

SECONDARY WORKBOOK

INFORMATION FOR SCHOOLS AND TEACHERS

A visit to a round of the Repco Supercars Championship provides fantastic opportunities for students to engage with and get excited about STEM education. In an environment where they can see, hear and smell STEM in action, students can make meaningful connections between the Australian Curriculum and the action on track. This booklet has been designed to be completed either independently or collaboratively and can be utilised both on the day and back in the classroom.



Alignment with the Australian Curriculum Year 7 – 10

Curriculum Area: Science

Physical sciences	Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object (ACSSU117)
Science inquiry skills	Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (AC SIS124)

Curriculum Area: Design Technologies

Knowledge and understanding	Investigate and make judgments on how the characteristics and properties of materials are combined with force, motion and energy to create engineered solutions (ACTDEK043)
Processes and production skills	Generate, develop, test and communicate design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques (ACTDEP036)

Curriculum Area: Mathematics

Number and algebra	<p>Round decimals to a specified number of decimal places (ACMNA156)</p> <p>Solve problems involving addition and subtraction of fractions, including those with unrelated denominators (ACMNA153)</p> <p>Express one quantity as a fraction of another, with and without the use of digital technologies (ACMNA155)</p> <p>Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157)</p>
Statistics and probability	Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (ACMSP171)
Measurement and geometry	<p>Solve problems involving duration, including using 12 and 24-hour time within a single time zone (ACMMG199)</p> <p>Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal (ACMMG163)</p>

General Capabilities:

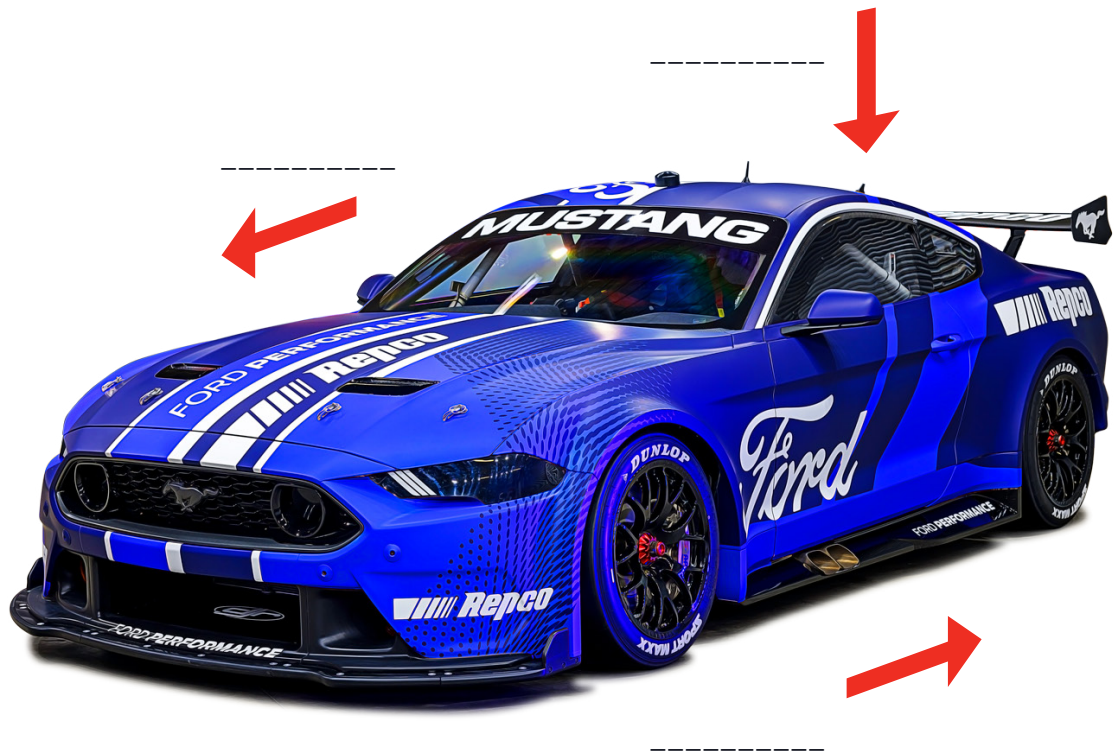
- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability

Cross Curriculum Priorities:

- Sustainability

Source: Australian Curriculum, Assessment and Reporting Authority (ACARA), www.australiancurriculum.edu.au

1. Complete the force diagram by adding the correct labels to the force arrows.



FRICION

GRAVITY

PUSH

2. Explain the features of a Supercar control tyre that improve its performance when compared to a normal road tyre.





3. What factors need to be considered when selecting the materials for the brake setup?



- 4.A In what ways could the force of friction be beneficial to a Supercar driver?

- 4.B In what ways could friction be an obstacle to performance?

