



2015 PRIMARY SCHOOL LEARNING PROGRAM

POWERHOUSE MUSEUM

SYDNEY OBSERVATORY

DISCOVERY CENTRE

Program introduction

Welcome to the 2015 Museum of Applied Arts & Sciences (MAAS) Learning Program. The Museum is undergoing a significant refresh, including new and ambitious spaces and exhibitions, many developed in partnership with leading local and international institutions, artists and curators. The new MAAS brand presents our three wonderful venues — Sydney Observatory, Discovery Centre and Powerhouse Museum — with greater prominence, and signifies a determination to bring even more of our amazing collection into public view. While each venue has a distinctive identity, we are united by our mission “to be a catalyst for creative expression and curious minds”.

Our 2015 learning experiences feature the See-Think-Wonder interpretation approach. Originally developed at Harvard University’s Graduate School of Education, See-Think-Wonder is already used in many NSW schools, and encourages positive learning ‘habits of mind’ and activates deeper connections with objects and content.

See-Think-Wonder works in three steps. Ask young people to look at an object and tell you what they can see (detailed observation, use of descriptive language). Then ask them what they think (making connections, sharing prior knowledge), and finally what they wonder (questions suggesting possible further research). In this way, judgement, categorisation and explanation are initially deferred in favour of eliciting as many diverse and personal responses as possible. Responses captured on paper, and as sound or video recordings, provide the basis for reflection, further exploration and deep enquiry.

Whether you are a principal, educator or parent, we invite you to incorporate See-Think-Wonder into your visit to enrich and personalise your experience of our collection, exhibitions, spaces and people.

The MAAS Learning Team is working on strengthening the curriculum relevance, and extending the duration of your engagement with our programs, collections and expertise. We will continue to make extensive use of digital technologies such as video conferencing and online platforms to increase access. We welcome your advice and feedback about our programs at any time.

Finally, because we understand that learning happens in a social context, we seek your help to ensure every visitor to MAAS in 2015 wears a clearly readable name badge displaying their first name. This simple courtesy facilitates easy dialogue between Museum staff and visitors, and contributes to the creation of a lively and participatory learning environment, and we greatly appreciate your support for this.

We look forward to meeting you at each of our three venues, and to working together to ensure MAAS delivers compelling learning experiences to enrich the life and learning of your whole school community.

For and on behalf of the MAAS Learning Team,

Peter Mahony
Education and Digital Learning Manager

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MAAS Learning Program Overview

There are 4 ways to visit MAAS in 2015.

<p>Workshop</p> <p>MAAS educator-led premium experiences delivering maximum interactivity and hands-on activity levels. Focussed learning environments. Duration: 1-5 – 2 Hours.</p>	<p>Expedition</p> <p>MAAS educator-led experiences such as tours and trails, which may incorporate one or more exhibition and learning spaces. Engaging, in-depth learning experiences for large groups. Duration: 45min – 1 Hour.</p>
<p>Video conference</p> <p>Highly-interactive screen based lessons, led by MAAS curators and educators, and guest experts such as university researchers. Direct to your classroom using Connected-classroom, or in-browser technology (Zoom). Duration: 45 minutes or as program.</p>	<p>Self-directed</p> <p>Free-range exhibition exploration, covering the widest range of exhibitions and themes. Incorporate See-Think-Wonder to optimise research and interpretation skills. Duration: Recommended minimum 2 Hours.</p>

Pricing for Education Visits

- There is a new pricing structure for education visits to Museum of Applied Arts and Sciences. Our aim is to make it easier for you plan and book excursions, as well as provide high-quality learning experiences for students.
- From 2015, we are offering a flat rate for your visit based on the size of your booking, and this rate is calculated in multiples of 10 students. This means that your numbers can vary slightly (+/- 5 learners) on the day of your excursion without the total cost changing, and also enable us to plan ahead in order to provide you with the best support possible during your visit.
- Our bookings staff will take you through the options that are most appropriate for your group.
- MAAS Powerhouse Museum and Sydney Observatory offer free admission for teachers for excursion pre-planning. Simply show your credentials on entry. Daytime hours only.

Supervisor – Learner: Free admission ratio

1:5 for Years K-2	1:1 for special needs
1:10 for Years 3-6	1:2 for under 5 Years

Combine your visit

Get more out of MAAS by visiting both Powerhouse Museum and Sydney Observatory in a single excursion. Alternatively, combine your MAAS excursion with our precinct partners such as include IMAX Sydney, National Maritime Museum, ABC Centre Ultimo, Sydney Aquarium, Sydney Learning Adventures and Rocks Walking Tours. With any combined visit, you'll receive a \$1 discount off the learner admission cost at the MAAS and enjoy savings at other venues too. Bookings and payments must be made separately at each venue.

MAAS Learning Program at a glance

KEY: Workshop = W Expedition = E Video Conference = V Self-directed = S

		KLA	Page	Venue
Early Stage 1				
Measuring the Weather	E	Science	8	Sydney Observatory
Stage 1				
Measuring the Weather	E	Science	8	Sydney Observatory
The Science Show (from Term 2)	E	Science	9	Powerhouse Museum
Transport	E	Science, History	10	Powerhouse Museum
Stage 2				
Astronomy	W	Science	4	Sydney Observatory
Dreamtime Astronomy	W	Science, History	4 / 11	Sydney Observatory or Video Conference
For Good Measure	V	Mathematics	11	Video Conference
Marvellous Machines	E	Science	8	Powerhouse Museum
Measuring the Weather	E	Science	5	Sydney Observatory
Pictures Tell the Story (from Term 2)	E	English	8	Powerhouse Museum
Scratch Maths	W	Mathematics	6	Powerhouse Museum
Space	E	Science	9	Powerhouse Museum
The Science Show (from Term 2)	E	Science	9	Powerhouse Museum
Transport	E	Science, History	10	Powerhouse Museum
Stage 3				
Astronomy	W	Science	4	Sydney Observatory
Dreamtime Astronomy	W	Science, History	4 / 11	Sydney Observatory or Video Conference
Electronic Technologies (from Term 3)	W	Science	5	Powerhouse Museum
For Good Measure	V	Mathematics	11	Video Conference
Gold Rush!	W	History	5	Powerhouse Museum
Mars Mission 5	V	Science	12	Video Conference
Measuring the Weather	E	Science	5	Sydney Observatory
Robots for Space Exploration (from Term 2)	W	Science	6	Powerhouse Museum
Scratch Maths	W	Mathematics	6	Powerhouse Museum
Space	E	Science	9	Powerhouse Museum
The Science Show (from Term 2)	E	Science	9	Powerhouse Museum

Book your MAAS Learning Program

1. Choose the program which suits your classes learning needs:

Refer to program description, curriculum links and venue information in the following pages.

