LENScience Bringing Schools and Scientists Together

Biology 2.2 Internal Assessment Resource

Folate in Bread

Supports internal assessment for:

Achievement Standard 90769 v1

Research the interaction between humans and an aspect of biology

Disclaimer: This assessment resource has been prepared LENScience teachers for use by schools to assess AS 90769 v1. All effort has been made to ensure they requirements of the standard have been met; however, this task has not been moderated.

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Teacher Guidelines:

The following guidelines are supplied to enable teachers to carry out valid and consistent assessment using this internal assessment resource. These teacher guidelines do not need to be submitted for moderation.

Context/setting:

This activity relates to how biological knowledge of the effects of folate on the embryo meets a human need or demand through the mandatory fortification of food with folic acid. Students are expected to collect information from secondary sources but some use of primary sources is acceptable (EN 2). Material from the "Nutrigenomics - Food to match your genes" workshop may also be used.
(http://lens.auckland.ac.nz/index.php/Nutrigenomics:_Food_to_Match_your_Genes)

Conditions:

This assessment task must be carried out under conditions that meet both the school Assessment policy and NZQA Assessment Guidelines. These conditions should be specified in the appropriate place provided on the Student Instructions sheet. Sufficient time will need to be given to ensure students have opportunities to access a wide range of appropriate resources, process and interpret the information gained and prepare their final report.

It is expected that students carry out their research and compile their presentation with teacher supervision. Checkpoints could be established over the duration of the research time where students conference with the teacher in order to check and clarify ideas.

Resource Requirements:

Students will require access to a range of sources of information on this issue.
Access to computers may be required.

Student Resources:

LENScience Nutrigenomics – Food to Match Your Genes
http://lens.auckland.ac.nz/index.php/LENScience_Special_Events_-_Students

Teacher Resources:

LENScience Teacher Professional Development Seminar Nutrigenomics: A Context for Teaching Year 12-13 Biology. http://lens.auckland.ac.nz/index.php/NUTRIGENOMICS

Other sites to support teachers and students to meet the criteria in the standard:

Database for secondary information sources

Epic Data base www.tki.org.nz

Integrate resource material into their own words.

What is Plagiarism? http://www.cite.auckland.ac.nz/index.php?p=plagiarism
Learnt to recognise plagiarism tutorial http://www.cte.usf.edu/plagiarism/plag.html

Selecting What is Relevant / Trash or Treasure
http://esolonline.tki.org.nz/content/download/5422/31950/file/relevance.doc

Dot–Jot Note making template
http://www.tki.org.nz/r/ict/ictpd/downloads/dotjot_templates.pdf

Referencing

It is good practice for students to record their sources of information so they are accessible by others, however, the need for referencing does not preclude achievement at any level.

Students should, however, still be encouraged to reference any diagrams, graphs, quotes (with quotation marks) and the processed/ integrated information in the body of their report in any format that is appropriate. For example, by referring to named sources/ individuals with dates in brackets or footnotes. This also helps to identify how well the information researched is integrated and evaluated. Integration at Merit and Excellence grades means that the student has used information from at least two different sources in either the same paragraph or a logical sequence of paragraphs.

Auckland University provides an online tool that produces references in the correct format e.g. APA http://www.cite.auckland.ac.nz/index.php?p=quickcite

Additional information:

Presentation methods such as poster, PowerPoint or newspaper articles tend to limit the ability of students to reach Excellence level as these formats make it hard to produce a "discussion". If these formats are used, care must be taken to ensure that good students are able to produce a "discussion" for Excellence.

It is useful to take in the research material with the presentation. This allows the teacher to check that information is in the student's own words rather than copied directly from the source without being in quote marks, as well as allowing references and referencing to be checked.

Folate in Bread

Achievement Standard 90769 v1
Research the interaction between humans and an aspect of biology
Credits: 3

Student Instructions Sheet

Introduction

Mandatory bread fortification with folate

Thursday, 16 July 2009, 10:57 am
Press Release: Paediatric Society of NZ

Mandatory bread fortification with folate

The Paediatric Society of New Zealand and the Royal Australasian College of Physicians, New Zealand Paediatric & Child Health Division strongly support the mandatory fortification of bread with folate. Folate is essential for human health and reproduction and the modern New Zealand diet does not contain sufficient folate.

