

Try  
This

# Eating chocolate



*Cocoa pods growing on a tree in India*

**C**hocolate is very popular. But what happens if you melt and re-harden it?

You will need:

- 2 identical bars of chocolate – dairy milk works well.
- A warm place
- A fridge

## What you do

Leave both bars of chocolate in their wrapping.

Keep one of the bars of chocolate at room temperature. Melt the other one by putting it into a warm place such as on a radiator or in the hot sun. When it has fully melted, put it into the fridge to re-set. We will call this the melted chocolate although it has re-hardened.

Remove it an hour or so before you want to do the experiment and allow it to come up to room temperature.

Un-wrap both bars of chocolate. Try snapping each bar and then try eating chocolate from each. What do you notice? How are they different? It is probably best not to read 'What you may find' until you have tried tasting it.

You may need to repeat the taste tests a few times to make sure!

You may notice that the normal chocolate makes a distinctive noise when you break it. This is called 'snap'. The melted chocolate does not normally do this – it is much softer. Sometimes the melted chocolate seems to have a more intense flavour. The normal chocolate seems to cool the mouth. The melted chocolate often seems 'grainier' and less smooth than the normal chocolate.

## What you may find

## What is going on?

You added nothing to the chocolate so exactly the same atoms are present as were there at the start. The way the atoms are arranged and the structure of the components have changed. In particular, one of the ingredients of chocolate, cocoa butter, can have many different structural forms which can easily be converted from one to another. The forms have different melting points.

When the chocolate is melted and put in the fridge it usually changes to a form with a lower melting point than the original chocolate. This causes a change in the properties. In the original chocolate, the melting point is about the same as body temperature, 37°C. Melting is an exothermic process so tends to cool the mouth. The melted chocolate has a lower boiling point so no longer has the cooling effect. It melts more quickly, however, which causes the flavour to be released faster.

*Vicky Wong is Chemistry editor of CATALYST.*



*Cocoa butter is a fat, extracted from seeds in the cocoa bean.*