Bike education program

A program supporting bike and road safety education in DECD secondary schools
ACKNOWLEDGEMENTS

The Department of Education and Child Development would like to thank the students and teachers from the participating schools who took the time to help develop, trial and provide valuable information about the Bike Education Program in South Australia. Thank you also to the key road safety and bike agencies who supported the pilot program.

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Department for Education and Child Development
Produced by the Office for Education and Early Childhood

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WHAT WE’VE LEARNED:

1. Students love bikes.
2. Bikes make lessons exciting.
3. Exciting lessons = better learning and more enjoyable teaching.
4. Bikes and bike education can be woven through any learning area!
INTRODUCTION

Background

In January 2015, the South Australian Government responded to recommendations of a Citizens’ Jury. The Jury convened in late 2014 and examined the topic: ‘Motorists and cyclists will always be using our roads. What things could we trial to ensure that they share the roads safely?’

One of the 10 recommendations put forward by the Citizens’ Jury report ‘Sharing the roads safely’ was:

Formal cycling education in schools.

_The Jury recommends developing and implementing an integrated safe cycling and road rule education program commencing in primary school and continuing through high school._

_(Citizens’ Jury Report, November 2014, p.2)_

Led by the Department for Education and Child Development (DECD), in consultation with Department of Planning, Transport and Infrastructure (DPTI); South Australian Police Officers League (SAPOL); Royal Automobile Association of SA (RAA); Motor Accident Commission (MAC); and Bike SA, two programs were piloted: one in primary schools and one in secondary schools.

DPTI has been successfully running the Way2Go Bike Ed Program in primary schools. Four primary schools piloted a revised and strengthened version of the program.

To date there has been no specific bike education program established at the secondary school level. Conscious of an overcrowded curriculum, a new program with a cross-curricular approach was developed and this was piloted in one metro and one rural school in Year 8.

The educational component of the Bike Education Program was designed and developed consistent with the:

- **Australian Curriculum** (Learning Areas, General Capabilities and Cross-Curriculum Priorities)
- South Australian Teaching for Effective Learning (TfEL) Framework Learning Design process
- SDERA (2009) _National Principles for School Road Safety Education_, Government of Western Australia
- Project-based learning methodology.

To evaluate whether these educational frameworks could teach safe cycling and road rule education, one metro and one regional school agreed to take part and lead the pilot programs. Although this was too small a sample of students to be statistically significant, overall findings from student pre- and post-surveys indicated some improvements in safe cycling knowledge, attitudes and behaviours. Furthermore, teachers reported that student engagement, enjoyment of learning, attendance and self-confidence all increased. They felt that through self-guided approaches and novel teaching methods, students learned skills that fostered life-long attributes which would contribute to their future success.

_I would definitely recommend it to other teachers and also to other schools._ Mathematics teacher

The key preliminary findings are summarised in the Citizens’ Jury bike education pilot program — Report and findings.
The Bike Education Program resource

This teacher resource has been developed to assist the classroom implementation of the Bike Education Program and was specifically designed to focus on the areas of safe cycling and road rules, and to re-engage students with bikes and their benefits.

There are clear links between the Bike Education Program and various learning areas in the Australian Curriculum. As part of this trial, the Bike Education Program focuses on Year 8 Achievement Standards and Content Descriptions and fits primarily within the Humanities and Social Sciences and the Mathematics learning areas. With teacher interest and thoughtful planning, the bike safety and road rules concept can also be incorporated across other learning areas of the Australian Curriculum and adapted for other year levels. Appendix 7 provides suggested Australian Curriculum Content Descriptions for other learning areas in year 8 that could be used to teach bike education.

The program is designed to be fun, innovative and engaging. By using a real world problem, project-based learning and links to the Australian Curriculum and the TfEL Framework, students are motivated to learn and achieve outcomes and have the potential to make a real difference to their community.

Key outcomes

1. Empower students to take responsibility for their actions and learning
2. Fulfil curriculum requirements
3. Engage students in meaningful, real life activities
4. Give students opportunities to have a voice and participate in problem-solving and decision-making
5. Increase knowledge of safe cycling and road rules and re-engage students with bikes and their benefits

Through the self-guided approach to this program, students learnt skills that will be lifelong attributes, helping them to be successful not only in their later school years, but in their life after school.

Mathematics teacher
DEPARTMENT FOR EDUCATION AND CHILD DEVELOPMENT
OFFICE FOR EDUCATION AND EARLY CHILDHOOD

DELIVERING THE BIKE EDUCATION PROGRAM

Overview
The Bike Education Program is made up of three components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Aim</th>
<th>Indicative time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student forum</td>
<td><strong>Introductory session</strong>: guest speakers and provocative questions foster large and small group discussions around safe cycling and road rules. See example of a student forum (Appendix 2).</td>
<td>A double lesson – 1/2 day</td>
</tr>
<tr>
<td>Student-initiated class projects</td>
<td><strong>The core of the Bike Education Program</strong>: using an inquiry-based approach, students work collaboratively in groups to design, plan and develop a project on safe cycling and road rules. See example lesson plans from metro and rural schools (Appendices 5 and 6).</td>
<td>1 term – 1 semester</td>
</tr>
<tr>
<td>Student presentation event</td>
<td><strong>Concluding event</strong>: students present their projects to a selected audience to demonstrate their learning and achievements. The celebration can include fun activities, such as a bike riding, or an outing to a cycling venue, etc. See example of a student presentation event (Appendix 3).</td>
<td>A double lesson – 1/2 day</td>
</tr>
</tbody>
</table>

Preparation
Before implementing the Bike Education Program in your school, it is recommended to read the *Principles for School Road Safety Education* (2009, Government of Western Australia). This research summary presents a set of principles for best practice in school road safety education. The Principles provide a framework of core concepts and values to guide the planning, implementation and review of road safety education programs, policies and practice in school communities.

To make the program more engaging for the students consider:

- a practical component so that students have opportunities to ride bikes and be involved in maintenance activities, etc
- conducting excursions to relevant locations
- inviting guest speakers to provide knowledge and instruction in the areas of bike riding skills, bike maintenance, bike safety and road rule knowledge
- appropriate access to bicycles, particularly for students who have no access to a bike outside school.

See Appendix 4: Bike Education Program resource guide to support you.

Every one of my students have continued to say well after the program how this was their favourite topic for the year across all of their subjects...when given the opportunity to decide the end of year celebration they all voted to go for a community bike ride, which is very significant for our school in particular, as we have been trying to improve the community culture towards physical activity. Humanities and Social Sciences teacher
STEP 1: WHOLE SCHOOL PLANNING

To make the implementation of this program more successful, discuss the following with your school management:

**Does your school:**
- promote road safety education and support staff by ensuring access to a variety of resources and professional learning opportunities?
- actively encourage staff to model appropriate road safety behaviour and attitudes?
- actively encourage and promote school-community participation in school and road safety programs?
- have an interested staff member or team of professionals who are prepared to implement a bike safety program?
- know of interested community members or groups who are prepared to assist with the implementation of the program?

**Does your curriculum:**
- include road safety education?
- incorporate road safety education for all year levels?
- encourage students to support and influence their peers positively as a way of improving road safety behaviour?
- use student-centred, interactive strategies to develop student knowledge, skills and attitudes regarding road safety?

Adapted from *Principles for School Road Safety Education* (2009, Government of Western Australia)

STEP 2: RESOURCE AUDIT

You could ask your students to conduct an audit as part of the student forum. However, it will also be useful for you to have an understanding of available resources in order to develop your lesson planning. Your audit could include:

- school resources, for example: availability of bikes; bike cage and its use; bike activities at your school; riding habits of staff and students, etc.
- community resources, for example: bike interest groups, local councils, key agency representatives, such as RAA, Bike SA, MAC, SAPOL, Cycling SA and local bike shops
- council projects, for example: bike paths, bike hiring and bike events.

The Bike Education Program resource guide (Appendix 4) can also support you in your audit.

STEP 3: LESSON PLANNING

The Bike Education Program was designed using the Learning Design ‘thinking map’ (see Appendix 1). The ‘thinking map’ is an example of a carefully planned unit, based around group project work that examines safe cycling and road rules. Relevant Australian Curriculum components have been brought together to ensure that the design of learning experiences is carefully planned, highly intentional and relevant to students’ lives and circumstances.

