# Activity: The viscosity of honey

The viscosity of honey ranges from runny to almost solid. In this experiment, you can compare the viscosity of several types of honey.

## Background

Viscosity is a measure of how much a fluid resists movement of a mass through it. It can be thought of as the ‘thickness’ of a liquid. Water is very ‘thin’ and has a very low viscosity, whereas honey is ‘thick’ and has a higher viscosity. An object will travel through water much faster than it does through honey.

Knowing the viscosity of honey is important. Many of the steps involved in extracting and processing honey are difficult to do if the honey is too viscous. For example, removing the honey from the honeycomb, filtering and putting honey into jars are all difficult to do if the honey is too thick and sticky.

Honey’s viscosity depends upon the amount of water and the type and amount of sugar it contains. If the concentration of water is increased, honey becomes less viscous. Temperature also changes the viscosity of honey, and heat is often used to make the honey easier to process.

## Aim

To compare the viscosity of different types of honey.

## Materials

50 ml honey samples   
50 ml measuring cylinder (one for each honey sample)  
Water bath at 37ºC (a chilly bin will work)  
A marble or small ball bearing  
Stopwatch

## Method

In this experiment, the viscosity of honey is measured by timing how long it takes for a mass to fall through a fixed volume.

1. Place 50 ml of each honey sample into separate measuring cylinders. Leave overnight to rest.
2. Place each sample into a water bath at 37ºC and bring to temperature. **Be careful – bumping, stirring or disturbing the honey will affect its viscosity.**
3. Place a marble or ball bearing on top of the honey and time how long it takes for the object to touch the bottom of the measuring cylinder.
4. Repeat with each of the other honey samples.
5. Use the results from the rest of the class as repeats of your experiment.

## Results

Measuring honey viscosity

|  |  |  |  |
| --- | --- | --- | --- |
| **Honey sample** | **Time taken (seconds)** | **Average time**  **(seconds)** | **Additional notes** |
| **A.** |  |  |  |
| **B.** |  |  |  |
| **C.** |  |  |  |
| **D.** |  |  |  |

Plot a graph showing type of honey sample versus average time taken to reach the bottom of the measuring cylinder.

## Conclusion

List the honey types in order from least to most viscous.

* What might cause the range of results observed for each honey type?
* What does this experiment show us about Mānuka honey?

## Extra for experts

Design further tests to find out:

* how temperature affects honey viscosity.
* how water content affects honey viscosity.