2A. Book Online – Priority Process

Visit <http://maas.museum/learn/book> and fill out the online booking form.

OR

2B. Book by email or fax

Print, fill out, fax or email the booking form included in this brochure.

Email: learn@phm.gov.au

Fax: (02) 9217 0622

For any special requests contact the MAAS Learning Team at learn@phm.gov.au

3. MAAS confirms your booking:

We will contact you to confirm your booking and provide an invoice for payment. Let us know the best ways and times to contact you.

When you receive your booking confirmation please check that the details are correct, sign and return the form. Only on receipt of this signed form will your booking be considered confirmed.

4. Complete payment:

Payment must be made in advance or on the day of your visit via cheque, credit card or cash. MAAS will issue you with a receipt for payment on the day of your excursion.

CONTACTS

MAAS Learning Team

c/- Powerhouse Museum

500 Harris St, Ultimo, NSW 2007

Email: learn@phm.gov.au

Tel: (02) 9217 0222

Fax: (02) 9217 0622

Sydney Observatory

1003 Upper Fort St

Millers Point NSW, 2000

Tel: (02) 9921 3485

Fax: (02) 9921 3489

LEARNING PROGRAM IN DETAIL

Workshops

Astronomy

Venue: SYDNEY OBSERVATORY

STAGE 2–3 (YEARS 3 and 5)

Journey through the Solar System, galaxy and beyond with an astronomy guide in the spectacular 3D space theatre. Day will turn into a perfectly clear, starlit night in the Sydney Planetarium, where learners discover how to navigate by the stars. Then from our domes, weather permitting, students observe the Sun in spectacular detail through filtered telescopes. A simple sundial is used to track the passage of time during the tour and each teacher receives a template to make at school.

Cost: day visit \$100 per 1–10 learners, night visit \$120 per 1–10 learners /

TEP schools day visit \$50 per 1–10 learners.

Duration: day visit 120 minutes, night visit 90 minutes

Availability: Monday – Friday 9.30 am and 12 noon; nights (non-daylight saving), 6.15 pm and 8.15pm; Monday – Saturday (daylight saving), 8.15 pm

Group size: 100 max

NSW Syllabus incorporating Australian Curriculum

STAGE 2

Science and technology: Values and attitudes [ST2-1VA](#), Working Scientifically [ST2-4WS \(ACSHE050\)](#), Earth and Space [ST2-9ES \(ACSSU048\)](#), [\(ACSHE050\)](#)

STAGE 3

Science and technology: Values and attitudes [ST3-1VA](#), Working Scientifically [ST3-4WS \(ACSHE081, ACSSU078\)](#), Earth and Space [ST3-8ES \(ACSHE082\)](#), [ST3-9ES](#)

Dreamtime Astronomy

Venue: SYDNEY OBSERVATORY

STAGE 2–3 (YEARS 3 and 5)

Learn stories of the night sky according to the cultures of Aboriginal and Torres Strait Islander people. In the Sydney Planetarium explore ways the original inhabitants of this land used stars for navigation, time keeping, food gathering, law and kinship. Compare Western astronomy with the astronomy of the Kamilaroi / Euahlayi (NSW) clans by making a planisphere (rotating star map) and solving practical observational problems. Viewing the Sun through telescopes, weather permitting, will highlight an astronomical component of the Australian Aboriginal flag. Learners take home a planisphere with Western and Indigenous star maps and information.

Cost: day visit \$100 per 1–10 learners, night visit \$120 per 1–10 learners /

TEP schools day visit \$50 per 1–10 learners

Duration: day visit 120 minutes, night visit 90 minutes

Availability: Monday – Friday, 9.30 am and 12 noon; nights (non-daylight saving), 6.15 pm and 8.15pm; Monday – Saturday (daylight saving), 8.15 pm

Group size: 100 max

NSW Syllabus incorporating Australian Curriculum

STAGE 2

Science and Technology: Values and attitudes [ST2-1VA](#), Working Scientifically [ST2-4WS \(ACSHE061\)](#)

History: First Contacts [HT2-3 \(ACHHK077\)](#)

STAGE 3

Science and Technology: Values and attitudes [ST3-1VA](#), Working Scientifically [ST3-4WS](#), Earth and Space [ST3-8ES \(ACSHE082\)](#)

History: The Australian Colonies [HT3-2 \(ACHHK094\)](#)

Electronic Technologies

FROM TERM 3, 2015

Venue: POWERHOUSE MUSEUM

STAGE 3 (YEARS 5–6)

Physical computing is building physical interactive systems using software and hardware to respond to the physical world. This hands-on, exciting workshop introduces the creative possibilities of electronics and programming with the Arduino language featuring the Museum's custom microcontroller, Thinker1. This credit-card-sized computer-science laboratory is a unique combination of microprocessor (brain) and electronic components (inputs: buttons, sensors; outputs: LED lights, sounds, etc), which are controlled by computer code. A practical and creative introduction to computer science. Experiment, tinker and invent.

"Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists and anyone interested in creating interactive objects or environments". www.arduino.cc

Understand where and how microcontrollers are used; learn to read, manipulate and write code in the Arduino language (based on C/C++); program LED lights and create custom light patterns on the Thinker1; and read sensor inputs and incorporate them in code.

