7

MORE WAYS TO REDUCE RISKS

LESSON 7 – MORE WAYS TO REDUCE RISKS		
Activity 7.1	page 116	Speed and stopping distances
Activity 7.2	page 124	Driving is a complex task

LEARNING INTENTIONS

1. Explain the impact speed can have on safe driving.
2. Predict stopping distances and what factors affect them.
3. Demonstrate how distractions impact driving.

MAPPING

LEARNING AREA	STRAND	SUB-STRAND	CONTENT DESCRIPTOR
Year 10 Syllabus Health and Physical Education	Personal, social and community health	Communicating and interacting for health and wellbeing	Critical health literacy skills and strategies
		Contributing to healthy and active communities	Social, economic and environmental factors that influence health
Year 10 Syllabus Science	Science inquiry skills	Processing and analysing data and information	Analyse patterns and trends in data, including describing relationships between variables and identifying inconsistencies
Year 10 Syllabus Humanities and Social Sciences	Humanities and Social Sciences skills	Communicating and reflecting	Compare evidence to substantiate judgements (eg use information and/or data from different places or times; use tables, graphs, models, theories)

GENERAL CAPABILITIES

- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability
- Ethical understanding
- Intercultural understanding

WHAT'S IMPORTANT FOR TEACHERS?

SPEED

1. Speed limits are enforced on all roads in WA including those that don't have visible speed limit signs. On local roads where there are no signs, the speed limit is 50 km/h.

2. Reducing speed limits is the single most effective and immediate way to reduce a large proportion of WA's road crashes.

3. Speed is clearly a major contributor to road crashes in WA (https://www.rsc.wa.gov.au/Your-Safety/Behaviours/Speeding).

4. It is imperative that young people receive road safety messages about the inherent dangers of speeding even 5 km/h over the posted speed limit (Road Safety Commission, 2016).

5. Driving above the posted speed limit is illegal and will incur a fine and demerit points.

6. Speeding is extremely dangerous and must also be avoided, whether it is low level speeding, excessive and deliberate speeding, or inappropriate speeding (ie driving too fast for the weather, light, traffic or road conditions).

7. Research about effective road safety education (Harris, 2013) highlights the need for young people to understand these facts about speed:
   - the human body is vulnerable and collision forces in a crash will result in serious injury and/or death
   - serious injury and trauma will occur at an impact speed over 40 km/h
   - the higher the speed in a crash, the greater the force on impact and severity of injuries to the human body
   - speeding is not just about driving faster than the speed limit, but also about driving too fast for the weather, time of day (visibility), traffic and road conditions.

SAFE TRAVEL SPEEDS

(Road Safety Commission, 2016)

ROAD TYPE	SAFE SPEED
Roads with possible conflicts between car and unprotected road users	30 km/h
Intersections with possible side conflicts between cars	50 km/h
Roads with possible head-on conflicts between cars	70 km/h
Roads with no possible head-on or side conflicts between road users	>100 km/h

1. In 2001, a state-wide default speed limit of 50 km/h was implemented in built-up areas.

2. The success of this initiative was proven in 2004 when an evaluation indicated that a 20% reduction in all crashes on 50 km/h and 60 km/h roads was achieved in the Perth metropolitan area, together with a 16% reduction in crashes in regional Western Australia.

3. This WA evaluation is consistent with the findings of evaluations of 50 km/h limits undertaken in other Australian jurisdictions (Road Safety Commission, 2016).

4. Tyres are the only contact between the road and vehicle and it is essential they are maintained. Tyres must be appropriately inflated and with the correct tyre tread (more than 1.5mm) to ensure that the vehicle steers, stops and responds in an emergency as expected.

FIND OUT MORE

Road Safety Commission
Stopping distance (0.39 sec)
https://www.rsc.wa.gov.au/Your-Safety/Behaviours/Speeding
https://www.youtube.com/watch?time_continue=7&v=XI35ll4eArI

Road Safety Commission
Priorities – Speeding (0.32 sec)
https://www.rsc.wa.gov.au/Campaigns/Speeding

Road Safety Commission
Post-It Notes (0.31 sec)
https://www.rsc.wa.gov.au/Campaigns/Speed

Road Safety Commission
Enjoy the ride – Fast vs Slow (0.31 sec)
https://www.rsc.wa.gov.au/Campaigns/Speed

Road Safety Commission
Zero Heroes
https://www.rsc.wa.gov.au/Campaigns/Zero-Heroes