New Zealand and Australia have a jointly agreed set of standards covering food safety. Under these standards both countries agreed to start fortifying bread with folate in 2009. Australia introduced folate fortified flour in September 2009, but the New Zealand government has deferred this until 2012.

In your research you will be looking at the biology behind why the fortification of bread with folate is considered necessary and the human need or demand this meets.

Conditions
<<insert information about conditions such as - Task 1 time allowed for research. For example 1 week of class time and three weeks of homework time. Task 2 Individual write up using researched material. One week of class time starting on _____.>>

Task 1 – Preparation for research

Your research is going to be about the **fortification of bread with folate**. In your research you should be collecting information about the human need or demand for the fortification of bread with folate and the biology relating to this.

Brainstorm:

What do you already know about this topic?
What do you want know i.e. what questions do you have about this topic?
Where do you think you could find the answers?

Do some initial reading / research to refine this topic down to a series of questions to focus your research.

Task 2 – Research your topic

1. In your research you should be collecting information about the human need or demand for the fortification of bread with folate and the biology relating to this. For example:
   - The human needs or demands that caused the government to consider fortifying bread with folate
   - How the fortification of bread with folate helps meets human needs or demands
   - Important biological concepts and processes related to the fortification of bread with folate
   - Any factors that are important to the use or carrying out of fortification
   - Any implications that result from the use or carrying out of fortification.

   These statements are starting points only, to indicate the kind of evidence you will need to produce a report in Part C below.

2. Keep a record of the sources of all the researched information so that it can be used to produce a **reference list** with the report.

3. Organise your research notes and copies of research material into a <<insert information about how the research is to be organised e.g. logbook, scrapbook, portfolio, clearfile folder etc>>.

4. Go through the researched material and highlight or tag the key ideas (e.g. colour highlighting, stickies, annotations etc). This will help you to quickly access key ideas from your researched material when you are writing your report.

Task 3 – Presentation

Produce a presentation written in your own words to integrate information and data that you have researched from a range of different sources to discuss:

- The human need or demand for the fortification of bread with folate.
- The important biological concepts and processes related to the fortification of bread with folate.

NOTE:

1. The presentation will be assessed on your understanding of the human need or demand and the biological ideas, concepts and processes related to the technique and not on its presentation. It should be appropriate for use with Year 12 non-biology students.

2. To ensure all data/quotes/graphs/diagrams/maps, etc. that you used can be checked and authenticated, any references used as information sources should be acknowledged with them in the body of the report. A small amount of information or facts can be copied but it must be written in quote marks and have the reference beside it in the body of the presentation. See instructions below.

3. If you have collected actual data yourself, record the following information with the presented data: date of collection, name and position of the persons interviewed.

4. Include a reference list of sources used, recorded in a way that the source can be located.

Authenticity of Ideas, Facts and Quotations used in the body of the report:

To ensure all sources can be checked and authenticated, any facts / ideas / data / quotes / pictures / diagrams / maps, etc from your reference sources should be acknowledged at the point where they are used in your report. This can be done in the form:

- Author's surname, date of publication, page numbers, in brackets.
  e.g. (Smith, 1998, p293)

This appears in the text of your report immediately after the sentence in which the material has been used.
e.g.
The Whale Liberation Society believes that whales are sacred animals and should never be killed (New Zealand Herald, Jan 10th, 2006)

This may also be done in the form of <u>footnotes</u>. This involves the use of a number in the text next to your quoted material which refers to the author, data of publication and page numbers (or Internet site) listed at the bottom of the page.

e.g The Whale Liberation Society believes that whales are sacred animals and should never be killed …….[1]

Reference List

Any references used as sources of information / facts / ideas / data / quotes / pictures / diagrams / maps, etc in your final report should be acknowledged in a reference list. It is recommended that you use the American Psychological Association (APA) referencing system. Auckland University provides an online tool that produces references in this format http://www.cite.auckland.ac.nz/index.php?p=quickcite

[1] New Zealand Herald, Jan 10th, 2006

Assessment schedule: AS90769v1 Folate in Bread

To be awarded the grade (A, M or E) the student must meet the holistic judgement statement at the top of the column.