Cost: flat rate \$300 per group / TEP schools \$150 per group / all supervisors free

Duration: 120 minutes

Availability: from Term 3, 10.30 am and 1.00 pm

Group size: 30 max. Sequential sessions can be arranged to accommodate up to 60 learners.

NSW Syllabus incorporating Australian Curriculum

Links TBA

Gold Rush!

Venue: POWERHOUSE MUSEUM

STAGE 3 (YEARS 5–6)

Eureka! Join a fast and furious new version of the Powerhouse Museum's popular gold rush learning program. This is your chance to join Sydney's wildest gold rush learning experience. Following a short Museum tour and historical source study, your learners will inquire: what do we know about the gold rush and how do we know? Close study of displays will allow learners to explore the tremendous technological and societal change brought about on the Australian goldfields. Put your learners' gold rush knowledge into action as they play the Powerhouse Museum's own costumed role play game, *Life in the Gold Rush*.

Cost: \$100 per 1–10 learners / TEP schools \$50 per 1–10 learners / all supervisors free

Duration: 120 minutes

Availability: Monday – Friday, 10.30 am and 1.00 pm

Group size: min 30, max 120

NSW Syllabus for the Australian Curriculum

STAGE 3

History: The Australian Colonies [HT3-1 \(ACHHK095, ACHHK096\)](#), [HT3-2 \(ACHHK097\)](#), [HT3-5 \(ACHHS099, ACHHS100, ACHHS104\)](#)

Measuring the Weather

Venue: SYDNEY OBSERVATORY

STAGES S2–3 (YEARS 4–6)

Working collaboratively, learners use real scientific instruments to measure and collect data. They interpret Mean Sea Level Pressure Maps (MSLP, the ones we see on TV and online), analyse results in order to predict the weather based on the season. Time to explore the exhibition *Observing the Weather*, featuring Australia's first weather map, historical recording devices and records gives learners an

understanding of the social impact of meteorology. Using Bureau of Meteorology data learners can check the weather on the day they were born (Sydney region only).

Cost: day visit \$100 per 1~10 learners / TEP schools \$50 per 1~10 learners

Duration: 120 minutes

Availability: Monday – Friday, 9.30 am and 12.00 noon

Group size: 60 max

NSW Syllabus incorporating Australian Curriculum

STAGE 1

Science and Technology: Values and Attitudes: [ST1-1VA](#), Working Scientifically [ST1-4WS \(AC SIS024\)](#), Earth and Space [ST1-8ES \(ACSSU019\)](#)

STAGE 2

Science and Technology: Values and Attitudes: [ST2-1VA](#), Working Scientifically [ST2-4WS](#), Earth and Space [ST2-8ES](#)

STAGE 3

Science and Technology: Values and Attitudes: [ST3-1VA](#), Working Scientifically [ST3-4WS \(ACSHE098\)](#), [\(ACSSU096\)](#)

Robots for Space Exploration

FROM TERM 2, 2015

Venue: POWERHOUSE MUSEUM

STAGES 3–4 (YEARS 5–8)

The Mars Mission museum visit experience will take your learners on an investigation of wonder, discovery and hi-tech science. This exciting Mars Lab educator-led program gives your class an engaging framework to talk about space, consider the possibility of life on other planets and to carry out an authentic collaborative scientific investigation. Learners are introduced to the search for life on Mars and what features to look for on our re-created Martian surface. Using our unique digital tools, learners will work together in teams to plan, practise and carry out an exciting scientific rover mission and explore the unique capabilities of a research grade rovers. Images captured by learners with the rover's cameras will be made available for download and post-mission analysis back in class.

Cost: flat rate \$300 per group / TEP schools \$150 per group / all supervisors free

Duration: 120 minutes

Availability: from Term 2, Monday – Friday, 10.30 am and 1:00 pm

Group size: 30 max. Sequential sessions can be arranged to accommodate up to 60 learners.

Australian Curriculum links

This program was developed in partnership with the Australian Government Department of Education, therefore curriculum links are currently national

YEAR 5

Science: Science understanding [ACSSU043](#), [ACSSU078](#) Science as human endeavour [ACSHE081](#), [ACSHE083](#) Science inquiry skills [AC SIS231](#), [AC SIS086](#), [AC SIS090](#), [AC SIS218](#), [AC SIS093](#)

YEAR 6

Science: Science understanding [ACSSU094](#), [ACSSU096](#) Science as a human endeavour [ACSHE098](#), [ACSHE100](#) Science inquiry skills [AC SIS232](#), [AC SIS103](#), [AC SIS107](#), [AC SIS221](#), [AC SIS110](#)

NSW Syllabus incorporating Australian Curriculum

Links TBA

Scratch Maths

Venue: POWERHOUSE MUSEUM

STAGES 2–3 (YEARS 3–6)

Scratch makes it easy to create and share interactive stories, games, animations and presentations. A project of the Lifelong Kindergarten Group at the MIT Media Lab, Scratch is a great way to introduce young people to the key concepts and processes of programming. Workshop participants will create a classic video game in Scratch, and along the way will develop their literacy, numeracy, programming and digital production skills.

Develop an understanding of interaction and logic in game coding, customise and develop their game by creating unique elements and sprites, learn about variables and program a score mechanism in the game, explore the Scratch website, learn how to upload their projects, and continue working in Scratch beyond the workshop.

Cost: flat rate \$300 per group / TEP schools \$150 per group / all supervisors free

Duration: 120 minutes

Availability: 10.30 am and 1.00 pm

Group size: 30 max. Sequential sessions can be arranged to accommodate up to 60 learners.

NSW Syllabus incorporating the Australian Curriculum

STAGE 2

Mathematics: Working Mathematically [MA2-2WM](#)

STAGE 3

Mathematics: Working Mathematically [MA3-2WM](#), Chance [MA3-19SP](#), Patterns and Algebra [MA3-8NA](#)

Expeditions

Marvellous Machines

Venue: POWERHOUSE MUSEUM

STAGE 2 (YEARS 3–4)

With a diverse array of machines on display, MAAS provides an exciting learning environment to see these important objects firsthand. Through observation, peer discussion and drawing, learners gain insights into how machines work. They are asked to isolate the lines, shapes and forms of the machines, make connections and see the big picture through drawing, discussions and writing. Utilising a drawing book they are guided through some of our most fascinating object displays.

