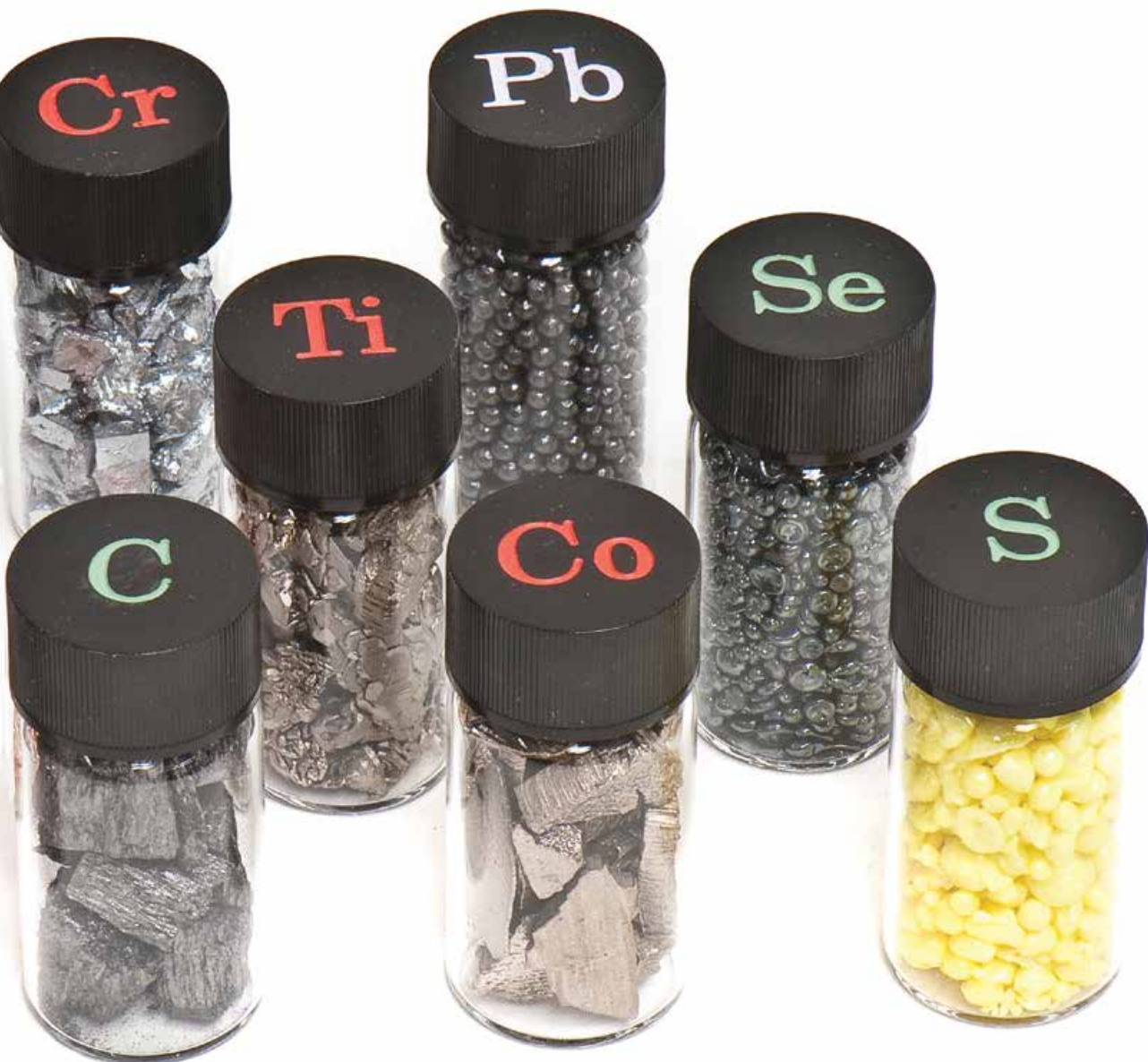


The Periodic Table of Elements

2015 catalogue version 1.0
displays, sets & samples



P 15
PHOSPHORUS
 White phosphorous sun

Mg 12 **S** 16
MAGNESIUM **SULFUR**
 Mg burns in dry ice Super dense SF₆ gas

Cl 17 **Ar** 18
CHLORINE **ARGON**
 Making salt from Na+Cl Argon in plasma ball

Ti 22 **V** 23 **Si** 14
TITANIUM **VANADIUM** **SILICON**
 Titanium jet fan Silicon blob

