

Ancient Greek Technology brought to life at Science Centre Singapore

The travelling exhibition to showcase over 40 inventions that pioneered modern technology

SINGAPORE, 18 October 2018 – Discover the inventions from ancient Greek history at Science Centre Singapore to be launched on 19 October. Titled ‘The Inventions of Ancient Greece: Origins of Our Modern Technology’, the first-of-its-kind exhibition in Singapore will feature over 40 inventions that laid the foundation for modern engineering and technology. It will offer an unprecedented opportunity to experience the remarkable technological achievements of the ancient Greeks.

The travelling exhibition at the Centre follows successful events in Paris and Athens, and will feature great inventions that span across a multitude of disciplines from automation to programming, timekeeping, astronomy, and music.

Guests can discover the legacy of technology and exploration of this era that precipitated many inventions in the past millennium. Greek technological marvels and ideas, for example, the automatic servant of Philon, the automatic theatre of Heron of Alexandria and the Antikythera calculating mechanism, can be found in modern iterations such as life-like robots, cinemas, and high-speed computers.

Associate Professor Lim Tit Meng, Chief Executive, Science Centre Singapore said: “We are excited to be presenting ‘The Inventions of Ancient Greece: Origins of Our Modern Technology’ at the Centre and in Singapore for the first time. The exhibition, which will take guests on a journey into the life of ancient Greeks, resonates with the Centre’s mission to create learning opportunities by bringing science and technology to life. Some of the items that were invented by the Greeks, such as gears, pulleys and springs, sprung out of an innovative culture that was resourceful and inquisitive. We have a lot to learn from the Greeks when building our very own innovation culture in Singapore.”

He added: “Today, these inventions form vital building blocks of modern technology, used by millions around the world. We hope that guests from Singapore and around the region will gain an appreciation for the pioneers of engineering who created inventions that lived beyond their time.”

The exhibits range from audio-visual material with explanatory labels and posters with information, diagrams, photos and bibliographical references that have been carefully curated after years of research by the exhibition’s founder, Mr. Kostas Kotsanas. To complement the exhibition experience, Science Centre has specially put together a new science show, Ancient Inventions Science Show. The Science Show will bring to life ancient Greek inventions through the eyes of historical characters. Via three mini shows, guests will learn about scientific concepts that were central to ancient Greek inventions such as the use of air pressure to produce air cannons, and water pressure in the world’s very first alarm clock.

Guests can also try their hand at creating replicas of some of the Greek inventions at the upcoming workshops and camps. The Centre will also be hosting ‘Athena’s Odyssey’, a half-day Greek-themed day camp for parents and children aged 10 to 12 years old. Participants will take

a tour around the exhibition, learn the mechanisms behind these ancient inventions, and discover the simple science concepts behind Greek inventions through workshops and shows. (Details can be found in Annex C.)

Mr Kostas Kotsanas, Founder, Kotsanas Museum of Ancient Greek Technology said: “We are pleased to share a part of Greek history with guests of Science Centre Singapore through this exhibition. The inventions, which have been painstakingly replicated in our exhibition, are originally designed by some of the most important inventors such as Archimedes, Ktesibios, Philon of Byzantium, Heron of Alexandria and Plato. This exhibition aims to present a nearly forgotten aspect of ancient Greek history in an experiential way.”

This exhibition is a collaboration with the Kotsanas Museum of Ancient Greek Technology and presented by Science Centre Singapore. ‘The Inventions of Ancient Greece: Origins of Our Modern Technology’ will run from 19 October to 17 March 2019 at The Annexe, Science Centre Singapore.

More information can be found in the following annexes:

Annex A – Exhibition highlights

Annex B – Exhibition ticketing details

Annex C – Workshops and activities

For more details about the exhibition, please visit: <https://www.science.edu.sg/whats-on/exhibitions/the-inventions-of-ancient-greece-origins-of-our-modern-technology>

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About Science Centre Singapore

Science Centre Singapore, a non-formal educational institution and leading regional Science Centre, along with its group of attractions, brings out the wonders of science, technology, engineering and mathematics through its unique blend of exhibitions, educational programmes and events. A custodian of creativity and innovation, Science Centre Singapore has captured the evolution of scientific developments for nearly four decades.