Cost: \$90 per 1~10 learners / TEP schools \$45 per 1~10 learners / all supervisors free

Duration: 45 – 60 minutes

Availability: groups can take this tour anytime during Museum hours (10.00 am – 5.00 pm)

Group size: 120 max

NSW Syllabus for the Australian Curriculum

STAGE 2

Science and Technology: Values and Attitudes [ST2-1VA](#), Physical World [ST2-7PW](#) ([ACSSU076](#))

Measuring the Weather

Venue: SYDNEY OBSERVATORY

STAGES ES1–S1 (YEARS K–1)

In a short format to suit young learners, participants make observations about the weather and work collaboratively to use real scientific instruments to measure and collect data. They create a weather report based on their observations incorporating seasonal changes. Using Bureau of Meteorology data participants can check the weather on the day they were born (Sydney region only).

Cost: \$90 per 1~10 learners / TEP schools \$45 per 1~10 learners

Duration: 60 minutes

Availability: Monday – Friday, 10.30 am and 12 noon

Group size: 60 max

NSW Syllabus incorporating Australian Curriculum

EARLY STAGE 1

Science and Technology: Values and Attitudes: [STe-1VA](#), Working Scientifically [STe-4WS](#) ([ACSH013](#), [ACSH233](#)), Natural Environment [STe-7NE](#) ([ACSSU004](#))

STAGE 1

Science and Technology: Values and Attitudes: [ST1-1VA](#), Working Scientifically [ST1-4WS](#) ([ACSH024](#)), Earth and Space [ST1-8ES](#) ([ACSSU019](#))

Pictures Tell the Story

FROM TERM 2, 2015

Venue: POWERHOUSE MUSEUM

STAGES 2–3 (YEARS 3–6)

The MAAS collection is full of stories. Using iPads, participants work together with a facilitator to create a story or information graphic in response to one or more Museum objects. During this workshop learners will express and develop ideas, use media to tell the stories while developing learners' interpretive and analytical skills. Create multimodal texts and express unique narratives about the objects. This fast-paced workshop inside a current exhibition is a highly engaging English class.

Cost: \$90 per 1~10 learners / TEP schools \$45 per 1~10 learners / all supervisors free

Duration: 45 – 60 minutes

Availability: from Term 2, Monday – Friday, 10.30 am, 11.30 am and 12.30 pm
Group size: 30 max. Sequential sessions can be arranged to accommodate large numbers.

NSW Syllabus incorporating the Australian Curriculum

STAGE 2

English: Writing and representing [EN2-2A](#) Using digital technologies [EN2-3A](#) Reading and viewing [EN2-8B](#) Thinking imaginatively, creatively and interpretively [EN2-10C](#) Expressing themselves [EN2-11D](#), Reflecting on learning [EN2-12E](#)

History: Develop texts, particularly narratives (ACHHS070, ACHHS086); Use a range of communication forms (oral, graphic, written) and digital technologies (ACHHS071, ACHHS087)

BOSTES unit of work [Pictures tell the story!](#)

Science and technology: Working technologically [ST2-5WT](#) Information [ST2-15I](#)

Creative arts: Music [MUS2.2](#) Visual Arts [VAS2.3](#), [VAS 2.4](#)

The Science Show

FROM TERM 2, 2015

Venue: POWERHOUSE MUSEUM

STAGES 2–3 (YEARS 3–6)

A fascinating interactive exploration of various scientific phenomena featuring demonstrations of specialised equipment, materials and experiments. Enrich the Values and Attitudes of your science learners with a truly phenomenal experience that will spark imagination and curiosity in science and the scientific process.

Cost: \$90 per 1~10 learners / TEP schools \$45 per 1~10 learners / all supervisors free

Duration: 45 minutes

Availability: From Term 2, Monday – Friday, 10.30 am, 11.30 am, 12.30 pm and 1.30 pm

Group size: 10 min, 180 max per show (subject to venue availability)

NSW Syllabus incorporating Australian Curriculum

Links TBA

Space

Venue: POWERHOUSE MUSEUM

STAGES 2–3 (YEARS 3–6)

Join a live character-guided audio tour, learn about the thrills of human spaceflight. Learners need to show brains, courage and aspiration to join the next generation of spaceflight heroes — the Powerhouse Cadets. Each learner is issued with a headset to stay in radio communication with their spaceflight tour guide, Commander Chip. A pulsing space soundtrack spliced with historical audio accompanies your group's examination of real space artefacts, the only collection of its kind in Australia.

Learn about rocketry, orbit and the force of gravity. Explore a replica of the International Space Station, designed to sustain life in the vacuum of space. Investigate the history of the Space Race, when the Soviet Union and the USA battled for technological supremacy. And yes, the question uppermost in every learner's mind is answered — how do astronauts go to the toilet in outer space?

Cost: \$90 per 1~10 learners / TEP schools \$45 per 1~10 learners / all supervisors free

Duration: 45 minutes

Availability: Monday – Friday, 10.30 am, 11.30 am, 12.30 pm and 1.30 pm

Group size: 30 max. Sequential sessions can be arranged to accommodate large numbers.

NSW Syllabus incorporating the Australian Curriculum

STAGE 2

Science and Technology: Values and Attitudes [ST2-1VA](#), [ST2-3VA](#), Built Environments [ST2-14BE](#), Earth and Space [ST2-9ES](#) ([ACSSU048](#)), Physical World [ST2-7PW](#) ([ACSSU076](#))

STAGE 3

Science and Technology: Values and Attitudes [ST3-1VA](#), [ST3-3VA](#), Built Environments [ST3-14BE](#), Earth and Space [ST3-8ES](#) ([ACSHE082](#), [ACSHE099](#))

Transport

Venue: POWERHOUSE MUSEUM

STAGES 1–2 (YEARS 1–4)

Experience a unique character-guided tour through Sydney's transport history and future options. This tour is a kinaesthetic game laced with wonderful storytelling. Learners join Powerhouse Museum aficionado Finn for an accidental tour through the history of transport in Sydney. They explore advances in transport: from walking to horseriding, cycling to driving, and train riding to aeroplane flying. Using scientific inquiry, your learners consider how changing forms of transport technology meet society's need to be quick, sustainable and quiet.

