NCEA LEVEL 2 QUESTIONNAIRES ASSESSMENT RESOURCES

Teacher guide. Supports AS91263.

This set of resources is a collection of internal assessment tasks that can be used to assess *AS91263 Design a Questionnaire*. This guide provides an overview of the tasks, background information for teachers and some links to teaching resources.

RESOURCES AND THEIR ROAD SAFETY CONTEXTS

Internal assessments	Context	Supporting resources
Drive website or mobile app survey Download task	Students design a questionnaire for visitors to the Drive website or users of the DriveGo app.	Teacher guide to the AS91263 assessment resources Lotus diagram template HookEd SOLO Hexagons Design a Questionnaire
Surveying the community about a road safety concern Download task	Students design a questionnaire about a road safety issue relevant to their school or local community, the experiences and concerns of the community, and potential solutions.	
Active modes for journeys to school Download task	Students design a questionnaire about active modes of transport for journeys to school.	
Rightcar website survey Download task	Students design a questionnaire for visitors to the Rightcar website, which helps New Zealanders buy safer, cleaner, and more economical cars.	

THE NEW ZEALAND CURRICULUM LINKS

Mathematics and Statistics Achievement Objective at Level 7

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Carry out investigations of phenomena, using the statistical enquiry cycle:

- conducting surveys that require random sampling techniques, conducting experiments, and using existing data sets
- evaluating the choice of measures for variables and the sampling and data collection methods used
- using relevant contextual knowledge, exploratory data analysis, and statistical inference.

(Highlighted statements are the ones covered by these resources)

Key Competencies

The following key competencies are foregrounded:

Participating and contributing

This competency is about being actively involved in communities. Communities include family, whānau, and school and those based, for example, on a common interest or culture. They may be drawn together for purposes such as learning, work, celebration, or recreation. They may be local, national, or global. This competency includes a capacity to contribute appropriately as a group member, to make connections with others, and to create opportunities for others in the group.

Students who participate and contribute in communities have a sense of belonging and the confidence to participate within new contexts. They understand the importance of balancing rights, roles, and responsibilities and of contributing to the quality and sustainability of social, cultural, physical, and economic environments.

Using language, symbols, and texts

Using language, symbols, and texts is about working with and making meaning of the codes in which knowledge is expressed. Languages and symbols are systems for representing and communicating information, experiences, and ideas. People use languages and symbols to produce texts of all kinds: written, oral/aural, and visual; informative and imaginative; informal and formal; mathematical, scientific, and technological.

Students who are competent users of language, symbols, and texts can interpret and use words, number, images, movement, metaphor, and technologies in a range of contexts. They recognise how choices of language, symbol, or text affect people's understanding and the ways in which they respond to communications. They confidently use ICT (including, where appropriate, assistive technologies) to access and provide information and to communicate with others.

Principles and Values

This unit focuses on students being informed decision makers and effective communicators for their communities.

The following principle and values are foregrounded:

Community engagement

The curriculum has meaning for students, connects with their wider lives, and engages the support of their families, whānau, and communities.

Innovation, inquiry, and curiosity by thinking critically, creatively, and reflectively.

Equity through fairness and social justice.

Community and participation for the common good.

Respect themselves, others, and human rights.

ROAD SAFETY EDUCATION AS A CONTEXT FOR STATISTICS

Our choice of contexts in Statistics teaching can increase student engagement and activate prior knowledge. It helps students to develop a meaningful purpose for their questionnaire design. It also helps to develop students' statistical thinking as they connect what they see in their analysis with their knowledge of the context. There is potential to develop citizenship skills and social competencies.

> *"...opportunities to explore authentic applications that arise out of real-life contexts can have a significant and sustained impact on student knowledge, attitude, self-esteem, independence, and confidence.*" (Alton-Lee, 2003)

Young drivers (aged 16-24) are over-represented in crashes in New Zealand. This is due to various factors, but a major contribution is lack of experience. At a time when students are becoming young drivers, or passengers of young drivers, these resources explore important topics. While supporting students to develop their skills in carrying out a statistical enquiry and report writing, the students will also develop competencies for citizenship and well-being outside of the classroom in a road safety context.

So why road safety education as a context for AS91263?