The collaborative, problem solving skills fostered in this program will be ones that will make these students invaluable to any work place in their future. **Humanities and Social Sciences teacher**

For further information, refer to the *South Australian Teaching for Effective Learning (TFEL) Framework* and the *Learning Design process* for more detail.

There are clear links between the Bike Education Program and specific learning areas in the Australian Curriculum. Whilst this resource has a focus on Year 8 Achievement Standards and Content Descriptions, it could be adapted to any year level. Similarly, whilst the pilot schools focused on two learning areas, the Bike Education Program fits with any learning area.

Year 8 lesson plans from two pilot schools focus on:
- Humanities and Social Sciences in a metro school (Appendix 5)
- Mathematics in a rural school (Appendix 6).

The Bike Education iTunes U site has examples of group project work from the two pilot schools, as well as a video of the students involved in the pilot program explaining what their projects were about and what they learnt from being involved in the program.

FURTHER CONSIDERATIONS

- As the Bike Education Program is based on group collaboration and project-based learning, many lessons take on an inquiry-based approach and involve information gathering and sharing. The Bike Education Program can be run with the usual technology and learning support materials that are generally available to teachers and students.
- The Bike Education Program can be conducted using the normal budget made available to a teacher. Costs for guest speakers and excursions can be funded in the usual manner for such arrangements, often by parents/caregivers paying for individual events.
Time is flexible but it is suggested to deliver the program over a semester with up to four lessons per week. It can be delivered in one learning area or, with considered planning, the lessons can be shared among several learning areas.

The Bike Education program is so open-ended that it enables any teacher to utilise the key learning outcomes and create a program that not only suits their learning area, but also suits their teaching style and student ability/interests.

Humanities and Social Sciences teacher

Implementation

STUDENT FORUM

The student forum can be seen as a first lesson or introduction to the Bike Education Program and can be a great way to set the scene for further teaching and learning. A student forum could be done in partnership with other classes in the same year level or with another school, providing an opportunity for students to meet other students. See Appendix 2 for an example of a student forum.

The aim of the student forum is to foster discussion around the culture of cycling, safe cycling and road rules through a series of provocations, guest speakers and group discussion. It is intended to:

• kick start the Bike Education Program
• gather together all participants and support staff
• provide an overview of the Bike Education Program, including the student-initiated class projects
• find out what students know and understand about safe cycling and road rules (prior knowledge, interests and experience; dispositions; misconceptions and biases)
• introduce/re-enforce safe cycling and road rules
• provide awareness of available agencies and local community groups and what they offer in the areas of safe cycling and road rule education
• provide opportunities to share ideas, discuss, brainstorm and ask relevant questions
• introduce and provide an outline for the scope of individual group projects
• document ideas and begin development of possible project topics
• set a timeline for the project completion and the presentation event.

The intended learning outcomes for the student forum are for students to:

• identify and inquire critically into the main road rules and the expectations related to safe bicycle use
• understand that their views are valued and that they can influence others’ attitudes toward bicycle riding
• brainstorm group projects around bicycle safety that focus on the suggested topics outlined overleaf.

Guest speakers might be invited to participate and could include members from local community groups and agencies, government and local council representatives (see Appendix 4: Bike Education Program resource guide and your audit). Parents and volunteers who have something to contribute to the investigation of safe cycling and road rules could also be invited.

The agencies that visited my students were fantastic and my students received a lot from this time. Humanities and Social Sciences teacher

Students developed a sound understanding of the bike and road laws. Humanities and Social Sciences teacher
Provocative questions are used to stimulate deep thinking and clarify ideas on safe cycling and road rules. The questions are designed to deliberately raise strong reactions from the students. The example of a student forum (Appendix 2) includes suggested provocative questions.

The final part of the student forum is to brainstorm ideas for the student-initiated bike education projects that are to be designed and developed in lesson time. By working in groups and interacting with others, students gain more understanding of the problems or questions being examined, supporting them to design and develop their own projects.

The most learning came from the group projects. Mathematics teacher

STUDENT-INITIATED PROJECTS

The student-initiated projects sit at the core of the Bike Education Program. In class time, students work collaboratively in groups to design, plan and develop a project on safe cycling and road rules. This inquiry-based approach engages students in a meaningful way with real life activities, problem-solving, and decision-making. Students may wish to begin by conducting an audit of local and electronic resources they can draw on.

Two examples of lesson plans for the Bike Education Program student-initiated projects are provided: each sits within a different learning area:

- Humanities and Social Sciences learning area (Appendix 5)
- Mathematics learning area (Appendix 6).

The intended learning outcomes for the student-initiated projects are for students to:

- develop confidence in being creative by designing solutions and transferring knowledge and skills to the area of safe cycling
- actively engage with real life problem-solving, and to gain a sense of belonging and being valued as an informed member of the community
- research, collect and organise information from a variety of sources and determine accuracy and reliability
- communicate, share ideas, work together and develop questions around project issues
- present findings in appropriate forms for different audiences and purposes.

The following are suggested topics for the projects:

- organising a major cycling event
- creating a social media message to encourage more cycling and improved cycle safety
- working with local groups to improve cycling safety and access to cycling opportunities (for example, local council, men’s shed, SAPOL, disability groups, new arrivals)
- designing a product or initiative to improve cycle safety in the community
- working with the local community to encourage and promote cycling/active travel opportunities.

What I found is that a lot of these agencies are really keen to help out. Mathematics teacher

Examples of student projects are provided on the Bike Education iTunes U site.

Teachers guide and encourage students by providing opportunities for explicit teaching, and by sharing knowledge and understandings of the learning that is occurring. Teachers can engage, challenge and support students’ learning throughout the projects by:

- providing access to appropriate online services, websites, internet and Facebook and inviting guest speakers from various community groups and agencies that provide knowledge and instruction in the areas of bike riding skills, bike maintenance, bike safety and road rules (see the Bike Education Program resource guide in Appendix 4).
• encouraging student-driven curriculum and control of learning activities and project design, and providing regular critical reflection time
• supporting students in learning that is consistent with TiEL and which incorporates links to Australian Curriculum learning areas
• providing choice and a variety of suitable resources
• making the learning relevant
• encouraging group work, collaboration, discussion and task sharing
• expecting high standards, and providing clear guidelines and outcomes
• planning outings, excursions and cycling activities
• providing information to parents, caregivers and local community and encouraging their participation
• providing scaffolding and intervention, for example, consider Bloom’s taxonomy and different levels of thinking.

What students were able to do was learn about maths in a fun way and not think they were doing it…They were able to look at real statistics and actually learn about how to use them. For example they learnt about what was significant and what a good sample size would be, whilst also learning about the usual statistical terms mean, medium, mode and range. Mathematics teacher
**PRESENTATION EVENT**

The presentation event concludes and celebrates student achievements relating to safe cycling and road rule education. Students present their projects, featuring real life issues and solutions, to a selected audience. The celebration can include fun activities such as a bike riding, or an outing to a cycling venue, etc. See an example of a student presentation event in Appendix 3.

Consider a range of ways to share learning:

<table>
<thead>
<tr>
<th>Who can you share with?</th>
<th>What can you share?</th>
</tr>
</thead>
<tbody>
<tr>
<td>For example:</td>
<td>For example, your:</td>
</tr>
<tr>
<td>• other classes</td>
<td>• findings</td>
</tr>
<tr>
<td>• whole school</td>
<td>• data</td>
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<tr>
<td>• the wider community</td>
<td>• ideas</td>
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<tr>
<td>• students</td>
<td>• suggestions</td>
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<td>• governing councillors</td>
<td>• models</td>
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<td>• parents.</td>
<td>• hypotheses</td>
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<tr>
<td>Who else?</td>
<td>• proposals</td>
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<td>• thinking</td>
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<td></td>
<td>• recommendations.</td>
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<tr>
<td></td>
<td>What else?</td>
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</table>

<table>
<thead>
<tr>
<th>Where can you do your sharing?</th>
<th>How can you share?</th>
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</thead>
<tbody>
<tr>
<td>For example:</td>
<td>For example:</td>
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<tr>
<td>• at school</td>
<td>• presentation</td>
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<tr>
<td>• with classes</td>
<td>• report</td>
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<tr>
<td>• in a community library</td>
<td>• movie</td>
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<tr>
<td>• at a staff meeting</td>
<td>• forum</td>
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<td>• at a governing council meeting</td>
<td>• poster</td>
</tr>
<tr>
<td>• at a parents’ evening</td>
<td>• co-facilitation</td>
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<tr>
<td>• in a shopping mall</td>
<td>• digital presentation</td>
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<tr>
<td>• at the DECD district or central office</td>
<td>• podcast</td>
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<tr>
<td>• at the local council offices</td>
<td>• flyer</td>
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<td>• through your local paper.</td>
<td>• artwork</td>
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<tr>
<td>Where else?</td>
<td>• display</td>
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<td></td>
<td>• drama</td>
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<td></td>
<td>• PowerPoint</td>
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<td>• animation</td>
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<td>• letter to the editor</td>
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<td>• puppetry</td>
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<td></td>
<td>• game</td>
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<td></td>
<td>• newspaper/newsletter article.</td>
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<tr>
<td>How else?</td>
<td>How else?</td>
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</table>

I really liked that the students felt at the end of the program that they actually had a sense of belonging of the project. Mathematics teacher
The intended learning outcomes for the presentation event are for students to:

- demonstrate responsibility for their presentation, including production, dialogue, scripts, accuracy and setting out of information, props, posters, production roles and timing
- display their knowledge publicly, in an authentic context and with real life consequences
- help build their understandings by listening and learning from other project presentations.