Cost: \$90 per 1~10 learners / TEP schools \$45 per 1~10 learners / all supervisors free

Duration: 45 minutes

Availability: Monday – Friday, 10.30 am, 11.30 am, 12.30 pm and 1.30 pm

Group size: 30 max. Sequential sessions can be arranged to accommodate large numbers.

NSW Syllabus incorporating the Australian Curriculum

STAGE 1

History: The Past in the Present [HT1-3 \(ACHHK046\)](#), [HT1-4 \(ACHHS054\)](#)

Science and Technology: Values and Attitudes [ST1-1VA](#), [ST1-2VA](#)

STAGE 2

History: Community and Remembrance [HT2-2 \(ACHHK061\)](#)

Science and Technology: Values and Attitudes [ST2-1VA](#), [ST2-2VA](#)

Video conferences

Dreamtime Astronomy

STAGES 2–3 (YEARS 5–6)

Learners will be amazed by the stories written across the night sky according to the cultures of Aboriginal and Torres Strait Islander people. They will be guided through the construction and use of a planisphere (rotating star map) to explore and compare western astronomy to the specific astronomy of the Kamilaroi / Euahlayi (NSW) clans. Practical seasonal problems will be solved using the planisphere and free astronomical software Stellarium. Eclipse glasses will then permit learners to look safely at the Sun to see the astronomical heart of the Australian Aboriginal flag.

Cost: \$110 per class / TEP schools \$55 per class PLUS Learning Materials Cost (\$10 per learner).

Materials posted to the school before the conference: planisphere cover, western star wheel, Aboriginal star wheel from the Kamilaroi / Euahlayi clans with corresponding explanatory notes, split pin, post visit online activity sheet.

Duration: 60 minutes

Availability: visit <http://from.ph/6ah> for session times

NSW Syllabus incorporating Australian Curriculum

STAGE 2

Science and Technology: Values and attitudes [ST2-1VA](#), Working Scientifically [ST2-4WS \(ACSHE061\)](#)

History: First Contacts [HT2-3 \(ACHHK077\)](#)

STAGE 3

Science and Technology: Values and attitudes [ST3-1VA](#), Working Scientifically [ST3-4WS](#), Earth and Space [ST3-8ES \(ACSHE082\)](#)

History: The Australian Colonies [HT3-2 \(ACHHK094\)](#)

For Good Measure

STAGES 2–3 (YEARS 4–6)

Get your learners experimenting with measurement and maths.

Discover how old-fashioned measurement systems give us insight into the measuring standards we use today. Join the Learning Team on this mathematical adventure, including access to the measurement collection that is rarely on public display. Learners will be guided through different standards of measure focusing on length, weight and volume. Learn about unique and interesting scaled instruments and hear stories of how they came about and what they were used for. Learners interact throughout the session with fun hands-on activities in your classroom.

Cost: \$110 per class / TEP schools \$55 per class

Duration: 60 minutes

Availability: visit <http://from.ph/6ah> for session times

NSW Syllabus incorporating the Australian Curriculum

STAGE 2

Mathematics: Length [MA2-9MG](#), Volume & Capacity [MA2-11MG](#), Mass [MA2-12MG](#)

STAGE 3

Mathematics: Length [MA3-9MG](#), Volume & Capacity [MA3-11MG](#), Mass [MA3-12MG](#)

Mars Mission 5

STAGE 3 (YEARS 5–6)

Mars Mission 5 will fill your classroom with a genuine sense of wonder, discovery and hi-tech science. Revolving around the search for evidence of life on Mars, this exciting program gives your class an engaging framework to talk about space, consider the possibility of life on other planets and to carry out an authentic collaborative scientific investigation. Just like real space scientists, your class will plan their own mission and remotely control a sophisticated robot rover across a recreation of the surface of Mars as they search for evidence of life — all from your classroom!

Cost: \$220 per class / TEP schools \$110 per class

Duration: 2 x 60 minute lessons

Availability: [Details online](#)

Australian Curriculum links

This program was developed in partnership with the Australian Government Department of Education

YEAR 5

Science: Science understanding [ACSSU043](#), [ACSSU078](#) Science as human endeavour [ACSHE081](#), [ACSHE083](#) Science inquiry skills [ACSIS231](#), [ACSIS086](#), [ACSIS090](#), [ACSIS218](#), [ACSIS093](#)

YEAR 6

Science: Science understanding [ACSSU094](#), [ACSSU096](#) Science as a human endeavour [ACSHE098](#), [ACSHE100](#) Science inquiry skills [ACSIS232](#), [ACSIS103](#), [ACSIS107](#), [ACSIS221](#), [ACSIS110](#)

Self-directed visit

Venue: POWERHOUSE MUSEUM

STAGES ES1–3 (YEARS K–6)

Book a self-guided visit to the Powerhouse Museum or Sydney Observatory and your group is free to explore the diverse range of exhibits at your own pace and find your own curriculum links. Exhibition notes and resources are available to support your visit online at maas.museum/learn.

See-Think-Wonder can be requested with your booking (see below)

Duration: 90 – 120 minutes recommended

Cost: \$80 per 1~10 learners / TEP schools free / all supervisors free

Availability: 10.00 am – 5.00 pm

Group size: no restrictions

See-Think-Wonder

Venues: POWERHOUSE MUSEUM

STAGES ES1–3 (YEARS K–6)

Part of a quality Museum learning expedition is when learners can focus their attention toward objects on display. Brimming with excitement, learners often bypass displays quickly without pausing to look more closely. See-Think-Wonder is an enquiry learning structure that gives all supervisors — parents, carers and support teachers — the confidence to engage learners more deeply in their Museum visit. This activity builds skills in appreciation and Museum literacy alongside English syllabus modes and skills in speaking and listening, thinking imaginatively and creatively and reflecting on learning.

