Road Smart Teacher Toolkit

Lesson Plan 2 – Saving lives through safety:
Picking the safest car you can

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Student Outcomes

In this interactive lesson, students will deepen their understanding of the importance of safety features in cars, and how to pick a safer car.

By the end of this lesson, students will be able to:

- Describe the methods for assessing vehicle safety in Australia
- Identify sources of information about safer vehicles available in Australia
- Identify different types of road users
- Describe vehicle safety features designed to protect vehicle occupants and other road users in a crash and to prevent crashes

Suggested Timing

40 - 50 min

Materials and Preparation

- Devices with internet access for each group of students so they can access the relevant online materials referenced in this lesson plan.
- A computer and projector, and/or digital whiteboard for the teacher to show the opening video.
- Print-outs, for each group, of Resource 2: Car Safety Features Template from this document (and writing implements to complete them with).

Lesson Description and Background

In this interactive and engaging lesson, students will be introduced to and explore the different types of safety features in cars.

Students first watch a video introducing the concept of vehicle safety features.

Students then work in teams to brainstorm different safety features of cars using a series of stimulus materials. They supplement their own brainstorm with internet research to discover more about the types and importance of vehicle safety features.

Students use the knowledge gained through this enquiry to complete a problem-based learning activity where they must find and assess a suitable vehicle for purchase within given budgets, using real-world examples and channels.

Students end the lesson by discussing and debating a provocative statement on road safety, and reflecting on the importance of the decisions they make every day about vehicle safety.

Evidence Base

Research suggests that if everyone started driving a five-star safety rated vehicle, road trauma could be reduced by up to half. Picking safe vehicles makes a major difference to road safety.

Coaching Tip

Explicitly explain the difference between crash avoidance safety features and crash protection safety features.

Curriculum Mapping

Science
Content Description

- The values and needs of contemporary society can influence the focus of scientific research (VCSSU116)

Achievement Standard (extract only)

- By the end of Level 10 students … predict how future applications of science and technology may affect people's lives.

Lesson Part 1 – Introduction (5 minutes)

1. Show students the TAC video *How safe is your car?*
   https://www.youtube.com/watch?v=yinmwp0brpc
2. Ask students what safety features were named in the advertisement, and if they can define them (further information and answers in *Resource 1*, below).
3. Explain to students that in this lesson they will be learning about the safety features of various cars, and how to pick the safest car that they can afford – which could save their life.

Lesson Part 2 – Group brainstorm and research – "What are these safety features?" (10-15 minutes)

1. Divide students into groups of two or three.

2. Distribute the *Car Safety Features template (Resource 2)* to each group. Ask students to think of as many car safety features as they can, and mark them on the template. It is not important that they mark them in the correct position – the template is only there for inspiration. Remind them to think of *internal* safety features, too (like seatbelts). They must both name the safety feature *and* briefly explain why it makes the car safer. Different safety features have different functions – some prevent crashes, some protect the vehicle occupants and road users. After students have attempted to brainstorm in groups, you may direct them to use the internet to learn additional safety features. Visit http://www.howsafeisyourcar.com.au/Safety-Features/Safety-Features-List/ for more info. *A sample filled-in template is included as Resource 3 in this document.*

3. Ask each group to share their responses with the class. If desired, you can project an image of the *Car Safety Features template* during the class discussion, and fill in every answer suggested by students on this template.

Lesson Part 3 – Group-based challenge – "Safety… on a budget!" (20-30 minutes)

1. In the same groups, ask each group to imagine that they have $3,000, $5,000 and $10,000 to spend on a first car.

2. Ask students to list all features that they want their first car to have (this can include both safety and non-safety related features). Encourage students to think about the features they actually want – it's okay to talk about things that really matter to some people, like 'looking cool', in a non-judgemental way, for the purpose of this exercise.

3. Without directing students to a specific website, challenge them to take 10 minutes to find some cars that fit their criteria and budgets online. (If students are struggling to find a place to start, direct them to www.carsales.com.au as a starting place, although they will visit a different site later in the activity).