I learnt not to be fearful of giving students ownership over their learning. If you can, structure it in a way where students are passionate, have options about their approach, and are constantly prompted to reflect on their goals and create practical problem-solving strategies. Humanities and Social Sciences teacher

Assessment and evaluation

ASSESSMENT OF STUDENT LEARNING AND PERFORMANCE

A variety of strategies and assessment tools can be utilised throughout the Bike Education Program to ensure that learning outcomes are achieved to a high standard. These can examine how students are able to show their learning as well as clearly define teacher expectations and performance criteria.

When planning the Bike Education Program, careful consideration must be given to measuring effects on student learning and providing information and recommendations to help improve future program design and implementation.

A well planned assessment strategy can:

- greatly improve teaching effectiveness
- create timely learning opportunities
- provide immediate feedback on what is successful and what is not working.

Here are some examples of assessment:

Formative assessment (assessment of learning):

- Each week, every student is required to write a reflection to include:
  - One paragraph: What your group has achieved thus far?
  - One paragraph: Is your group meeting its weekly goal? If not, what isn’t working and how can you fix it to get back on track? If you are meeting your weekly goals, what has allowed this to happen and how can you keep this going?
  - One paragraph: What have you learnt and enjoyed this week?

Summative assessment (assessment of learning):

- group projects
- group presentations.

The discussions during class time were obviously bike-centred, but we were talking outside of the classroom too. Students were talking about this bike program with all of their other teachers as well. Mathematics teacher
EVALUATION AND REVIEW

As educators, it is important to continually reflect on teaching methods and to evaluate educational programs to determine merit or value, working toward continual improvement and successful delivery of the program that is being offered.

Here are example questions that maybe useful for evaluating your bike education program:

- How did the program go?
- What worked well? (Why?)
- Were there any components that didn’t work so well? (Why?)
- What did you like about the program?
- What did you dislike about the program?
- To what extent did it achieve the intended learning outcomes?
- Did you have sufficient resources?
- Did you have sufficient time?

- What were the key learnings for students?
- Have you had any feedback from students? (What was it? Positive? Negative?)
- Have you had any feedback from parents, including via students? (What was it?)
- What were some of the things you yourself learned about conducting a program like this?
- Do you think you will do the program next year? If so, what would you do differently?
- Would you recommend this program to other teachers/schools?

Students are coming into the class this term and asking why we are not doing the cycling program any more! They are disappointed as they have to go back to some of the more traditional ways of using maths. I would definitely look at doing the program again next year.

Mathematics teacher
**BiKE EDUCATION PROGRAM**

A program supporting bike and road safety education in DECD secondary schools.

**APPENDIX 1**

**Learning Design—Bike Education Program**

**Aligning what and how of teaching and learning in the Australian Curriculum**

**What is the intended learning and why is it important?**

Students:
- Inquire critically into what are the main road rules and expectations related to safe bicycle use
- Understand that their views are valued and that they can influence others’ attitudes toward bicycle riding
- Design group projects around bicycle safety that focus on five key outcomes outlined in the lesson plans
- Present their final product at the end of the unit, to a selected audience, to demonstrate their learning and achievement of curriculum outcomes.

**Mathematics:** (ACMMG196), (ACMMG197), (ACMSP284), (ACMSP206), (ACMSP293), (ACMSP207).

**Humanities and Social Sciences:** (ACHHS071), (ACHHS072), (ACHHS073), (ACHHS056), (ACHASSI152), (ACHASSI160), (ACHASSI162), (ACHASSI163).

**What could the intended learning look like at this level?**

**How will we engage, challenge and support their learning?**

Organise a student forum that values individual views & opinions, sets the scene for ongoing learning and asks provocative questions to engage interest & deep thinking.

Provide access to online services, websites, internet, Facebook.

**B.** invitation & presentation to interested community groups:
- SAPOL, RAA, Bike SA, Cycling SA, MAC, DPTI.
- Involve guest speakers from various community groups and agencies: SAPOL, RAA, Bike SA, Cycling SA, MAC, DPTI.
- Encourage student-driven curriculum and control of learning activities & project design.

**How will we engage, challenge and support their learning?**

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**What is the intended learning and why is it important?**

Students:
- Develop confidence in being creative by designing solutions & transferring knowledge & skills to the area of bicycle safety
- Actively engage with real life problem solving & gain a sense of belonging & being valued as an informed member of the community
- Research, collect & organise information from a variety of sources & determine accuracy & reliability
- Communicate, share ideas, work together & develop questions around project issues
- Present findings in appropriate forms for different audiences & purposes.

Teachers:
- Guide & encourage students & provide opportunities for explicit teaching, sharing knowledge & understanding of the learning that is occurring.
- Plan outings, excursions & cycling activities
- Expect to high standards, provide clear guidelines & outcomes.
- Scaffold & intervene: consider using Bloom’s Taxonomy and different levels of thinking.

**What will we do to get there?**

- **Design the teaching and learning plan**
  - School-based projects—Year 8
  - Your project needs to address safe cycling and road rules.
  - Use one of the following to structure your project:
    - Conversations with peers, questioning, group work
    - Organise a major riding/cycling event
    - Create a social media message to encourage more cycling &/or improved cycle safety
    - Various strategies can be used to capture and enable this evidence.

