

Star Wars: Where Science Meets Imagination

Information for educators, NSW Science Syllabus Stage 5

Guide your students on a journey to ‘a galaxy far, far away’. This is a galaxy where sophisticated machines abound: powerful spacecraft travel through space, land transporters hover above the ground, and droids perform numerous tasks — with attitude! These are technologies born of fertile imaginations but could they exist in the real world?

Star Wars: Where Science Meets Imagination will engage students with the technologies of this far flung galaxy and shows how they could be part of a future not so far away. Not only will students see original artefacts from the *Star Wars* films, they will also explore the real world technologies that are making the *Star Wars* fantasy a reality. Students will learn about cutting-edge research through hands-on experiences, models and video interviews with scientists and engineers.

This resource material is designed for teachers to use before and after their visit to the exhibition. It focuses on tasks that will draw on and enhance students’ understanding of technology: its inspiration, use and design.

■ ■ Syllabus outcomes

The exhibition supports the following NSW Syllabus outcomes:

5.3 A student evaluates the impact of applications of science on society and the environment. Students learn about the applications and uses of science, and learn to 5.3 a) identify and describe examples of scientific concepts and principles that have been used in technological developments; and c) identify and describe examples where technological developments have impacted on science.

5.4 A student discusses evidence supporting different viewpoints. Students learn about the implications of science for society and the environment, and learn to c) identify choices that need to be or have been

made when considering whether to use particular scientific advances.

5.5 A student analyses how current research might affect people’s lives. Students learn about current issues, research and developments in science, and learn to 5.5 a) describe some recent scientific contributions made by male and female scientists, including Australians, and discuss the effect of their contributions.

5.12 A student relates the interactions involved in using some common technologies to their underlying scientific principles. Students learn about technology and learn to 5.12 c) describe some benefits and problems of using biotechnology.

5.21 A student uses creativity and imagination to suggest plausible solutions to familiar problems. Students learn about the use of creativity and imagination and learn to 5.21 c) produce creative solutions for problems.

5.22 A student undertakes a variety of individual and team tasks with guidance.

5.25 A student recognises the importance of lifelong learning and acknowledges the continued impact of science in many aspects of everyday life.

■ ■ Suggested teaching/learning context

In preparation for their immersion in the fantasy world of *Star Wars*, students will themselves take on an imaginary role. They are Scientists working for the Super Top-Secret Australian Technology Intelligence Corp, STATIC. They will be taking on a top secret exploratory mission to the *Star Wars* galaxy to set up research stations on some of the planets there (Tatooine, Hoth, Coruscant, Kashyyyk).

Outline of activities

■ ■ Before the Museum visit

(suggested time 1 to 2 lessons)

Introduce students to their new role as a STATIC scientist

Explain to students that they have been assigned a top secret mission to travel to the *Star Wars* galaxy and set up a research station on one of the planets there. They have to determine what technologies they will need to exist on the new planet, evaluate the *Star Wars* technologies for potential use on Earth, and design their own robot to perform a particular function on earth. Below are some questions to work through before your visit.

Question: What is technology?

(Manipulating the natural world/making work easier or more convenient)

- **Possible activities:** brainstorming; drawing pictures of technology; listing examples of technology in the classroom; providing examples of humorous inventions, looking at the earliest examples of technology, for example primitive tools; inclined plane (ramp); wheel and axle; lever (shaduf).

Question: What is science?

(Understanding of the natural world)

- **Possible activities:** brainstorming; matching names for branches of scientific study to pictures/ descriptions of the branch of science

Question: How are science and technology related?

- **Possible activities:** place items or pictures of items around the room. Students decide whether the item represents a technology that was inspired by science, or a technology that improved our scientific understanding. They will learn that science and technology are interrelated. Below are some suggested items for discussion.

Impact of technology on science

- Telescope (Galileo): better astronomical measurements, led to better understanding of our solar system
- Silicon chip: more efficient, higher processing power, greater calculations.
- Steam engine: led to thermodynamic explanations
- Simple tools

Impact of science on technology

Applications of electromagnetic radiation: microwaves, x-rays, radio, mobile phone (from greater understanding of electricity and magnetism)

- **Possible activities:** look at the scientific process (basic research, applied research, development, engineering) as applied to one particular technological advance; design a wacky invention and explain the role that scientific understanding played in the invention.

Question: Issues to consider before using new technologies?

- **Possible activities:** small groups act out scenarios and class discusses ethical considerations



See many examples of space technology in the *Space* exhibition.

Star Wars: Where Science Meets Imagination

■ ■ Immediately before the visit

Tell students what will be required of them during the Museum visit and remind them of the tasks they must complete after the Museum visit.

■ ■ During the visit

Students will not be carrying worksheets around the exhibition but can take any notes they wish to. Encourage students to discuss ideas with each other and with the adult helpers in the exhibition.