B 5 **C** 6 **N** 7 **O** 8 **F** 9 **Ne** 10
Na 11 **Mg** 12 **Al** 13 **Si** 14 **P** 15 **S** 16 **Cl** 17 **Ar** 18
K 19 **Ca** 20 **Sc** 21 **Ti** 22 **V** 23 **Cr** 24 **Mn** 25 **Fe** 26 **Co** 27 **Ni** 28 **Cu** 29 **Zn** 30 **Ga** 31 **Ge** 32 **As** 33 **Se** 34 **Br** 35 **Kr** 36
Rb 37 **Sr** 38 **Y** 39 **Zr** 40 **Nb** 41 **Mo** 42 **Tc** 43 **Ru** 44 **Rh** 45 **Pd** 46 **Ag** 47 **Cd** 48 **In** 49 **Sn** 50 **Sb** 51 **Te** 52 **I** 53 **Xe** 54
Ba 56 **La** 57 **Ce** 58 **Pr** 59 **Nd** 60 **Pm** 61 **Sm** 62 **Eu** 63 **Gd** 64 **Tb** 65 **Dy** 66 **Ho** 67 **Er** 68 **Tm** 69 **Yb** 70 **Lu** 71
Hf 72 **Ta** 73 **W** 74 **Re** 75 **Os** 76 **Ir** 77 **Pt** 78 **Au** 79 **Hg** 80 **Tl** 81 **Pb** 82 **Bi** 83 **Po** 84 **At** 85 **Rn** 86
Fr 87 **Ra** 88 **Ac** 89 **Th** 90 **Pa** 91 **U** 92 **Np** 93 **Pu** 94 **A** 95 **Bk** 96 **Cf** 97 **Es** 98 **Fm** 99 **Md** 100 **No** 101 **Lr** 102
103 **104** **105** **106** **107** **108** **109** **110** **111** **112** **113** **114** **115** **116** **117** **118**

THE PERIODIC TABLE OF THE ELEMENTS

The largest periodic table display we have created to date is located at the Chemical Heritage Foundation in Philadelphia, USA. This 6 metre (18 feet) tall video column presents a spectacular 8 minute looping "fountain of the elements" featuring experiments and demonstrations showing all the natural chemical elements.

The Most Beautiful **Periodic Table** Displays in the World

We offer a range of physical periodic table installations, engaging educational displays and boxed sets all featuring real element samples. Our company has been creating beautiful periodic tables for over a decade. We have now installed more than fifty displays around the world.



Large display at Dow Chemical headquarters, USA.

Large periodic table displays (pages 2-3)

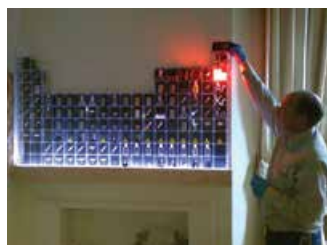
Our large displays measure approximately 3 metres (10 feet) across and 1.8 metres (6 feet) in height. They make an impressive feature in any science building, attracting and engaging visitors. A range of options is available for cabinet materials and finishes to harmonise with any interior. Working discharge tubes in the shape of the chemical symbols are used to present the five noble gases. We also offer a package of enhanced samples/exhibits and an interactive touchscreen with beautifully filmed videos of experiments and demonstrations for most elements. The cost ranges from UK £40,000 up to £75,000.



Medium size display at Latymer Upper School, UK.

Mid-range periodic table displays (pages 4-5)

Medium displays are based around 120 x 120 x 120mm (4 x 4 x 4 inch) compartments which, like our large displays, also present both element samples and a selection of artefacts. The range of samples and objects is somewhat smaller than for the large displays. The overall cabinet is approximately 2.3 metres (8 feet) across and 1.7 metres (5.5 feet) in height. Enhanced samples and interactive options are also available with this version. Materials, cabinet design and finish can be customised to match your interior. Cost is in the range £25,000 to £45,000.



Small display, private collector.