Road Safety Commission
Tyre maintenance
https://www.rsc.wa.gov.au/Your-Safety/Vehicles/Light-Vehicles/Tyre-maintenance

7.1

ACTIVITY 7.1

SPEED & STOPPING DISTANCES

PLANNING AND PREPARATION

- Activity sheet – *How fast can you stop?* (page 119) – photocopy one per student
- Activity sheet – *Speed signs* (pages 121-123) – photocopy one set of signs
- Trundle wheel (or 100 metre tape measures)
- Witches hats or markers (eg ice cream container, duster or ruler)
- Area approximately 100 metres long
- *Behind the wheel – Task 5 – Getting ready to stop* (page 8)
- *Behind the wheel – Task 6 – Keeping a safe distance* (page 9)
- *Behind the wheel – Task 7 – Check your speed* (page 10)
- *Behind the wheel – Quiz 1 – Speed* (page 20) (if not yet completed)

PROCEDURE

HOW FAST CAN YOU STOP?

1. Explain that the time or distance it takes a vehicle to stop is the combination of both the driver's reaction time and braking distance of the vehicle (eg stopping distance = reaction distance + braking distance). For example, if the driver has been drinking alcohol their reaction time will be slower which will contribute to a greater stopping distance. Other factors will impact a driver's ability to slow down, react, and stop a vehicle such as alcohol and other drugs, distractions, tyre tread, condition of the vehicle and brakes, wet and slippery roads, etc.

2. Place students in small groups and distribute copies of the activity sheet *How fast can you stop?* (page 119).

3. Explain that groups are to guess the reaction, braking and stopping distances for each speed and record these on the activity sheet.

4. Take the markers, trundle wheels and speed signs outside to an area that is at least 100 metres long. Groups should also take their activity sheet and a pen.

5. Indicate a line on the ground to represent the front of a car.

6. Explain that the driver of the car, who is experienced, alert and not under the influence of alcohol or other drugs, has just seen a small child run out onto the road about 45 metres ahead. The driver's car is in excellent condition and the weather is fine.

7. Give each small group a speed sign. Explain that the signs are to be placed where each group thinks that the car (travelling at the speed indicated on the speed sign) would stop once the driver has reacted to seeing the child and applied the brakes (eg the stopping distance written on their activity sheet).

8. Allow enough time for each group to place their sign.

At this stage no measuring devices are to be used.

9. When all signs have been placed, use the trundle wheel to measure the distances marked by groups (eg from the starting line to where the group has placed their speed sign). If the distances are more or less than the distance indicated on students' sheets, discuss this discrepancy by asking the following questions.
   - Were you surprised by the stopping distances of different speeds? Why?
   - Why is it important to scan for hazards and judge distances when driving?

- What builds a person's skill at judging stopping distances accurately?

10. Provide groups with the correct stopping distances for each speed as listed in the table below. Ask students to add these to their activity sheet.

Speed (km/h)	Reaction distance (m)	Braking distance (m)	Stopping distance (m)	Speed (km/h)	Reaction distance (m)	Braking distance (m)	Stopping distance (m)
20	8	2	10	**70**	29	27	56
40	17	9	26	**80**	34	35	69
50	21	14	35	**100**	42	54	96
60	25	20	45	**110**	46	66	112

(Source: Australian Transport Safety Bureau)

11. Have groups remeasure the stopping distances and place the speed signs at the correct point. Listen to students' observations.

PROCESS

1. Ask the students the following questions discussing their responses.
   - What did you notice about your estimations and the correct stopping distances?
   - What might affect stopping distances? (Factors such as wet weather, different road surfaces, the size of the vehicle, the load being carried and driver reaction time are a few examples).
   - If you were going to share this information about stopping distances with a learner driver, what tips would you give them? (Travel at the posted speed limit; leave at least a two second gap between your vehicle and the vehicle travelling in front; drive for the conditions; don't drive impaired by alcohol, other drugs or fatigue; ensure your card is roadworthy eg safe tyres and brakes).
   - What areas other than around schools would benefit from having a 40 km/h speed limit? Why?

REFLECT

1. On returning to the classroom, ask students to complete the questions at the bottom of *How fast can you stop* (page 119).