- Relevant to students as they and their peers learn to drive.
- Accessible and engaging context.
- Develops citizenship skills as students consider their role in a wider community.
- Foregrounds the key competency of *Participating and Contributing.*
- Builds social competencies.
- Potential for cross-curricular themes using NZTA's Education Portal secondary curriculum resources available in a range of learning areas.
- Whanaungatanga – build relationships with your students by showing them that you care about what happens to them outside of the classroom.
- And, because young drivers in NZ are over-represented in death and serious injury crashes.

A note of caution on the context for teachers

Teachers should be aware that these resources on active modes, learning to drive, vehicle safety, and road safety concerns might lead to discussion of road crashes or road trauma, although this is not the intended focus of these resources. Students may have first-hand experience of such issues and teachers should be discreet during discussions.

GUIDING PRINCIPLES FOR THE DESIGN OF THESE RESOURCES

There are two guiding principles underpinning the design of these resources.

Resources fully align to the New Zealand Curriculum and NCEA standards

These resources are designed to be used by Mathematics and Statistics teachers with their classes to support the assessment of AS91263 in a meaningful context. They are not intended to be 'something extra' the teacher is expected to do.

Resources fully align to NZTA's Good Practice in Road Safety Education factsheets

These resources align to evidence-based, effective road safety education strategies. These are outlined in the *Good practice in road safety* research summaries on the Waka Kotahi Education Portal.

Good practice in road safety

Importantly, these resources have been designed to empower students by developing their knowledge and competencies in road safety through the Statistics curriculum.

All resources avoid the use of fear tactics. Fear tactics have been shown to be at best ineffective and at times have negative unintended consequences by promoting the behaviour the intervention was designed to reduce.

The contexts have also been designed so that students responding to questionnaires are not being asked to reflect on their own behaviour with regards to a road safety concern (e.g. speeding, drink-driving, driving in breach of their restricted licence conditions) as this may unintentionally promote the behaviour to others.

USEFUL BACKGROUND READING

Information on the contexts

Drive resources:

Drive website

DriveGo mobile app

Road safety concerns and campaigns

Education Portal news - contains stories of action taken by students and schools to address a local road safety concern

Coordinator Resources - Education Portal for information on road safety campaigns in schools

Active modes of transport to school

New census data reveals more than half of NZ's students use private vehicles to commute

Vehicle safety

Rightcar website

1-star reality advertising campaign

Other background information and links can be found in Resource 1 for each internal assessment task.

Young drivers in New Zealand

Overview of young drivers crash statistics

Young drivers summary (Ministry of Transport)

Statistics education

Census at School New Zealand website

https://new.censusatschool.org.nz/

WHO TO CONTACT

Your local Road Safety Coordinator (council) or School Community Officer (Police) may have ideas to help your students find a purpose and audience for the questionnaire design. They may be willing to be interviewed by students about a local issue or campaign.

You can contact Road Safety Coordinators through your local council. Find out more about working with your School Community Officer, including how to contact them, through the NZ Police Schools Portal.

Your school's SADD group may also provide an issue or campaign they would like more information on and could become the audience for the student's survey.

TEACHING RESOURCES AND IDEAS

1. Understanding the context

Modelling how to understand the context supports students to develop their own skills by:

- removing any barriers created by the context in an assessment
- increasing statistical thinking in the PPDAC enquiry process by allowing students to connect contextual and statistical understanding
- providing an authentic learning opportunity as they experience the process a statistician uses to understand the context before defining the Problem and Plan (Pfannkuch & Wild, 2000).

There are a number of tools that can be used to help students understand the context and help them develop their ideas around the purpose, audience and target population.

Lotus diagram

A Lotus diagram puts the important ideas about a topic at the centre and encourages students to expand on these.

To find out more about Lotus diagrams:

https://www.virtuallibrary.info/mind-maps-for-note-taking-and-brainstorming1.html

https://vimeo.com/28799678?ref=em-share%E2%80%8B

You can do this with students working in a spreadsheet or as a paper copy by printing:

- Level 2 Questionnaire Lotus diagram template

This can be readily adapted to suit what you would like students to focus on. In the spreadsheet update the labels in the centre and the labels around the outside will auto-update.

Not all boxes need to be filled in. Students can also write questions in the boxes with things they are unsure about.

Mindmap

Mindmaps work in a similar way to the Lotus diagram to support students to organise their ideas.