The Centre and its partners have played a pivotal role in transforming the way students and the public interact with and learn about science, technology, engineering and mathematics. Since 1977, the Centre has welcomed over 30 million visitors and inspired them with more than 1,000 exhibits spread across 14 exhibition galleries and outdoor exhibition spaces.

The Centre's group of attractions include Omni-Theatre, Snow City and KidsSTOP™. The Omni-Theatre is an immersive dual-technology edutainment destination fitted with Southeast Asia's largest seamless dome screen and featuring the latest and brightest 8k digital fulldome system in the world. Snow City is Singapore's only permanent indoor snow centre offering an Arctic inspired experience at Singapore's first ice gallery and snow chamber. KidsSTOP™ - Where every child gets to Imagine, Experience, Discover and Dream - is Singapore's first children's science centre offering an enriching experience through purposeful play for children aged 18 months to 8 years old.

For more information, please visit www.science.edu.sg.

About Kotsanas Museum of Ancient Greek Technology

Founded in Greece, Kotsanas Museum of Ancient Greek Technology ("the Museum") is home to more than 300 operating models of ancient Greece. These inventions have been painstakingly revived by Konstantinos "Kostas" Kotsanas, a former mechanical engineer.

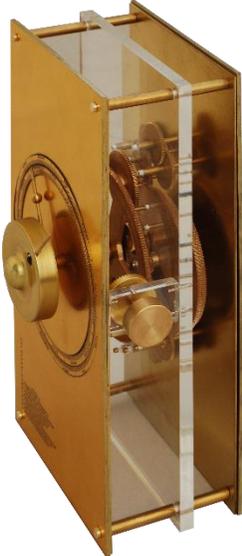
Kostas has set up the "Kotsanas Museum of Ancient Greek Technology" and the "Museum of Ancient Greek Musical Instruments and Toys" operating in Athens, "Kotsanas Museum of Ancient Greek Technology" in Katakolo and the "Archimedes' Museum" in Ancient Olympia. Approximately 500 functional models of ancient Greek inventions are displayed in the museums and their aim is to reveal an unknown aspect of ancient Greek civilization and their relevance to modern life.

Many of the exhibits and studies, upon which the constructions were based, have been presented at international conferences and exhibitions. The Museum has held temporary exhibitions in more than five continents, including Singapore.

For more information, please visit: www.kotsanas.com

ANNEX A: Exhibition highlights

Exhibit image	Exhibit description
	<p>The automatic servant of Philon (3rd c. B.C.) Dimensions: (L x W x H): 50 x 50 x 175</p> <p>This was a humanoid robot in the form of a servant which in her right hand held a jug of wine. When the visitor placed a cup in the palm of her left hand, she automatically poured wine, and would then pour water into the cup mixing it when desired.</p> <p>Source: "Philon of Byzantium, Pneumatics"</p>
	<p>The automatic holy water server with coin-collector (1st c. A.C.) Dimensions: (L x W x H): 25 x 30 x 55</p> <p>The oldest automatic vending machine in history. It was placed outside temples and allowed the faithful to obtain holy water by dropping a five-drachma coin into a vessel. The coin fell onto the disc of a balance, the diversion of which opened a conical valve and out flowed certain amount of water.</p> <p>Source: "Heron, Pneumatics, A 21"</p>
	<p>The alarm clock of Plato (4-5th c. B.C.) Dimensions: (L x W x H): 50 x 50 x 180</p> <p>It was a hydraulic alarm clock which was invented by Plato.</p> <p>The upper ceramic vessel supplied the next vessel with water through a tap (appropriately calculated provision for each case). When the second vessel was full at the programmed moment (e.g. after 7 hours), it emptied quickly through an axial siphon to the next airtight vessel and forced the contained air to come out with pressure, whistling through a syringe at its top.</p> <p>Because the flute led to water, the vibrating sound length produced a chirp with notes of</p>