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Example of a student forum

Suggested time: a double lesson – 1/2 day

<table>
<thead>
<tr>
<th>Event</th>
<th>Detail</th>
<th>Preparation and resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome</td>
<td>Welcome all participants and guests. Outline background and purpose.</td>
<td>Identify and invite speakers.</td>
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<tr>
<td></td>
<td>Introduce an opening/guest speaker.</td>
<td>Prepare ice breaker activities.</td>
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<tr>
<td></td>
<td>Ice breaker activities—team building, getting-to-know-you games,</td>
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<tr>
<td></td>
<td>incorporating bike issues/questions.</td>
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<tr>
<td>Introducing bikes</td>
<td>Ask questions of the class and then encourage students to share their ideas. For example:</td>
<td>Identify questions.</td>
</tr>
<tr>
<td></td>
<td>• How do you usually travel and get around on most days?</td>
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<tr>
<td></td>
<td>• How would you prefer to get around?</td>
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<tr>
<td></td>
<td>• Why is this your preferred way of getting around? What supports it?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• What gets in the way of your preferred way of getting around?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify questions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short break if required</td>
<td>Gather butcher’s paper, pens and post-it-notes.</td>
</tr>
<tr>
<td>Provocations</td>
<td>Ask the following questions and encourage students to share their ideas through small group discussions and documentation while teacher assists and guides discussion. For example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Now, let’s talk specifically about bike riding. Hands up who regularly rides a bike?</td>
<td>Video examples</td>
</tr>
<tr>
<td></td>
<td>• Whether you ride or not, can you make a list of the advantages and disadvantages of riding a bike? (post-it-note activity)</td>
<td>Volvo life paint (length 2’30&quot;) Demonstrates how important it is to be seen, especially at night.</td>
</tr>
<tr>
<td></td>
<td>• Motorists and cyclists will always be using our roads. What do you think about this?</td>
<td>Danny MacAskill: The Ridge (length 7’39&quot;) Extreme and heart-stopping mountain bike ride by a pro-rider across the ridges of the Isle of Skye.</td>
</tr>
<tr>
<td></td>
<td>• What does this mean to you? (as a future driver or as a cyclist)</td>
<td>Jackson run bike to kindergarten (length: 2’42&quot;) 3 year old mountain biker.</td>
</tr>
<tr>
<td></td>
<td>• What does this mean to your school?</td>
<td>Indoor cycling world championships (length 5’48&quot;) (posted by Safe Cycling Australia) 4 Slovakian girls perform synchronised cycling gymnastics.</td>
</tr>
<tr>
<td>Videos</td>
<td>Show two or three short video clips. Clips will relate back to the discussion.</td>
<td>Video examples</td>
</tr>
<tr>
<td></td>
<td>(Social media clips and videos can be used throughout the forum to keep the students engaged)</td>
<td>Volvo life paint (length 2’30&quot;) Demonstrates how important it is to be seen, especially at night.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Danny MacAskill: The Ridge (length 7’39&quot;) Extreme and heart-stopping mountain bike ride by a pro-rider across the ridges of the Isle of Skye.</td>
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<td>Jackson run bike to kindergarten (length: 2’42&quot;) 3 year old mountain biker.</td>
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<td></td>
<td>Indoor cycling world championships (length 5’48&quot;) (posted by Safe Cycling Australia) 4 Slovakian girls perform synchronised cycling gymnastics.</td>
</tr>
<tr>
<td>Event</td>
<td>Detail</td>
<td>Preparation and resources</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Videos [continued]</td>
<td></td>
<td><strong>Simulated games examples</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Bike race: get the edge</strong> (ESA) Gears, wheel size and tyres affect performance. Links to AC Years 5–8 Science.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Get a grip</strong> (ESA) The role of tyre treads under different conditions. Links to AC Years 6–8 Science.</td>
</tr>
<tr>
<td>Guest speaker</td>
<td>1–3 guest speakers from local key agencies (eg, SAPOL, RAA, DPTI, Bike SA, MAC, local council or bike groups) plus time for a Q&amp;A.</td>
<td>Identify and invite speakers who will engage students by sharing relevant information about safe cycling and road rule education.</td>
</tr>
<tr>
<td>Project explanation</td>
<td>Teachers present any frameworks, guidelines or options relating to their possible project topics and how they may be incorporated into their project ideas, problem-solving and decision-making. Teachers explain how they see the project developing in class time and lead discussions of possible opportunities within their school community and various options for project work. It may be useful for the students to complete an audit of their school and community resources in the next lesson or for homework.</td>
<td>Examples of projects from the 2015 pilot schools:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Bike technology</strong>: designing a smart bike</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Bike safety</strong>: teaching junior primary and special needs students from other schools about cycling and road safety</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Bike event</strong>: planning and conducting an event where students bring bikes to school and showcase their skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Bike borrowing</strong>: designing a program in which students borrow school bikes for the weekend and journal how they used them</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Bike path design</strong>: designing and campaigning council members for more bike paths and signage</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Social/media campaigns</strong>: promoting safe cycling through videos and posters</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>School bike cage design.</strong></td>
</tr>
<tr>
<td>Project brainstorm</td>
<td>Students brainstorm project ideas on paper and share with the class.</td>
<td></td>
</tr>
<tr>
<td>Next steps</td>
<td>Inform students of the date of the presentation event when they will showcase their projects.</td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td>• What did you particularly enjoy about the forum?</td>
<td>Prepare feedback forms.</td>
</tr>
<tr>
<td></td>
<td>• Any ideas on how the forum could have been improved?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How are you feeling about being involved in the Bike Education Program?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Any other relevant comments?</td>
<td></td>
</tr>
</tbody>
</table>
## Example of a student presentation event

**Suggested time:** a double lesson – 1/2 day

<table>
<thead>
<tr>
<th>Event</th>
<th>Detail</th>
<th>Preparation and resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome</td>
<td>Welcome all participants and guests. Outline background and purpose. Introduce an opening/guest speaker. Introduce staff involved in the project and allow time to say a few words about involvement in the Bike Education Program.</td>
<td>Identify and invite speaker.</td>
</tr>
<tr>
<td>Student presentations</td>
<td>Begin student group presentations of projects. Invite the first student group to present their project. Thank the presentation group. Provide opportunity for audience to ask any questions or make comments. Continue with next student group presentation.</td>
<td>Resources as required to showcase student presentations.</td>
</tr>
<tr>
<td>Short break if required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student presentations</td>
<td>Continue with student group presentations until all projects have been presented. Thank everyone and congratulate them on their efforts.</td>
<td>Resources as required to showcase student presentations.</td>
</tr>
</tbody>
</table>
| Feedback                                   | Obtain feedback from the students about the Bike Education Program. Method: small group discussion and documenting ideas. Questions to ask:  
  - What did you particularly enjoy about the whole program?  
  - How do you think the program could be improved?  
  - Any other relevant comments?                                                                            |                                                                                            |
| Celebration activities over lunch (if time available) | Celebration, including some fun activities, such as:  
  - bike riding trip  
  - bike activities run by guest bike group  
  - ‘smoothie bike’ riding  
  - various physical activities.                                                                           |                                                                                            |
Bike Education Program resource guide

Begin by identifying your local networks and resources, which may be free or at low cost.

<table>
<thead>
<tr>
<th>Local bike shop/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local bike interest groups, cycling clubs and speedways</td>
</tr>
<tr>
<td>Local Council member/s</td>
</tr>
</tbody>
</table>

AGENCIES AND ORGANISATIONS

- **Cycling SA**: SA branch of Cycling Australia, the national administrative body responsible for track and road racing. Includes a full listing of affiliated cycling clubs in SA.
- **Bike SA**: Bike education for schools; Adelaide free bikes and bike hire; Riding maps and trails.
- **SAPOL**: Road safety programs.
- **RAA**: General cycling advice.
- **Bicycle Institute of SA**: Voluntary association that exists to advocate for a safe and pleasant cycling environment in South Australia. Free membership.
- **Ride2School Program**: Ride2School is a nation-wide initiative by Bicycle Network (including Bike SA).

OTHER ONLINE RESOURCES

- **A guide for new and rusty riders** (Department of Planning, Transport and Infrastructure, 2013)
- **Cycling & the Law** (Government of South Australia, 2015)
- **Staying safe on the road: Protecting vulnerable road users** (RiAus and Motor Accident Commission, 2014). Inquiry-based learning of road safety for pedestrians and cyclists, aligned to Australian Curriculum.
- **Residents win grants program**: Creating people friendly streets and safer roads.
- **Be Safe Be Seen**: (Motor Accident Commission)
- **Be Safe Be Aware**: (Motor Accident Commission)
- **Cycle instead journey planner**: Interactive journey planner generates cycling routes using Adelaide’s Bikedirect network of main roads, bike lanes, local streets, off-road paths and some unsealed paths.
- **Way2Go Bike Ed** (Government of South Australia) Bike education program for SA primary school students aged 9–13.
- **Cycling** (Government of South Australia) Rules, safety tips and facts.
- **Strava maps**: Use GPS devices to record and analyse your route: compare yourself against friends and pros. Free to join.

EDUCATION RESOURCES

- **Australian Curriculum**
- **Australian Curriculum Assessment Reporting Authority (ACARA)**
- **SA Teaching for Effective Learning (TfEL) Framework**
- **Principles for School Road Safety Education – A Research Summary** (Government of Western Australia, 2009)
Example lesson plan: Humanities and Social Sciences

PLANNING AND PROGRAMMING

Year level: 8
Duration: 5 weeks
Subject: Humanities and Social Sciences

Year: 2015
School: Ocean View College
Author: Danielle Weaver

Humanities and Social Sciences Achievement Standards (Civics and Citizenship)

By the end of Year 8, students **analyse** features of Australian democracy, and **explain** features of Australia’s democracy that enable active participation. They **recognise** different types of law in Australia and **explain** how laws are made. They **identify** the diverse belief systems in Australia and **analyse** issues about national identity and the factors that contribute to people’s sense of belonging.

When researching, students **develop** a range of questions to **investigate** Australia’s political and legal systems and **critically analyse** information gathered from different sources for relevance. They **explain** different points of view on civics and citizenship issues. When planning for action, students take into account multiple perspectives, use democratic processes, and **develop** solutions to an issue. Students **develop** and present reasoned arguments on civics and citizenship issues using appropriate texts, subject-specific language and concepts. They **identify** ways they can be active and informed citizens in different contexts.