Other designs: smaller periodic table displays (pages 6-7)

For those with more restricted budgets, we offer a range of attractive wall-mounted or free-standing frames to present the periodic table while still retaining the magic of including real element samples. The lowest cost displays are approximately 1m (3 ft) across and 0.7m (2 ft) tall. The element samples in these small displays can be presented in engraved 7ml vials (the same ones provided in our Element Collection Boxed Set) or permanently embedded in solid clear acrylic blocks (50 x 50 x 30mm). Element samples are also available in larger size acrylic blocks (100 x 100 x 30mm) and in this case the resulting display is approximately 2m across and 1.5m tall. The cost of these smaller 1m and 2m wide displays ranges from £7,500 to £20,000.

Boxed Sets (pages 8-9) & **Element Samples** (pages 10-12)

Our high-quality boxed sets and museum-grade individual element samples are intended for anyone interested in owning a collection of the elements. Safety and beautiful presentation are the key design considerations.



Both our large and medium displays present each element in its own carefully curated compartment. As well as containing museum-grade samples of the elements themselves, the individually illuminated cubes in these displays are filled with exciting tableaux of objects and artefacts showing how each element is used in our civilisation as well as relevant minerals and ores.

Large Periodic Table Displays Case Study

Questacon Science Centre

“The best thing about it is that it is so engaging for the people who visit. It’s one of the stars of our social media feed.”

The Q Lab at Questacon, The National Science and Technology Centre in Canberra, Australia, is a hands-on gallery that encourages visitors to explore the world of science. The centrepiece is the display of the periodic table of the elements. Jared Wilkins, manager of learning experience at the Centre, says he often watches people as they explore the display.

“Yesterday afternoon there was a young couple who were just contemplating it, like people would a painting on the gallery wall,” he says. “It’s a wonderfully instructive art piece so you can appreciate it that way.” Mr Wilkins says that Questacon had looked at building a periodic table display by themselves but felt that it was more of a challenge than they wanted to take on. Instead they opted to go with RGB. The process was straightforward, says Mr Wilkins. There were a few things to resolve with Australian customs because the display contains potentially hazardous materials and the Centre had to satisfy authorities that the samples, once in place, would be safe. “RGB Research helped us with the risk assessment and it was fine,” says Mr Wilkins.



Questacon's large display in solid oak cabinet and (above) tableau for the element iron.

Engaging visitors

The display manages to engage visitors regardless of their age or level of scientific knowledge. Those who don't know very much about chemistry can cast a curious eye over the collection of examples, while those who really understand the logic behind the periodic table can enjoy exploring how each element is explained.

Those who want a little more information often turn to the touchscreen display. But what keeps people engaged the longest," Mr Wilkins says, "is peering through the different windows to look at the individual elements."

A constantly rewarding exhibit

Overall, Mr Wilkins says Questacon is delighted with their periodic table. "It's a wonderfully attractive piece. It looks terrific in there. And visitors love taking selfies in front of it." He concludes: "It encourages and repays close exploration. You can have a superficial look and it's rewarding, and you can have a really deep look and it's rewarding. It's pretty hard to come up with interactive exhibits that achieve that."

Large & Medium Periodic Table Displays Case Studies



The Cabinet for CalPoly's large display was designed with materials that match the interior of the University's new building. Below are element tableaux presenting nickel and copper.

California Polytechnic State University

"Even before I meet the students I ask them to take a picture of their favourite element in the display and share it."

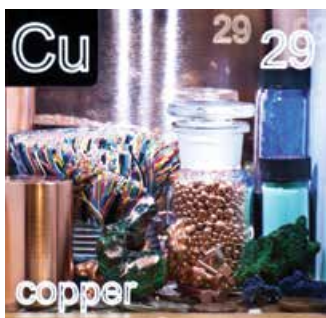
The Warren J Baker Center for Science and Mathematics has just opened on the Cal Poly campus in San Luis Obispo, California, USA. Every student will take a class in the building at some point. During the planning stage, the staff decided to include a periodic table display. "It was a unanimous decision," says Professor Gragson "We wanted something for the community to enjoy." RGB proposed a bamboo finish to match the wood used throughout the Center. The result is an impressive display that has become an essential stop on every campus tour.