Students could carry a small card with some questions to think about such as:

- What is this designed to do?
- Does this exist in the real world or does something like it exist?
- If this technology were to exist in the real world, how would it affect people's lives?
- If this technology were to exist in the real world, how would it affect the environment?

■ ■ After the visit

Students will work as part of a team of STATIC scientists. Each team has been assigned to a *Star Wars* planet — choose from Tatooine, Hoth, Coruscant or Kashyyyk.

The STATIC scientists have three tasks:

- Planning to live on the *Star Wars* planet: deciding what technologies they will need to take with them from Earth and what they will use from the *Star Wars* galaxy
- Evaluating some of the *Star Wars* technologies to determine whether they are worth researching further to be used on Earth. They will also compare these to the most similar Earthly attempts to date.
- Designing a new robot for use on Earth, based upon inspiration from the *Star Wars* droids.

Part 1: Planning a move to a *Star Wars* planet

Students should start by describing the planetary environment, focusing on the challenges facing inhabitants. They can use the Internet or other sources to find out more information about the planet, and can use their imaginations to augment the available facts.

When selecting technologies, STATIC scientists should consider questions such as:

- What is needed for survival?
- What is needed for convenience?
- Do scientists from Earth know how to make this technology? If so, describe the science behind the technology; if not, describe the gap in understanding.
- Ethical considerations: how will this technology impact upon the existing inhabitants, the environment, and the new inhabitants?

It is up to each team of students to decide how best to get along with the current inhabitants (will they be war-like or peaceful?); how to get around; whether to use droids, and if so, what for.

They should then present their proposal to the STATIC chief.

Part 2: Planning where to invest in research

From their temporary new *Star Wars* planetary research station home, the STATIC scientists will evaluate some of the technologies of the *Star Wars* galaxy. They must choose one example of a technology from the following categories:

- transport
- medicine
- weaponry

They must describe the technology, the science behind it, how this would benefit society on Earth, and any potential problems it could cause if brought back to Earth.

The STATIC scientists also need to be familiar with cutting edge technologies on Earth. They are to compare their selected *Star Wars* technologies with the most similar real world achievements. They are to recommend/veto further investment in researching this technology for use on Earth.

Star Wars: Where Science Meets Imagination

Part 3: Planning a robot for the future

Inspired by their discoveries in the *Star Wars* galaxy, the STATIC scientists will also design their own robot, designed to do a specific task or have a specific role on earth.

Students need to think of what they would like the robot to do. They must consider whether their robot needs mobility, cognition, senses etc

Students should then present their design. Some possible methods of presentation:

- Film the 'robot' doing its task
- Make a model
- Draw the design
- Debate: robots in society

Powerhouse collection online

Search the Museum's collection online for information on innovative technologies, past and present. Here are some examples:

- **Solar Resource:** <http://www.powerhousemuseum.com/collection/database/?irn=109983&search=space&images=&c=&s=>
- **Hargrave box kite:** <http://www.powerhousemuseum.com/collection/database/?irn=103253&search=hargrave+box+kite&images=&c=&s=>
- **AIBO:** <http://www.powerhousemuseum.com/collection/database/?irn=8421&search=robot&images=&c=&s=>
- **Heart pump (VentrAssist left ventricular assist device):** <http://www.powerhousemuseum.com/collection/database/?irn=383167&search=implant&images=&c=&s=>

Star Wars: Where Science Meets Imagination, presented by Bose Corporation, was developed by the Museum of Science, Boston & Lucasfilm Ltd.
© 2008 Lucasfilm Ltd. & TM. All rights reserved.

PRESENTED BY



MAJOR EXHIBITION PARTNER



EXHIBITION PARTNER



MEDIA PARTNERS



For more information on the exhibition *Star Wars: Where Science Meets Imagination*, visit the Powerhouse Museum's website <http://www.powerhousemuseum.com>

For more information about education support or your booking, contact Education and Program Development at the Powerhouse Museum:
Telephone — (02) 9217 0222
Fax — (02) 9217 0622
Email — edserv@phm.gov.au

Subscribe to *Connector*, our free education e-newsletter, by logging on to www.powerhousemuseum.com/teachersguide/subscribe

	500 Harris Street Ultimo PO Box K346 Haymarket 1238 www.powerhousemuseum.com
--	--

© Trustees of the Museum of Applied Arts and Sciences 2008

This publication is copyright. Apart from fair dealing for the purposes of research, study, criticism or review, or as otherwise permitted under the Copyright Act, no part may be reproduced by any process without written permission.

The Powerhouse Museum, part of the Museum of Applied Arts and Sciences, also incorporating the Powerhouse Discovery Centre, Sydney Observatory and NSW Migration Heritage Centre, is a NSW government cultural institution.