4. Get students to rank the cars that meet their criteria in order of preference.

5. Ask students how they will assess whether or not their preferred car is safe. Introduce the concept of the Australasian New Car Assessment Program (ANCAP) and the Used Car Safety Rating (UCSR) (this is explained in detail in Lesson Resource 4 and 5).

6. Direct students to howsafeisyourfirstcar.com.au and review the video on the main page (you may wish to play this to the entire class, or have students view it on their own devices). The video can be found at https://youtu.be/ww_MSVsj2sc

7. Ask students to get the safety ratings for the cars that they had previously identified, and re-rank them using this new information.

Lesson Part 4 – Conclusion (5 minutes)

1. Write the following statement on the board:

   "If you can't afford a <u>safe</u> vehicle, you can't afford a vehicle!"

2. Ask students to discuss this statement in the context of what they have learned in this lesson.

Resource 1: Further information and answers

The **two** safety features identified in the TAC commercial are:

1. ESC (electronic stability control)
2. Side head-protecting airbags (also called 'curtain airbags')

Further details about ESC:

According to TAC's www.howsafeisyourcar.com.au, Electronic Stability Control (ESC) helps drivers to avoid crashes by reducing the danger of skidding, or losing control as a result of over-steering. ESC becomes active when a driver loses control of their car. It uses computer controlled technology to apply individual brakes and help bring the car safely back on track, without the danger of fish-tailing.

Australian research shows that ESC reduces the risk of:

- Single car crashes by 25%
- Single 4WD crashes by 51%
- Single car crashes in which the driver was injured by 28%
- Single 4WD crashes in which the driver was injured by 66%

It has been estimated that no other active safety device has such potential to reduce single car crashes. In 2016, 41 lives lost on Victorian roads could have been saved if the vehicle involved was fitted with ESC.

Please note that different manufacturers have different names for this functionality.

See more at www.howsafeisyourcar.com.au/Electronic-Stability-Control/

Further details about curtain airbags:

According to TAC's www.howsafeisyourcar.com.au, curtain airbags are designed to protect the driver's and passenger's heads in a crash. The curtain airbag activates instantaneously in the event of a side impact crash, deploying from the top of the door rails above the side window. They form a cushion between the driver or passenger and the window and stay in place if the car rolls over to protect their head.

