

Biology 1.2 Internal Assessment Resource

Diabetes: An Issue for My Community

Supports internal assessment for: Achievement Standard 90926 v1 **Report on a Biological Issue** Credits: 3

Disclaimer: This assessment resource has been prepared by LENScience teachers for use by schools to assess AS90926v1. Every effort has been made to ensure the requirements of the standard have been met; however, this task has not been moderated.

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Teacher Guidelines:

The following guidelines have been written to support teachers in the implementation of this internal assessment task and to assist teachers in providing a valid assessment task that is consistent for all students.

Background:

This assessment task is a directed research assignment in which students collect and process primary or secondary information from a range of sources. The teacher may provide these resources.

At Level 1, teacher direction sets the scope of the research by:

- choosing the issue that students will report on. In this case it is 'Diabetes An Issue for My Community'.
- providing templates that students can use to report and process information, to make the necessary links between the biological information; to explain different views/outlooks/opinions on the treatments, risk factors and/or prevention strategies used to treat Type 2 diabetes; and to reference and evaluate the sources of information they have used.

Direction also means that teachers can interview students to give advice on their progress. Draft reports and notes from student interviews can assist in providing evidence for authenticity.

From the prior teaching (see Science Unit Plan '*Diabetes – An Issue for My Community*') students will have a basic understanding of the biology behind this disease and will be familiar with some of the key treatments, risk factors and prevention strategies. From their engagement with the prior teaching, students will also be familiar with the impact that Type 2 diabetes is having on New Zealand communities. Provided with an overview of the different perspectives that scientists, healthcare professionals and community groups have with respect to the health issues associated with Type 2 diabetes, students are encouraged to explore how different approaches are being used to address one of the major epidemics of our times.

The assessment task consists of several parts, structured to allow students to progress through a series of steps that will lead them to presenting their findings.

- 1. After the conclusion of the prior learning in class, students are given the big picture question 'What can be done?' They refine this question to set a clear focus for their research, e.g. Prevention exercise, diet or both. Risk factors mother's diet or age? Biology of obesity genes or environment?
- 2. Students write research focus questions and list key terms to inform their search for relevant material. Teachers need to check that students have selected questions and terms that will allow them to meet all the requirements of the standard; specifically that students will be able to detail the biology related to their chosen topic and report on a range of views/perspectives/outlooks, justify their position on the issue and make recommendations for future action.
- 3. Students collect and process information for their report from at least <u>three</u> sources. The teacher can provide these or the student can carry out their own research. The sources of information used need to be recorded in a format that allows others to access them in the future. Students and assessors need to be able to verify the information gathered from the web pages, book pages, magazine pages and/or journal articles used. In order to achieve with Excellence, students must evaluate their sources of information with respect to how useful or relevant they are in answering the research questions. Note: for the purposes of this standard, all material may come from one type of source, e.g. the

internet. However students are encouraged to access a range of different types of sources, as would any good researcher. Websites used may look at the research questions and come from different perspectives (e.g. scientific, social, cultural) to help them gather information from a range of perspectives. LENScience Diabetes © Liggins Institute 2011

- 4. Processing is required for Achievement, Merit, and Excellence. Strategies such as Dot-Jot-Evaluate, Venn diagrams, structured overviews, data charts, listing, sorting, collating, highlighting or underlining relevant information can be used to provide evidence of processing. Student research notes and source material should be organised and handed in as part of the authenticity process.
- 5. Students link the processed information to their research topic and key questions. Covering the key biological ideas and outlining the different views/outlooks/opinions on the treatment(s), risk factors and/or prevention of Type 2 diabetes, students will then explain and justify their position on the issue. Based on the research they have conducted, students will conclude by making a recommendation for action which addresses the question 'What can be done?'

It is recommended that teachers implement regular checkpoints to monitor student work. Progress noted during these checkpoints may assist in ensuring the authenticity of the student work.