5. What design features does a Supercar have that make it faster than an ordinary road car?



6. What design features do Supercars have that improve the safety of the driver?

7. What design features does the race track that you are at have to improve safety for spectators?

8. A Supercar can complete a maximum of 145km on one tank of fuel. How kilometers could be covered on 4 tanks of fuel.



9. David Reynolds' Bathurst lap record is 2m06.2769. Round this time to the nearest...

a) Second

b) Tenth of a second

c) Hundredth of a second

10.A If a race started at 11.30am and has completed half of the total number of laps by 12.15pm, what time can the race be expected to finish?

10.B What is that time in 24-hour time?

11. If a driver has completed 100km of a 500km race, what fraction of the race have they completed?

12.A If $\frac{1}{2}$ of a race is completed on tyre set A and $\frac{1}{4}$ is completed on tyre set B, what fraction of the race is left to complete on set C?

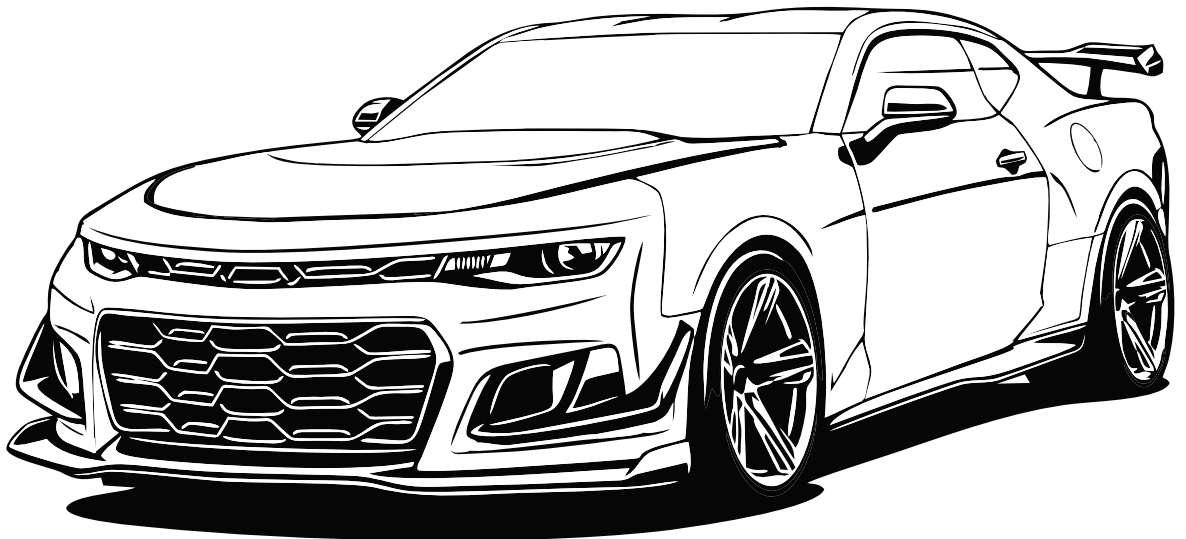
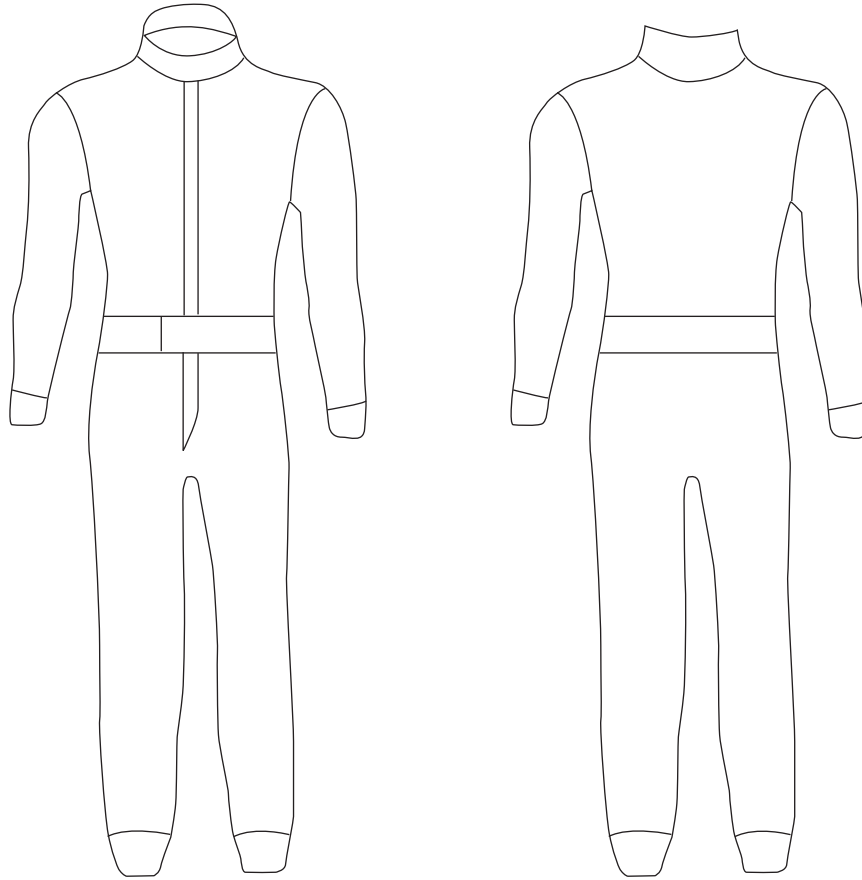
12.B What is that fraction as a percentage?

