Scorpio Technology NEWSLETTER

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TEACHER CONFERENCES & WORKSHOPS

Scorpio is attending or supports these Design & Technology teacher activities:

DATTA ACT – 21st September, 2019: TECHnow Conference
DATTA AUST - 14-20 October 2019: Design & Technologies Week 2019
ITE (was IIATE) - 27–29 November 2019
DATTA VIC - 6th December 2019: Annual Teachers' *Makerspace* Conference

Success depends upon previous preparation, and without such preparation there is sure to be failure.

Confucius (Chinese philosopher)

WELCOME

This month our feature article looks at the challenges faced by the Engineers and their teams preparing for the Apollo space missions. To make it work required perserverence and hard work.

PRIMARY – SOLAR BOATS & CARS

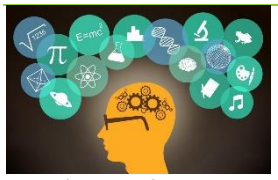
Most Primary schools have incorporated sustainability and alternative energy into their curriculum. With intergrated STEM, a great choice is solar boats and cars. Many schools already compete in their state Model Solar competitions and have experienced the fantastic student participation and excitement at these events. We encourage you to give solar a try! Not sure where to start? Just email your query to sales@scorpiotechnology.com.au or check out our solar section on our website.

Scorpio stocks kits to introduce solar vehicles. For upper Primary we suggest:

Kits for introducing solar (non competitive)		
Solar car basic kit – No Solder version	SOLARB-NS	$19.12
Intro solar boat kit	SBTINT	$26.52

Starter kits for Solar Challenge (competition)		
Junior solar boat kit	SBTJUN	$27.35

SECONDARY PHYSICS



Our Physics range is expanding and we want you to share in our excitement!

INTRODUCTORY OFFER

- ☆ During **SEPTEMBER** you can pre-order from our 2020 Physics Pre-Order and Special Product Order online catalogue. Some of these items are ONLY available for order at this time (expected delivery late January 2020). Not all of these items will be available from us in the near future.
- ☆ Discount prices will apply to some products during this period.
- ☆ T&C – Orders must be received by our sales office no later than **30 September 2019**.

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August/September 2019

Victorian Model Solar Vehicle Challenge

https://sites.google.com/view/modelsolar/

The **2019 Victorian Model Solar Vehicle State Challenge** will be held on 19 and 20 October at Scienceworks Museum in Spotswood.

Saturday 19th - Designed Car, Boats (Metro)
Sunday 20th - Designed Car, Boats (Regional), Sheridan Kit Car

Organisations/schools and teams must be registered by **9 September**. Registration fees are payable.

Scorpio Technology can help you with ALL your Model Solar Vehicle Challenge requirements. Suit levels Primary and Secondary.

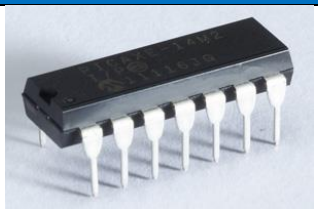
There are 3 options for you to choose from:

1. Student designed cars: the most involved project due to the larger number of components. It is ideal if you want to give a more comprehensive challenge (more time for testing and refining) that also offers opportunities for creativity.
2. Boats: this offers an equal opportunity for creativity and involves hydrodynamics as well as the other aspects of vehicle design. However, there are fewer moving parts so the resources and time demands are fewer. Also ideal for students who live near large bodies of water and boating is a part of their lives.
3. Sheridan kit cars: an introductory program suited to situations where you are more interested in getting something built and learning about the science than developing the engineering and creativity skills. Ideal for cases where students prefer cars, but you don't have a lot of time.

This Challenge is suitable for first timers to students with more experience. Challenge them – the students develops real skill in Aerodynamics, construction and Mechanical Engineering. Team work, planning and so much more.

If you are not in Victoria, we encourage you to check out your state association. Competitions are held throughout the year culminating in a National competition.

This Month's Q&A Technology Tips: Picaxe microcontroller



Q: Your microcontroller kits use Picaxe chips. Why don't you use Arduino or Raspberry pie?

A: A Picaxe microcontroller is designed to be the **brain of an electronic project**. Originally designed specifically for school programmes but are now widely used by hobbyists. Picaxe microcontroller chips a readily available and affordable. They have the advantage that students do not need a great deal of experience prior to programming the Integrated chips.
Our teaching units contain sample programs.

Q: What is needed to program and use Picaxe microcontrollers?

A: To use Picaxe, you need the PICAXE editor which can be downloaded for free from www.picaxe.com.

You set up the program on your computer and load it onto the Picaxe using a USB download cable (Code: PICUCAB $26.78) that plugs into a 3.5mm socket on the PCB.

Once the student has got the device working, they can then play with the program and change the parameters to make them devices perform differently.

“THE SPACE CHALLENGE”

The Apollo Moon programme is still regarded as mankind’s single greatest technological achievement.

In 1961, President **John F. Kennedy** committed the U.S.A. to the goal of landing a man on the Moon by the end of the decade. There was no precedent for manned space flight. Everything needed to be planned, calculated, experimented, tested and risks taken. Engineers began the long and difficult task that was placed before them.

The Space Programme is a perfect example of a **STEM program**. Physics and Engineering experiments were conducted. Giant wind turbines tested aerodynamic principles. Engineers required draftspeople to draw models by hand. A small change could mean a total redraw. As a whole, the Apollo program required the skills of approximately 400,000 engineers, technicians and scientists.

“That's one small step for (a) man, one giant leap for mankind.”

Neil Armstrong

on July 20, 1969

(First man to step on the moon)

Lunar Module 1962 Concept Model
This was the original design that won the contract for Grumman. Five fixed legs and round Ascent Stage with large helicopter-like windows.

Cradle of Aviation Museum, New York

The original *computers* were mathematicians who spent labourious hours calculating mathematics and physics equations. In the 1960s electronic computers were only in their infancy. These machines were huge, expensive and needed special conditions to ensure that they worked properly.

The Apollo guidance computer contained just 73 kilobytes of memory—tiny by today’s standards. The Apollo computer was the first computer of any significance to use integrated circuits and computer chips.

It wasn’t only the actual spacecraft but also every part of the mission and equipment needed to be planned, manufactured and rechecked. Spacesuits were handsewn by Playtex staff. Many parts of the Apollo Spacecraft were handmade. There could be no mistakes or failures in space so everything was checked and rechecked. This really was a matter of life or death, as well as national pride, since the U.S. was competing against the Soviets for Space supremacy.

The lunar rover presented its own challenges. It needed to be lightweight, stable, have traction and be able to travel distances The tyres posed the greatest challenge as they needed to cope with the very fine and abrasive lunar surface.

Goodyear tyres designed an outer wheel made of woven wire mesh made of piano wire for durability, flexibility and stability. The zinc-coated piano wire was hand-cut and hand-woven into a mesh, on a specially designed loom. Each tyre required about 914.4 metres of piano wire.

On 16 July 1969, astronauts Neil Armstrong, Buzz Aldrin and Michael Collins left Earth in their Apollo spacecraft on top of the Saturn V rocket. Four days later an estimated 650 million people watched in awe as Armstrong and Aldrin became the first humans to set foot on the moon’s surface.

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