The overall level of performance required for achieved, merit and excellence is summarised below. Less able students may be working towards achievement with teachers directing them to ensure they have the opportunity to meet all parts of the standard necessary for achievement. From 2011, this standard meets the requirements for literacy at Level 1; achievement of this standard will earn students three of the ten credits needed for literacy.



Cross-curricular collaborative planning and assessment:

Students can now meet the requirements for NCEA Level 1 literacy by achieving 10 credits from a selection of specified Achievement Standards, including AS90926 (Biology 1.2). Check whether your school will be using the new **10 credit** literacy requirement **or** the current **8 credit** literacy requirement with previously specified Unit and Achievement Standards. If using the new 10 credit requirement, inform students that this task will go towards meeting their literacy requirements for Level 1.

(http://www.tki.org.nz/e/community/ncea/pdf/lit num 10jun10.pdf)

The New Zealand Curriculum (2007) has achievement objectives across the learning areas that relate to futurefocused issues including sustainability and citizenship. This gives the potential for different learning areas, e.g. Science, English, Social Sciences and Health and Physical Education to use the same learning context, in this case 'Diabetes – An Issue for My Community'. Students may be invited to develop an understanding of an issue that is relevant to them in their community from the multiple perspectives of different learning areas and may be assessed against the respective subjects' achievement specifications.

Achievement Standards across the learning areas require students to use their research skills. These skills are the same no matter which area the student is working in and, again, it is appropriate for these areas to collaborate. Students may be familiar with skills used in one subject area, but do not intuitively apply them across subject areas. The use of common terms and strategies to develop research skills (e.g. trash and treasure, skim and scan, presenting a report) aims to support student learning and achievement across the curriculum. Furthermore, subject teachers can use this opportunity to reinforce skills and establish consistency in the requirements for referencing or the interpretation of symbols/graphs.

Conditions/setting:

This assessment task must be carried out under conditions that meet both the school Assessment Policy and NZQA Assessment Guidelines. These conditions must be specified in the appropriate place provided on the Student Instruction Sheet.

This assessment activity is an open-book research assignment and is to be done individually. As a guide, it is expected that the research component could be completed in 4–5 hours with a further 2–3 hours required to complete the report. Students can present their research as written reports or in a combination of written/oral/visual formats. Whatever the format(s) of the assessment, evidence used by the assessor to make the overall judgment on student work, should be collated and stored for the purposes of internal and external moderation.

Resource requirements:

Ideally, students will have access to computers and the internet.

Students need to use at least **three** discrete sources of information, which may or may not come from one source type (e.g. the internet). These can be primary or secondary data and/or information.

- Primary information could be a student collecting information by interviewing someone with Type 2 diabetes, asking questions of a scientist via the LENScience Year 11 Diabetes Wiki Community or interviewing a health worker or other expert.
- Secondary information is information previously collected and processed by another person. This may include science magazines, science internet sites, science research posters and healthcare groups (e.g. Diabetes Association).

The LENScience website (<u>http://lens.auckland.ac.nz/index.php/Science_Research_Stories</u>) lists up-to-date and relevant secondary sources of information on the biology, different views/outlooks/opinions on the treatments, risk factors and/or prevention strategies for Type 2 diabetes. Teachers are encouraged to supplement and up-date this resource as advancements are made.

Student Resources:

LENScience Reading 'Children Programmed for Obesity – A Global Problem' LENScience National Education Event Year 11 Science: Diabetes – An Issue for My Community (Broadcast Term 2, 2011) Ministry of Health: <u>http://www.moh.govt.nz/diabetes</u> Diabetes Projects Trust: <u>http://www.dptresources.org.nz</u>

Teacher Resources:

Teacher PowerPoint: 'Diabetes – An Issue for My Community' 'A Portrait of Health – Key Results of the 2006/2007 New Zealand Health Survey' (NZ Ministry of Health): <u>http://www.moh.govt.nz/moh.nsf/pagesmh/7601/\$File/diabetes-ch3.pdf</u>

