

Rocketry for Kids



Science Level 4

Guide to Rockets in Australia



Department of Education and
Early Childhood Development

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NASA – National Aeronautics and Space Administration, Office of Human Resources and Education, Education Division.

<http://exploration.grc.nasa.gov/education/rocket/>

Woomera Rocket Range



The Woomera Rocket Range in South Australia is one of the world's largest launch sites. The facility covers some 127,000 sq km, which is almost exactly the size of England. Woomera is an Australian aboriginal word meaning "spear thrower". Since Woomera's first missile was launched in 1949, the range has played an important role in the history of rocketry. It has been the site of guided weapons testing, space capsule launch and retrieval, sounding rocket tests, satellite launches, and tracking of early spacecraft, including the crewed spacecraft of the American Mercury program.

In 1967, a U.S. Redstone rocket carried the Australian science satellite, WRESAT, to orbit from Woomera. That made Australia the fourth nation in the world – after the USSR, the U.S. and France – to place a satellite in Earth orbit launched from its own territory. In 1971, Great Britain became the sixth nation to launch an artificial moon to orbit above Earth. The science satellite Prospero, also named Black Knight 1, rode atop a British rocket called Black Arrow in a launch from Woomera. No further satellites have been launched from Woomera, and most of the rocket range equipment has been destroyed or sold off for scrap.



WRESAT on the launch pad

Launch Site Description



In addition to its largely flat, featureless, and vast terrain, which allows easier access for test object recovery and provides an important safety valve for hazardous launch activities, Woomera's desert climate is another positive feature of the range. Rainfall is rare, which results in few overcast days, and the climate is generally warm and dry, with only a brief, generally mild winter. The area's stable climatic conditions virtually assure the ability to conduct year-round operations, with little downtime resulting from poor weather conditions.

An important aspect of Woomera's remote location is the ability of the range to enforce strict security when required and to limit overflights by air traffic during launch and test activities. The low population density of Woomera is another range attribute. With an area of 127,000 square km, Woomera is the largest land locked rocket firing range in the world.

Zuni Rockets

Woomera is used by the Australian Space Research Institute to launch Zuni rockets for educational purposes. These are based on surplus military rocket motors adapted for educational use. Recently an RMIT post graduate student launched a Zuni rocket which carried her research as well as "Mission Patches" created by primary school students for a competition run by VSSEC.

HYSHOT



The University of Queensland has a research project exploring supersonic ramjet engines currently underway. Launches of rockets carrying the experimental engine to high altitude have been taking place since 2001 at Woomera. The Japanese Space Agency (JAXA) has been conducting similar experimental launches from Woomera.

The World's Largest Virtual Solar System

For NSW teachers in the centre of the state, and for Victorian students on holiday, there is a great model solar system spread across the countryside. Huge roadside billboards featuring 3-dimensional fibreglass planets are placed along the five main roads that lead to Siding Spring Observatory, 28 kilometres west of Coonabarabran. Start at the regional towns of Tamworth, Dubbo, Gulgong, Moree and Merriwa and hurtle your way through space from Pluto towards the huge 8 storey high Anglo-Australian Telescope dome at Siding Spring which represents the sun and central point of the solar system. The colourful 3D planets on the billboards are scaled in size relative to the huge observatory dome and the location of the billboards are scaled in distance, just as you'd find the planets in outer space - only 38 million times smaller.



The World's Largest Model Stellar System.

The Melbourne Planetarium at Scienceworks in Spotswood has a model of the red dwarf star Proxima Centauri, (after the Sun, the star nearest the Earth), in its foyer. This is part of a model with the Sun and planets at the same scale in size and distance. The Solar System section is located in the city of Borlänge, Sweden.

Space at the Powerhouse

The Powerhouse Museum in Sydney has an extensive, permanent *Space* exhibition which includes recreations of a Space Shuttle, Sputnik and an early rocket motor by Robert Goddard. Comprehensive notes and an exhibition map can be found at www.powerhousemuseum.com/pdf/education/teachersnotes/space.pdf