



WELCOME

This month's newsletter looks at materials. Check out the article about smart materials which are the materials of the future.

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

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What's New? PPE
Humour – Just for laughs
Did you know?

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Feature Article – Time to design something new

PRIMARY STEM: NATIONAL SCIENCE WEEK

Science Week (12-20 August 2023)



National Science Week is Australia's annual celebration of science and technology. Science Week has released their free Teaching Resource book. It's packed with stories of Australian innovation, and hands-on activities you can do at home or in the classroom! Resource suit both primary and secondary.

Head to the [National Science Week website](#), where you can download the book, and [check out events happening all across Australia](#) this August.

Scorpio has many ideas, projects and activities to help you celebrate Science Week. Check our online catalogues for inspirational ideas.

TEACHER CONFERENCES, WORKSHOPS & EVENTS



Scorpio is attending or supports these teacher activities:

[DATTA ACT Conference](#) Daramalan College, Dickson, **Sat 09-09-2023**

[Victorian Model Solar Vehicle](#)

[Challenge](#) **14-15-10-2023**

[Design and Technologies Week](#) 16-22 October 2023

[iTE Technology Education](#)

[Conference 2023 TechExpo](#), Sydney **30-11-2023 – 01-12-2023**

[DATTA WA Conference Bridging the Gap](#), Perth, 30-11 to 01-12-2023

[DATTA VIC Conference Future Innovators](#), NCAT Preston **01-12-2023**

**LEARN TO MAKE,
MAKE TO LEARN**

“Creating your best work possible means embracing strange ideas.”

Robert Sutton, Stanford professor and author





NOW AVAILABLE: PERSONAL PROTECTIVE EQUIPMENT

Click here: <https://www.scorpiotechnology.com.au/personal-protective-equipment>



GLOVES

- ULTRA TOUCH NITRILE POWDER FREE
- ULTRA FRESH VINYL POWDER FREE
- ULTRA FRESH LATEX POWDER FREE

	XS	S	M	L	XL
NITRILE	468417XS	468417S	468417M	468417L	468417XL
VINYL		468402S	468402M	468402L	468402XL
LATEX	468405XS	468405S	468405M	468405L	468405XL

Quantity 100 per box. Certified HACCP suited to educational and lab settings, puncture resistant, beaded cuff and ambidextrous design. Great value.



Ultrasafe Economical Earmuffs – Blue, Certified to AS/NZS 1270 Standard
(Code: EARM500021)



Masks

- Titan P2 Disposable Respirators (Box of 20)
(Code: 606020)
- Titan P2 Valved Disposable Respirators (Box of 10)
(Code:600622)



Adam Highland Portable Precision Balances

Well-suited for lab work, field use, and many industrial applications. (See website for more information)



A guy tried to tell me about a tool that makes holes in hard materials, but I stopped him.

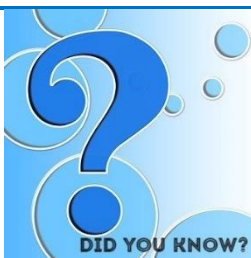
I know the drill.

An engineer, a physicist and a mathematician have to build a fence around a flock of sheep, using as little material as possible.

The engineer forms the flock into a circular shape and constructs a fence around it.

The physicist builds a fence with an infinite diameter and pulls it together until it fits around the flock.

The mathematicians thinks for a while, then builds a fence around himself and defines himself as being outside.



Graphene is a man-made material and has many amazing qualities. It is a single carbon layer material that is the world's strongest material, an extraordinary conductor of electricity and heat, and is nearly 100% transparent to light.



SCORPIO TECHNOLOGY Vic Pty Ltd, 1/31 Dalgety St. Oakleigh Vic 3166

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BIOLOGY MODEL CLEARANCE

Help us make way in our warehouse for a new range of products. **Limited stock available.** Everything must go. For super bargains