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

- <u>Find a range of resources</u>. Epic Data base: <u>www.tki.org.nz</u>
- <u>Processing Information into own words.</u>

What is Plagiarism?: <u>http://www.cite.auckland.ac.nz/index.php?p=plagiarism</u> Learn to recognise plagiarism tutorial: <u>http://www.cte.usf.edu/plagiarism/plag.html</u> Selecting What is Relevant / Trash or Treasure: <u>http://esolonline.tki.org.nz/content/download/5422/31950/file/relevance.doc</u> Dot–Jot Note making template: <u>http://www.tki.org.nz/r/ict/ictpd/downloads/dotjot_templates.pdf</u> <u>http://www.slideshare.net/nzhistory/dot-and-jot-notetaking</u> Raft activity: <u>http://daretodifferentiate.wikispaces.com/R.A.F.T.+Assignments</u>

<u>Referencing</u>

Students are required to record their sources of information so they are accessible by others. Students can also be encouraged to reference any diagrams, graphs, quotes (with quotation marks) and the processed information in the body of their report in any format that is appropriate. Useful sites: <u>http://www.cite.auckland.ac.nz/index.php?p=electronic_sources</u> <u>http://www.library.auckland.ac.nz/subjects/med/pdfs/apa-guide.pdf</u>

<u>Evaluating Sources of Information</u>

The National Library of New Zealand Service to Schools webpage gives websites that have strategies to help students develop the skills needed to evaluate sources of information: http://schools.natlib.govt.nz/21st-century-literacy-inquiry/school-libraries-21st-c-literacy/skills-support-inquiry#Evaluating%20information

Also at: <u>http://www.cite.auckland.ac.nz/index.php?p=electronic_sources</u> <u>http://school.discoveryeducation.com/schrockguide/eval.html</u>

Diabetes: An Issue for My Community

Achievement Standard (insert AS number) v1 Report on a Biological Issue Credits: 3

Student Instructions Sheet

Inquiry into Obesity and Type 2 Diabetes in New Zealand

(from a report presented in 2007 to the New Zealand House of Representatives)

- Obesity and Type 2 diabetes are crucial issues for New Zealand; they adversely affect the health of many and negatively impact the social and economic welfare of all New Zealanders.
- These "epidemics" have the potential to overwhelm the health system if left unchecked.
- These epidemics impact disproportionately on Māori and Pacific people. The trends in children and young people are particularly worrying.

The Facts:

- One in 20 adults has been told they have diabetes, about 157,100 New Zealanders.
- One in seven adults aged 65 years and over have diabetes.
- Pacific men and women are three times more likely than the rest of the population to get diabetes. Asian and Māori men and women follow closely behind in being at high risk.
- Adults living in the poorest neighbourhoods are more than twice as likely to have diabetes than adults living in the wealthier neighbourhoods.
- One-third of the increase in the incidence of diabetes seen today is due to obesity. Even if all the current programmes to reduce obesity were successful, the number of New Zealanders with diabetes would still increase.
- Diabetes cannot be cured but science can be used to help prevent or control this disease.

The Question: What can be done?

Introduction

In this activity, you will research and present your findings on an aspect of the treatments, risk factors or prevention strategies for Type 2 diabetes.

You will be assessed on how well you:

- Decide on your research topic and develop key research questions.
- Collect and process information relevant to your selected topic.
- Evaluate your sources of information to show how they are useful.
- Report on the biology linked to your topic.
- Report on the different ideas that people are working on, or the opinions that people have about your topic.
- State and justify your own opinion or position on the issue.
- Make a recommendation for action, based on your research.

Conditions

Insert conditions for time available, when checkpoints must be done by, resources that are available, and requirements for individual work and authenticity.

