

2026 Semester 2 - Year 9/10 Unit Outline

STEM Elective

Teacher(s): Alistair Scherer

Faculty: Science and Technology

Unit Duration: Semester 2, 2026

The **Australian Curriculum Achievement Standards in Students** use design and technologies knowledge and understanding, processes and production skills and design thinking to produce designed solutions for identified needs or opportunities of relevance to individuals and local, regional or global communities. They work independently and collaboratively. Problem-solving activities acknowledge the complexities of contemporary life and make connections to related specialised occupations and further study. Increasingly, study has a global perspective, with opportunities to understand the complex interdependencies involved in the development of technologies and enterprises. Students identify the steps involved in planning the production of designed solutions. They develop detailed project management plans, incorporating elements such as sequenced time, cost and action plans, to manage design tasks safely. Students apply management plans, making adjustments when necessary, to successfully complete design tasks. They identify and establish safety procedures that minimise risk and manage projects with safety and efficiency in mind, maintaining safety standards and management procedures to ensure success. They are introduced to the concepts of conservation of matter and energy and begin to develop a more sophisticated view of energy transfer. They understand that motion and forces are related by applying physical laws and can be modelled mathematically.

Australian Curriculum Achievement Standard Technology: By the end of Year 10 students explain how people consider factors that impact on design decisions and the technologies used to design and produce products, services and environments for sustainable living. They explain the contribution of innovation, enterprise skills and emerging technologies to global preferred futures. For one or more of the technologies contexts, students explain the features of technologies and their appropriateness for purpose, and create designed solutions based on an analysis of needs or opportunities. Students create, adapt and refine design ideas, processes and solutions and justify their decisions against developed design criteria that include sustainability. They communicate design ideas, processes and solutions to a range of audiences, including using digital tools. Students independently and collaboratively develop and apply production and project management plans, adjusting processes when necessary. They select and use technologies skilfully and safely to produce designed solutions.

Unit Description: The *STEM Racing Elective* immerses students in an authentic STEM experience where they will work collaboratively in teams to design, test, and evaluate a miniature Formula 1™ car using the design, make and appraise process. They will apply knowledge of physics, engineering, mathematics, and digital technologies to solve real-world challenges through the engineering design process. This project-based unit fosters innovation, teamwork, and problem-solving, culminating in a formal presentation and a timed race of the final design. Throughout the semester, students will explore the physics of motion, including Newton's Laws, aerodynamics, and friction, apply mathematical concepts to measure, test and analyse performance, design and model a CO₂-powered, build and test a prototype using digital and manual technologies, evaluate and refine their designs using feedback and data and communicate design processes, decisions and final outcomes in a team portfolio and verbal presentation. Students will also apply creative and collaborative skills to complete fortnightly STEM challenges.

Essential Learning Outcomes developed from the Achievement Standards of the Australian Curriculum:

Technology:

1. Communicates design ideas, processes and solutions to a range of audiences, including using digital tools
2. Independently and collaboratively develops and applies production and project management plans, adjusting processes when necessary
3. Selects and uses technologies skilfully and safely to produce designed solutions

Science:

4. Analyses and connects data and information to identify and explain patterns, trends, relationships and anomalies
5. Constructs logical arguments based on evidence to support conclusions and evaluate claim

Materials and Equipment Required: Students are expected to arrive at every class with a class book/folder to write notes for that subject, a writing instrument and a Chromebook or similar, appropriate electronic device. Students may also be required to provide the following additional materials and equipment: [Click here to enter text.](#)

Absences from Class: Students who miss classes due to absence or excursions must use Google Classroom to catch up missed work, unless otherwise negotiated with the teacher.

Use of IT in Class: A Google Classroom and Stileapp.com class has been set up for this class. Students will be required to log into these accounts regularly to access course material. Students must bring a charged Chromebook (not a phone) to all lessons, however, the use of these devices in class will be at the discretion of the teacher.

Homework: All students will be given multiple opportunities to demonstrate a proficiency level of 3 or above across all Essential Learnings during class time. Students may use time at home to complete additional enrichment and extension activities that demonstrate a proficiency above level 3, or to catch up on missed or unfinished classwork.

Late Work: Extensions may be negotiated with individual teachers before the due date.

Plagiarism: Plagiarism is copying or using another's work and claiming it as your own. This includes copying, cutting and pasting text or using ideas directly from a text, the internet or some other source without appropriate referencing. If this happens, work may not be graded and students will be asked to discuss the assessment with the classroom teacher and Executive Teacher for that subject. Parents may be contacted as part of this process.

Assessment Portfolio: This contains evidence of work from the opportunities the students have been provided to demonstrate elements of the achievement standard.

Portfolio Assessment Tasks for this subject will include:	Week / Date Due	Essential Learning
1. STEM Challenges / Classwork	Ongoing	All
2. Car Design	Week 4	1, 5
3. Car Manufacture, Testing and Analysis	Week 8	2, 3, 4, 5
4. Racetrack Design and Presentation	Week 12	1, 5
5. Racetrack Construction, Testing and Analysis	Week 16	2, 3, 4, 5

A-E Reporting Grade Descriptors These are the grades and grade descriptors for reporting at the end of each Semester.

A	Demonstrating excellent achievement of what is expected (Consistently achieving a proficiency level of 4 or above in each of the Essential Learnings)
B	Demonstrating a high achievement of what is expected (Consistently achieving a proficiency level of between 3 and 4 in each of the Essential Learnings)
C	Demonstrating satisfactory achievement of what is expected (Achieving a proficiency level of 3 across the Essential Learnings)
D	Demonstrating partial achievement of what is expected (Achieving a proficiency of between 1 and 3 across the Essential Learnings)
E	Demonstrating limited achievement of what is expected (Achieving a proficiency of 1 or less in each of the Essential Learnings)

S **Status** is awarded where unavoidable circumstances have prevented assessment. Must be negotiated with the Principal.

Grade Descriptors and the "C" grade

In ACT public schools the Australian Curriculum Achievement Standard is aligned with a 'C' grade. The 'C' grade indicates that your child has demonstrated a satisfactory level of knowledge, understanding and skill in relation to the Achievement Standard.

Appeals

A student must initiate an appeal for any grade with their subject teacher. If a student is dissatisfied with that initial process, they must pursue further appeal through the Faculty Executive Teacher for that subject.

Executive Teachers

Gary Rolfe and Rebecca Hanrahan 30/06/2026 _____