Research conducted in the USA estimates that head protecting airbags can reduce driver deaths in the event of a side impact crash by close to 40%. Without them, in a side impact crash there is little to protect your head from striking the side of the car or rigid objects like trees or poles.
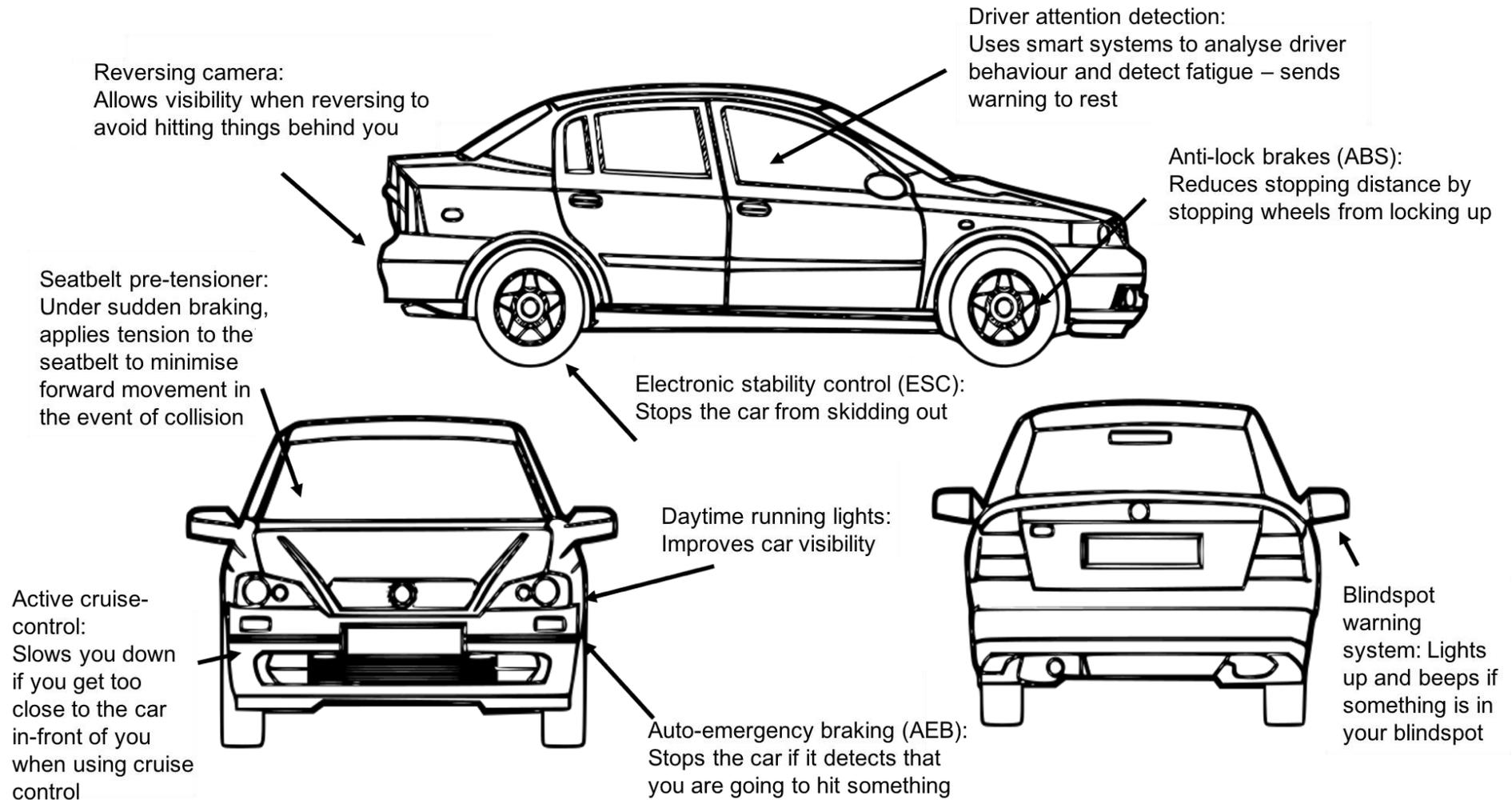
See more at http://www.howsafeisyourcar.com.au/Curtain-Airbags/

