Scorpio Technology NEWSLETTER

INSIDE THIS ISSUE

TEACHER CONFERENCES, WORKSHOPS & EVENTS

Scorpio is attending or supports these teacher activities:

DATTA QLD State Conference 2023, online and onsite, Brisbane Convention & Exhibition Centre from **15 – 16-06-2023**

Victorian Model Solar Vehicle Challenge **14-15-10-2023** at Brunswick East Primary School in Melbourne

iTE Technology Education Conference 2023 TechExpo, Sydney Masonic Centre, 66 Goulburn St, Sydney. **30-11-2023 – 01-11-2023**

WELCOME

We hope you had some time out to rest and recharge. We find the start of the new year is a good time to reflect on achievements and set new goals. We're sure that you will be inspired with Scorpio's great projects and products.

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

PRIMARY STEM: EXPLORE ELECTRICITY

Scorpio has a wide range of Electrical kits, projects and products to use with middle to upper primary students. We hope you love them as much as we do!

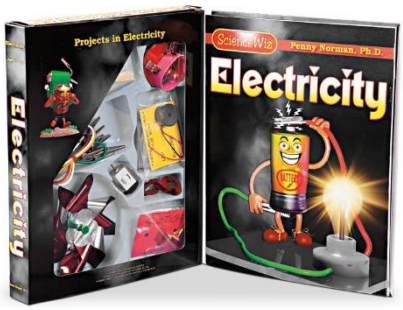
INTRODUCTION TO ELECTRIC CIRCUITS

- Morse Code Kit (Code: MORSE)
- Introducing Simple Circuits (Code: SIMPCIRC**)**
- Simple Circuits Extension Kit 1 (Code: SIMPCEXT1**)**
- Simple Circuits Extension Kit 2 – EM (Code: SIMPCEXT2)

ELECTRICITY, MAGNETISM AND ALTERNATIVE ENERGY STEM KITS

Large range available including:

- Electricity & Magnetism STEM Kit (Code: SN620417**)**
- Dynamo Generator - Free Electricity Kit (Code: HJ1891)
- Discover Electricity and Magnetism STEM Kit (Code: SN5724)
- Lemon Clock (Code: FSG3306)



Check out the **catalogues** for more inspirational ideas. Click here: **https://www.scorpiotechnology.com.au/catalogues**

LEARN TO MAKE, MAKE TO LEARN

"Motivation is the electrical power that activates the engine of success."

Remez Sasson
Author, blogger and self-improvement motivator

VICTORIAN MODEL SOLAR VEHICLE CHALLENGE

Model Solar Vehicle Challenge (VMSVC) brings together students from **primary and secondary schools** from across the state. Participants from other states are also welcome. Among last year's participants was a secondary school group from Taiwan. It was a another great event!

Scorpio stocks an extensive range of model solar products. Check out the online catalogue.

The **REGULATIONS for 2023** can be found at https://www.modelsolar.org.au/the-challenge/regulations

COMPETITION CATEGORIES: Paul Wellington Student Designed Car, Junior Boats, Advanced boats and Victorian Sheridan Car Challenge (Kit car).

TECHNICAL VIDEOS: Check out the Youtube Channel. Ideal for you and your students. Take a look at the playlist here - https://www.youtube.com/playlist?list=PLxghQCM7a3gMhOi3HAFJ7ZQUyMJOW839y

EVENT: Weekend of the 14th & 15th of October 2023 (NB: If required may be held on one day only).

VENUE: Tentatively at Brunswick East Primary School in Melbourne

WEBSITE: www.modelsolar.org.au

CONTACT: Please contact VMSVC at info@modelsolar.org.au

FASTEST SOLAR-POWERED RACE CAR – SUNSWIFT 7

NSW engineering students at UNSW have developed a solar-powered race car that has narrowly set a provisional Guinness World Record in a 1,000 kilometre race, claiming the title with just six minutes to spare.

Some interesting facts:

- UNSW students began making solar-powered cars in 1996.
- Sunswift 7 travelled 1,000km in a single charge in under 12 hours.
- Sunswift 7 weighs just 500kg which is about a quarter of a standard electric car.
- Car has a low profile body with a drag coefficient of only 0.095.
- It is powered by a battery and solar panels on its roof and bonnet.
- Professor Hopkins said the vehicle would not be "a production car of the future" due to cost and other practicalities but said its design could provide valuable lessons to the design of future fuel-efficient vehicles.

Sunswift 7 – front view

Sunswift 7 – side view

REFERENCES:

https://www.abc.net.au/news/2022-12-19/solar-powered-car-unsw-sunswift-7/101790478?utm_campaign=abc_news_web&utm_content=link&utm_medium=content_shared&utm_source=abc_news_web

ELECTRICAL SAFETY

- I caught my son chewing on electrical cords. So I had to ground him. He's doing better currently and now conducting himself properly.
- Electrician goes into a coma after coming in contact with power lines. "He should be fine," said the doctors. "He's just taking a power nap.
- An electrician was shocked by a live wire when he was asked why. He said he couldn't resist.
- A sweater I bought was picking up static electricity. So, I returned it to the store. They gave me another one free of charge.

DID YOU KNOW?

