# Activity: The thixotropic nature of Mānuka honey

Mānuka honey is thixotropic. This means that it is solid when undisturbed, but becomes fluid when stirred or agitated. In this experiment, you can investigate Mānuka honey’s thixotropic nature.

## Background

Mānuka honey that has been sitting around for a while in the cupboard is thick and solid. You can turn a Mānuka honey jar upside down and the honey won’t pour out. However, if you stir the honey, it becomes runnier and will pour easily. This is because Mānuka honey is thixotropic. Tomato sauce also has a thixotropic nature - you often need to squeeze or shake it to get it to pour.

Watch the video [Honey is thixo-what?](https://www.sciencelearn.org.nz/videos/1030-honey-is-thixo-what)

 In this experiment, you can examine the thixotropic nature of Mānuka honey.

## Aim

To observe how long it takes for Mānuka honey to become solid again after being stirred.

## Materials

Mānuka honey
Ten 10 ml measuring cylinders
Water bath at 37ºC
Stirring rod
Small marble or ball bearing
Stopwatch

Note: Students prepare this experiment, leave overnight and complete the following day.

## Method

1. Label measuring cylinders with the time you plan to stir them. For example: 0 (not stirred), 9.00 am, 10.30 am, 12.00 pm and 1.30 pm.
2. Add 10 ml of honey to each measuring cylinder and place in a water bath at 37ºC overnight.
3. Stir your labelled Mānuka honey samples at intervals the following day.



1. After you stir the last two honey samples, measure the viscosity of all samples using the marble and stopwatch method – 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.
2. Use the results from the rest of the class as repeats of your experiment.

## Results

Record your results in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
|    | Time since stirring (hours)  | Viscosity (time taken (seconds))  | Additional notes  |
| Not stirred  |    |    |    |
|    |    |    |
| Stirred 9:00  |    |    |    |
|    |    |    |
| Stirred 10:30  |    |    |    |
|    |    |    |
| Stirred 12:00  |    |    |    |
|    |    |    |
| Stirred 1:30  |    |    |    |
|    |    |    |

Plot a bar graph showing time since stirring versus viscosity.

## Conclusion

* What is the viscosity of the honey before stirring?
* What is the viscosity of the honey after stirring?
* Did the honey become solid during this experiment? When?

## Extra for experts

Design an experiment to get a more accurate time at which the honey becomes solid again, using the same equipment.