Task One: Develop Your Own Research Questions

- a) Decide on your research topic it can be about the treatments, risk factors or prevention strategies for Type 2 diabetes. Some examples of topics include:
 - Treating diabetes with insulin? The past, present and future.
 - The Type 2 diabetes epidemic is it caused by our environment or our genes?
 - Prevention of obesity = Prevention of Type 2 diabetes?
 - Effective treatments: is it exercise, diet or both?
 - Prevention if we cannot change our genes, can we change our lifestyle?
 - Does the diet of the mother during pregnancy increase the chance of the child developing Type 2 diabetes?
 - Why do so many Pacific peoples have Type 2 diabetes? Could it be the Thrifty Gene Theory?

Two questions that everyone will need to answer are:

- Question 1: Why is Type 2 diabetes an issue in our community?
- Question 2: What is the biology behind Type 2 diabetes?
- b) Develop **two more research questions** around your chosen topic. These research questions will focus your research around **different approaches** or **viewpoints** or **areas of research** on your topic.

To help you get started, use what you have learnt previously in class, from the National Education Event '*Year 11 Science: Diabetes – An Issue in my Community*' and two or three of the resources provided by your teacher about your topic. Draw up a concept map (see Template A) to identify what you already know and what you need to find out about your topic, remembering you need to find out about the biology as you do your research.

<u>CHECKPOINT 1:</u> Confirm your research topic and questions with your teacher.

Task Two: Collecting and Processing Information

c) You now need to collect and process information relating to your research questions from at least <u>three</u> different sources. To help you do this develop a <u>chart</u>, e.g. a data chart (Template B) or Dot-Jot-Evaluate (Template C), where you can record and organise relevant material.

Write the research question at the top of the column or table. List each source you use in a way that allows someone else to find that source of information. Note whether it is useful or not.

- d) When you first look at each source skim over the surface of the information, looking at the title, headings and the first and last sentences of paragraphs to see if any of your main ideas are touched on in your source. Making a list of <u>key words</u> that link to your research focus before examining your source will allow you to quickly scan the source to identify whether or not it talks about your main ideas.
 - Evaluate how useful or relevant it is in answering your research questions. Note down why or why not it is useful on your <u>chart</u>. Use questions like:

Is the biology accurate? e.g. not sure – the words were too complicated so did not use.

- Is the information useful? e.g. yes it gives someone's personal experience.
- Is the information accurate? e.g. yes it is from the government-owned website.
- Is the information up-to-date? e.g. yes the statistics are from the past 3–5 years.

• List each source in a way that allows someone else to find that source of information.

For a book include the title, author, name of publisher and year published.

For a website include the URL or address – make sure this is the page where you got the information from.

For an article from a magazine or journal include the title of the article, the author, the magazine title and the date it was published.

For an interview, include the name of the person and the date you spoke with them.

<u>CHECKPOINT 2</u>: Confirm your method for recording sources of information.

Confirm the sources you plan on using will provide relevant information.

e) Using the sources you identified as useful from the **skim and scan** activity, you may start to read the information more carefully to identify relevant information that relates to your research questions and any important biological ideas. **Trash** any information that is not relevant and **treasure** relevant key points. Note these key words, phrases or ideas on your <u>chart</u>. Select illustrations, diagrams and graphs that may be useful. These will be expanded later into full notes.

As you read your sources and gather information, be aware that you may need to modify your research questions depending on what you find out from your sources.

<u>CHECKPOINT 3:</u> Confirm that you can provide evidence of how you processed your information.

Task Three: Reporting

f) Look at the notes recorded on your data chart and choose the points you will include in your final report. Decide how you will organise your final report using headings and informative examples to produce a draft report.

You can write up your findings in one of the following formats:

- written report (including illustrations, diagrams and graphs, if appropriate);
- poster presentation, including annotations or supporting notes;
- Teachers can add other modes for the final product, e.g. seminar, presentation to parent body, role play interview of an expert, RAFT type activity, etc.

<u>CHECKPOINT 4:</u> Check your draft report with your teacher.