Resource 2: Car safety features template
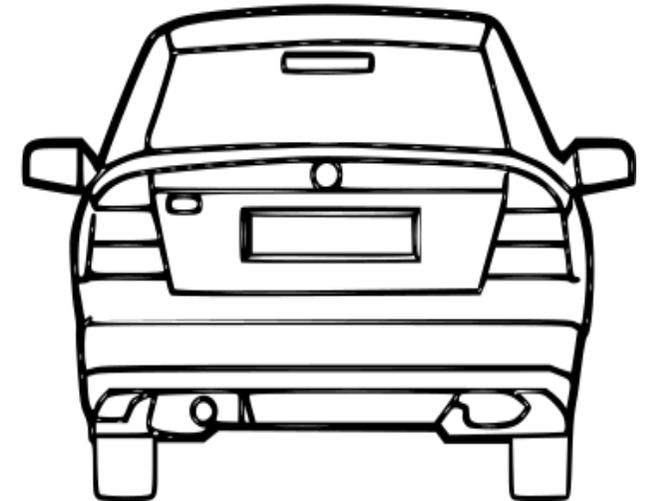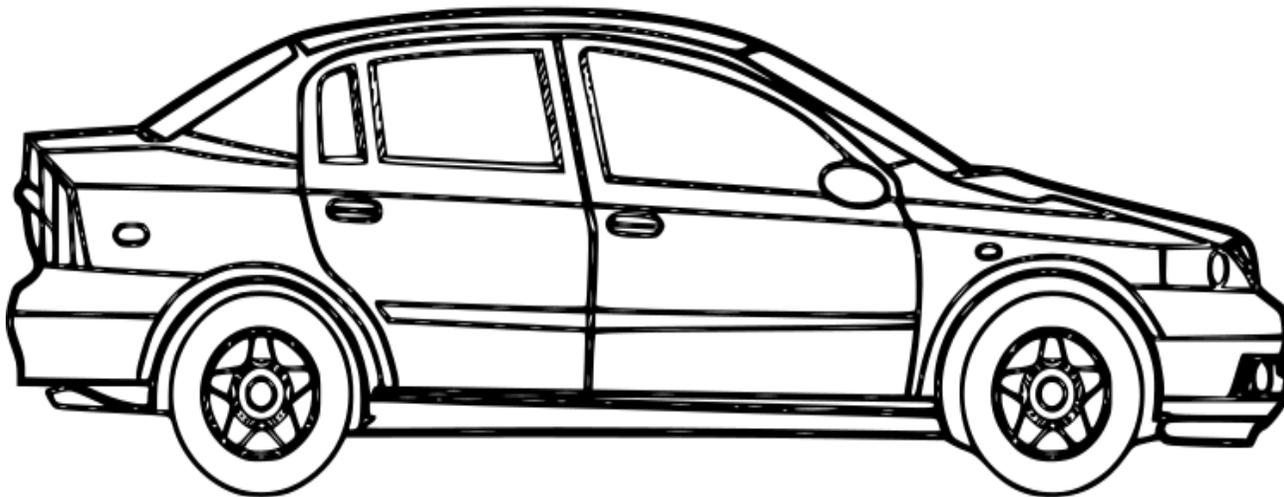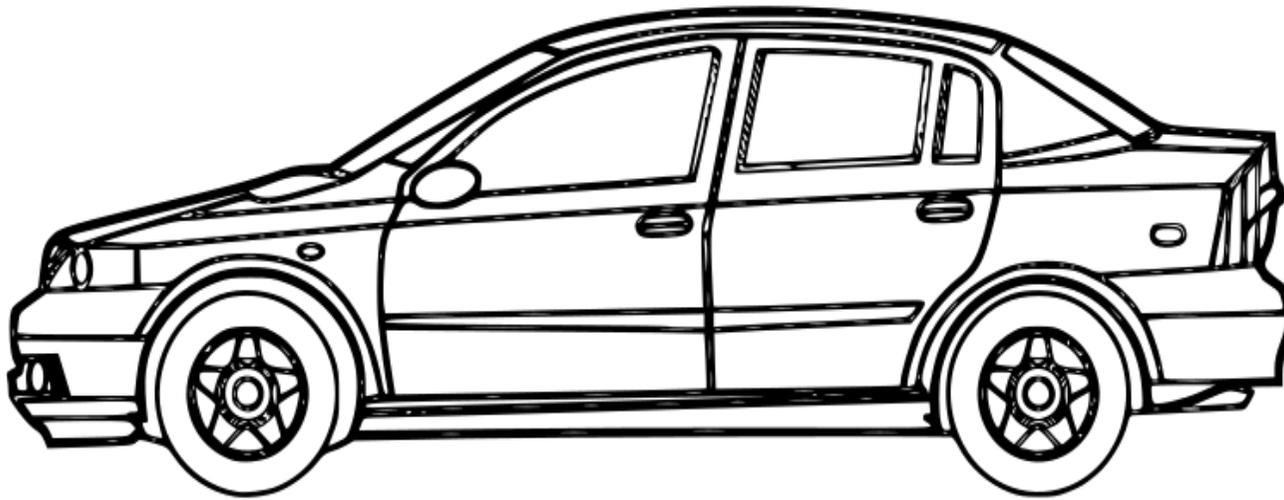
Resource 3: Sample filled-in car safety template

Note for teachers: the below image is a sample of what a filled-in student template may look like. This is not a comprehensive list of features. For a detailed list and explanation of safety features, visit: www.howsafeisyourcar.com.au/Safety-Features/Safety-Features-List/

Driver attention detection:
Uses smart systems to analyse driver behaviour and detect fatigue – sends warning to rest