Professor Gragson says that in addition to thousands of Cal Poly students, the display is seen by schoolchildren on summer camps, teachers attending workshops and prospective students and their parents. He says: "The number of people who have seen the periodic table is already in the tens of thousands." He adds "We also use the display in our classes. Before I even meet the students I message them 'go take a picture of your favourite element in the display and post it on our Moodle site explaining why you like it.'"



The Artefacts

Professor Gragson's students have plenty of fascinating samples and objects to choose from. There are around 600 artefacts, including some that were added by Cal Poly faculty. RGB selected artefacts to demonstrate interesting applications of each element; others are selected simply because they look beautiful: for example the jar of oddly shaped nickel-chromium nodules that are a waste product from chrome plating car bumpers. Asked about his favourite, Professor Gragson says: "I'm partial to the aluminum display. I just think it's really colourful. A lot of students say they like the copper display and, of course, people are always fond of the gold."



A discussion starter

Installation was straightforward and took just a few days, Professor Gragson says. "I'm sure it involved many weeks of preparation, but from our perspective it was a simple process." The Cal Poly display has a big job to do: it's in a high-traffic area and the people who see it range widely in age and scientific knowledge. Professor Gragson says that it offers something for all of them - managing to be intriguing for non-scientists while offering intellectual engagement for those with some chemistry expertise and rewarding deeper inspection by all. "It gets all kinds of reactions," says Professor Gragson, "from 'oh, that's neat' to 'Wow! That's really cool.' It starts the discussion oftentimes, which is really nice."

All case studies by **Shane Richmond**, former Technology Editor of the *Daily Telegraph*.



Putney High School

“The periodic table display creates a buzz in the science department - and the girls really enjoy it.”

The periodic table display at Putney High School in London, UK stands by the library. Its imposing oak case matches the interior design and is filled with brightly lit samples and topped by an interactive touchscreen display as well as the School Crest. The display catches the eye of passing pupils and teachers alike. “There’s some jealousy from other departments!” says Dr Will Dixon, head of science at the school, with a laugh.

It was Dr Denise Lodge, the Headmistress, who had the idea of getting a periodic table for Putney High School. She saw one at Oxford High School and, being a scientist by background, she immediately wanted one for her own school. Alistair Gray, the school’s director of finance and operations, says: “She took some photos, came back here, put the photos on my desk and said ‘find out where this came from’.” Having traced the Oxford display to RGB Research, Mr Gray got in touch to find out what options were available. “Dr Max Whitby from RGB came and we took a walk round the school to look at potential sites. Max offered the benefit of his experience,” says Mr Gray.



A single information resource

Putney High School uses both the Element Collection boxed set and the main periodic table display in teaching chemistry. “The box works well with Sixth Form,” says Dr Dixon. He says that the box adds a layer of authenticity because the children are able to hold the elements. He says: “Just the fact that you know that what’s in your hand is real adds immediacy and has significance.”

The display, says Dr Dixon, offers a valuable opportunity to get the girls out of the classroom and talking about science. According to Dr Dixon, teaching the periodic table previously involved spending a long time explaining the concept of the table. Now, he says, “there’s a single highly engaging resource that they can get all the information from.”



A powerful idea

As well as teaching, the display has an important role in impressing parents of potential pupils as they tour the school. “We’ve got Open Week coming up,” says Mr Gray, “and the display is something we will certainly showcase. That’s part of why it is where it is. It’s on the tour route that we take new girls around so that’s an external marketing piece.”

Another benefit of the display is the message it sends about science in the school. “Basically, it gives a buzz to the science department - the girls enjoy it,” says Dr Dixon. “By having it in a more central part of the school we can spread a bit of a science ethos, which pervades everything we do.”



This is a selection of real element samples permanently embedded in robust, clear acrylic blocks. They are available in two standard sizes: 50 x 50 x 30mm (2 x 2 x 1.25 inches) and 100 x 100 x 30mm (4 x 4 x 1.25 inches). They combine excellent safety with strong visual appeal, the elements apparently floating in space. The samples are securely protected yet presented in a way that allows close inspection from all sides.

Other Designs

smaller periodic table displays



Periodic Coffee Table opposite.



For those on more restricted budgets, we offer a range of attractive wall-mounted or free-standing frames to present the periodic table while still retaining the magic of including real element samples. These lower-cost displays are approximately 1m (3 ft) across. One unusual option here is a Periodic Coffee Table.

