Scorpio Technology NEWSLETTER

INSIDE THIS ISSUE

TEACHER CONFERENCES & WORKSHOPS

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

DATTA AUSTRALIA – 11-17/10/21 Design & Technologies Week Theme: "*Developing Creative Problem Solvers*"
DATTA VIC – *"Gathering"* 29/11/2021-03/12/2021 exciting program of after school, virtual teach meets.
~~2-3/12/2021 Conference "*Preferred Futures*" & Makerspace~~ **cancelled**
iTE – ~~24-26/12/2021~~ 17-18/03/2022 Technology Education Conference, Sydney

WELCOME

Are you as excited as we are that Spring is finally here?. The warmer weather helps us forget about the troubles around us.

We're here to support you, however we can. Contact us at (03) 9802 9913 or email us at sales@scorpiotechnology.com.au

LOCKDOWN: HOW CAN WE HELP?

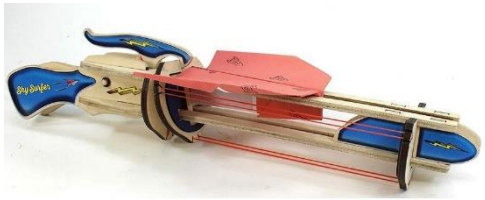
Hopefully, lockdowns will soon be over but in the meantime, Scorpio is here to support your program.

SPECIAL OFFERS FOR HOME LEARNING PHASE

- We are offering a FREE service - packing items for individual students. We can package these into packs for students (e.g. a kit + hook-up wire + corflute base + batteries + double sided tape squares). This will help you distribute items quickly.
- If buying tools for students to take home, we can pack them into "student packs" for you – and we will give you a 5% discount
- If buying a 40W soldering iron for students to take home, we can include a 2m length of 0.71mm 60/40 solder and a 15cm length of desolder braid at no cost (but tell us they are for students)

***NOTE**: these special offers only apply during the Home based learning phase of Covid-19, and are designed to help you during this difficult time.*

PRIMARY STEM: NEW PRODUCTS AVAILABLE

Trojan Horse (Code: **WM6733)** Wooden model based on drawings and written records. The original was a huge hollow wooden horse in which several Greek soldiers hid to enter the city of Troy. Suitable for beginner model maker. Ages 8+	
Sky Surfer Paper Plane Airplane Launcher (Code: WM6735) Launch paper planes from 3-16 metres (approx.) in a repeatable and consistent way. Build takes 30 mins. Includes 20-page booklet with plane designs, ideas, paper & card.	

LEARN TO MAKE, MAKE TO LEARN

"*Learn the rules like a pro, so you can break them like an artist*"
Pablo Picasso (1881- 1973, painter, sculptor, printmaker, ceramicist, and stage designer

SCORPIO TECHNOLOGY Vic Pty Ltd,
1/31 Dalgety St. Oakleigh Vic 3166
www.scorpiotechnology.com.au

SECONDARY: NEWEST PRODUCTS BY SCORPIO

Unveiling our newest kit, the ***LUMA LED DESK LAMP*** **(Code: *LUMA*)**. This kit that encourages design, planning, electronics and functionality. Who doesn't need a great looking lamp?

The ***LUMA LED DESK LAMP*** is a hands-on STEM project that incorporates the concepts of sustainability and reuse of materials. It has a cantilever and is an articulated design. Students may use the included design or use it as a starting point for their own design. The project is suitable for different secondary year levels and abilities. The kit is Intermediate Level, with mechanical, soldering, electronics. Construction time: 12-18 hours

Luma derived from the Latin "lumen,**" meaning "light**."

