vertically if you let go of the spoon?
5. Stir it around very **slowly** with a spoon, first slowly and then increase your speed. What do you notice?
6. Try to spoon out some of the mixture. What did you notice?
7. Now, try to pour a little of the mixture. What happened to the cornstarch mixture when you tried to pour it?
8. Skim your finger across the top of the mixture. How did the cornstarch mixture feel when you touched it?
9. Does the cornstarch mixture have attributes like a solid or a liquid? Explain your answer.
10. Name at least two unusual characteristics of the cornstarch and water mixture.
11. What is a trait common to all non-newtonian fluids?
12. Considering that quicksand is very similar to the substance you studied in this experiment, using what you learned today, what would you do if you ever found yourself in quicksand?