2. Discuss responses.

AT HOME TASK

1. **Ask students to complete *Task 5 – Getting ready to stop* (page 8), *Task 6 – Keeping a safe distance* (page 9) and *Task 7 – Check your speed* (page 10) in *Behind the wheel*.**
2. **Remind students that they must complete all 10 tasks in the *Behind the wheel* journal to be considered eligible to sit the test at the end of the Keys4Life program.**
3. **Encourage students to complete *Quiz 1 – Speed* (page 20) in *Behind the wheel* (if not yet completed).**
4. **Encourage students to access the Department of Transport's road rules theory test quizzes to begin building and consolidating their knowledge of road rules.**

FIND OUT MORE

Department of Transport
Road rules theory test quiz
https://www.transport.wa.gov.au/licensing/road-rules-theory-test-quiz.asp

EXTENSION ACTIVITY

TWO SECOND RULE

PROCEDURE

1. Explain it is recommended that drivers travelling at 60 km/h or lower leave at least a 'two second gap' between vehicles. This gap will enhance safety by allowing the driver to scan more of the driving environment, have more time to avoid hazards, and distance to react and stop if the vehicle in front suddenly stops.

2. The preferred gap between traffic in less than ideal conditions such as wet or foggy weather is at least four seconds.

3. The following ideas can be used to demonstrate the two second rule.
   - Take students to the roadside and stand next to a pole, tree or marker. Students choose a vehicle driving past and a vehicle following behind to check if there is a two second gap. When the vehicle in front passes the marker, students should count as follows: one thousand and one, one thousand and two. At the end of this two second period the vehicle following behind should pass the same marker.
   - Students, in groups of three or four, line up around the perimeter of a basketball court. Call out instructions such as walk, jog, run, slow down or sprint as students follow each other around the court. Randomly blow a whistle to indicate when students are to stop. Instruct them not to deliberately 'crash' into other students. Repeat the process with students trying to leave a two second gap between themselves and the person in front.

PROCESS

1. Ask the following questions discussing students' responses.
   - Does speed affect the distance required to stop?
   - Why is it difficult to maintain a two second gap?
   - How did the actions of the person in front and behind you affect your ability to keep a two second gap?
   - What factors other than speed may affect stopping distance? *(In wet or foggy weather drivers need to increase the distance between their vehicle and the vehicle in front and leave a three or four second gap).*
   - Why is it important to know this information as a driver?

ACTIVITY SHEET

HOW FAST CAN YOU STOP?

Did you know....

You are twice as likely to have a serious crash travelling at 65 km/h in a 60km/h zone.

You are 4 times more likely to have a serious crash travelling at 70km/h in a 60km/h zone and 32 times more likely travelling at 80 km/h in a 60km/h zone.

Stopping distance (metres)	=	**Reaction distance (metres)**	+	**Braking distance (metres)**
Stopping distance is the combination of the reaction and braking distances		**Reaction distance is the distance a car travels from when the driver sees a problem and hits the brakes**		**Braking distance is the distance a car will travel between the driver hitting the brakes and coming to a complete stop**
		The time it will take a driver to react – if they're alert and not playing with the radio or chatting with mates – is 1.5 seconds. If the car is being driven at 60 km/h, it will travel another 25 metres in the time it takes for the message to get from the driver's brain to their foot.		If the car is being driven at 60 km/h, it will cover another 20 metres before stopping, assuming the road is dry, and the car has good tyres and brakes. If the road is wet or the car is a bit dodgy, things can change dramatically.

THE 2-SECOND RULE

1. **Select a landmark ahead and when the vehicle in front of you passes that landmark, start counting 1001 and 1002 .**
2. **If you reach that point before you count 1002, you are too close. SLOW DOWN!**

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ACTIVITY SHEET

HOW FAST CAN YOU STOP?

TASKS

(1) Guess the reaction, braking and stopping distances for each speed and record these below in the 'Estimate' columns.

(2) Write in the correct distances at the end of the activity.

Speed (km/h)	20	20	40	40	50	50	60	60
	Estimate	Actual	Estimate	Actual	Estimate	Actual	Estimate	Actual
Reaction distance (m)		8		17		21		
Braking distance (m)		2						20
Stopping distance (m)		10						45
Speed (km/h)	**70**	**70**	**80**	**80**	**100**	**100**	**110**	**110**
	Estimate	Actual	Estimate	Actual	Estimate	Actual	Estimate	Actual
Reaction distance (m)				34				46
Braking distance (m)						54		
Stopping distance (m)								

Keep in mind that reaction distance here is being measured with an experienced driver, who is healthy, unimpaired and regularly scanning the driving environment in good weather/driving conditions.

(3) Answer the following questions.

1. Describe what you thought when you compared your guesses to the actual stopping distances.

2. In this activity we used an experienced and unimpaired driver travelling in a roadworthy vehicle in perfect conditions. What might happen to the stopping distance if the driver was tired, not concentrating or under the influence of alcohol or other drugs?