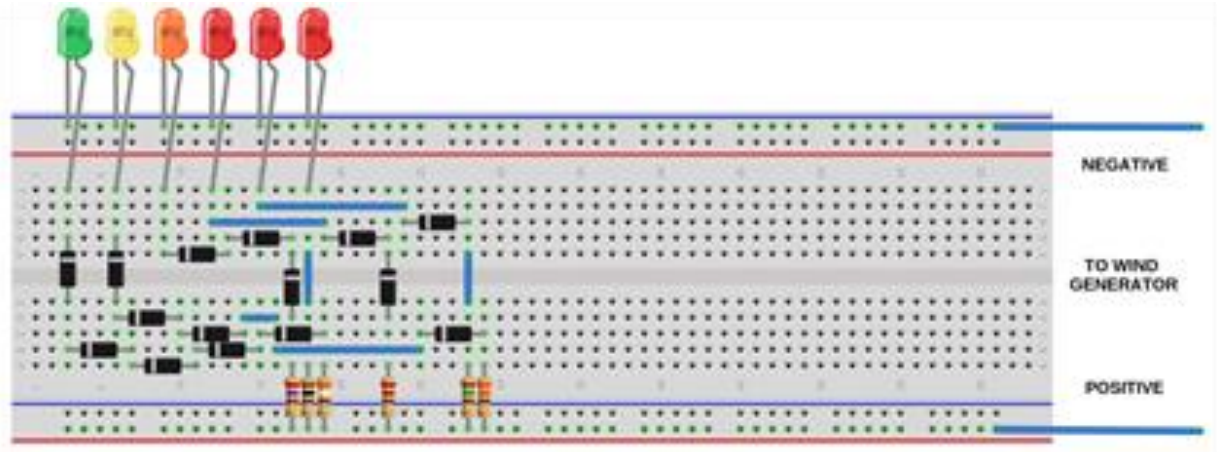
WIND GENERATOR BREADBOARD:

Breadboards are great for experimenters, beginners and even engineers to wire up and try circuits without the need for soldering. Many circuits are prototyped using Breadboards because they allow components to be easily changed and circuits modified until they perform as expected.

During lockdown and school closures, students studying at home don't have access to a soldering iron. For this reason, we received a request from a teacher, asking if we could adapt our *WIND GENERATOR* kit to use on a breadboard, as breadboards are a great way for students to continue improving their practical skills and learning.

We now have a design for that project, available to teachers on request. The circuit was designed on an 830 tie point circuit board, using a set of jumper wires and a couple of alligator clips with wires.

The finished circuit looks like this:



NOTE: It's not possible to do this with all kits, as many PCBs are too complex – especially when they use ICs.

SECONDARY: NEW PRODUCTS:

Laser Pointer Keyring (Code: HLLASRAYKR)

This Laser light source hand held giving you portability.

Chrome plated laser pointer on keyring with 670nm red beam wavelength.

Click on link: https://www.scorpiotechnology.com.au/catalogues

SECONDARY: WORLDWIDE SHORTAGES

We would like to notify you and apologise for the supply issues with our radio control PCBs despite ordering them in February. This is due to the worldwide shortage of chips. The pandemic has increased demand and manufacturing has had increasing problems that will take time to resolve.

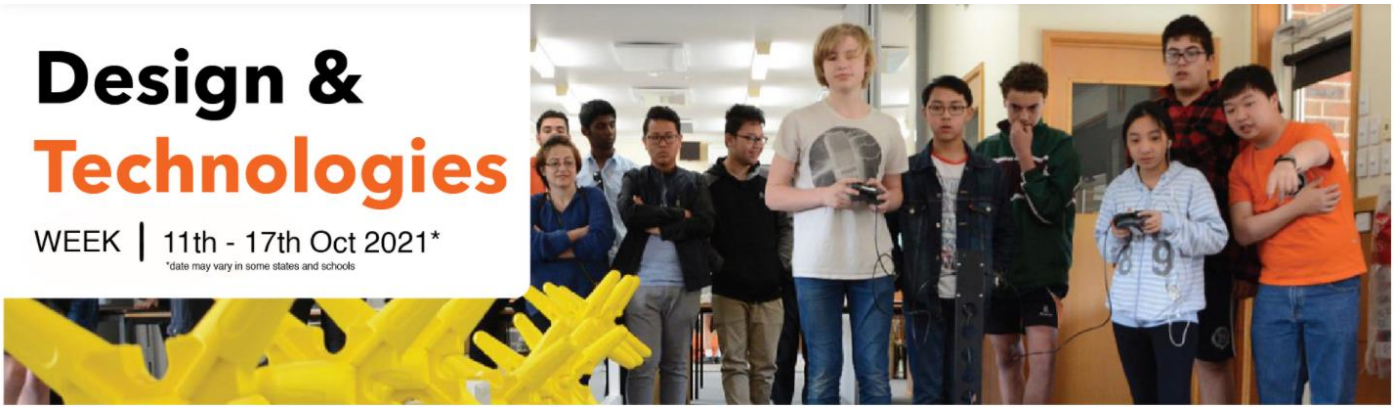
We are currently out of stock of the Un-assembled PCBs and very low on the supply of Assembled PCBs. We do not have an outlook for arrival of the new Radio Control PCBs for both our Radio Control Vehicles and the Radio Control Unit kits. We thank you for your patience and understanding.

