

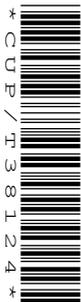
**ADVANCED SUBSIDIARY GCE  
APPLIED SCIENCE**

**G623/INSERT**

Unit 4: Cells and Molecules

**PLAN FOR AN INVESTIGATION  
INSERT**

For issue on or after: **17 NOVEMBER 2007**



**INSTRUCTIONS TO CANDIDATES**

The extracts on pages 2 and 3 of this insert are to give you some background that you might find helpful in planning for the task that follows. Not all the information included will be directly relevant and you are expected to select the information which is relevant to the task.

This document consists of **4** printed pages.

## Information on Juicing Pineapple

Pineapples don't ripen after they're picked, so make sure they are ripe in the shop before buying. To tell whether a pineapple is ripe and ready for juicing lift it, squeeze it, and smell it. The fruit should be heavy, which means it's juicy; the skin should yield slightly to a gentle squeeze; and the aroma should be sweet.

Pineapple juice contains the enzyme bromelain. Bromelain is a natural digestive enzyme that also has anti-inflammatory properties.

Bromelain is found in highest concentrations in the rind of the pineapple, only juice the rind if you know the pineapple has been grown organically.

Pineapples used to be used to prevent scurvy in sailors who were passing through the tropics as pineapple juice is a good source of vitamin C.

A native of the Americas, the pineapple was named pina by the Spanish because of the fruit's likeness to a pine cone.

## Why Pineapple is Good for You

Most people will be familiar with the practice of placing a pineapple ring or two onto a cooked gammon steak, but would they know why, other than it's a great food combination? Pineapple is a rich source of the bromelain group of enzymes, which break down protein. That makes pineapple a natural meat tenderiser *and* a digestive aid.

Bromelain has also been used successfully as a digestive enzyme following pancreatectomy, in cases of pancreas insufficiency, and in other intestinal disorders. The bromelain enzyme has an anti-inflammatory action. A combination of bromelain and quercetin (which is commercially available) is beneficial for complaints such as gout, rheumatism and arthritis. Quercetin is a plant pigment found in red wine and some vegetables and fruits (e.g. cranberry, apples, onions) which can inhibit the formation of uric acid crystals. Pineapple juice is rich in the mineral manganese, which has been found to be reduced by up to two-thirds in women suffering from osteoporosis.

## **A Warning About Jelly**

Jelly (that's the wobbly, children's party food, not American 'jam') made with fresh pineapple does not set. This is because jelly consists of gelatin (a protein) which is insoluble. Bromelain in the fresh pineapple degrades the gelatin to form amino acids, which are soluble. Jelly made with processed pineapple does set because, during the canning process, pineapple is heated to a temperature high enough to alter the bromelain enzyme (a protein itself) making it inactive. So, you get set jelly.

## **Photographic film**

The silver grains on fogged and developed film are embedded in a thin layer of gelatin. The gelatin is supported by a thin sheet of translucent acetate sheet.

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*Copyright Acknowledgements:*

"Information on Juicing Pineapple"  
"Why Pineapple is Good for You"  
and "A Warning About Jelly"

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