3. We've all heard the advertisements telling us that dropping 5 km/h can save lives. After completing this activity would you agree? Why?

4. How can knowing the distance it takes a vehicle to stop help you become a safer driver?

5. Do you think that heavy vehicles such as buses and trucks would have the same stopping distance as cars? Why?

6. Has your attitude towards speeding changed after completing this activity? Why?

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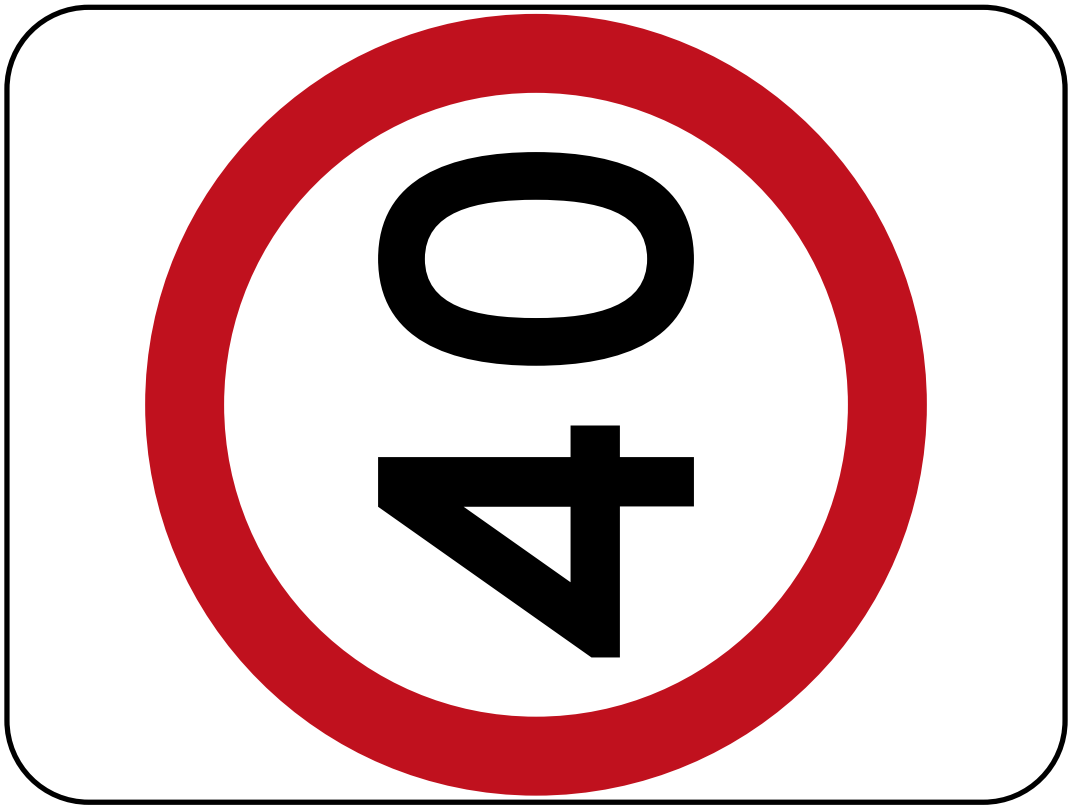
ACTIVITY SHEET