	<p>different frequency. After its operation, the third vessel emptied slowly (through a small hole located at its bottom) to the lower storage vessel in order to be reused.</p>
	<p>The “hydraulis” (organ) of Ktesibios Dimensions: (L x W x H): 120*60*160</p> <p>It was the first worldwide keyboard instrument that was invented by Ktesibios</p> <p>It consisted of a) two pumps which supplied the air (of piston pump type), b) the “pnigeus” for the regulating of constant air pressure, c) the keyboard, and d) the musical pipes.</p> <p>Source: “Vitruvius, On Architecture, X”, “Heron of Alexandria, Pneumatics, A 42”</p>
	<p>The Antikythera calculating mechanism (2nd c. B.C.) Dimensions: (L x W x H): 17 x 10 x 33</p> <p>The first calculating machine in history used to determine and forecast important astronomical and calendar events. In 1900, sponge divers accidentally found its remains during the eminent shipwreck off the island of Antikythera.</p> <p>Its manufacture dates from around 120 B.C. and it is probably the product of a Rhodian or an Asia Minor laboratory, which developed the tradition of Archimedes' “Sphere-Making”, directly inspired by Hipparchus or Posidonius. It consisted of indicators, scales and at least 35 cooperating gear wheels that were moved by a handle.</p> <p>Source: “The Antikythera Mechanism Research Project”</p>