PRIMARY AND SECONDARY:

DESIGN & TECHNOLOGIES WEEK: *"Developing Creative Problem Solvers"*

"*Design and Technologies Week is a National initiative engaging schools throughout Australia. From **11-17th October 2021***, D&T Week is time to promote our fantastic learning area, showcasing the creative, innovative and challenging work your students are engaged in – to colleagues, principals, families and the wider community*". (DATTA Australia).

Getting free ideas is just a click away. Click here: https://dattaaustralia.com/design-technology-week-2021/resources/. Scorpio has contributed its own challenge "Move it" especially for this event. Use the power of magnetism to move objects from one spot to another and more. Click here:



MODEL SOLAR VEHICLE CHALLENGE update

VICTORIAN MODEL SOLAR VEHICLE CHALLENGE

The MSVC is an event and an organisation focused on promoting Science, Technology, Engineering and Mathematics to school students as an ideal career path for those interested in sustainability.

Unfortunely, due to Covid-19 restrictions, the live event at Scienceworks will not be possible. The Challenge will now be video based. The due date is now 31 October. This allows you to spend time on building a vehicle (physical or virtual) that your students can document in their video.

There is no restriction on what students choose to do:

- they might choose to build a vehicle that runs on batteries to infer what would happen when using a solar panel
- they might only have CAD
- they might have a fully developed solar vehicle
- it might be mix of the above

The key is what they learned and how they approached the challenge.

The Team have produced informative and practical videos on model Solar vehicles. Arnie from Scorpio discussed and showed resources and products you can use to maximise the outcome of the 2021 event. An ideal video for everyone at this time and a special episode we put together given the recent change to the event this year.Click here for video: https://fb.watch/88VYrWIrv-/ Another interesting one discusses the use of recycled materials in your solar vehicle https://www.facebook.com/ModelSolarVehicleChallenge/videos/164962112435441

More information and videos available here: https://www.facebook.com/ModelSolarVehicleChallenge/

DID YOU KNOW?

A "jiffy" is a real measurement.
If you've ever said "I'll be back in a jiffy," you were actually saying, "I'll be back in 10 milliseconds."

A jiffy is an actual measurement of time, referring to the length of one cycle of the computer's system clock – about 10 milliseconds.
When used in physics, it stands for the amount of time that it takes light to travel one centimetre.

The Law of Refraction and The Two Mathematicians

Article written by Alex Kapoyanis

Snellius quadrant at Museum Boerhaave

In the study of Optics, one will encounter the law of refraction. "*Refraction is the bending of the path of a light wave as it passes across the boundary separating two media. Refraction is caused by the change in speed experienced by a wave when it changes medium*" (The Classroom Physics). Basically, the wave will change speed and wavelength. The angle of refraction (bending of the light ray) will depend on what is known as the indices of refraction of each of these media (but does not apply to substances like crystals, that can be split into two rays). This is now commonly known as **Snell's law**:

$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$

Who was Snell?

Willebrord Snell van Royen (1580–1626), also known by the Latin Snellius, was a Dutch mathematician best known for his work on defining the law of refraction in 1621.

Snell's early education took place at home, under the tutelage of his father, Rudolph, who was a professor of mathematics at the University of Leiden. While at this private home school run by his father, Snell learnt Latin, Greek and philosophy. Snell entered the university at a reasonably young age to study law but had a keen interest in mathematics, which he taught alongside his father, while he studied law. Years later he would be appointed as professor of mathematics, too.