SPEED SIGNS



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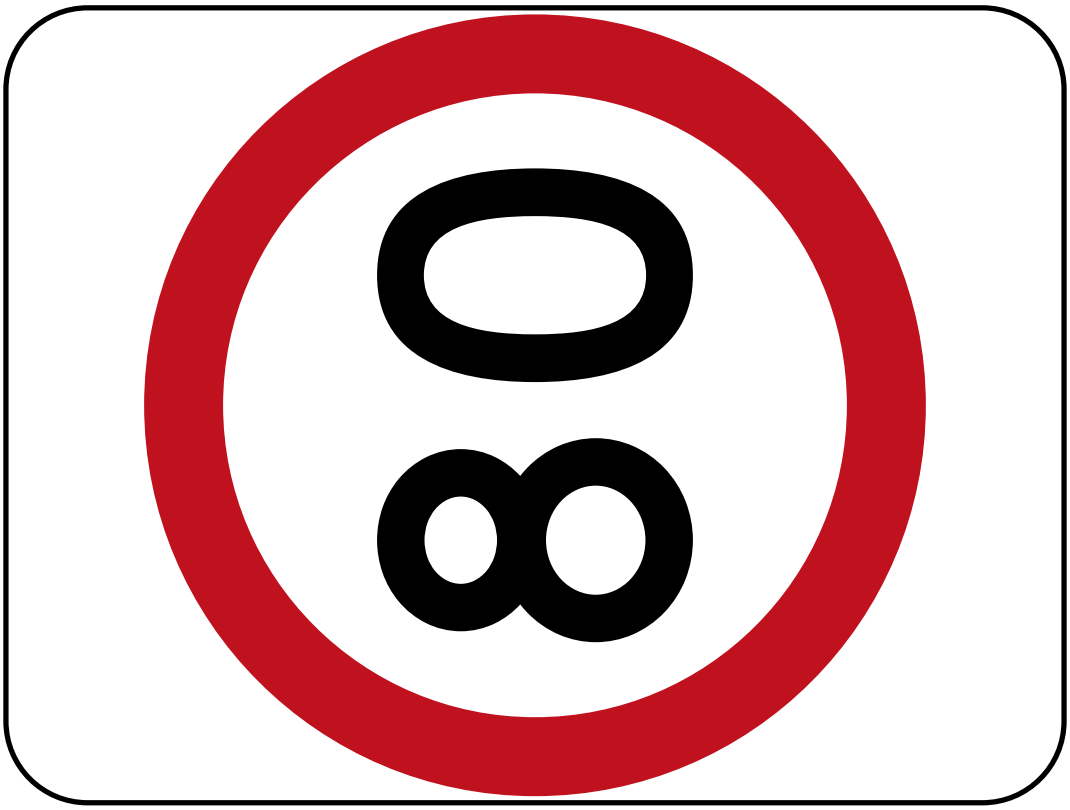
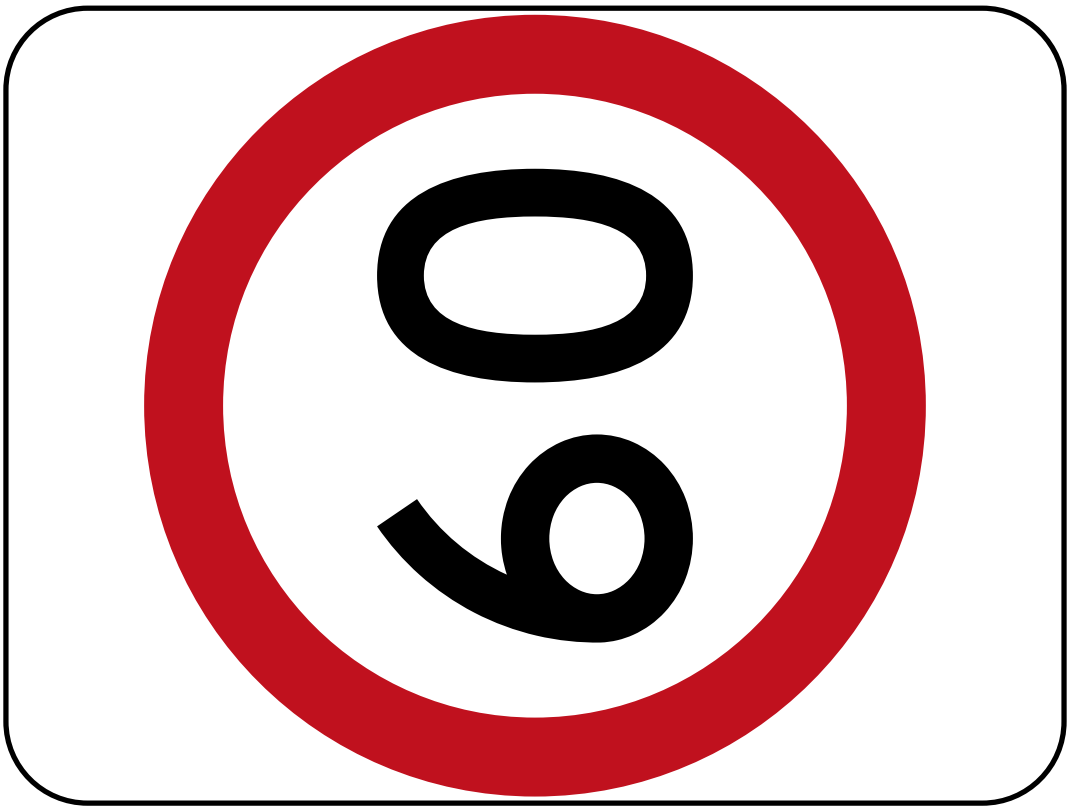
SPEED SIGNS