Humanities and Social Sciences Content Descriptions (Years 7 and 8)

- Appreciate multiple perspectives and use strategies to mediate differences (ACHCS071)
- Use democratic processes to reach consensus on a course of action relating to a civics or citizenship issue and plan for that action (ACHCS072)
- Present evidence-based civics and citizenship arguments using subject-specific language (ACHCS073)
- Reflect on their role as a citizen in Australia’s democracy (ACHCS074)
- Critically analyse information and ideas from a range of sources in relation to civics and citizenship topics and issues (ACHCS056)
- Present ideas, findings, viewpoints, explanations and conclusions in a range of texts and modes that incorporate source materials, citations, graphic representations and discipline-specific terms, conventions and concepts (ACHASSI163)
- Reflect on learning to propose personal and/or collective action in response to an issue or challenge, taking into account different perspectives, and describe the expected effects (ACHASSI162)
- Collaborate to generate alternatives in response to an issue or challenge, and compare the potential costs and benefits of each (ACHASSI160)
- Construct significant questions and propositions to guide investigations about people, events, developments, places, systems and challenges (ACHASSI152)

General capabilities
- Literacy
- Numeracy
- Information and Communication Technology (ICT) Capability
- Critical and Creative Thinking
- Personal and Social Capability
- Ethical Understanding
- Intercultural Understanding.

Cross-curriculum priorities
Sustainability – this concept was explored through the analysis of the environmental, social and political impacts of bike use in Australia and the decline in usage in people aged 13 and over.

Assessment
Assessment for learning:
- Pre-survey at student forum
- Pre-test at beginning of unit
- Pre-survey of student parents and friends

Formative assessment (assessment of learning):
- Each week, over the weekend, every student is required to write a reflection which includes:
  - One paragraph: What has your group achieved thus far?
  - One paragraph: Is your group meeting its weekly goal? If not, what isn’t working and how can you fix it to get back on track? If you are meeting your weekly goals, what has allowed this to happen and how can you keep this going?
  - One paragraph: What have you learnt and enjoyed this week?

Summative assessment (assessment of learning):
- Post-test at the completion of the unit
- Group projects
- Group presentation.
What do they bring?

- Students learn the bike laws, bike safety routines and equipment.
- Increase willingness to ride as a mode of transport.

Importance:

The reason we are teaching this unit of work and having students engage in a bike education program is that currently the number of people using bikes as a means of regular transport has decreased. One of the key reasons is that the number of people using bikes as a means of regular transport has decreased.

What is the intended learning and why is it important?

- Students will be able to:
  - list all relevant bike and driving laws relating to bike riding
  - name all parts of a bike and perform basic bike maintenance
  - fit a helmet correctly
  - demonstrate their understanding of laws and safety through teaching other community groups and year levels.

Engagement:

- Use of a variety of technology, inviting multiple guests to speak to the class and run practical sessions, and going on multiple excursions to ride in the local community.

Challenge:

- Students will take on their first opportunity in their schooling career to work as a group to plan, create, present and reflect on a large scale project to promote bike safety and bike riding to their wider schooling community. Students will also be required to provide their own improvements and justify why.

Support:

- Students will be supported through various experts that will visit the class, be given a variety of information based upon their project, given ample class time, meet with the teacher to work on the project and how they can be supported to be successful.

What do we want them to learn?

- Few students ride regularly and have a sound understanding of how to use a bike and the road rules.
- Of those that don’t ride, the reasons for not doing so are:
  - It’s not cool—only younger kids ride bikes
  - It’s too hard and time-consuming
  - I’m scared of getting into an accident.

Post-test of student knowledge.

Students running teaching sessions on what they have learnt.

Students successfully maintaining bikes.

Students creating their ‘projects’ based on an area of interest and presenting this project at the final presentation event.

In order to design the teaching and learning unit, the following documents have been used:

- Australian Curriculum
- SA Teaching for Effective Learning (TfEL) Framework
- National Principles for School Road Safety Education.

Lesson plans follow, detailing the teaching and learning plan.
STUDENT FORUM / STUDENT-INITIATED PROJECTS

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Outline of lesson</th>
<th>Resources</th>
</tr>
</thead>
</table>
| 4    | Prior knowledge              | **Introduction:** Play several biking demonstration videos that display the wide opportunities available. Road safety, bike stunts, mountain biking, etc.  
**Activity:** Group brainstorm: what do you know, think and feel about biking? Discuss and share as a class to create a class brainstorm. Students then interview a partner (someone they haven’t worked with) with the following questions, plus two of their own questions.  
• Have you ridden a bike before? If no, what do you think has stopped you?  
• Do you own a bike? If so, how often do you ride and what do you use it for? (Is it just for recreation or do you use it also as a means of transport to school/work?)  
• What do you think are the benefits that come from riding a bike?  
• What are the road and safety rules that apply to bike riders?  
• Why do you think many people don’t ride bikes regularly for recreational or transport use?  
*Students must add two questions of their own.  
**Conclusion:** Students are given surveys to take home to survey their parents/family/community member about their attitudes towards bike riding and road safety. | • Computer  
• Videos  
• Surveys  
• Books  
• Writing implements  
• Butcher’s paper |
| 4    | Grouping and deciding a focus | **Introduction:** Students as a class brainstorm their interests in terms of ideas they would like to focus on for their group projects. As a class, narrow down to 4 key topics which are placed around the room for students to sign up for, based on their interests. The teacher has the final say in making modifications in terms of effective student grouping.  
**Activity:** Students are given group work time to narrow down their focus and decide how they will present their projects: each student will need a formal record of their focus, the presentation and any other ideas.  
The teacher will move around between the groups, guiding them in focusing their ideas and making decisions.  
**Conclusion:** Each group shares with the class what they have decided upon and one goal they wish to achieve in their next group work lesson.  
**Homework:** Students formulate three questions they can ask an expert about their project area of interest for the excursion. | • Whiteboard  
• Whiteboard markers  
• Butcher’s paper  
• Writing implements  
• Folders for each student to keep all records of their work |
| 4    | LeFevre Cycle Speedway       | **Introduction:** Students leave school at 8:30am by bus to the LeFevre Cycle Speedway to partake in a modified bike safety lesson for Year 8’s.  
**Activity:** Road safety and cycling skills session conducted by experts.  
**Conclusion:** Students ask questions they prepared for homework in the previous lesson before returning to school. | • Bus  
• Consent forms  
• Booking with LeFevre Cycle Speedway |
### STUDENT FORUM / STUDENT-INITIATED PROJECTS

