

Kia ora from the School of Physical and Chemical Sciences!

We are taking 2021 bookings for the Physics 2.5, Chemistry 2.1, 3.1 and 3.2 workshops based here in the Ernest Rutherford building at the University of Canterbury.

### **NCEA Achievement Standards**

#### **Radioactivity:**

Physics 2.5 Demonstrate understanding of atomic and nuclear physics

#### **Titration Investigations:**

Chemistry 2.1 Carry out quantitative analysis

Chemistry 3.1 Carry out an investigation in chemistry involving quantitative analysis

#### **Spectroscopy:**

Chemistry 3.2 Demonstrate understanding of spectroscopic data in chemistry

### **Physics 2.5 Radioactivity and Rutherford's Den**

#### **Available 2022 dates:**

8 - 16 February

11 - 14 April

7 June – 8 July

29 August – 9 September

25 October – 11 November

### **Chemistry 3.2 Spectroscopy**

Dates are available all year round subject to availability. Please enquire early for preferred dates by contacting [physical-chemical-outreach@canterbury.ac.nz](mailto:physical-chemical-outreach@canterbury.ac.nz)

### **Chemistry 2.1 and 3.1 Titration Investigations**

Chemistry 2.1 and 3.1 Workshops will typically run in the same period as our other workshops. Dates may be restricted due to availability of the Chemical Laboratories. Please enquire by contacting [nathan.alexander@canterbury.ac.nz](mailto:nathan.alexander@canterbury.ac.nz)

## **Ernest Rutherford Building**

The Ernest Rutherford building has modern state-of-the-art facilities that encourage collaborative teaching, learning and research. It houses specialist teaching and research laboratories for Physics, Astronomy, Chemistry, Geology, Geography and Biological sciences.



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## **Physics 2.5 Radioactivity**

To support Year 12 students studying atomic and nuclear physics, UC collaborates with [Arts Centre Education](#) (ACE) (formerly Rutherford's Den) to provide a curriculum-linked set of activities.

To make full use of the workshop and the Arts Centre Education session we recommend that your students have done at least some of the work for the Physics 2.5 standard.

This year we wish to **book** as many sessions **as early as possible** to allow sufficient planning time, especially for Arts Centre Education who have to relocate their resources from the Arts Centre.

To expedite this we request you book as soon as possible by contacting [physical-chemical-outreach@canterbury.ac.nz](mailto:physical-chemical-outreach@canterbury.ac.nz) with your preferred option(s). At this stage, we only require your school's name, main contact name/email and preferred half/full day choice(s). An estimate of numbers attending based on previous workshops would be of assistance, but not necessary.

A **live** UC and ACE booking list provided via this link [Radioactivity bookings](#) will help you identify if your preferred option is available to be booked before making your request. Once we have placed your booking we will let you know and the live list status will be updated automatically.

The package comprises:

- 1 hour 45 min workshop session, in the brand new laboratories in the Ernest Rutherford building run by the School of Physical and Chemical Sciences at UC, using radioactive sources and Geiger counters to investigate the absorption of beta and gamma radiation by biological materials, along with a second activity measuring the half-life of a short-lived copper isotope.
- 1 hour 30 min session with the team from [Arts Centre Education](#), learning about Ernest Rutherford, his gold foil experiment and the progression of scientific ideas on the structure of the atom. \$5 per student. These sessions include activities that demand quite a depth of understanding. Students need an understanding of the Models of the Atom and The Geiger–Marsden/Rutherford’s Gold Foil Experiment.
- A tour of the School of Physical and Chemical Sciences, highlighting pathways into careers and opportunity to look around the campus.

Many teachers use the day to prepare for or to assess the Physics 2.5 standard. A maximum group size is 30 so we would split you into two groups per day if you have +30 - 60 students visiting.

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### **Chemistry 2.1 and 3.1 Titration Investigations**

The School of Physical and Chemical Sciences at UC offers use of their laboratories to New Zealand schools for students to undertake their Chemistry 2.1 or 3.1 investigations. The School will provide staff and graduate students to assist your students along with the glassware, equipment and most of the chemicals that you will need. Solutions of chemicals can be provided as long as the dilutions and quantities are requested five working days in advance.

We prefer students to do assessments, which have been tested and proven such as those linked below. They have been developed with the Canterbury Science Teachers Association and are intended for use by students carrying out the Chemistry 3.1 standard. A student may be permitted to take on an alternative investigation, but the written protocol must be submitted three full weeks in advance for safety reasons.

For a list of experiments go to <https://www.canterbury.ac.nz/science/outreach/chemistry/>

Please contact [nathan.alexander@canterbury.ac.nz](mailto:nathan.alexander@canterbury.ac.nz) for details and available dates.

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### **Chemistry 3.2 Spectroscopy**

The School of Physical and Chemical Sciences runs an interactive spectroscopy presentation followed by a tour of our state-of-the-art instrument suite.

To make full use of this workshop we recommend that your students have done at least some of the work for the Chemistry 3.2 standard, otherwise it would not be so effective.

Please contact [physical-chemical-outreach@canterbury.ac.nz](mailto:physical-chemical-outreach@canterbury.ac.nz) for further details and available dates.