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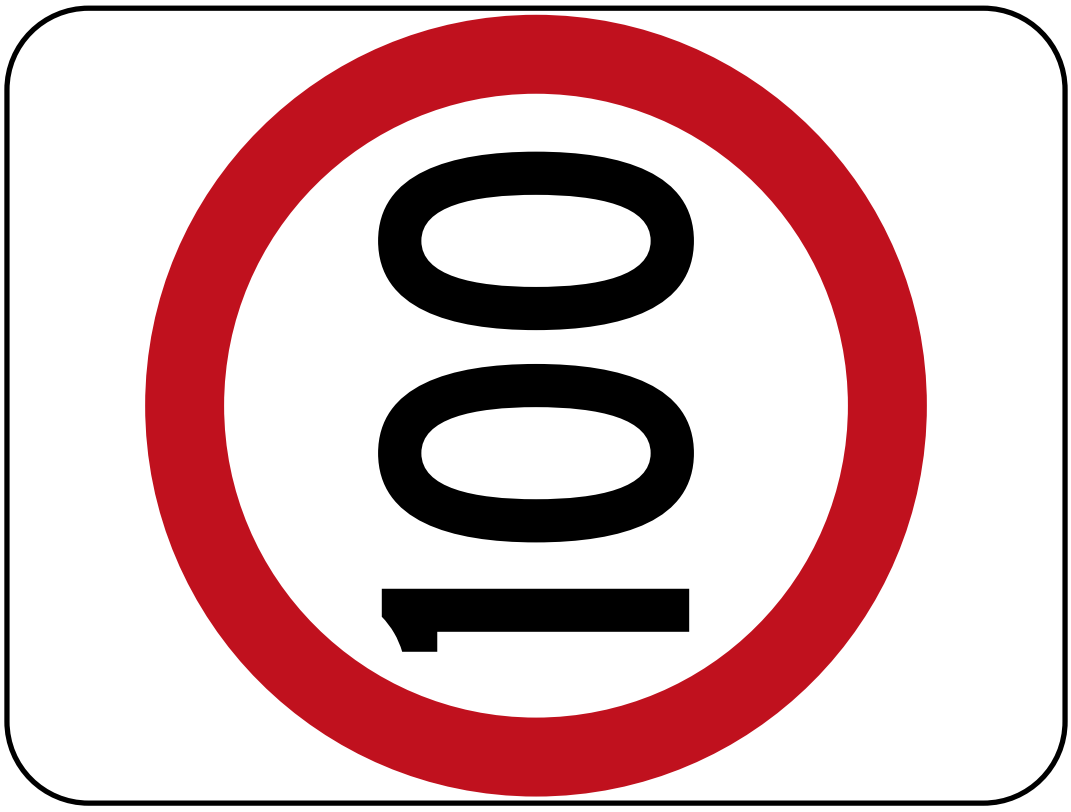
SPEED SIGNS



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7.2

ACTIVITY 7.2

DRIVING IS A COMPLEX TASK

PLANNING AND PREPARATION

- Activity sheet – *Driving is a complex task* (pages 126-127) – photocopy one per student
- Activity sheet – *Passenger questions* (page 128) – photocopy one per group
- Activity sheet – *Skill cards* (page 129) – photocopy and cut out one set per group
- Activity sheet – *Hazard cards* (page 130) – photocopy and cut out one set per group
- Playing cards – one deck per group
- One desk and four chairs per group
- *Behind the wheel – Task 4 – Be aware of distractions* (page 7) (if not yet completed)

PROCEDURE

DRIVING IS A COMPLEX TASK

1. Place two chairs behind a desk and a chair either side of the desk. Give each student a copy of *Driving is a complex task* (pages 126-127).

2. Select a group of four students and allocate the roles of driver, passenger, skill card manager and hazard card manager as described on the sheet.

3. Demonstrate the activity using the group of students explaining that the purpose of the activity is to draw attention to:
   - how distractions affect driving
   - the importance of developing hazard perception by practising extensively as a learner driver.

4. Place other students in groups of four.

5. Give each group their equipment including:
   - a set of hazard and skill cards
   - a deck of playing cards
   - a copy of the passenger questions.

6. Allow enough time so that all students experience being the driver. If time allows, let each student repeat the task so it becomes clear that practice can improve performance.