To find out more about Mindmaps, including links to free online software for developing editable Mindmaps:

https://www.virtuallibrary.info/mind-maps-for-note-taking-and-brainstorming1.html

Hexagonal thinking

Students organise SOLO hexagons (or post it notes) with single ideas on the context on each hexagon and start to explain the connections (relational thinking) and generalise (extended abstract thinking). These ideas are annotated and students can explain their thinking to their peers and teacher.

To find out more about hexagonal thinking:

https://socialstudiesoutloud.com/2017/02/16/the-awesome-six-sided-world-of-hexagonal-thinking/

https://www.activehistory.co.uk/Miscellaneous/menus/A_Level/Late_Modern/Stalin_Rise/index.php

https://www.youtube.com/watch?v=UKq69ANaOLM

SOLO hexagons can be downloaded from here:

http://pamhook.com/solo-apps/hexagon-generator/ or you can use the Word file included with this resource.

2. Critiquing a questionnaire

Students can be given questionnaires (or a subset of questions from a questionnaire) to identify the variable type (quantitative or qualitative) and question type (open, closed, ranking, single answer, multi-choice etc).

Students can also critique the questions, including the answer options, and identify how they could be improved.

Questionnaires to critique

- CensusAtSchool New Zealand 2019 Survey questions (and spreadsheet with database variables from the Take Part in CensusAtSchool 2019 webpage)
- Walking school bus parent caregiver survey from the Education Portal's Walking school bus webpage
- The Auckland Transport commissioned report Measuring and growing active modes of Transport in Auckland contains the findings of a survey and includes the survey questions.

3. Resources for designing a good questionnaire

As well as resources on the CensusAtSchool New Zealand website, there are a number of other resources available to support the writing of a good questionnaire.

Questionnaire design resources

- Survey Monkey's best practices for survey creation
- Statistics NZ Tatauranga Aotearoa has produced A guide to good survey design (fifth edition) to support the planning and implementation of surveys.
- This guide can be used to provide students with advice on designing a questionnaire for a website.
- Dr Nic's Maths and Stats videos on Designing a Questionnaire and Writing Good Survey Questions.

4. Ethics in questionnaire design

Ethics is an important consideration in the questionnaire design process.

Resources on questionnaire ethics

- NZSA Education Committee produced a statement on Values, Ethics, and Statistical Experiments.
- This video provides an overview of Survey Ethics.

There are ethical considerations when students decide on the topic. They should not choose something which may have a negatively influence, by unintentionally normalising risk-taking behaviour, or which distresses students by discussing road trauma.

INFORMATION ON THE ASSESSMENTS

The internal assessment tasks can be adapted to suit your students and local community. To protect the authenticity of these assessment tasks, examples of the types of responses that can be expected from students have not been included in the assessment schedules as these resources are not kept secure. A few notes for teachers are provided on the tasks.

Purpose

Students are provided with a primary audience and purpose for the questionnaire design, which they can further develop, refine, and justify.

When students identify secondary audiences for the data they should be clear on the purpose and should be able to clearly justify why the group would be interested and how they might use the data collected. Students could consider as part of their reflection at the end possible extensions to the purpose and how the questionnaire would be altered to cater to this.

For the website survey tasks (Drive website/app survey and Rightcar website survey), they could consider the organisations who are funding the websites as secondary audiences.

For the community road safety concerns and active modes tasks they can think about other groups in the school and local community who might be able to use the data. This could include the Board of Trustees, whānau groups, the SADD group in the school, or community groups that support young driver education.

Survey questions

It will usually be appropriate to include screening questions in these questionnaires. For example, the website surveys have a target population which is a subgroup of all visitors to the sites. How will they screen for this and what message will those visitors outside of that group receive?

Reflection on the process

If students are completing the Drive or Rightcar survey there is a rich discussion to be had about the limitations of the pilot study as the survey will not be embedded in the website. This guide to designing surveys for websites is a useful resource as they discuss how to implement their survey and the limitations of their pilot.

REFERENCES

Alton-Lee, A. (2003). *Quality teaching for diverse students in schooling: Best evidence synthesis.* Wellington: Ministry of Education.

Pfannkuch, M., & Wild, C. (2000). Statistical thinking and statistical practice: Themes gleaned from professional statisticians. *Statistical Science*, 15(2), 132–152.