There was electricity aboard the Endeavour!
Captain Cook's ship had a form of electricity aboard when it arrived in **1770**. Joseph Banks used Leyden jars, which were primitive batteries, to create a weak electric current across the salt-water soaked canvas floor of his cabin. (*Read more about Leyden Jars in our feature article).*

Electricity in Australia
In the **1880s-1890s** electricity supply wasn't available in all states and towns. It was not reliable, street lights went off at midnight, and power stations were closed on Sundays. Appliances which worked on one system weren't compatible with others. Each state developed its electricity network and power generation.

https://www.globirdenergy.com.au/14-fascinating-facts-about-the-history-of-electricity-in-australia/
https://www.ewh.ieee.org/r10/nsw/subpages/history/electricity_in_australia.pdf

Pieter van Musschenbroek

Electricity - The Leyden Jar

Anita Vejins

Electricity plays an important role in our modern society, but it wasn't always the case. Man had discovered static electricity – amber rubbed on fur could be used to pick up small particles.

The first device capable of storing an electric charge was the Leyden Jar. **Ewald Georg von Kleist** (c. 1700-1748), a German physicist and Lutheran cleric on November 4, 1745, made the discovery by accident. While experimenting with electricity, he touched his electric generator to a nail stuck into a medicine bottle through the cork. Later, he received a great shock by touching the nail. His invention consisted of a glass vial that was partially filled with water and contained a thick conducting wire capable of storing a substantial amount of charge. Although he did not understand how it worked, he had discovered that the nail and the jar were capable of temporarily storing electrons. This invention is a capacitor. The Leyden Jar can only be used to store electrons and are not capable of producing them.

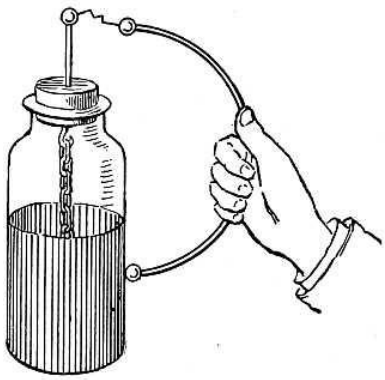
"I've found out so much about electricity that I've reached the point where I understand nothing and can explain nothing."

Pieter van Musschenbroek

(1746)

Not long after **Pieter van Musschenbroek (1692-1761),** a physicist, mathematician and professor of medicine from Leiden, Netherlands independently discovered and conducted electical experiments with his Leyden Jar. Many sources name him as the inventor of the Leyden Jar as he improved the documentation and Jar.

Leyden Jar circa 1745



Leyden jar being discharged.

Its discovery was of fundamental importance in the study of electrostatics. The Leyden Jar was the first means of storing an electric charge which then could be discharged at the experimenter's will.
The new invention was demonstrated to interested crowds. Electric charges were sent over rivers and lakes. 1746 in France, King Louis XV watched a current sent through a chain of 180 Royal Guards. There is another recorded demonstration that made 200 monks jump up due to the electric shock.

The Leyden Jar was further improved and used in experiments by **William Watson** (1715 – 1787), an English physicist, physician, and botanist. He improved Musschenbroek's design by coating its inside and outside with metal foil. In 1747 an electric spark was transmitted via wire was strung across the River Thames at Westminster Bridge.

In America, **Benjamin Franklin** (1706 – 1790) conducted many electricity experiments. In 1752, Franklin collected electric charge from a cloud by means of wet twine attached to a key and to a Leyden jar.

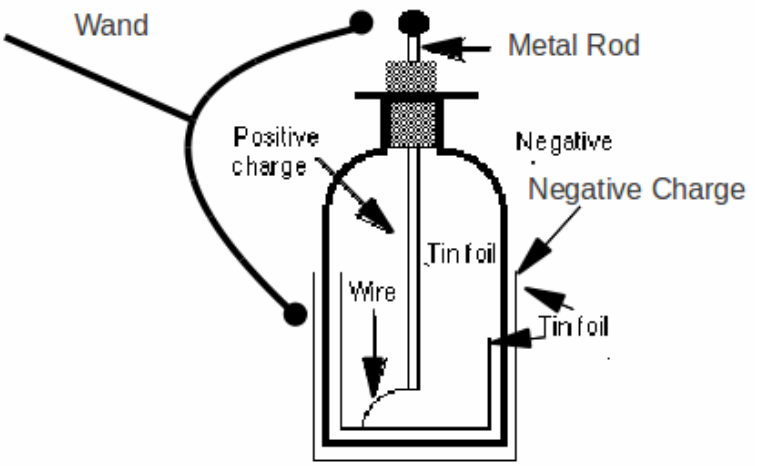
Daniel Gralath (1708 – 1767) continued experiments with the Leyden jar. He was the first to connect several jars in parallel to increase the total possible stored charge. Benjamin Franklin used the term "*battery*", as it reminded him of battery of cannons that were grouped together.

Michael Faraday (1791–1867) continued experimenting on the Leyden Jar. He invented the first commercial capacitor.

Many others continued to work with the Leyden Jar and then went on to develop better ways to store electricity. Many earlier experiments were very dangerous.

Inside a Leyden Jar

The Leyden jar is a fairly simple device. It typically consists of a glass jar with metal foil cemented to the inside and the outside surfaces, and a metal terminal projecting vertically through the jar lid to make contact with the inner foil.



Experimenting with the Leyden Jar

This Leyden Jar is designed for classroom demonstrations and activities in static electricity. It comes with a durable inner and outer plate, a plastic dielectric, and instructions. The inner plate has a hook and ball attached which makes it easy to charge.

Use this equipment to duplicate many classic static electricity experiments. Learn about static electricity and the function of a dielectric with this unique device. Scopio code: (Code: **LEYJAR)**

Click here:

https://www.scorpiotechnology.com.au/electrostatic/leyden-jar

REFERENCES

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