Rocket Challenge Curriculum guide

Wonder Project

Module overview

Preparation
Week before starting modules

Learning and activities
- Plan lessons with Ambassador (allow 1–2 hours per week, for 6–8 weeks)
- Get familiar with modules
- Complete teacher pre-survey
- Get class to complete student pre-surveys
- Check rocket kit has arrived (purchase any additional kits needed)
- Plan assembly of rocket launcher
- Hand out parent information sheets

Printing required
- Parent information sheets

Module 1: Mission Command
Week 1

Learning and activities
- Unpack your rocket kit
- Understand crew roles and responsibilities
- Meet your Ambassador
- Basic rocketry

Videos for students to watch
- Four things to launch a rocket

Printing required
- Mission Brief 1 (per group)
- Sticker chart (per student)

Equipment required
- Rocket kit

Module 2: Solving the problem
Week 2

Learning and activities
- Understand the problem: I wonder how rockets fly?
- Explore the engineering design process
- Brainstorm rocket concepts
- Health and safety

Videos for students to watch
- Rocket Lab countdown to launch
- How to think like an engineer
- Safety first

Printing required
- Mission Brief 2 (per group)
- Mission Brief 3 (per student)
- A3 health and safety poster (per class)
- A3 design process poster (per class)

Equipment required
- Rocket kit

Module 3: Force
Week 3 (two sessions)

Learning and activities
- Newton's first law of motion (force/motion)
- Launch first rocket
- Collect flight data and plot flight paths on a graph

Videos for students to watch
- Newton's first law
- Launching your rocket

Printing required
- Mission Briefs 4, 5 & 6 (per group)
- Mission Brief 7 (per student)

Equipment required
- Rocket kit
- 1.5 litre soda bottles
- Ball
- Bike pump
- Measuring cup
- Water
- Phone or camera for filming

Module 4: Aerodynamics
Week 4 (two sessions)

Learning and activities
- Newton's second law of motion (acceleration/mass)
- Design and create a prototype
- Use geometry

Videos for students to watch
- Newton's second law
- Features for a rocket to fly

Printing required
- Mission Briefs 8 & 9 (per group)

Equipment required
- 1.5 litre soda bottles
- Paper
- String
- Scissors
- Cardboard, plastics, decorations
- Glue guns
- Phone or camera for filming

Module 5: Thrust
Week 5

Learning and activities
- Newton's third law of motion (thrust/gravity)
- Launch prototype designs
- Collect data on rocket design (strength/durability) and evaluate
- Add a parachute

Videos for students to watch
- Newton's third law

Printing required
- Mission Brief 10 (per student)
- Mission Brief 11 (per group)

Equipment required
- Rocket kit
- Rockets
- Bike pump
- Measuring cup
- Water
- Parachute materials
- Timer
- Balloons
- Phone or camera for filming

Module 6: Optimise
Weeks 6–7

Learning and activities
- Collect data on distance, time and launch angles
- Evaluate and continue to improve rocket designs and flights
- Complete teacher post survey
- Get class to complete student post surveys

Printing required
- Mission Brief 12 (per group)

Equipment required
- Rocket kit
- Rockets
- Bike pump
- Measuring cup
- Water
- Timer
- Measuring wheel/tape
- Phone or camera for filming

Module 7: Optimise
Week 8

Learning and activities
- Use final and best design to launch final blast off and record results (invite parents for a showcase)
- Create a video of your learning
- Enter the final blast off video challenge

Videos for students to watch
- Past final blast off winners

Printing required
- Mission Brief 13 (per group)

Equipment required
- Rocket kit
- Rockets
- Bike pump
- Measuring cup
- Water
- Timer
- Measuring wheel/tape
- Phone or camera for filming

Curriculum links

Science

Physical world
- Explore and describe examples of physical phenomena, such as movement and forces.
- Identify and describe the effect of forces (contact and non-contact) on the motion of objects.

Technology

Technological modelling
- Explore possibilities and decision making through functional modelling.
- Use prototyping to refine their technological outcomes.

Mathematics

Statistics
- Determine appropriate variables and data collection methods.
- Gather, sort, and display measurement, and time-series data to detect relationships, and trends.
- Communicate findings, using appropriate displays.

Teachers can also make wider links to other achievement objectives depending on student level and individual learning programmes.