Click here: <https://www.scorpiotechnology.com.au/sale-items>



HUMAN LUNG (Code:AM0067)
~~\$60.00~~ **NOW \$40.00**



RNA PROCESS RAISED RELIEF
60 X 45CM (Code: ZM0060)
~~\$110.00~~ **NOW \$50.00**



LEAF – DICOT T.S. PLANT
MODEL (Code: BM0020) ~~\$35.00~~
NOW \$20.00



LEAF – MONOCOT V.S. PLANT
MODEL (Code: BM0022) ~~\$35.00~~
NOW \$20.00



STEM – DICOT – T.S. (Code:
BM0012) ~~\$35.00~~ **NOW \$20.00**



STEM – DICOT -T.S. (Code:
BM0012S) ~~\$35.00~~ **NOW \$20.00**



ROOT – DICOT PLANT MODEL
(Code: BM0024) ~~\$35.00~~ **NOW**
\$20.00



STEM – DICOT – HUGE (Code:
BM0011) ~~\$68.00~~ **NOW \$30.00**



SEED GERMINATION –
MONOCOT (Code: BM0044)
~~\$35.00~~ **NOW \$20.00**



EUGLENA PLANT MODEL
(Code: ZM0036) ~~\$35.00~~ **NOW**
\$20.00



AIDS VIRUS MODEL (Code:
AM0105) ~~\$30.00~~ **NOW \$20.00**



NEURON MODEL (Code:
AM0101B) ~~\$35.00~~ **NOW \$20.00**



ANIMAL CELL ON STAND
(Code: ZM0004) ~~\$35.00~~ **NOW**
\$20.00



STEM – MONOCOT (Code:
BM0016) ~~\$35.00~~ **NOW \$20.00**



UPPER TRIPLE ROOT MOLAR
WITH CARIES (Code: AM0046)
~~\$36.00~~ **NOW \$20.00**

Time to design something new

Anita Vejins



“At the heart of solving (global) problems lies the design of a new material.”

Prof. Jeffrey Grossman
Materials Science and Engineer

Material Science or Material Technology investigates the properties of materials and substances. With this knowledge new materials can be created with enhanced chemical and physical properties. They aim to improve production processes, reduce cost and environmental impact.

We use materials every day. Most of these were developed using traditional materials such as paper, wood, stone, and metals. New materials are now available due to many different sciences.

“Life solves its problems with well-adapted designs, life-friendly chemistry and smart material and energy use.”

Janine Benyus
Biologist, Author, Innovation
Consultant

MATERIALS THAT CHANGED HISTORY



https://mse.engr.uconn.edu/wp-content/uploads/2020/04/Materials_thatchangeHistory.png

SMART MATERIALS

Definition:

“A smart material is an object that holds a property that is susceptible to change with the introduction of an external stimulus. This change must be either tangible or visible for the material to qualify for ‘smart’ status. These changes can include Electrical, Chemical, Thermal, Mechanical, Magnetic. Materials that may not display a physical change but do hold electronic functionality are also smart materials.”

<https://www.engineerlive.com/content/what-smart-material>



Thermochromic pigments shown in use in a mug that reveals an image when heat is applied.

<https://www.gocongr.com/quiz/1557627/smart-materials>

Types of Smart Materials:

- Piezoelectric materials
- Magnetorheological materials
- Thermoelectric materials
- Shape Memory Alloy
- Self-healing materials
- Chromoactive materials

Where are Smart Materials used?

- Piezoelectric materials convert mechanical energy into electrical energy and vice-versa.
- Magnetorheological materials change properties when a magnetic force is applied. Currently used in shock absorbers to prevent seismic vibrations in bridges or skyscrapers. In fluid form it can be used to reinforce Kevlar armour.
- Thermoelectric materials are used in Thermochromic thermometers which identify whether a specific part of a machine is too hot to touch.
- Shape Memory Alloy can change shape and return to their original shape.
- Self healing material can repair itself. Self-healing paint is an example.
- Chromoactive materials change colour in response to external stimuli. Photochromic glasses change colour in sunlight.

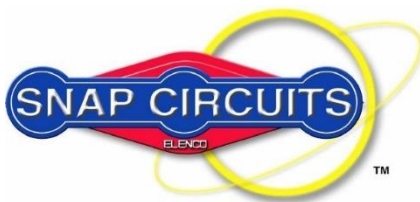
Why use Smart Materials?

Due to the ability of smart materials to adapt, they can be useful in

- Buildings where the concrete used could absorb earth movement and atmospheric conditions. This will save lives and costs associated with a building collapse.
- Textiles can be improved through fibre strength and the ability to regulate body temperature in a variety of climatic conditions. Some could light up and change colour.
- Healthcare where medications are released into the bloodstream and fight infection.
- Sustainability of materials is a great challenge. Reusing or remanufacturing smart materials is a prime goal.

REFERENCES:

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- Worksheet explaining Smart and Modern Materials, [https://www.nottinghamfreeschool.co.uk/data/uploads/homework/files/Product_Design_KOs/Materials and Properties -Smart and Modern Materials.pdf](https://www.nottinghamfreeschool.co.uk/data/uploads/homework/files/Product_Design_KOs/Materials_and_Properties_-_Smart_and_Modern_Materials.pdf)
- Materials scientist Anna Ploszajski has produced some interesting talks. <https://www.annaploszajski.com/talks>
- <https://www.bbc.co.uk/bitesize/guides/znd48mn/revision/2>
- Quiz about smart materials, <https://www.goconqr.com/quiz/1557627/smart-materials>



Remember to check out our **Snap Circuits** range, which is being **drastically reduced to clear**, while stocks last.

See our website for prices. Great for small groups and also home education settings.

Click here: <https://www.scorpotechnology.com.au/snap-circuits>



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