<table>
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<tr>
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</tr>
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</table>
| 5    | Goal setting and staying focused | **Introduction:** A guest teacher from the Year 10–11 research class speaks to students about how to successfully work on a personal project.  
**Activity:** Students are given a goal planner onto which each group writes a weekly goal that they will meet to ensure they have a high quality finished product at the end of Week 8. Groups meet with the teacher for 10 minutes at the end of each week to discuss whether they have met these goals.  
As (graded) homework each week, students write a reflection in response to the following questions:  
• What has your group achieved thus far?  
• Is your team on track in terms of meeting their goals? Explain.  
• If you are meeting your weekly goals, what has allowed this to happen and how can you keep this going?  
• If your team has not met its goals, what actions will you take to get back on track with your goals?  
• What have you learned and enjoyed so far?  
**Conclusion:** Groups share their goals and the teacher outlines homework expectations and structure. | • Weekly goal planner sheets  
• Student folders  
• Writing implements  
• Weekly reflection homework sheet |
| 5    | Cycling SA: Be Safe Be Seen (After school) | Cycling SA: Cycling SA presentation on **Be Safe Be Seen** presented to parents and students about being safe on the road as a bike rider and a driver, and how to make yourself seen. | • Laptops / computers  
• Writing implements  
• iPads |
| 5    | Group project work (This is repeated each week) | **Introduction:** Teacher sets expectations for the lesson and each group shares what they plan to achieve this lesson.  
**Activity:** Students work on their projects. Teacher meets with each group to discuss what has been achieved, whether their goals need to be modified, and if there is anything that can be done to further support them in sorting out any issues.  
**Conclusion:** All groups share with the class what they have achieved in this time, promoting both ownership and responsibility to the class to achieve as much as they can. | |
| 5    | Road rules | **Introduction:** Watch **Behind the news: safe cycling**.  
**Activity:** Reflecting on the **Be Safe Be Seen** presentation, students research bike and road safety laws, brainstorming why they are important and their implications for both bike riders and drivers. In pairs, students make bike safety posters to display in both junior and middle schools.  
**Conclusion:** Each pair presents their poster to the class, highlighting the rules they have focused on and how they designed their poster for their intended audience. | |
<p>| 5    | Group project work | As described for week 5. | |</p>
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Outline of lesson</th>
<th>Resources</th>
</tr>
</thead>
</table>
| 6    | Geography: Local riding paths in the community | **Activity:** Each group is given a map of a different cycling path in Adelaide and is required to discuss, write and reflect upon the map design of the bike path, including:  
  • environmental impact  
  • human impact  
  • ease of use  
  • enjoyment: what features of this path make it fun?  
  • the intended purpose of each feature: why were these design choices made?  
**Conclusion:** All groups share their analyses and feedback with the class. |  |
| 6    | Cycling SA – Cycling session  
20 bikes  
Time: 2 hours | **Introduction:** Cycling SA presentation on how to ride safely on the road with a key focus on the three S's: Scan, Signal and Scan again. Each student is given a helmet and instructed on how to fit it properly to decrease the level of injury in an accident.  
**Activity:** Each student is given a bike and the Cycling SA instructors take the students through various real-world situations where they simulate what it is like to turn a corner or cross an intersection.  
**Conclusion:** Fun cycling games and a discussion on what was covered during the lesson. |  |
| 6    | Bikes and bike maintenance | **Introduction:** Watch the following videos:  
5 Essential Bike Maintenance Tips  
Road biking vs Mountain biking  
**Activity:** Students work in groups to research and label all bike parts on their diagram, after which they re-watch the bike maintenance video and take notes on the relevant bike parts.  
**Conclusion:** Mini quiz: as a whole class, the teacher shows a PowerPoint bike part and maintenance quiz with the students working in their project groups. The team with the most points receives a prize. | • projector/ smart board  
• bike diagrams  
• prize |
| 6    | Group project work | As described for week 5. |  |
| 7    | Geography | **Introduction:** A teacher colleague, who is a regular bike rider, speaks to the class about his experiences as a bike rider and answers students’ questions.  
**Activity:** Teacher colleague leads the class on a short bike ride along the beach path in front of the school. |  |
<p>| 7    | Group project work | As described for week 5. |  |</p>
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Outline of lesson</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Bike safety and technology</td>
<td><strong>Introduction:</strong> Watch the video <em>Volvo life paint</em></td>
<td>• Various bike safety equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Activity:</strong> Students are shown various items of bike safety equipment/technology. They discuss in their groups the purpose of each piece of equipment and the benefit to the rider. Students design their own piece of safety equipment that encompasses these benefits and more.</td>
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<td></td>
<td><strong>Conclusion:</strong> Each group presents to the class their design for bike safety and how it will help keep the community safe.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Group project work</td>
<td>As described for week 5.</td>
<td></td>
</tr>
</tbody>
</table>
| 8    | Local bike organisations and community  | **Introduction:** Watch the following videos:  
*Inspired Bicycles – Danny MacAskill April 2009*  
*Danny MacAskill: The Ridge*  
*Tour de France 2014: Stage 10 Race & Highlights*  
**Activity:** The teacher discusses sport cycling with the class, beginning with local cycling clubs and tracks for young people to use, followed by the professional cycling world locations. Students research 2–3 bike organisations, including:  
• the name of the organisation  
• what the organisation does  
• contact details.  
All information is placed on the ‘Bike Education community wall’ in the middle school for students to access. |
| 8    | Group project work                      | As described for week 5.                                                                             |                                    |
| 8    | Bike riding and the community           | **Introduction:** Students take their bikes to visit small groups of students from the junior school/special needs school and talk about bikes and the health benefits and safety tips they have learnt.  
**Activity:** Students work with small groups of students from the junior school to practice their project presentations and inform them of the ‘bike clubs’ they have started, as well as any technology they are designing.  
**Conclusion:** As a class, students share how their sessions went. |
| 8    | Group project work                      | As described for week 5.                                                                             |                                    |

**PRESENTATION EVENT**
Example lesson plan: Mathematics

PLANNING AND PROGRAMMING

Year level: 8
Duration: 8 weeks
Subject: Mathematics
Year: 2015
School: Murray Bridge High School
Author: Luke Starczak

Mathematics Year 8 Achievement Standards

<table>
<thead>
<tr>
<th>Unit outline: They choose appropriate language to describe events and experiments. They explain issues related to the collection of data and the effect of outliers on means and medians in that data.</th>
<th>Guiding question: How can students improve bicycle safety in their community?</th>
</tr>
</thead>
</table>

General capabilities:
- Literacy
- Numeracy
- ICT Capability
- Critical and Creative Thinking
- Personal and Social Capability
- Ethical Understanding

Cross-curriculum priorities:
- Sustainability

Overarching ideas:
- Geometry and Measurement
- Data representation and interpretation

Content Descriptions | Potential resources | Learning activities | Assessment tasks | Achievement standards |
| --- | --- | --- | --- | --- |

**Geometry**
- Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)
- Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)

**Data collection (surveying)**
- Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)
- Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)
- Explore the variation of means and proportions of random samples drawn from the same population (ACMSP293)
- Investigate the effect of individual data values, including outliers, on the mean and median (ACMSP207)

**Introductory activities**
- (How will I capture the students’ interest and use what they already know?)
- Pre-test – Bike Education Student Survey
- – Statistics
- Student forum
- Activity – How far have I ridden?

**Formative activities**
- (What activities can help the students understand the key ideas?)
- Progress reviews
- Post-test – Bike Education Student Survey
- – Statistics

**Summative activities**
- (What activities – oral, written, visual – can I assess to check whether the students understand the key ideas?)

1. **Investigation:** How far have I ridden?
2. **Presentation:** Present ideas to a wider audience.
3. **Test:** Data representation and interpretation.

- Convert between units of measurement for area and volume
- Perform calculations to determine perimeter and area of parallelograms, rhombuses and kites
- Name the features of circles and calculate the areas and circumferences of circles
- Explain issues related to the collection of data and the effect of outliers on means and medians in that data.
## Aligning *what* and *how* of teaching and learning in the Australian Curriculum

### What is the intended learning and why is it important?

**Students:**
- Understand the importance of statistics in today’s society and how statistics can be used to improve people’s safety and wellbeing.
- Learn the bike (road) laws and conventions, bike safety routines and bike equipment management.
- Increase willingness to ride as a mode of transport.

This program is being delivered so that students engage in a bike education program because currently the number of people using bikes as regular transport is decreasing. One of the key reasons being that as students reach middle school age they are no longer allowed to ride on the footpath and quit riding due to their fear of accidents and misunderstanding road rules.

### What could the intended learning look like at this level?

**Students:**
- Explain issues related to data collection and the effect of outliers on means and medians in that data.
- List all relevant bike and driving laws relating to bike riding.
- Name all parts of a bike and perform basic maintenance.
- Fit a helmet correctly.
- Demonstrate their understanding of laws and safety throughout.

### How will we engage, challenge and support their learning?

**Engagement:** Use a variety of technologies; invite multiple guests to speak to class and run practical sessions; provide opportunities to ride inside and outside school.

**Challenge:** Complete a mathematics investigation challenging students’ understanding of circles’ properties; provide opportunities for group work to plan, create, present and reflect on large scale projects promoting bike safety and riding to and outside school; develop critical thinking skills through tasks that require analysis of laws and requirements to justify students’ reasoning behind suggested improvements.

**Support:** Teacher directed information sessions; provide students with information from various visiting experts; allocate dedicated lesson time and provide information specific for student projects; schedule weekly teacher meetings to discuss progress and support success.

### What evidence will enable us to assess the intended learning?

**Post-test of student knowledge.**
- Students running teaching sessions on what they have learnt.
- Students successfully maintaining bikes.
- Students creating their ‘projects’ based on an area of interest and presenting this project at the final presentation event.

### So what will we do to get there?

**Design the teaching and learning plan**

In order to design the teaching and learning unit the following documents have been used:
- Mathematics for Year 8 (2007, Haese and Harris Publications)
- Australian Curriculum
- SA Teaching for Effective Learning (TfEL) Framework
- National Principles for School Road Safety Education
- Department for Planning, Transport and Infrastructure (DPTI):
  - A guide for new and rusty riders
  - Cycling & the Law
- RIfAus and Motor Accident Commission (MAC)
  - Staying safe on the road: Protecting vulnerable road users
  - The science and myths of low level speeding.