Reversing camera:
Allows visibility when reversing to avoid hitting things behind you

Anti-lock brakes (ABS):
Reduces stopping distance by stopping wheels from locking up

Seatbelt pre-tensioner:
Under sudden braking, applies tension to the seatbelt to minimise forward movement in the event of collision

Electronic stability control (ESC):
Stops the car from skidding out

Daytime running lights:
Improves car visibility

Active cruise-control:
Slows you down if you get too close to the car in-front of you when using cruise control

Auto-emergency braking (AEB):
Stops the car if it detects that you are going to hit something

Blindspot warning system: Lights up and beeps if something is in your blindspot

Resource 4: ANCAP Safety Ratings

ANCAP (Australasian New Car Assessment Program) is the leading independent vehicle safety advocate.

ANCAP uses a star system to rate the safety of vehicles.

The following information is taken from http://www.howsafeisyourcar.com.au/Rating-Process/What-is-ANCAP, and explains more about the system – for more details, visit this link.

"ANCAP provides Australian and New Zealand consumers with independent vehicle safety information through the publication of ANCAP safety ratings. ANCAP safety ratings take into account the level of occupant and pedestrian protection provided by new cars through the conduct of physical crash tests and the assessment of collision avoidance technologies.

The more stars, the better the vehicle performed in ANCAP tests. To achieve the maximum 5 star ANCAP safety rating, a vehicle must achieve the highest standards in all tests and feature advanced safety assist technologies.

Since 1992, ANCAP has published crash test results for a wide range of new passenger and light commercial vehicle makes, models and variants sold in Australia and New Zealand.

ANCAP is supported by all Australian and New Zealand motoring clubs, the Australian Government, the New Zealand Government, Australian state and territory governments, the Victorian Transport Accident Commission, NRMA Insurance and the FIA Foundation.

ANCAP buys and tests cars that are available to Australian and New Zealand consumers. Car manufacturers can examine the test cars before and after tests, and view the tests and results.

ANCAP uses a range of internationally recognised crash tests, undertaken by independent specialist laboratories.

In each of the physical tests, dummies are used to scientifically measure the various forces on occupants in the crash. The data gathered is then assessed in conjunction with a physical assessment of the vehicle, and a score determined for each test. In addition, vehicles must be fitted with certain safety features and safety assist technologies. These requirements are then assessed alongside the physical crash test scores with an overall score translated into an ANCAP safety rating of between 1 to 5 stars.

The higher the score and the greater the safety inclusions, the more stars."

Resource 5: Used Car Safety Ratings (UCSR)

Used Car safety ratings is a resource that displays results of research conducted by Monash University Accident Research Centre around car crashes where someone has been seriously injured or killed.

The following information is taken from http://www.howsafeisyourcar.com.au/Rating-Process/What-is-UCSR/, and explains more about the system – for more details, visit the link listed here.

*"The **Vehicle Safety Research Group** (VSRG) engages Monash University Accident Research Centre to estimate and develop the UCSR. The data system created through estimating these ratings is further used to research a range of vehicle safety issues to inform future policy.*

The ratings system covers both the role of the vehicle in determining injury outcomes (secondary safety) and the contribution of vehicle design and specification to crash risk (primary safety). Secondary safety includes driver protection (crashworthiness) and protection for other road users (aggressivity). Driver protection ratings indicate the relative safety of vehicles in preventing severe injury to their own drivers in the event of a crash whilst protection for other road user ratings indicate how well the vehicle protects other road users with which they collide.

HowSafeIsYourCar.com.au displays the driver protection rating and protection for other road user's ratings. The ratings reflect safety performance related to vehicle design alone by controlling for a range of non-vehicle related factors known to affect injury outcome, such as, sex, age, speed limit and number of vehicles involved. The ratings were also adjusted for the type of crash and road user combination.

Vehicles can also be awarded a "safe pick". These vehicles provide excellent protection to their own driver and cause less serious injury to other road users.

With the progression of vehicle safety, newer vehicles are usually safer than older ones. Vehicles are now being fitted with features that can help avoid a crash or reduce the severity if a crash does occur."