12.C Record 10 different lap times for one driver during the race. Calculate the mean, mode and median for that driver.

Lap Times				
1.	2.	3.	4.	5.
6.	7.	8.	9.	10.

Mean: _____ Mode: _____ Median: _____

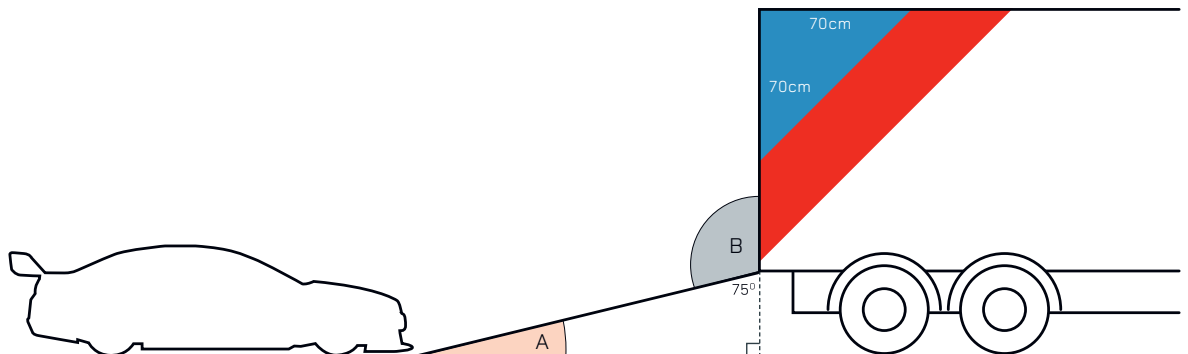
Imagine you are starting your own race team!
Come up with a design for your car and race suit.



