



Newton Moore Senior High School

Science

Year 9 Engineering Specialist

2016



Course Description

The aim of this unit is to build on the basic principles of the design process including: investigation, devising producing and evaluating. This will be done through participating in the F1 in Schools program, 3D Printer projects, modelling gears and then applying their knowledge to the Solar Car Challenge.

Students will work through a series of self-paced activities that enable them to design and build models and then troubleshoot and revise designs to improve their own model performance. They will gain hands-on practical and theoretical experience whilst also using mathematical, science and technology concepts.

Technology Process

Students apply technology processes to understand and build robots using learnt knowledge and mathematical ideas.

Investigating – Students investigate issues, needs and opportunities.

Designing – Students devise and generate ideas in preparation for assembly.

Producing – Students assemble, operate and manage production processes

Evaluating – Students evaluate intentions, plans and actions

Course Outline

| Week | Content |
|---------------|---|
| Term 1 | |
| 1 | Introduction: course outline, F1 in schools introduction |
| 2 - 5 | F1 car design tutorials using Autocad to produce individual drawings |
| 6 - 7 | F1 team allocation, break down of roles and car colour scheme decided and cardboard model created |
| 8 | F1 car design tutorials using Autocad to produce individual drawings last week |
| 9 | Practice setting up racing track and racing cars |
| 10 | F1 groups begin tasks required in F1 competition portfolios poster, display, power point, business card, sponsors, car design, manufacture |
| Term 2 | |
| 1 - 7 | F1 groups continue tasks required in F1 competition portfolios poster, display, power point, business card, sponsors, car design, manufacture |
| 8 | F1 Manufacturing engineers – CNC router used to cut out cars Other students – introduction to 3D printing |

| Week | Content |
|---------------|--|
| 9 | F1 Manufacturing engineers – CNC router used to cut out cars Other students – 3D printing balloon cars |
| 10 | Set up Racing track in gym, race cars Select team to race at State Champs |
| Term 3 | |
| 1 - 2 | 3D printing balloon cars task |
| 3 | Prepare F1 cars, portfolio, displays for science fair |
| 4 | Science Fair preparation 3D balloon cars |
| 5 | Background for Solar Cars LEGO ROBOTICS: GEARS Introduction: Work booklet. Review simple machines |
| 6 - 8 | Work booklet and Lego kits - gears |
| 8 - 9 | Build a fast or slow car with gears and race them |
| 10 | Introduction to soldering and practice soldering for solar cars |
| Term 4 | |
| 1 | SOLAR CAR CHALLENGE – Gearing up to make a faster car Groups allocate roles and identify tasks. |
| 2 - 6 | SOLAR CAR CHALLENGE - Group work on graphics, design and construction, recording electronically on power point, notes in portfolio |
| 7 | F1 in Schools competition |
| 8 | SOLAR CAR CHALLENGE – Present power points and cars to class |
| 9 - 10 | SOLAR CAR CHALLENGE – Finalize project and race cars |

This course outline may be subject to change, any changes will be communicated to students.

Assessment Outline

| Assessment Item | Outcome | Date Due | Max Score | Weighting |
|---|---------------------------|----------|-----------|------------|
| Semester 1 | | | | |
| Task 1 - Individual Autocad drawing of F1 car | Technology Process | Week 8 | 100 | 15.0 |
| Task 2 - F1 Power point – group | Technology Process | Week 15 | 100 | 17.5 |
| Task 3 - Display – poster | Technology Process | Week 16 | 100 | 17.5 |
| Semester 1 Total | | | | 50 |
| Semester 2 | | | | |
| Task 4 - Portfolio -group | | Week 18 | | 10 |
| Task 5 - 3D Project | Technology Process | Week 24 | 100 | 10 |
| Task 6 - F1 Car | Technology Process | Week 31 | 100 | 10 |
| Task 7 - Solar Car Project | Technology Process | Week 6 | 100 | 20 |
| Semester 2 Total | | | | 50 |
| Total | | | | 100 |

The above weightings are intended to show the importance of each task. The allocation of a grade at the end of a semester is determined based on grade related descriptors issued by School Curriculum and Standards Authority.