Scorpio Technology NEWSLETTER

INSIDE THIS ISSUE

TEACHER CONFERENCES & WORKSHOPS

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

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

Design is not just what it looks like and feels like. Design is how it works.

Steve Jobs (Businessman)

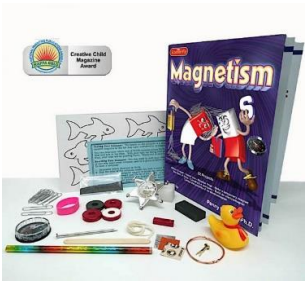
WELCOME

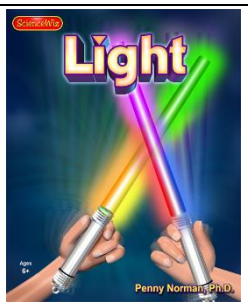
Basic? Intermediate? Advanced? STEM? Solar? … We have a project designed for your student needs and skill level. Lots of great projects for **Design & Technologies Week**.

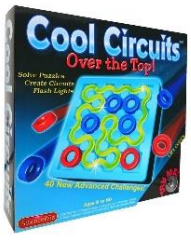
STEM AT PRIMARY– SCIENCE WIZ

Science Wiz are a great way to KICK START a Science Program at your school. Use also as a source of enrichment and motivation for your current program. The superb manuals (40pp) ***develop concepts*** in a systematic way while reinforcing the ***Scientific Method***. The included material will ensure that your classes will be up and running with minimum preparation.

ITEM NAME	CODE	PRICE
ELECTRICITY	SW7800	$34.95
MAGNETISM	SW7801	$34.95
LIGHT	SW7802	$34.95
ENERGY	SW7805	$34.95
PHYSICS	SW7806	$34.95
CHARGE	SW7814	$34.95
COOL CIRCUITS	SW7850	$39.95
COOL CIRCUITS JR.	SW7857	$39.95
COOL CIRCUITS OVER THE TOP	SW7858	$39.95
INVENTIONS	SW7901	$34.95







Teaching kids STEM the scientific way!

SCORPIO TECHNOLOGY Vic Pty Ltd
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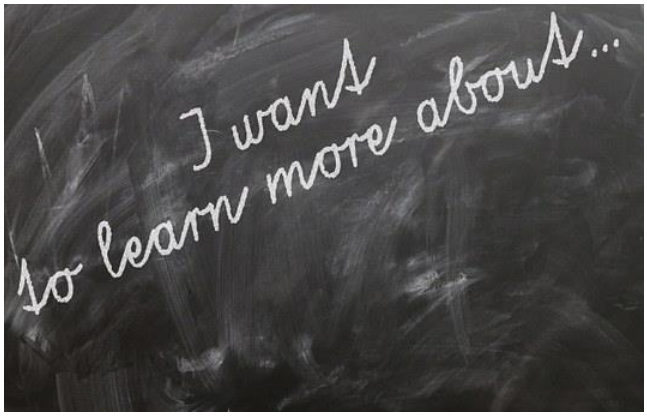
www.scorpiotechnology.com.au

SECONDARY PHYSICS

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

We trust you will enjoy our new selection and look forward to bringing you lots more in the future. The following is just a sample of what is availabe.



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**. A 10% deposit is required for special order products (non-refundable if order is cancelled).

Optical Bench Kit PH0649

Elastics Materials Kit PH0324

Westminster Electromagnetic Kit AR1070940

Helmholtz Coils, Pair PH0845HEL

Harbottle AR1021245

AC/DC Motor Generator Demo Activity Model – Hand Powered PH1245N8

Laser Ray Kit AR1110752

Pascal's Law Apparatus AR1020370

Boyle's Law AR1020910

Variable Magnet Set PH0800C

Pulley demonstration set PH0305

Wimshurst Electrostatic Generator AR1080620

Projectile Launcher with Photo Gate AR1030898

SCORPIO TECHNOLOGY Vic Pty Ltd
October 2019

This Month's Q&A Technology Tips: Cutting rods & tubes

Q: What is the best way to cut steel axle rods?

A: Steel axles can be cut in various ways. A budget conscious tool is a 200mm bolt cutter. It does require a bit of strength to operate. Another option is using pliers.

The end of the steel axle will need to be deburred. Do this by running a steel file over the end to remove sharp edges

Pliers used for cutting steel axle

Deformed end of cut shaft.

Shaft end after filing

Q: What is the best way to cut the PVC tube?

A: To minimize squashing the tube we suggest that it is placed it on a cutting board. Roll the tube under the knife blade keeping moderate pressure on the blade. It will need to be rolled several times (back and forward also works well).

Q: What is the best way to cut Carbon fibre tube?