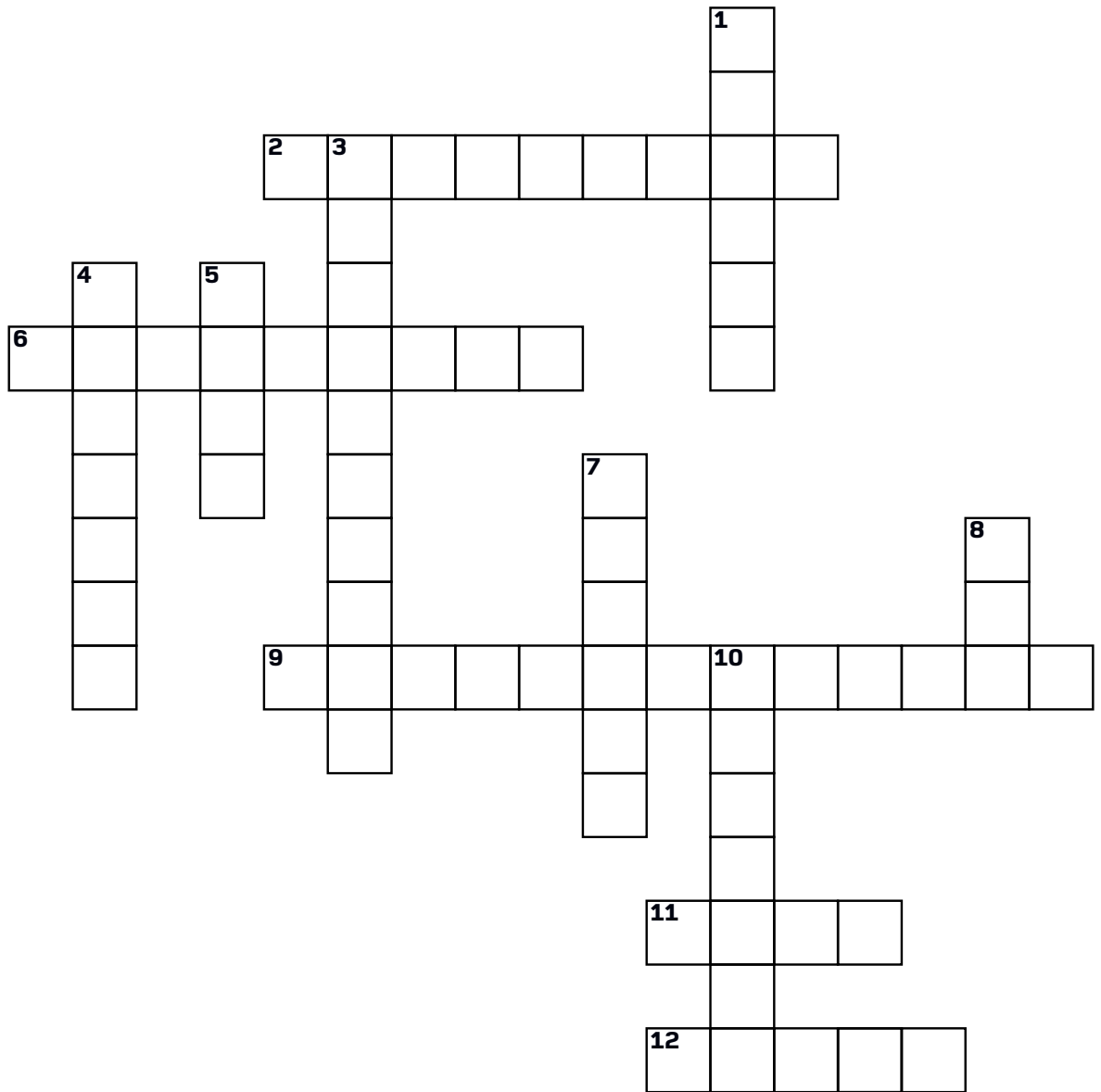


Study the diagram and answer the questions.

1. Mark an X on a pair of parallel lines.
2. Calculate angle A – the angle of the ramp the Supercar needs to climb.
3. Calculate angle B – the angle of the ramp opening.
4. Name the shape that is formed by the red stripe on the truck.
5. What is the area of the blue triangle?



SUPERCARS CROSSWORD PUZZLE



Across

- 2. Comes onto the track after a crash
- 6. Equal to 1,000 metres
- 9. Turns the car
- 11. Where Supercars go for repairs
- 12. Help the Supercar grip the road

Down

- 1. Used to slow the Supercar down
- 3. Move faster
- 4. Another name for a race track
- 5. Number of wheels on a Supercar
- 7. Gives the Supercar its push force
- 8. Number of people in a Supercar when it is racing
- 10. The force that pulls objects towards Earth

SUPERCARS WORD SEARCH PUZZLE



C N R R L U S Z O S F K H G R C S L
M H W A J E B E P U T U A Y H H P A
U G A D C N E E K I S L E A E A O I
I Z Y M E R C H U A F U S L L N I C
D N I D P T E S W D R S Q E M A L I
O T L X A I E P E G I B R F E J E F
P O R T C C O R U S N Y R O T T R F
H U O R A H E N C S T I Z R H S P O
Q R E R Q U H W S I R I R D X R B K
U W E U Q R O T F H R Z P E G U J C
A X L E N G I N E J I C G G E H B A
L H H R O L L C A G E P U X M T C R
I C S P O R T S M A N S H I P A S T
F R O S N O P S A D F P A L T B E C
Y L S G C V W F I F E B M M G M Z C
I N Q Z A C E R M F E E J V F Q M Q
N R W E X D T A W W Y T P R U V B H
G D I R G T R A T S D K Y S S O Z H

AXLE

BATHURST

BRAKES

CHAMPIONSHIP

CHASSIS

CHEQUERED FLAG

CIRCUIT

CREW

ENGINE

FORD

FUEL

HELMET

HOLDEN

LAP

PIT

PODIUM

QUALIFYING

RACE SUIT

ROLL CAGE

SAFETY

SPECTATOR

SPEED

SPOILER

SPONSOR

SPORTSMANSHIP

START GRID

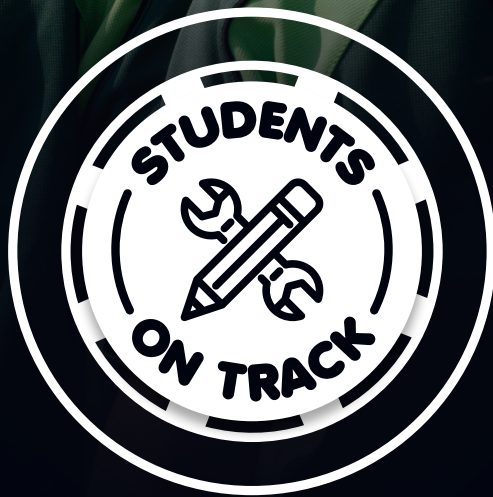
STEERING WHEEL

SUPERCAR

TORQUE

TRACK OFFICIAL

TYRE



SUPERCARS
CHAMPIONSHIP