The element samples in these displays can be presented in engraved 7ml vials (the same ones provided in our Element Collection Boxed Set) or permanently embedded in solid clear acrylic blocks (50 x 50 x 30 mm). Element samples are also available in larger size acrylic blocks (100 x 100 x 30 mm) and in this case the resulting display is approximately 2m across and 1.5m tall. The cost of these smaller 1m and 2m wide displays ranges from £7,500 to £20,000.



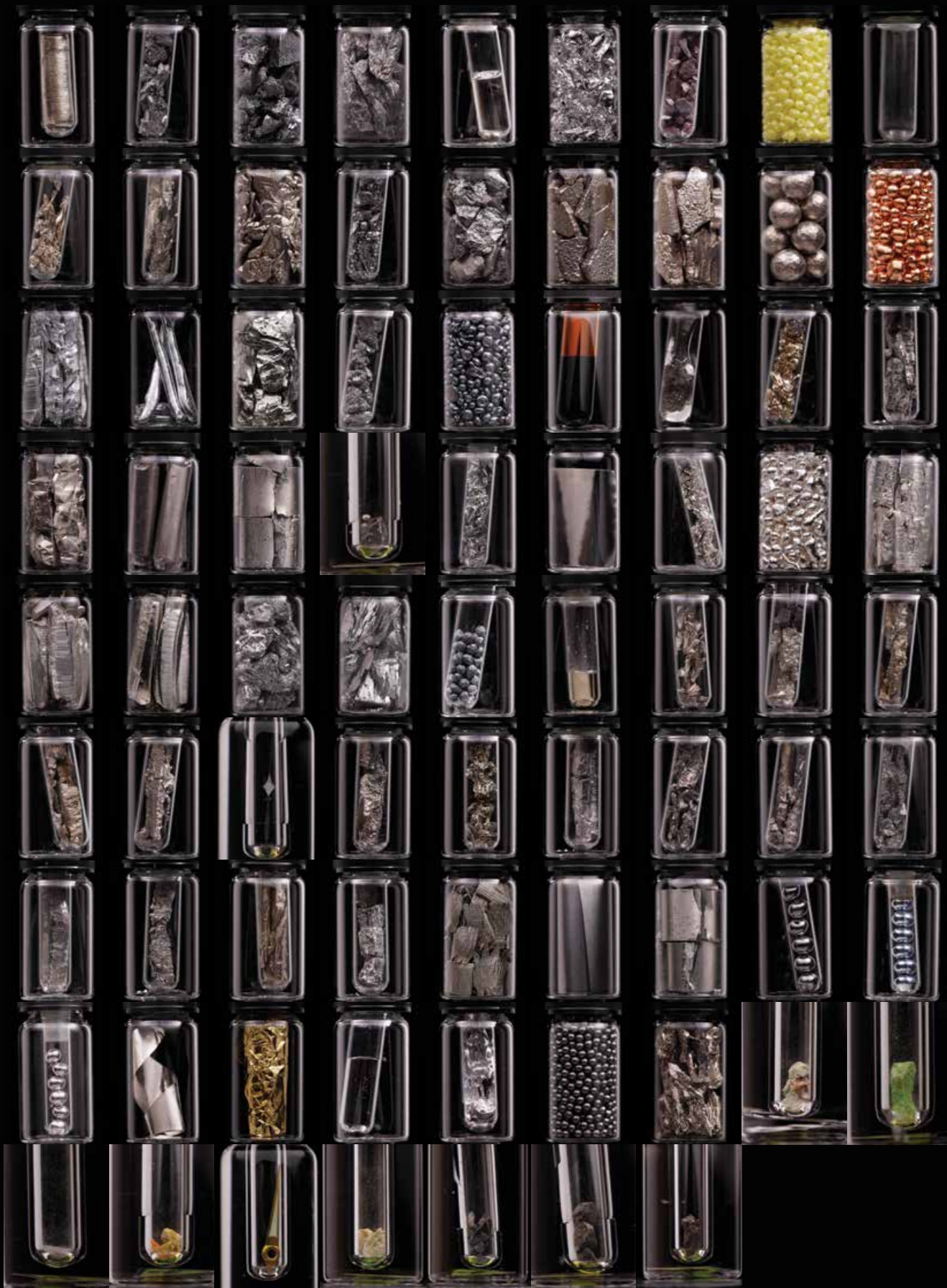
Framed 1m wide acrylic block display produced for Sigma Aldrich.