A: Carbon fibre can easily be cut and finished using simple workshop tools like a hacksaw with a fine tooth blade and some wet-and-dry paper. It is best, however, to use a diamond coated abrasive cut-off blade rather than a toothed blade so that the fibres do not catch and separate. Standard equipment will become blunt.

Carbon fibre sheets can be cut with standard tools, ranging from scissors and razor knives for thinner sheets, to abrasive cutting wheels and dremel tools.

- Support or brace the tube against a straight edge to minimise movement during cutting. Ideally brace in more than one area.
- Cut the tube slowly as this stops delamination of the fibres. If delamination continues use a thinner blade.
- Use sand paper or other abrasive material to deburr the cut edge.

Carbon fibre dust is hazardous to electronics as they are electrically conductive. The dust can short out computers and cause other digital device problems.

Health and Safety Considerations

Carbon fibre dust is not toxic but it is a mild irritant to the skin, eyes, and lungs. Ensure you follow basic safety precautions such as wearing a dust mask, safety glasses and gloves (to avoid cuts and slivers).

REFERENCES:

- https://news.nilfiskcfm.com/2017/04/5-hazardous-dusts-commonly-found-composites-manufacturing/
- https://www.clearwatercomposites.com/resources/how-to-guides/cut-carbon-fibre-tubes/
- http://www.protechcomposites.com/pages/Working-With-Carbon-Fibre.html

"PROBLEM SOLVED – THE BICYCLE"

A simple idea can spur a great design. When designers look at a problem they begin to analyse it so that they can start the improvement or redesign process.

Man has always wanted to travel faster and with less effort. So began problem solving and invention of how to achieve this aim. The bicycle in historical terms is only just over one century old but the advancement it has undergone is truly amazing – from design, shape, material etc. and it continues to evolve.

"Education is a continual process, it's like a bicycle... If you don't pedal you don't go forward".

George Weah

(Sportsman)

Draisine, also called Laufmaschine "running machine", from around 1820. The above Draisine was built with cherry tree wood and softwood. It is displayed at the Kurpfälzisches Museum in Heidelberg, Germany
Wikimedia Commons (CC BY-SA 3.0)

The bicycle that we recognise today was only invented in 1817 by Baron Karl von Drais in Germany. His invention known as Laufmaschine had no chain based transmission so the rider needed to walk or run to get to a cruising speed before getting on the bicycle.

From this point the bicycle has continued to improve. We now have bicycles made for different terrains, speeds and uses, have quick release wheels and other features. It's hard to imagine that the bicycle needs further development.

The 2019 Design and Innovation Award All Winner 2019 Urban was won by a bicycle named **Leg&go Balance Bike 3in1.** It features the following:

- ☆ It is eight bikes in one – grows with the child from 6 months to 6 years old with additional extension packages.
- ☆ High-quality wood construction meaning it is sustainable
- ☆ The springing nature of the timber protects the child's spine.
- ☆ Durable, modern and innovative design
- ☆ Weight: 4.80 kg (in bicycle setup)

BICYCLE FACTS

- The term "bicycle" was introduced in France in the 1860's to describe a two-wheeler with a mechanical drive.
- Bicycles are more efficient in transforming energy to travel than cars, trains, airplanes, boats, and motorcycles.
- Same energy that is expended for walking can be used with bicycle for x3 increase of speed.
- Energy and resources that are used for creation of one single car can be used for creation of up to 100 bicycles.
- The longest "tandem" bike was over 20 meters long and it seated 35 people.
- You can park about 15 bicycles in the same space that one car takes.
- The Tour de France is one of the most famous bicycle races in the world. Established in 1903, it is considered to be the biggest test of endurance out of all sports.

REFERENCES:

- http://www.bicyclehistory.net
- https://billbonebikelaw.com/news-from-the-road/12-fun-facts-cycling/

Leg&go Balance Bike 3in1

transforms into Baby bike and Bouncy bike without any additional parts.

- ☆ Promotes good balance, coordination, straight posture, safety and stability.
- ☆ Suitable for children weighing up to 30 kg
- ☆ A steering limiter prevents sharp turning angles. This helps to control the bike and protects the rider in a case of a fall, ensuring that the handlebar will not hit the rider's stomach.
- ☆ Bicycle Weight – 3.3 kg

Designer: Egons Garklavs
Experience: Mechanical engineer
Awards received: *Eurobike Winner Award 2015* in the Urban bike category and *ISPO Munich Brandnew Finalist 2016/2017* honours among the best sports business start-ups for its natural wooden design and versatility.

https://legandgo.com/

Baby Bike
(Ages 10 months – 2 years)

Balance Bike
(Ages 1.5 – 5 years)

Bouncy Bike
(Ages 2 – 3 years)