Lesson plans follow, detailing the teaching and learning plan.
# YEAR 8 MATHEMATICS BIKE EDUCATION: LESSON-BY-LESSON PLAN

**School:** Murray Bridge High School  
**Author:** Luke Starczak

## STUDENT FORUM

<table>
<thead>
<tr>
<th>Week</th>
<th>Key ideas</th>
<th>Learning activities and resources</th>
<th>Assessment</th>
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</table>
| 0    | Students critically inquire into what are the main road rules related to safe bicycle use. Students understand that they can influence others’ attitudes toward bicycle riding and possibly increase number of bicycle riders. Students design a group project around bicycle safety that focuses on one of these four key outcomes:  
- Organising a major event  
- Getting more students on bicycles  
- Creating a social media message or product around bicycle riding and safety  
- Designing a product or initiative that improves bicycle safety. | **Student forum**  
- Bike safety – SAPOL  
- MAC – Be Safe Be Seen  
- RAA  
- DPTI  
- Bike SA | **Assessment**  
- Attend the student forum.  
- Pre-test: Bike education. | ✓ |

## STUDENT-INITIATED PROJECTS

<table>
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<tr>
<th>Week</th>
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</table>
|      | Introduction to the program  
- Recap the student forum  
- Class discussion on what they remember the rules to be when riding on the roads  
- Talk about the actual rules. |  
- TAC – Strings video  
- DPTI (2015) Cycling & the Law | |
|      | Brainstorming program ideas  
- Narrow down to 4 projects  
- Individually, students select which project they want to be involved in. | Identify topic for project. | |
|      | Introduction to measurement  
### STUDENT-INITIATED PROJECTS

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<th>F</th>
<th>S</th>
</tr>
</thead>
</table>
| 2    | Measurement  | • Perimeter  
  - Notes and discussion about how to calculate perimeters for different shapes  
  - Textbook questions.  
  *Mathematics for Year 8, pp. 174–177* | Measurement investigation  
In small groups, students measure the dimensions of a variety of different shapes to calculate perimeter and area before drawing labelled scale diagrams of each shape (minimum 10 diagrams). |   |   |
| 3    | Measurement  | • Circumference  
  - Notes and discussion about how to calculate the circumference of a circle  
  - Textbook questions.  
  *Mathematics for Year 8, pp. 178–185* | Investigation: How far have I ridden?  
Students are given the formula to calculate the circumference of a circle. They calculate the distance travelled on three bikes with different wheel sizes when given the number of revolutions.  
**Extension activity:** Students are given the formula to calculate average speed. Using the wheel size of the road bike, they calculate average speed when given the number of revolutions and time taken. | ✓ |   |
|      | Whole class talk about vulnerable road users  
• RIAus Inquiry Task 1. | RIAus *Staying safe on the road: Protecting vulnerable road users* p. 6 |   |   |
|      | Identify project specifics within the 4 groups  
• Students to present an outline, timeline and goals by the end of their discussion. |   | Present an outline, timeline and goals for the project. | ✓ |   |
| 4    | Vulnerable road users discussion  
• RIAus Inquiry Task 2  
• Watch Scinamations. | RIAus *Staying safe on the road: Protecting vulnerable road users* pp. 6–8  
**Scinamations**  
**Going for a Walk**  
**Going for a Ride** |   |   |
<table>
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</table>
| 4    | Group project work (this is repeated each week) | **Introduction:** Teacher identifies learning intentions and success criteria for the lesson.  
**Activity:**  
- Students work on their projects.  
- Teacher walks around and meets with each group to discuss what has been achieved, whether their goals need to be modified and asks the students if there is anything they can do to further support them or to sort out any issues they may be having.  
**Conclusion:** All groups share back with the teacher what they have achieved in this time. | F | S |

Cycling SA presentation (guest speaker)  
- How to fit a helmet  
- Scan, Signal and Scan again  
- How to negotiate:  
  - T-intersection  
  - Roundabout  
- **Practical session**  
  - Fitting a bike to your body  
  - Riding as a group  
  - Negotiating intersections  
  - Riding slow (challenge activity).  

Cycling SA presentation (guest speaker)  
- Teach how to fit a helmet  
- Teach how to signal  
- Scan over right hand shoulder when turning  
- Put arm out to indicate  
- Students learn how to navigate:  
  - T-intersection  
  - Roundabout  
Bicycles and helmets provided by Cycling SA in order for students to go for a ride on school courts while practicing these skills.

<table>
<thead>
<tr>
<th>5</th>
<th>Cycle clothing discussion</th>
<th>MAC – <strong>Be Safe Be Seen</strong> website</th>
<th>F</th>
<th>S</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Group project work (as described for week 4)</td>
<td></td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Week</td>
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</table>
| 5    | Murray Bridge Cycling Group presentation | • Types of cycling activities in Murray Bridge  
• Communications through Facebook to organise rides  
• Explanation of types of bikes  
• Safety and the law talk  
• Nutrition and hydration talk  
• Lights explanation  
  – Different types of lights  
  – Lux/lumen/watts  
• Bike security  
• Backpack/saddle bag  
• Introduction to Strava as a means to record and connect  
• Clothing for cycling. |  |
|      | **Group project work** (as described for week 4) | | **Progress review 1**  
One paragraph  
• Goals you have met  
• Goals you haven’t met  
• How you are going to get back on track? | ✓ |
| 6    | **Pre-test: Why are statistics important?**  
Class discussion and teacher notes:  
• Census data vs sample data  
• What is bias in statistics?  
• How do we determine what a reasonable sample size is?  
• RiAus Activity 1 & 2. | Mathematics for Year 8, pp. 379–399  
RiAus *Staying safe on the road: Protecting vulnerable road users* pp. 20–21 | **Pre-test: Statistics**  
Students state definitions for:  
• mean  
• median  
• mode  
• range.  
They sort data into a frequency table and frequency graph to identify range, mean, median and mode. |  |
|      | **Group project work** (as described for week 4) | |  |
|      | **Bicycle Express presentation – bike maintenance session** (guest speaker) | • Safety and rules talk  
• Tyre pressure for different bikes  
• Demonstration on how to fix a puncture and change a tyre  
• Maintenance check before riding or after a ride  
• Explanation of how to service a bike. |  |
## STUDENT-INITIATED PROJECTS

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</table>
| 7    | Class discussion and teacher notes | • Categorical data  
  – Frequency and tallies  
  – Graphing  
  • Numerical data  
  – Graphing  
  • RiAus Activity 2. | *Mathematics for Year 8*, pp. 380–386  
  *RiAus Staying safe on the road: Protecting vulnerable road users* pp. 25–30 | | |
|      | | • Measuring the centre and spread  
  – Mean  
  – Median  
  – Mode  
  – Range  
  • RiAus Activity 3. | *Mathematics for Year 8*, pp. 391–398 (Reference)  
  *RiAus Staying safe on the road: Protecting vulnerable road users* pp. 25–30 | | |
|      | Group project work  
 (as described for week 4) | | Progress review 2 | ✔ | |
| 8    | Class discussion and teacher notes | • Grouped data  
  – Stem and leaf plots. | *Mathematics for Year 8*, pp. 387–390 | | |
|      | Teacher directed discussion  
 reviewing the last lesson  
 • RiAus Activity 4 & 5. | | *Mathematics for Year 8*, pp. 398–402 (Reference)  
  *RiAus Staying safe on the road: Protecting vulnerable road users* pp. 30–36 | | |
|      | Group project work  
 (as described for week 4) | | | | |

### PRESENTATION EVENT
Suggested Australian Curriculum Content Descriptions

**HEALTH AND PHYSICAL EDUCATION**

- Plan and use health practices, behaviours and resources to enhance the health, safety and **wellbeing** of their communities (ACPPS077)
- Practise and **apply** personal and social skills when undertaking a range of roles in physical activities (ACPMP086)
- **Investigate** the benefits to individuals and communities of valuing **diversity** and promoting inclusivity (ACPPS079)
- Plan and **evaluate** new and creative interventions that promote their own and others’ connection to **community** and natural and built environments (ACPPS097) [Year 9/10]
- Participate in and **investigate** cultural and historical significance of a range of physical activities (ACPMP085)

**Ideas for classroom use**

- Create a community event and let the groups take on different roles, eg design, promotion, logistics and community engagement.
- Investigate community resources that promote health: students create their own website/ Facebook aimed at their age group.
- Research the health and community benefits of bikes, eg heart rate monitors, research professional riders, such as diet, body composition and training.
- Participate positively in groups and negotiate roles and responsibilities, eg become your own ‘Tour Down Under’ Team; investigate the roles within a riding team. Plan a safety message using student's own perspectives and suggestions to health situations.
- Investigate various community groups and organisations and devise a local map of bike trails, venues, paths and facilities that can be accessed within the community. Include the ‘most important’ safety messages in student presentations to educate younger riders.

