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Rocket Factory +

Subject Area(s): Science, Technology and Mathematics

Key Stages: Ideal for KS 3 and 4

Time Requirements:

Set-Up Time	30 Minutes
Duration	1 Day
Reset Time	10 Minutes
Set Down Time	20 Minutes

Description:

Rocket Factory + is an extended full day Rocket Factory 2 package. In addition to the Rocket Factory 2 programme pupils explore rocket design in depth and find out about the scientific theory behind rocket flight. The session is designed to support activities from as many subjects as possible. Pupils cover the physics of flight, the chemistry of rocket engine reactions and the mathematics of tracking and telemetry. They experience the practical challenges of producing the rockets and if the students progress well even the opportunity to deliver an oral report on rocket technology for the group.

Learning Points:

- Rocket design, flight and engine reactions
- Mathematics of tracking and telemetry
- Relevance of streamlining and air resistance to flight

Group / Class Size: 40 maximum

Space Requirements:

Floor area for science investigation.
Area for rocket construction with flat surfaces (i.e. tables.)
Outdoor area for launching such as large playground.

Equipment Requirements: Suitable surfaces for cutting and glueing.

Notes: No additional notes

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Package Breakdown

Rocket Factory+ is a full day session.

This example timetable is based on a typical school day but timings are flexible.

A handout accompanies each theory session, for follow up the Excel worksheet used can be kept, and the balloon demonstrations and rocket engine competition can give ideas for further work.

Useful pre-day activities may include a recap of Newton's three laws of motion or an introduction to trigonometry for younger pupils who may not yet have been taught it.

09:00 – 10:15
Rocket Science 101:

- Forces in rocketry – Basic principles of rocket flight, passive and active guidance, the principles of passive guidance systems.
- Rocket Chemistry – Rocket engines & how they work, the principles of chemistry that apply to rocket engine design, thrust and mass flow.

10:15 - 10:30
Break

10:30 – 11:15
Rocket Factory 1:

- Practical: Build your own basic rocket – An introductory competition to design the most effective paper rocket. Rockets are launched to test construction.

11:15 – 11:30
Maths & Rocketry

- Trigonometry – Measuring the altitude of rocket flight and what it can tell you about the flight
- Theodolite: How they work in practice

11:30 - 12:30
Rocket Factory 2

- Part 1 – Building the rocket

12:30 – 13:15
Lunch

13:15 – 14:15
Rocket Factory 2

- Part 2 – Completion of rockets

14:15 – 15:00
Launch of rockets

15:00 – 15:15
The results

- Students calculate the altitude of their rockets and a winner is announced

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