7. Have students individually complete the questions on *Driving is a complex task* (page 127).

PROCESS

1. Ask the following questions discussing the responses.
   - What did you notice about your ability to concentrate and complete each activity accurately while being distracted? *(Explain that different areas of the brain control different actions. Even though activities may be regularly carried out, when two are combined it becomes more difficult as the complexity is increased).*
   - Why do young drivers underestimate the number of things that must be managed to be a safer driver? *(Lack of experience and overconfidence).*
   - What could assist young drivers to be able to manage the number of tasks involved in driving? *(Extensive hours of driving practice before driving solo).*
   - Would the driver's workload increase as the vehicle's speed increases?
   - As a passenger, why is it important that you understand the complexity of driving? *(A passenger needs to understand their responsibilities and aim not to distract a driver. A driver's attention should always be on driving the car safely. Distractions can cause road crashes).*

AT HOME TASK

1. Ask students to complete *Task 4 – Be aware of distractions* in *Behind the wheel* (page 7) if not yet completed.
2. Remind students that they must complete all 10 tasks in the *Behind the wheel* journal to be considered eligible to sit the test at the end of the Keys4Life program.
3. Encourage students to access the Department of Transport's road rules theory test quizzes to begin building and consolidating their knowledge of road rules.

FIND OUT MORE

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ACTIVITY SHEET

DRIVING IS A COMPLEX TASK

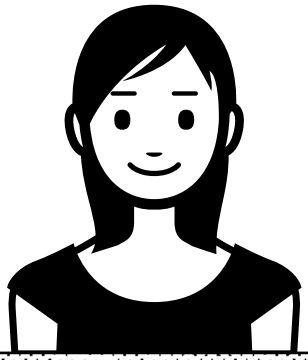
SDERA KEYS 4 LIFE WA

TASKS

1. Read the role descriptions and get ready to drive.

For this activity, you will need:

- four chairs and a desk
- a deck of cards
- a set of hazard cards
- a set of skill cards.



DRIVER

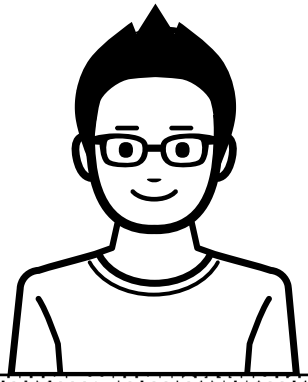
Sit in the driver's seat.

Sort the cards into suits from lowest to highest.

Read out aloud all of the skill and hazard cards shown to you.

Answer your passenger's questions.

Don't stop sorting the cards. If you stop sorting, you have stopped driving!



PASSENGER

Sit in the passenger seat.

Ask the driver each of the questions. The driver should answer you.

Keep track of the questions not answered by the driver.

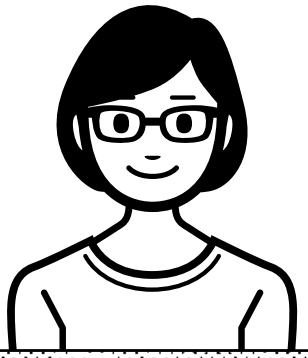
Try to distract the driver as much as possible.

SKILL CARD MANAGER

Sit to the right of the driver.

At different intervals and for a few seconds, show a skill card to the driver.

Keep track of the cards the driver fails to read out aloud.



HAZARD CARD MANAGER

Sit to the left of the driver.

At different intervals and for a few seconds show a hazard card to the driver.

Keep track of the cards the driver fails to read out aloud.

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ACTIVITY SHEET

DRIVING IS A COMPLEX TASK

(2) How did you go? Circle the face that best represents how you went with this activity.

This activity was very easy. I sorted the cards, read out loud most of the hazard and skill cards, answered all of the questions and didn't make many mistakes.

This activity was okay. I sorted most of the cards, answered some of the questions and read out loud some of the hazard and skill cards. I made quite a few mistakes.

This activity was hard. I made lots of mistakes when sorting the cards. I missed reading out loud many of the hazard and skill cards, and didn't answer all of the questions.

(3) Answer the following questions after completing the activity.