**ENGLISH**

- Analyse how the **text** structures and **language features** of persuasive texts, including **media texts**, vary according to the **medium** and **mode** of communication (ACELA1543)
- Interpret the stated and implied meanings in spoken texts, and use evidence to support or challenge different perspectives (ACELY1730)
- Plan, rehearse and deliver presentations, selecting and sequencing appropriate content, including multimodal elements, to reflect a diversity of viewpoints (ACELY1731)
- Use comprehension strategies to interpret and evaluate texts by reflecting on the validity of content and the credibility of sources, including finding evidence in the **text** for the **author’s** point of view (ACELY1734)
- **Create** imaginative, informative and persuasive texts that raise issues, report events and advance opinions, using deliberate language and textual choices, and including digital elements as appropriate (ACELY1736)
- Use a range of software, including **word** processing programs, to **create**, edit and publish texts imaginatively (ACELY1738)

**Ideas for classroom use**

- Write a report about findings that may influence decision-makers. Include any data collected, eg students would ride to school regularly if the school had lockable bike racks.
- Write a narrative, eg My cycling trip to Melbourne.
- Write regularly in a personal or group journal to track progress and record thoughts, ideas, future goals and outcomes.
- Analyse newspaper articles and ‘Letters to the Editor’, presenting summaries and views to others. Additionally, write your own.
- Design a PowerPoint presentation around a cycling topic, eg A new techno bike.
- Listen to extended spoken and audio texts. Evaluate information and ideas and present a summary to share with a group, eg Is it important to always wear a helmet?
- Design a safety poster complete with information, diagrams, graphs etc.
- Write a letter to the local council inquiring about its funding decisions and what proportion is set aside for cycling and path development.
- Communicate with local agencies and businesses and see how they can assist project work, eg safety or maintenance talk.
- Hold debates, eg ‘All primary school students need to regularly be involved in cycling activities’.
- Prepare an argument presenting a specific point of view and deliver to a focus group, eg ‘Schools need to have lock up bike sheds’.
- Write a persuasive argument, eg for not wearing a bike helmet; cyclists of all ages should never ride faster than 20kms per hour.
THE ARTS

- Analyse how technical and symbolic elements are used in media artworks to create representations influenced by story, genre, values and points of view of particular audiences (ACAMAR071)
- Plan, structure and design media artworks that engage audiences (ACAMAM069)
- Develop and refine media production skills to shape the technical and symbolic elements of images, sounds and text for a specific purpose and meaning (ACAMAM068)
- Combine the elements of drama in devised and scripted drama to explore and develop issues, ideas and themes (ACADM040)
- Present artwork demonstrating consideration of how the artwork is displayed to enhance the artist’s intention to an audience (ACAAM122)

Ideas for classroom use
- Research relevant information and produce a poster or social media item. Eg ‘How to fit a helmet correctly’.
- Prepare a presentation on cycling issues to a select audience and plan carefully for maximum impact, eg ‘Why we need safe bike racks at our school’. Think carefully about information to present, format, appropriate use of voice, visual components, type of audience etc.
- Create a dramatic presentation relating to cycling issues that takes into account physical and emotional attributes, eg dramatise Mary’s fifth birthday party when she receives an eagerly awaited bicycle as a gift! Consider carefully how to make use of voice, music, movement, volume and mood to express an opinion. Ensure all members have a role and understand the intention of the performance. Create a musical item that reflects the work done in the area of cycling and road rules. Many sounds can be used most effectively to reflect emotions, adverse situations and ideas.
- Create an art display or gallery filled with cycle-related artworks and invite community members to come along. Include a variety of works, such as paintings, graphic designs, sculptures.

DESIGN AND TECHNOLOGIES

- Investigate the ways in which products, services and environments evolve locally, regionally and globally and how competing factors including social, ethical and sustainability considerations are prioritised in the development of technologies and designed solutions for preferred futures (ACTDEK029)
- Investigate and make judgments on how the characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions (ACTDEK046) [Year 9/10]
- Independently develop criteria for success to evaluate design ideas, processes and solutions and their sustainability (ACTDEP038)
- Use project management processes when working individually and collaboratively to coordinate production of designed solutions (ACTDEP039)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

Ideas for classroom use
- Generate, develop and communicate design ideas and decisions using appropriate terms and graphical representation techniques. Research carefully and collect information to design something new, eg a new type of bicycle or bicycle shed. Include and explain any specific and interesting features.
- Organise a social media campaign, eg ‘Get moving—go by a bike!’
- Design various posters and video clips around safe cycling and road safety, eg Things to watch out for when riding; How to maintain your bike; Cycling can be fun; Keep healthy—get cycling.
- Using all technologies available to the group, plan and document a sequence of production steps to assist individual and collaborative work. Present in a suitable format.
- Select from a range of materials, tools and equipment to develop design ideas. Prepare a fun activity where a range of everyday items, such as paperclips, straws, string, paper plates and wire are provided and groups are set a task to design a bike or representation of one. Make the activity more challenging by setting different criteria, eg the bike must have a child seat attached; design a bike for mountain terrain.
- Organise a Facebook account for the group and nominate students to be responsible for its use. Encourage regular activity, including posting items related to cycling and road safety; responses to community comments; sharing project information and graphics etc.
- Gain information on the major local and global environmental concerns and decide if cycling can have an effect on futures and sustainability. Document findings and produce evidence to support.
**SCIENCE**

- Solutions to contemporary issues that are found using science and technology, may impact on other areas of society and may involve ethical considerations (ACSHE135)
- Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSIS140)
- Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships in data using digital technologies as appropriate (ACSIS144)
- Summarise data, from students’ own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions based on evidence (ACSIS145)
- Critically analyse the validity of information in secondary sources and evaluate the approaches used to solve problems (ACSIS172) [Year 9]
- Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations (ACSIS174) [Year 9]

**Ideas for classroom use**

- Utilise RiAus Research situations where knowledge from different disciplines or areas of science has been used in relation to bike riding to solve real world problems, such as transport, environment, sustainability, pollution. Explain how the solution was viewed by and impacted on different groups in society, such as industries, commuters, governments etc.
- Identify suitable questions that can be asked and investigated within cycling surveys, explaining all considerations.
- Draw on a variety of collected evidence to support ideas and conclusions about cycling, eg ‘Early bike models were not as safe as those today’.
- Summarise collected data and comment on any trends evident in the area of cycling, eg ‘More children rode bicycles twenty years ago than now’.
- Research areas of interest relating to a multitude of cycling issues, eg How many people regularly ride mountain bikes in SA? Collect and collate data and communicate findings using appropriate language and representations, such as graphs, diagrams, sketches etc.
- Make predictions about cycling activities and needs and propose explanations, using the collected evidence to support views, eg by 2020, the number of cyclists will increase by x%.
- Investigate future trends and predict and estimate requirements for all community groups concerned, eg new and improved bike paths; community hire bike stations; repair and maintenance stations etc. Include pricing of materials, cost of goods and fees, and figures for government assistance and funding.
Whilst they were doing maths during the Bike Education Program, they actually did not feel like they were doing a lot of maths. My students were able to learn a subject in a different way from what they have experienced before. They were still able to get the content knowledge, but they were enjoying how they were learning this. This was really important and hopefully will enable them to enjoy maths in the future. — Mathematics teacher
The Bike Education Program has been developed in response to a Citizens’ Jury who recommended formal cycling education in schools in order that motorists and cyclists might share the roads safely.

The resource includes example lesson plans which focus on Year 8 Achievement Standards and Content Descriptions for Mathematics and Humanities and Social Sciences. However, bike safety and road rules can be incorporated across other learning areas and adapted for other year levels. Teachers highly recommend the program to other teachers and other schools.