Judgement for Achievement	Judgement for Achievement with Merit	Judgement for Achievement with Excellence
The student is able to **research** information on an applied biology technique in a presentation and **describe** both the **use of an applied biology technique** in relation to **human need/demand** AND the **biological concepts and processes** used in technique. <u>*Describe*</u> requires the student to define, give characteristics of, or an account of.	**As for achieved and explain** aspects of EITHER the use of an applied biology technique in relation to human need/demand OR the biological concepts and processes used in technique <u>*Explain*</u> requires the student to provide a reason as to how or why something occurs	**As for achieved and discuss** aspects of EITHER the use of an applied biology technique in relation to human need/demand OR the biological concepts and processes used in technique <u>*Discuss*</u> requires the student to show understanding by linking several biological ideas. It may involve justifying, relating, evaluating, comparing and contrasting, or analysing.
Evidence for Achievement	**Evidence for Achievement with Merit**	**Evidence for Achievement with Excellence**
Excerpts from reports as examples of description: • *Fat and cholesterol enter our body through our diet and cholesterol is made by our liver. As cholesterol builds up in our arteries it forms plaques which restricts the blood flow in our coronary arteries[3]. This disease is called atherosclerosis. If the disease is not treated then it could lead to chest pains and heart attacks.[6]* • *The balloon catheter is then inflated, then deflated and removed. When it is inflated, the balloon catheter pushes the plaque against the artery wall and thus creates a channel in the artery through which normal blood flow can resume (Miller, 2005). Sometimes a*	*Excerpts from reports as examples of explanation:* • *Sometimes fissures are made in the plaque by the balloon as it inflates because the plaque is so brittle as a result of calcification. The patient may experience chest pain during inflation since the entire coronary artery is blocked momentarily, preventing blood flow to the heart muscle (Adcock 2006).* • *An increasing prevalence of obesity and diabetes, a more sedentary life style and an ageing population have seen a dramatic increase in coronary artery disease[4]. Because of this increase and the long waiting lists for surgery that result, angioplasty is a very*	*Excerpts from reports as examples of discussion:* • *The idea of angioplasty was to bring a patient in the midst of a heart attack into a catheterisation laboratory and to instantly open the blocked artery. This had the effect of halting the infarction, restoring blood flow and minimising the damage done to the heart tissue. As a result of the use of angioplasty during a heart attack the patient also had decreasing risk of future heart attacks and sudden cardiac death (McGilloway 2006). This is because the procedure had eliminated or reduced blockages in the coronary arteries thereby reducing the number of episodes of*

stent is placed in the artery to help keep the artery open. • *The development of dialysis (artificial kidney) has provided a precious lifeline to patients with ESRD, allowing them to remain alive when their kidneys have stopped working completely and permanently (http://www.healthsystem.virginia.edu/).* ***<< Include an annotated script showing descriptions as an example of evidence for achievement>>***	*important procedure that can be performed in a quick, non-invasive way.* ***<< Include an annotated script showing explanations as an example of evidence for achievement with merit>>***	*angina and the need for long term medication.* • *Angioplasty is quick and non-invasive procedure. Prior to the development of angioplasty, patients would have to have coronary by-pass surgery, which, in comparison, is not as safe and definitely not as quick to perform. Patients undergoing angioplasty remain in hospital for one night only meaning they don't tie up hospital resources for long. Whereas coronary by-pass surgery takes a lot longer to recover from. Also, angioplasty requires only local anaesthetic, so recovery time is short meaning people can return to normal life and work quickly.* ***<< Include an annotated script showing discussion as an example of evidence for achievement with excellence>>***