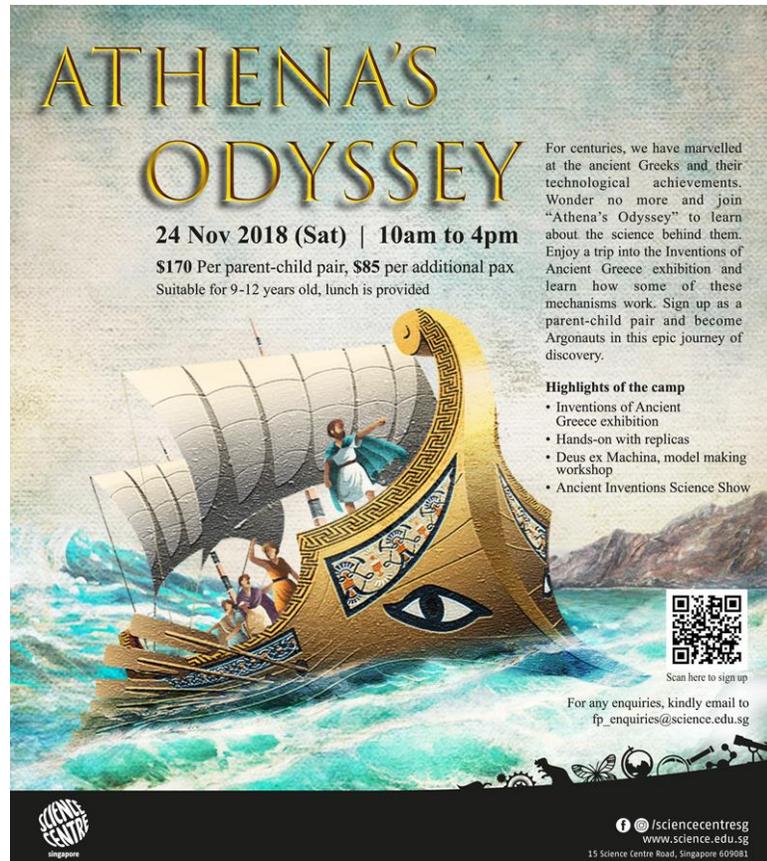
ANNEX B: Exhibition Ticketing Details

Exhibition title	The Inventions of Ancient Greece: Origins of Our Modern Technology														
Exhibition run	19 October – 17 March 2019														
Opening hours	10:00am to 6:00pm daily (Last admission at 5:30pm)														
Entry fees	Standard: S\$9 (Adult/Child) *Singaporeans and PRs enjoy free entry into the Science Centre during off-peak weekdays.														
	<table border="1"> <thead> <tr> <th colspan="4">Singaporean/PR</th> </tr> <tr> <th>Ticket type</th> <th>Adult</th> <th>Child</th> <th>Senior Citizen</th> </tr> </thead> <tbody> <tr> <td>General admission (Peak)</td> <td>\$6</td> <td>\$4</td> <td>\$4</td> </tr> </tbody> </table>			Singaporean/PR				Ticket type	Adult	Child	Senior Citizen	General admission (Peak)	\$6	\$4	\$4
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Standard	\$12	\$8	\$12												
	<p>Peak includes weekends, <u>public holidays</u> and <u>school holidays</u>. Off-peak refers to weekdays during school term (excluding public holidays and school holidays) Child Age is 3 to 12 years Senior Citizen Age is 60 years and above</p>														

ANNEX C: Workshops and Activities

Workshops

Athena's Odyssey



ATHENA'S ODYSSEY

24 Nov 2018 (Sat) | 10am to 4pm

\$170 Per parent-child pair, \$85 per additional pax
Suitable for 9-12 years old, lunch is provided

For centuries, we have marvelled at the ancient Greeks and their technological achievements. Wonder no more and join "Athena's Odyssey" to learn about the science behind them. Enjoy a trip into the Inventions of Ancient Greece exhibition and learn how some of these mechanisms work. Sign up as a parent-child pair and become Argonauts in this epic journey of discovery.

Highlights of the camp

- Inventions of Ancient Greece exhibition
- Hands-on with replicas
- Deus ex Machina, model making workshop
- Ancient Inventions Science Show

Scan here to sign up

For any enquiries, kindly email to fp_enquiries@science.edu.sg

 [/sciencecentresg](https://www.science.edu.sg)
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For centuries, we have marvelled at the ancient Greeks and their technological achievements. Wonder no more and join "Athena's Odyssey" to learn about the science behind them. Enjoy a trip into the ancient Greek exhibition, see the inventions of the Greeks and learn how some of these mechanisms work. We will explore the creations of mechanical marvels that require no electricity to operate. Learn how these mini "miracles" are possible using simple science concepts. Sign up as a parent-child pair and become argonauts in this epic journey of discovery.

Objectives of the camp

- Learn about the inventions of the ancient Greeks
- Learn which modern day items were inspired by these Greek inventions
- Hands on with replicas
- Creation of simple machines

Date: 24 November 2018 (Saturday)

Time: 10:00am to 4:00pm

Venue: Science Centre Singapore

Suitable for 10 to 12 years old, lunch is provided.

Course fee: \$170 per Parent-Child pair, \$85 per additional person.

To sign up for Athena's Odyssey day camp and workshop, please click [here](#).

Activities

1. DIY Flower Crown Activity | \$5

Bring home a piece of your Greek experience with a Do-It-Yourself flower crown.

2. Pantograph | \$5

The ancient Greeks produced the first device to copy drawings and figures. By manipulating the ratios and proportions of the machine, one can enlarge or reduce the image or sculpture. The pantograph of Heron used gears and axles to achieve this purpose.

Participants will be making a more modern version of the pantograph using wooden planks and connectors. Drilling and sawing will be required so this activity is geared towards the older participants even adults will find it interesting.

3. Panpipes | \$5

The panpipes or syrinx was a musical wind instrument first invented and played by Ancient Greek shepherds. While that was thousands of years ago, you can still be enthralled by the mythology behind the instrument, learn about the science of sound, assemble your very own panpipes, and play a happy little tune!