Request See-Think-Wonder with your booking to have a Museum Educator talk to your group on arrival and introduce supervisors to maximising learning opportunities for your learners.

NSW Syllabus incorporating Australian Curriculum

EARLY STAGE 1

English: Speaking and listening [ENe1-A](#), [ENe-6B](#) Thinking imaginatively and creatively [ENe-10C](#) Reflecting on learning [ENe-12E](#)

STAGE 1

English: Speaking and listening [EN1-1A](#), [EN1-6B](#) Thinking imaginatively and creatively [EN1-10C](#) Reflecting on learning [EN1-12E](#)

STAGE 2

English: Speaking and listening [EN2-1A](#), [EN2-6B](#), Thinking imaginatively, creatively, interpretively and critically [EN2-10C](#) Reflecting

on learning [EN2-12E](#)

STAGE 3

English: Speaking and listening [EN3-1A](#), [EN3-5B](#), Thinking imaginatively, creatively, interpretively and critically [EN3-7C](#) Reflecting

on learning [EN3-9E](#)

For people with a disability

Expeditions

Creative Music – Special Access Kit

Venue: POWERHOUSE MUSEUM

Workshops for groups of people with a disability. Suitable for post-school options, recreation and respite-care programs, each service books a regular weekly 60 minute timeslot for 10-week session. Participants use a variety of electronic and acoustic musical instruments to create live musical jams and sing-alongs as they explore popular songs and music styles from jazz and classical to rock and dance.

Electronic instruments used include keyboards and drum pads, 'jelly-bean' buttons and switches, touch-sensitive devices including iPads, and the Special Access Kit 'banana' keyboard — an ergonomically designed MIDI-interface designed to suit a wide range of physical abilities.

Traditional instruments include a wide range of hand-percussion and stringed instruments such as electric guitar and digital drum kit.

Please contact the Learning Team for more information about this program.

Cost: \$50 per week, per group

Duration: 60 minutes

Availability: Wednesdays during school term

Group size: 10 learners, plus carers

Accessible Astronomy

Venue: SYDNEY OBSERVATORY

For learners who use wheelchairs, or mixed access groups, experience the newly reconstructed East Dome featuring Sydney's most advanced optical telescope thanks to sponsorship from the NSW Department of Ageing, Disability and Home Care. Book a sixty minute learning expedition and visit both the 3D Space Theatre and the East Dome.

Cost: \$50 per 1~10 learners plus carers

Duration: 60 minutes

Availability: by request

Group size: recommend 10 learners plus carers

Professional development

STEM: Prototyping with Arduino and Scratch

Venue: POWERHOUSE MUSEUM

Develop classroom confidence with computer programming with this practical introduction to code conducted at the Powerhouse Museum's Thinkspace laboratories. Workshop topics include basic copper tape and coin cell battery circuits, LED review, RGB LED, potentiometer and buzzer. Programming languages: Arduino or Scratch. Curriculum materials and all equipment supplied. Recommended for TAS, Maths and Science teachers.

Cost: \$120 per person per day (min 7) includes lunch.

Duration: 2 days. 9:00 am – 3:30 pm

Venues and exhibitions

Powerhouse Museum

The Powerhouse Museum opened in 1988 as the flagship of the Museum of Applied Arts and Sciences (MAAS). Located in the old Ultimo Power Station adjacent to Darling Harbour, the Powerhouse Museum is one of three sites operated by the institution.

Its unique and diverse collection spans science, technology, design, industry, decorative arts, transport and space exploration. It is also home to the material heritage and stories of Australian culture, history and lifestyle, providing a comprehensive insight into this rich and diverse country. There is estimated to be well over 500,000 separate items in the Museum's collection.

A range of 12 permanent exhibitions at the Powerhouse is complemented by a changing program of temporary exhibitions and displays. Learning and creativity are a strong focus of the Museum. There are regular tours and demonstrations, performances, workshops, forums and other special events held throughout the Museum.

Venue features include cafes on two levels and the Powerhouse Shop. Thinkspace is the Museum's digital learning precinct which offers booked workshops for all ages to develop media production skills. The Lace Study Centre, where the Museum's lace collection is stored, and the Reference Library are open to the public by appointment.

Unless specified, exhibition entry is included with Powerhouse admission

Circus Factory

Featuring all the wonder of the circus with live performances, sideshow favourites, vintage toys and novelties. Over 200 items from the Museum's vast collection will be on display throughout *Circus Factory*, including for the first time, stunning objects and photographs from the collection of the famous Australian Wirth's Circus. Explore an exhibition of 60 circus costumes and props from local and international collections that will explore ringmasters, trainers and tamers, acrobats, clowns, dressing rooms, accessories and the grand parade, in partnership with the Centre National du Costume de Scène (CNCS), Moulins, France.

<http://www.powerhousemuseum.com/exhibitions/circus-factory/>

Entry \$12 per learner (includes museum admission)

Interface: People, Machines, Design

Examine how design has been applied to information technology products. The exhibition features products from the late 19th century to the early 21st century, including radios, typewriters, calculators and computers.

Visit *Interface* online for teachers notes:

http://www.powerhousemuseum.com/pdf/education/teachersnotes/interface_teachers_notes.pdf/

EcoLogic

Explore one of the world's hottest topics today: climate change. Discover the science behind global warming and what we can do to prevent it from getting worse.

Visit *EcoLogic* online for teachers notes:

<http://www.powerhousemuseum.com/ecologic/resources/pre-visit-resources/>

Space

Discover what it's like to live and work on the International Space Station and experience the illusion of weightlessness in the Zero Gravity Space Lab. Find out what astronauts eat and how they go to the toilet.

Visit *Space* online for teachers notes:

<http://www.powerhousemuseum.com/exhibitions/space.php/>

Transport

Understand the different types of transport that have shaped our way of life. See how vehicles have connected us over time, from bicycles and horse-drawn carriages to trains and planes.