1. How did you feel 'driving' the car?
2. Did this activity make you think about all of the things you have to do when you drive? Why?
3. Do you think driving is a complex activity? Why?
4. What can you do to make driving easier and safer? (Before and after you have a licence)

Before:	After:
1	1
2	2

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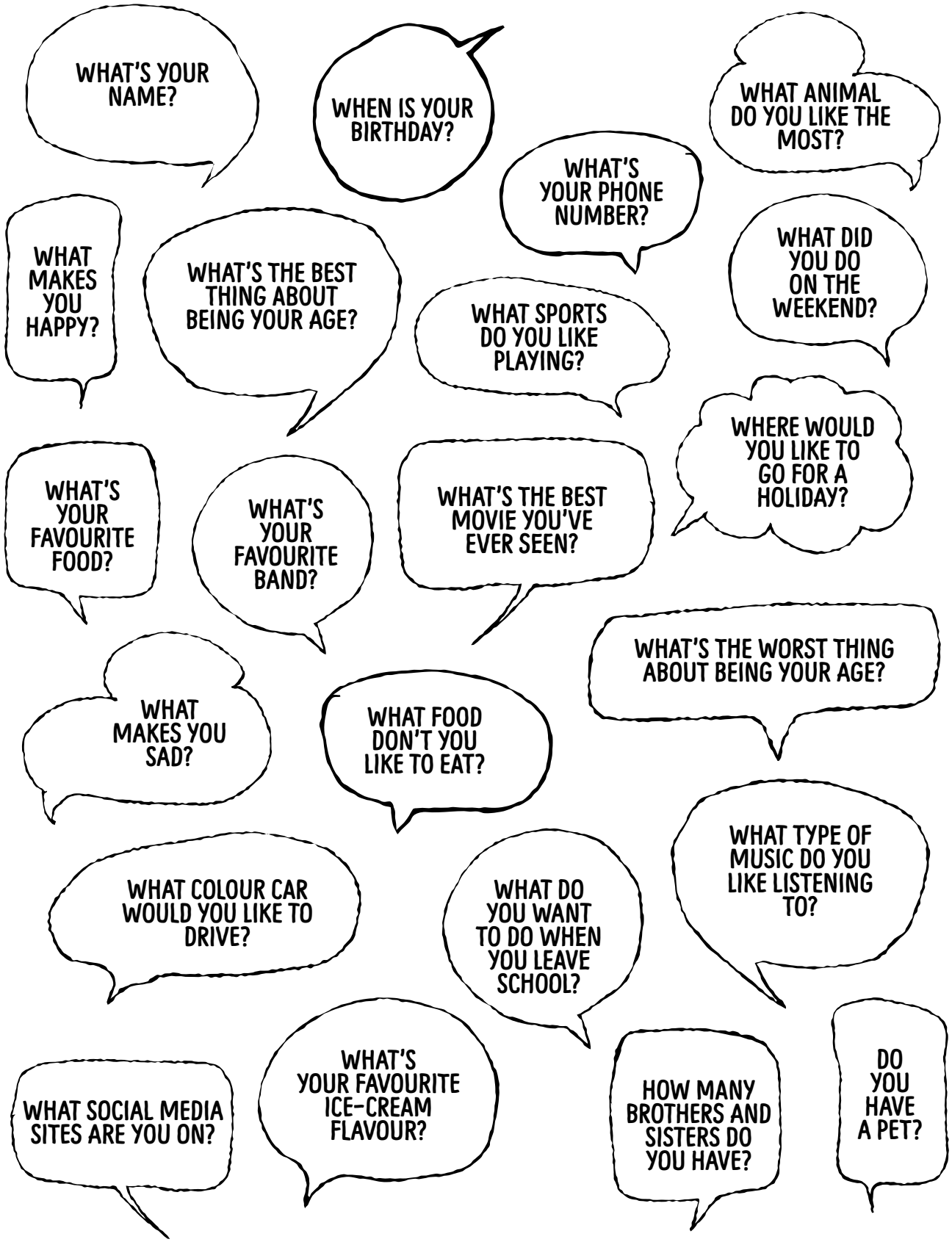
ACTIVITY SHEET

PASSENGER QUESTIONS



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ACTIVITY SHEET

SKILL CARDS

Check mirrors	Turn right
Give way	Check over shoulder
Turn on lights	Make a U turn
Merge	Slow down
Check speed	Change lanes
Indicate	Pull down sun visor
Turn on wipers	Turn left
Use horn	Change gears
Speed up	Check petrol

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ACTIVITY SHEET

HAZARD CARDS

Pot hole	Traffic warden waving crossing flag
Passengers getting off a bus	Ambulance coming
Wet road	Road train ahead
Dog running onto road	Road works ahead
Young person on skateboard	Traffic lights not working
Motor bike overtaking	Birds flying across road
Child playing on side of road	Cyclist in left lane
Car stalled at intersection	Hail storm
Detour ahead	Corrugated dirt road

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