Key Stage 4 – Sweet success

Pupil worksheet

Sugar vs sweeteners

Soft drinks, chocolate, ice cream...most people love sweet foods. Unfortunately, eating too much sugar can lead to conditions like obesity and diabetes.

The food industry uses sweeteners to replace sugar. These taste sweet but contain far fewer calories than sugar because during digestion they are not broken down into glucose so therefore cannot be taken up by the bloodstream and used in respiration.

However, they have disadvantages. Sweeteners may taste slightly bitter and many do not behave in the same way as sugar when cooked. They are tainted with the opinion that many hold they are bad for our health, having been linked to cancer and other illnesses, although there is no scientific evidence to back these claims up.

Many food companies are looking for 'natural' low calorie sweeteners that will appeal to calorie conscious consumers.

Chirality as a solution?

There are many natural sugars including sucrose, fructose and glucose. These molecules are chiral and so have different forms (called enantiomers) which are mirror images that have a different structure.

These enantiomers taste sweet, are completely natural but contain very few calories - are they the perfect sugar substitute?

Your task

Tagatose is an enantiomer of fructose, the sugar found in fruit. Your task is to persuade the soft drinks manufacturer Popsi to use it in their drinks (rather than the artificial sweetener aspartame)

What to do

1. Research into tagatose.
2. Write an email to the director of Popsi persuading them to use tagatose in their drinks. Explain:
   - What it is
   - Why it tastes sweet
   - Why it has fewer calories than sugars
   - Why their customers would want to eat foods that it contains
   - How you know it's safe
   - How it can be made cheaply
3. Swap emails and write a reply as the director. Give feedback on how persuaded you are and why.

http://www.oxfordsparks.net/animations/give-us-hand
### Writing the email

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<tr>
<th>To: <a href="mailto:director@popsi.com">director@popsi.com</a></th>
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Follow these tips to help you write a piece of persuasive writing.

- At the start of your email grab the reader's attention.
- Explain how you will solve their problem - be positive!
- Use evidence – back up what you say by using facts or data from reliable sources
- Use ‘you’ and ‘we’ to make it personal
- Include questions to make the reader think
- Repeat your key points throughout

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Writing the reply

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Are you persuaded? Write a reply email saying whether you will consider using tagatose and why.

- Do you believe what they claimed? Did they explain all the key points using correct scientific terminology? (look for keywords: chiral, enantiomer, receptor, energy, calories, respiration)
- Was their writing well constructed and ordered?
- Did they answer all your questions? Is there any other information you felt you needed which they didn’t include?