- g) Use the material you have gathered and processed to write a report that includes:
 - An introduction saying why Type 2 diabetes is an issue in your community.
 - Explain the biology behind this disease.
 - State your specific research topic and two research questions on different viewpoints.
 - Discuss information relating to these questions and the underlying biology.
 - State what you think should be done, giving reasons from your research for your position.
 - Give a recommendation for action, giving reasons for this.

Please note:

- To produce a <u>comprehensive</u> report you must present relevant information on all your research questions in a clear way. This can be done when you:
 - Listed and evaluated your sources of information.
 - Confirm all <u>Checkpoints</u> with your teacher.
 - Make links between the biology, the issue and your research questions.

• Use <u>connecting words</u> to help you write your report or poster.

Introducing ideas/views/perspectives/outlooks

- According to
- Scientists at
- This is shown by
- In the case of
- Research done
- Data collected by

Explain the how's/whys/conclusion

- Therefore
- As a result of
- Highlights
- As a consequence of
- Because ... is caused by ...
- Consequently

Take a position

- I believe we should
- I think that
- In my view
- In my opinion
- I agree with
- We need to
- My own feelings about this are

Make links

- Likewise
- Is similar to
- As well as
- Also
- Hence
- In addition to
- The reasons for

Justify

- The reason for this
- ... because ...
- Research has shown
- Evidence for this
- According to ...
- Experts tell us ...
- The results from ...
- Include **evidence** of the way you processed your information, such as your data chart, Jot-dot, listing, sorting, collating, highlighting or summarising. This should be attached to the end of the report or handed in with the report.

Template A: Concept Map – Developing My Key Research Questions



My Research Questions:

- 1. Why is Type 2 diabetes an issue?
- 2. What is the biology behind Type 2 diabetes?

3.

4.

My Keywords are:

Template B: Data Chart My Research Topic: ______

Name: _____

Questions Question 1: Wh	ny is Type 2 Question 2: The biolo	gy Question 3:	Question 4:	Reliable Useful Source?
Sources diabetes an	n issue? of Type 2 diabetes?	,		Yes – Why? No – Why not?
Source 1:				
Source 2:				
Source 3:				
Source 4:				
Source 5:				

Template C: Dot-Jot and Evaluate My Research Topic: _____

Research Question 1: Why is Type 2 diabetes an issue?

Source (website, newspaper, book, interview)

Title:

Author:

Publisher:

Year of publication:

URL:

Reliable/Useful Source? Yes – Why? No – Why not?

Dot-jot Notes

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Research Question 1: Why is Type 2 diabetes an issue?
Source (website, newspaper, book, interview)
Title:
Author:
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Year of publication:
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Reliable/Useful Source? Yes – Why? No – Why not?
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 Research Question 1: Why is Type 2 diabetes an issue?

 Source (website, newspaper, book, interview)

 Title:

 Author:

 Publisher:

 Year of publication:

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 Reliable / Useful Source? Yes – Why? No – Why not?

 Dot-jot Notes

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Research Question 1: Why is Type 2 diabetes an issue?		
Source (website, newspaper, book, interview)		
Title:		
Author:		
Publisher:		
Year of publication:		
URL:		
Reliable/Useful Source? Yes – Why? No – Why not?		
Dot-jot Notes		
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Name:

Dot-Jot and Evaluate My Research Topic:

Name:

Research Question 2: The biology of Type 2 diabetes?	Research Question 2: The biology of Type 2 diabetes?
Source (website newspaper book interview)	Source (website newspaper book interview)
Title	Title
Author	Author:
	Publisher:
Year of publication:	Year of nublication:
Reliable/Useful Source? Yes – Why? No – Why not?	Reliable/Useful Source? Yes – Wby? No – Wby not?
Dot-jot Notes	Dot-jot Notes
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Research Question 2: The biology of Type 2 diabetes?	Research Question 2: The biology of Type 2 diabetes?
Source (website, newspaper, book, interview)	Source (website newspaper book interview)
Title:	Title:
Title: Author:	Title: Author:
Title: Author: Publisher:	Title: Author: Publisher:
Title: Author: Publisher: Year of publication:	Title: Author: Publisher: Year of publication:
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Dot-Jot and Evaluate My Research Topic: _____