Visit *Transport* online for teachers notes:

<http://www.powerhousemuseum.com/exhibitions/transport.php/>

What's in Store?

Discover the fascinating story of Australia's retail history from 1880–1930. Find out how urban and rural stores have fostered social links between city and country.

Visit *What's in Store?* online for teachers notes:

http://www.powerhousemuseum.com/exhibitions/whats_in_store.php/

Experimentations

Experiments start from everyday experience. Why does the freezer door stick? How does a battery work? See how scientific and technological breakthroughs have answered questions like these and changed many of our ideas about everyday phenomena.

Visit *Experimentations* online for teachers notes:

<http://www.powerhousemuseum.com/exhibitions/experimentations.php/>

The Steam Revolution

For more than 200 hundred years, steam did almost everything ... pumped water, drove factories, and powered ships. Steam turbines still provide 90% of our electricity. *The Steam Revolution* shows how steam touched the lives of millions.

Visit *The Steam Revolution* online for teachers notes:

http://www.powerhousemuseum.com/exhibitions/steam_revolution.php/

Sydney Observatory

A visit to this spectacular state-listed heritage site, night or day, is a memorable experience. Sydney Observatory is home to Australia's most accessible telescope domes, with modern and historic instruments to safely view the Sun and other stars, planets and astronomical objects. As part of a Learning Expedition with our expert guides you can use an 1874 refractor telescope and modern reflector telescopes or measure the weather to make your own forecast. At 1.00 pm daily the historic time ball drops, just as it has done since 1858. The Sydney Planetarium and 3D Space Theatre immersive astronomy experiences are also included in the Learning Expedition cost.

Other features of the site include an historic fort dating back to 1804, a signal station from 1848 and a magnificent flagstaff.

More information <http://www.sydneyobservatory.com.au/whatson/historic-buildings-and-grounds/>

By the Light of the Southern Stars

The first watchers of the night sky from the Sydney region were the Aboriginal people of the Eora Nation. Find out how astronomy has shaped our nation, from Captain James Cook's early expeditions to Mathew Flinders' voyages as he mapped Australia's coastline. See instruments from early colonial observatories and those used to observe the first Southern Hemisphere star catalogue.

More information <http://www.sydneyobservatory.com.au/whatson/exhibits/>

Observing the Weather

Sydney Observatory astronomers were once timekeepers, surveyors and meteorologists. Investigate the temperature on Observatory Hill from 1858, find out what makes the greenhouse effect, observe what happens when the temperature rises, see historic instruments and use a modern pluviometer.

More information <http://www.sydneyobservatory.com.au/whatson/exhibits/>

Accessing the Sky in the East Dome (from March 2015)

Sydney Observatory has a new building with an historic dome and an accessible exhibition and telescope viewing experience. Highlighting Sydney Observatory's participation in the 1887 *Carte du Ciel* (*Chart of the Sky*) and *Astrographic Catalogue*, the new display features a spectacular 1890 Star Camera telescope. Supported by the NSW Department of Ageing, Disability and Home Care, the dome features a telescope with an articulated eyepiece for easy viewing of the night sky by people in wheelchairs.

More information <http://www.sydneyobservatory.com.au/whatson/exhibits/>

Fort Phillip Signal Station

Historic Fort Phillip was constructed in 1804 for the British military. Signal flagstaffs were first erected on Fort Phillip's walls about 1810. After the fort was partially demolished, the sandstone Signal Station was constructed. In 2008 an archaeological dig uncovered finds which explained the site's use and occupation. Today you can explore the building, exhibits on the process of archaeology and a small display of paintings and drawings of the fort throughout its history, including paintings depicting the Gadigal People. Site entry included with Dreamtime Astronomy expedition.

More information <http://www.sydneyobservatory.com.au/whatson/exhibits/>

Discovery Centre

The Discovery Centre is temporarily closed for major refurbishment that will deliver a significant new cultural facility at Castle Hill and provide world class storage for the collections of three of our state cultural institutions: the Australian Museum, Sydney Living Museums and the Museum of Applied Arts and Sciences.

The development will include new and enhanced educational learning and public engagement areas and a 9,000 square metre building that will house the collections of the three partner institutions. The new facility will offer visitors behind-the-scenes access to engage with the breadth and depth of the three collections and will build on the success of the Discovery Centre, which opened in 2007 and has become a significant cultural attraction in north western Sydney.

There will be a staged reopening of the site to the public from mid-2015.

Keep up to date with the progress of our new site: <http://castlehill.powerhousemuseum.com/>

Explore the MAAS collection online

The Museum acts as custodian and manager for a collection of over 500,000 material culture objects and artefacts owned collectively by the people of the state of NSW. At any time only a small proportion of this collection is on display in exhibitions across all MAAS venues, however Museum staff are constantly working to develop, conserve and strengthen the quality of this unique resource.

Access to the entire collection is available 24/7 using our searchable online collection database:
<http://www.powerhousemuseum.com/collection/database/menu.php>

BOOKING FORM

To book your Museum of Applied Arts and Sciences visit complete this form and return it via:

Email: learn@phm.gov.au

Fax: (02) 9217 0622

Mail: 500 Harris Street, Ultimo NSW 2007

We will contact you to confirm your booking and provide an invoice for payment.

When you receive your booking confirmation please check that the details are correct.

Payment must be made in advance or on the day of your visit.

Booking deadline: bookings must be made and confirmed at least two (2) weeks prior to the date of your visit.

School details

School name: _____

Contact first name: _____

Contact last name: _____

Email: _____

School address: _____

Suburb: _____

State: _____ Postcode: _____

School phone: _____ School fax: _____

Best time of day to call: _____

Alternative contact phone number: _____

Your visit

Please provide three dates for your visit. The confirmed date will be included in your confirmation form.