Detail Sigma Aldrich display.



2m wide periodic table display based around real element samples embedded in 100 x 100 x 30 mm clear acrylic blocks installed at Kirkeparken Skole, Moss, Norway.



The samples in our boxed set are carefully chosen and prepared to present each element to best effect. We avoid powders and prefer natural formats that clearly show characteristics such as colour, reflectivity and, where possible, crystal structure.

The Element Collection boxed set



This beautiful boxed set contains real samples of all the natural elements in the periodic table. It was the first product that we created when we started the business more than a decade ago. Our latest design features many enhancements, making this truly a "super-deluxe" set.

The high-quality box that houses the element samples is available in a range of hardwoods. One example of the care that cabinet-maker Marcos Palomo has put into the design is the chemical symbol engraved at the bottom of each well to facilitate replacing sample vials in the correct position.



Samples

We avoid powders and prefer natural formats that clearly show characteristics such as colour, reflectivity and, where possible, crystal structure. Each sample is contained in an individual 7ml glass vial 45mm (1.75 inches) tall and 20mm (0.75 inches) diameter. The chemical symbol is engraved on the lid.

Pricing

The Element Collection Boxed Set is priced at £3,275 (plus delivery and plus VAT in the EU). We also offer an instalment plan, allowing the collection to be built up 10 elements at a time, spreading the cost over 12 months.

Elements Samples (atomic number 1-43)



012 Magnesium

Magnesium is one of the lightest metals with a density 4.5 times less than iron or steel. It gradually tarnishes in air. This sparkling fresh sample of distilled magnesium, showing the element's beautiful crystal structure, is protected under an atmosphere of inert argon inside a sealed quartz dome.



017 Chlorine

The distinctive yellow-green colour of this chlorine sample is clearly apparent. The gas is permanently sealed inside a dry glass sphere. Chlorine is a reactive member of the halogen family, widely used in the chemical industry.



020 Calcium

It is surprising how few scientists have ever seen the element calcium as the un-oxidised shiny metal. This exquisite sample of distilled calcium, clearly showing its crystal structure, is permanently sealed under inert argon in a quartz dome for long-term display.



029 Copper

Copper is positioned above silver and gold in the periodic table. It certainly shares those elements' beautiful appearance, as this sample demonstrates. All three elements are excellent electrical conductors, which makes them valuable industrial raw materials.



035 Bromine

Bromine is one of only three elements that are liquid at room temperature (or at least body temperature in the case of caesium). Bromine is also unpleasantly corrosive and remarkably difficult to contain. This sample is safely imprisoned in an acrylic block



038 Strontium

Shiny distilled strontium metal like this will turn into a white powder within a few minutes of being exposed to oxygen in the air. This sample is protected under an inert argon atmosphere in a sealed inner ampoule. The crystal structure of the metal is attractively revealed.

Elements Samples 44-75



044 Ruthenium

This large sample of crystalline metal ruthenium has been prepared using a high-temperature vapour-transport method. Ruthenium is one of the platinum group of precious metals.



047 Silver

We love the look of these silver droplets that we prepare from solid silver ingots in our laboratory. This is a good example of our approach: seeking to present not only the physical characteristics of an element, but also to bring out its aesthetic qualities.



054 Xenon

This is a sample of high purity xenon contained in a glass tube in the shape of that element's chemical symbol. Pass a few thousand volts through the gas and xenon produces a beautiful violet glow. This is how we present all the noble gases.



055 Caesium

The alkali metal caesium, which becomes liquid if warmed in the hand, is one of the most reactive elements and explodes violently on contact with water. Here the sample is safely contained in a solid block of clear acrylic, which allows you to appreciate caesium's beautiful pale golden colour.



063 Europium

The element europium is one of the most difficult to prepare as a stable shiny metal sample. It darkens in seconds on exposure to the air. We are therefore delighted to have found a way to manufacture these europium metal crystal samples permanently sealed under inert argon.