Name: _____

Research Question 3	Research Question 3
Source (website, newspaper, book, interview)	Source (website, newspaper, book, interview)
Title:	Title:
Author:	Author:
Publisher:	Publisher:
Year of publication:	Year of publication:
URL:	URL:
Reliable/Useful Source? Yes – Why? No – Why not?	Reliable/Useful Source? Yes – Why? No – Why not?
Dot-jot Notes	Dot-jot Notes
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Because Question 2	Becoreh Question 2

Research Question 3
Source (website, newspaper, book, interview)
Title:
Author:
Publisher:
Year of publication:
URL:
Reliable/Useful Source? Yes – Why? No – Why not?
Dot-jot Notes
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Research Question 3
Source (website, newspaper, book, interview)
Title:
Author:
Publisher:
Year of publication:
URL:
Reliable/Useful Source? Yes – Why? No – Why not?
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Dot-Jot and Evaluate My Research Topic: _____

Name: _____

Research Question 4	Research Question 4
Source (website, newspaper, book, interview)	Source (website, newspaper, book, interview)
Title:	Title:
Author:	Author:
Publisher:	Publisher:
Year of publication:	Year of publication:
URL:	URL:
Reliable/Useful Source? Yes – Why? No – Why not?	Reliable/Useful Source? Yes – Why? No – Why not?
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Research Question 4	Research Question 4

Research Question 4
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Reliable/Useful Source? Yes – Why? No – Why not?
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Research Question 4
Source (website, newspaper, book, interview)
Title:
Author:
Publisher:
Year of publication:
URL:
Reliable/Useful Source? Yes – Why? No – Why not?
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Assessment Schedule: Biology 1.2 Diabetes - An Issue for My Community

To determine the overall level of performance all judgements within a column must be met.

For each judgement, evidence can be obtained from anywhere in the report.

Text in bold font includes both the key aspects of the judgement and differences between the levels Achievement, Merit and Excellence.

Task	Judgements for Achievement	Judgements for Merit	Judgements for Excellence
1	Refines the question 'What can be done?' to develop specific research question(s) that related to their selected topic. Refining can be shown in a concept map e.g. Insulin Where did it come from in the past? Where does it come from now? Where might it come from in the future? Obesity = Type 2 Diabetes Why does obesity cause Type 2 diabetes? How does our lifestyle lead to obesity → diabetes?	Same as for Achievement and,	Same as for Achievement and,
2	At least three sources of information are recorded in a form that others can access them, e.g. Book – includes title, author and publishing details and page numbers. Website – includes the address of a web page. Magazine article – title of the article and the author, the magazine title and date published. Note: although using a range of different types of sources is desirable for any research, it is not a requirement of the standard.	Same as for Achievement and,	Same as for Achievement and,
2	Gathers and processes information from at least three sources . This may involve using a data chart, Dot-Jot- Evaluate, highlighting, listing, sorting.	Same as for Achievement and,	Same as for Achievement and evaluates sources of information or data in respect to the question or purpose.
3	 Presents findings in a report which: Describes biological ideas related to their questions. Takes a position on the issue. 	 Presents findings in an in depth report which: Explains biological ideas related to their questions. Identifies two different views/outlooks/ opinions/perspectives with supporting evidence. Takes and justifies a position on the issue. 	 Presents findings in a comprehensive report which: Links multiple biological ideas related to the research questions. Identifies two different views/outlooks/ opinions/perspectives with supporting evidence. Justifies a position on the issue and makes a recommendation for action.

Examples of Evidence. Contact Helen Mora at <u>h.mora@auckland.ac.nz</u> to access exemplars of annotated student work that show evidence for Achievement, Merit and Excellence.