First preferred date (dd/mm/yy): ___ / ___ / ___

Second preferred date: ___ / ___ / ___

Third preferred date: ___ / ___ / ___

Arrival time: _____ Departure time: _____

Number of learners: _____ Number of supervisors: _____

Stages/year levels: _____

Topic being taught (relevant to your visit): _____

Number of supervisors; please apply the ratio for your group as per below:

- 1:5 for Years K–2 1:10 for Years 3–6 One supervisor to one student (1:1) for special needs

Does your group have any special needs or requirements? Please specify:

Teacher resources

Download teacher resources to support your visit to the Museum from powerhousemuseum.com/education

Cancellation Policy

The Powerhouse Museum requires notice of at least two (2) weeks for cancellations.

Cancellations received less than two (2) weeks prior to the excursion and 'no shows' will incur a charge of the full excursion cost.

Cancellations may be made via Tel: (02) 9217 0222 Fax: (02) 9217 0622 Email: learn@phm.gov.au

PRIMARY SCHOOLS PROGRAM

Please indicate which programs you would like to book for your visit on your first preferred date. Please consider the days the program is available, the duration of each program and your overall time at the Museum. If your first preferred date is unavailable we will contact you to discuss any changes to your program.

	Cost	Powerhouse Museum	Sydney Observatory	Availability
Workshops 90 - 120 minutes				
Astronomy S2-3 Max 100 per session	day visit \$100 per 1-10 learners, night visit \$120 per 1-10 learners / TEP schools day visit \$50 per 1-10 learners,		X	Monday – Friday <input type="checkbox"/> 9.30 am <input type="checkbox"/> 12.00 noon Monday – Saturday Non-daylight saving (winter) <input type="checkbox"/> 6.15 pm Daylight saving (summer) <input type="checkbox"/> 8.15 pm
Dreamtime Astronomy S2-3 Max 60 per session	day visit \$100 per 1-10 learners, night visit \$120 per 1-10 learners / TEP schools day visit \$50 per 1-10 learners,		X	Monday – Friday <input type="checkbox"/> 9.30 am <input type="checkbox"/> 12.00 noon Monday – Saturday Non-daylight saving (winter) <input type="checkbox"/> 6.15 pm Daylight saving (summer) <input type="checkbox"/> 8.15 pm
Electronic Technologies from Term 3, S3 Max 30 per session	flat rate \$300 / TEP schools flat rate \$150	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 1.00 pm
Gold Rush! S3 Max 120 per session	\$100 per 1-10 learners / TEP schools \$50 per 1-10 learners	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 1.00 pm
Measuring the Weather S2-3 Max 60 per session	day visit \$100 per 1-10 learners / TEP schools \$50 per 1-10 learners		X	Monday – Friday <input type="checkbox"/> 9.30 am <input type="checkbox"/> 12.00 noon
Robots for Space Exploration S3 Max 30 per session	flat rate \$300 / TEP schools \$150 per 1-10	X		Monday – Friday

	learners			<input type="checkbox"/> 10.00 am <input type="checkbox"/> 1.00 pm
Scratch Maths S2–3 Max 30 per session	flat rate \$300 / TEP schools \$150 per 1–10 learners	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 1.00 pm
Expeditions 45 – 60 minutes				
Marvellous Machines S2	\$90 per 1–10 learners / TEP schools \$45 per 1–10 learners	X		Groups can take this tour anytime during Museum hours (10.30 am – 5.00 pm)
Measuring the Weather ES1–S1 Max 60 per session	\$90 per 1–10 learners / TEP schools \$45 per 1–10 learners		X	Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 12.00 noon
Pictures Tell the Story (iPad) from Term 2, S2 Max 30 per session	\$90 per 1–10 learners / TEP schools \$45 per 1–10 learners	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 11.30 am <input type="checkbox"/> 12.30 pm
The Science Show from Term 2, S1–3 Max 180 per session	\$90 per 1–10 learners / TEP schools \$45 per 1–10 learners	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 11.30 am <input type="checkbox"/> 12.30 pm <input type="checkbox"/> 1.30 pm
Space S2–3 Max 30 per session	\$90 per 1–10 learners / TEP schools \$45 per 1–10 learners	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 11.30 am <input type="checkbox"/> 12.30 pm <input type="checkbox"/> 1.30 pm
Transport S1–2 Max 30 per session	\$90 per 1–10 learners / TEP schools \$45 per 1–10 learners	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 11.30 am <input type="checkbox"/> 12.30 pm <input type="checkbox"/> 1.30 pm
Video conferences 45 – 60 minutes				
Dreamtime Astronomy S3 Max 1 class per session	flat rate \$110 / TEP schools flat rate \$55 plus Learning Materials \$10 per learner			Monday – Friday check online for more information maas.museum/learn
For Good Measure S2–3 Max 1 class per session	flat rate \$110 / TEP schools flat rate \$55			Monday – Friday check online for more information maas.museum/learn
Mars Mission 5 S3 Max 1 class per session	flat rate \$220 / TEP schools flat rate \$110			Monday – Friday x 2 sessions check online for more information maas.museum/learn
Self-directed visit 90 – 120 minutes recommended				
Self-directed visit ES1–3	\$80 per 1–10 learners / TEP schools free	X		Powerhouse Museum Monday – Sunday Name of exhibitions you wish to visit:
See-Think-Wonder ES1–3	\$80 per 1–10 learners / TEP schools free	X		Monday – Friday <input type="checkbox"/> 10.30 am <input type="checkbox"/> 11.00 am <input type="checkbox"/> 11.30 am <input type="checkbox"/> 12.00 noon <input type="checkbox"/> 12.30 pm <input type="checkbox"/> 1.00 pm <input type="checkbox"/> 1.30 pm
For people with a disability 60 minute expeditions				

Accessible Astronomy.	\$50 per 1-10 learners plus carers		X	Monday – Friday <input type="checkbox"/> 9.30 am <input type="checkbox"/> 12.00 noon Monday – Saturday Non-daylight saving (winter) <input type="checkbox"/> 6.15 pm Daylight saving (summer) <input type="checkbox"/> 8.15 pm
Creative Music – Special Access Kit	\$50 per week per group	X		Wednesdays during school term