067 Holmium

Holmium is one of the lanthanides, sometimes known as the rare earth elements (although they are not especially rare in the Earth's crust). This attractive sample is comprised of long crystals that appear almost fibrous. Holmium has few industrial applications and is relatively stable in air.

Elements Samples 76-92



076 Osmium

Osmium is another rare member of the platinum metal group and not easy to obtain. It is usually supplied in the form of finely divided "sponge", which oxidises in air to produce the toxic tetroxide. We transform the osmium by melting into solid pearls, which are safe to handle and show the element's distinctive blue hue.



077 Iridium

Iridium and osmium vie with one another for the distinction of being the most dense element. Both have a density close to 22.5 grams per cubic centimetre. Compared to the osmium sample, you can see that iridium has a slightly warm yellow hue.



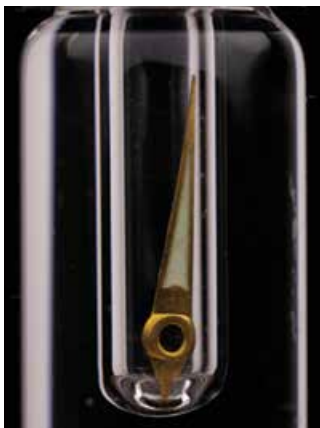
079 Gold

This is the gold sample from the Element Collection boxed set. It is in the form of high-purity gold foil that has been shaped to visually fill the vial. We would love to supply solid gold pieces instead, which would weigh a surprisingly heavy 100g to completely fill the 7ml vial. But the cost of this single sample would then be over \$4,000.



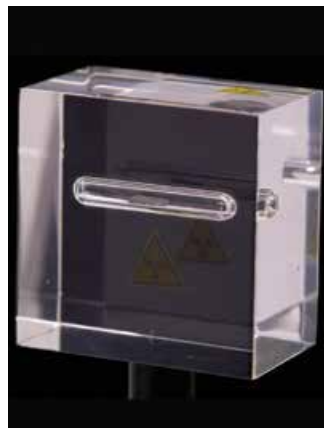
081 Thallium

Highly toxic thallium is rarely seen in this form as a shiny silvery metal. It is another reactive element that swiftly tarnishes when exposed to the air. This sample is permanently sealed in a glass ampoule both for its protection and ours.



088 Radium

The longest-lived isotope of the element radium has a half life of only 1,600 years, which means that it is highly radioactive. It was once used as an ingredient in luminous paint for watch hands and aircraft instrument dials.



092 Uranium

We are able to supply metallic samples of two radioactive elements: thorium and uranium. This one is uranium. A special export licence is required for shipments outside the EU and we can help with the application process.

Ordering Information contact details

To order

To order or enquire about **periodic table displays** please contact:

Dr Max Whitby
max.whitby@rgbco.com

UK telephone: 020 8749 3354
international: +44 (0)20 8749 3354

To order or enquire about **elements sets and samples** and for shipping quotes please contact:

Andrew Goodall
andrew.goodall@rgbco.com

UK telephone: 020 8749 3354
international: +44 (0)20 8749 3354

Company background

RGB Research Ltd is a subsidiary of The Red Green & Blue Company Ltd which was founded by Max Whitby in 1987. For the past decade we have worked in close partnership with Theodore Gray (periodictable.com) author of *The Elements* with over a million copies in print and a further million copies downloaded for the iPad and iPhone. In 2010 Max and Theo co-founded the app development company Touchpress (touchpress.com). RGB has delivered large projects for a range of international clients including Apple, the BBC, Cambridge University, The Chemical Heritage Foundation, Dow Chemical, Harvard University and the Howard Hughes Medical Institute. We have installed more than 50 periodic table displays around the world.

For further information please visit our website periodictable.co.uk.



Dr. Max Whitby, CEO & Founder, RGB Research Ltd.



Theodore Gray, www.periodictable.com and author of the best-selling book and app *The Elements*.

Please read the Frequently Asked Questions page on our website periodictable.co.uk where you will also find our terms and conditions.

RGB Research Ltd, 3 Warple Mews, Warple Way,
London W3 0RF, UK.



 periodictable.co.uk

RGB Research Ltd.
3 Warple Mews
Warple Way
London W3 0RF, UK

UK telephone 020 8749 3354
International +44 (0)20 8749 3354