Snell didn't just dabble in optics. He had an interest in astronomy and from 1600 he travelled around Europe, visiting many mathematicians and astronomers on his travels. Snell was introduced to Danish astronomer Tycho Brahe (1546-1601) in Prague and spent some time with him, assisting Brahe in making observations. Johannes Kepler (1571-1630), the famous German astronomer, was Brahe's assistant at the time. Snell would continue his own astronomical observations over the subsequent years, including publishing works on comets.

The foundation of geodesy and modern-day surveying and the mapping of large areas are a direct result of Snell's work. Thanks to his brilliance as a mathematician, he developed the method of triangulation using two trigonometry formulae (sines and cosines laws), to measure the Earth. The ancient Greek scientist, Eratosthenes of Cyrene, had attempted this same feat, with a great degree of accuracy, using "the different lengths of the sun's shadows at noon in two towns as the basis for his calculations" (Gurstelle, 2015). Snell achieved this with his trusty quadrant.

Snell never published his findings about the law of refraction in his lifetime and it wasn't for about another 70 years before it was, thanks to fellow countryman, the mathematician, astronomer & physicist,

"Each problem that I solved became a rule, which served afterwards to solve other problems."

René Descartes,
(1596 – 1650)

Mathematician, Philosopher and Writer

Christiaan Huygens (1625–1695).

Despite only living to 46 years of age, Snell's contribution to the world of physics, astronomy and surveying survives to the present time.

René Descartes (1596 – 1650)

Snell, alone, was not the only person to have discovered the law of refraction. In France, it is referred to as **Descartes law** – named after French philosopher, mathematician and scientist, René Descartes. In 1637, unlike Snell who used experimentation to develop his findings, Descartes applied his corpuscular (little particles) model of light and derived his law of refraction. Sir Isaac Newton would go on to further develop it and publish it in his book "Opticks" years later, although the corpuscular model was subsequently disproven when applied to refraction.

Refraction was not the only field in which Descartes is known. The Frenchman is famous for having made an important connection between geometry and algebra. This allowed for the solving of geometrical problems by way of algebraic equations.

As a result of the contribution both men made to the law of refraction, the name "Snell-Descartes law" can also be found in some physics literature.

René Descartes four main ideas for scientific progress were:

1. Never accept anything as true until all reasons for doubt can be ruled out.
2. Divide problems into as many parts as possible and necessary to provide an adequate solution.
3. Thoughts should be ordered, starting with the simplest and easiest to know, ascending little by little, and, step by step, to more complex knowledge.
4. Make enumerations so complete, and reviews so general, that nothing is omitted.

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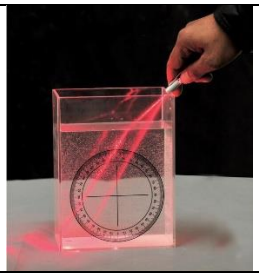
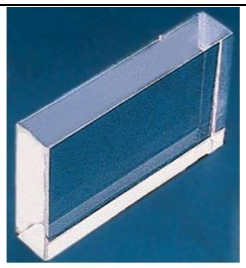
- Photo: Snell's, https://stringfixer.com/en/Willebrord_Snellius
- https://commons.wikimedia.org/wiki/File:Portrait_of_Ren%C3%A9_Descartes,_bust,_three-quarter_facing_left_in_an_oval_border,_(white_background_removed).png

Related Physics Products:

			
Laser Pointer with Key Ring Code: HLLASRAYKR Chrome plated laser pointer on keyring with 670nm red beam wavelength.	**Reflection & Refraction Tank** Code: AR1110815 Acrylic tank for performing experiments. Includes printed protractor on front & laser diode.	**Rectangular Glass Block 115x65x18mm – Deluxe** Code: AR1110380-7 High quality glass block with polishes surfaces.	**Acrylic Hollow "D" Cell – 200mm dia.** Code: PH0585B For refraction, reflection and wave demonstrations.