



Teacher Earth Science Education Programme

Geoscience Australia, Canberra and Tumut –

Sponsored by SMEDG (Sydney Mineral Exploration Discussion Group)

Summary

The trip included:

- 5 x professional development workshops at event at Geoscience Australia (GA) in Canberra and McAuley Catholic College in Tumut.
- 2 x field trips were conducted at Red Hill / Deakin Anticline and at Adelong Falls / Adelong Museum.
- The 7 x events were attended by a total of 49 teachers and laboratory technicians, comprising 28 individuals from 15 different schools, plus the Academy of Future Skills.
- 1 x new school received TESEP rock kit and plate tectonic poster (McAuley Catholic College, Tumut).

Monday 09/12/2024 – Geoscience Australia, Canberra

- 1 x 3-hour professional development workshop was presented in the Education Centre on the 'Chemistry of the Rock Cycle, Plate Tectonics and Critical Minerals'.
- This was a newly modified workshop to incorporate crossover of chemistry and geology to attract a broader range of science teachers. The chemistry elements including examining the chemistry of magmas at divergent margins v convergent margins and how this results in effusive v eruption volcanism with implications of natural hazards, how chemistry controls the rock cycle (e.g. different magmas based on plate tectonic setting, weathering and the carbon cycle based on uplift, erosion and sedimentation), and chemical controls on where minerals (specifically critical minerals) form.
- The attendees were also shown around the Education Centre and the 3d-immersion room to look at the location and depth of earthquakes globally.
- 12 teachers and laboratory technicians from 9 schools attended, with 2 attendees from the Academy of Future Skills.



Attendees in the 3d-immersion room at GA.

Monday 09/12/2024 – Field Trip to Red Hill, Canberra

- 1 x 3-hour field trip to Red Hill and the Deakin Anticline.
- This field trip examines different rock types and orientations in the field to teach basic geological observations and descriptions, with an overview of the geology and landscapes of Canberra. Red Hill reserve includes Silurian sedimentary rocks (Yarralumla Formation) and volcanic rocks (Deakin Volcanics). The sedimentary rocks were contact metamorphosed to form hornfels by the ~419 Ma Federal Golf Course Tonalite. At Deakin Anticline, the sedimentary rocks are folded with bedding and cleavage easily observed.
- 3 teachers and laboratory technicians from 3 schools attended, with 1 attendee from GA.



On the rocks at Red Hill and Deakin Anticline (bottom right). Photos by Cressida Gilmore.

Tuesday 10/12/2024 – Geoscience Australia, Canberra

- 1 x 3-hour professional development workshop was presented in the Education Centre on the ‘How Geology influences Biology and the Big 5 Extinctions’.
- This was a newly modified workshop to incorporate more crossover of biology and geology to attract a broader range of science teachers. The biology aspects included the conditions needed for life, how the elements for life changed from ‘geochemistry’ to ‘biochemistry’ to enable cell reproduction and mutation, and the likely setting for first life – by examining the geological history of early Earth. The workshop also examined galactic and Earth processes that can change conditions for life (e.g., atmospheric composition, climate etc) that can lead to life explosions and mass extinctions.
- The attendees were able to view numerous fossils through time – from stromatolites from the Pilbara to mega-fauna and lots in between!
- 14 teachers and laboratory technicians from 7 schools attended, with 1 attendee from the Academy of Future Skills.

Tuesday 10/12/2024 – Geoscience Australia, Canberra

- 1 x 2.5-hour professional development workshop was presented in the Education Centre on ‘Our place in space’.
- This workshop examines the Big Bang, the formation of our solar system and Earth, galactic and orbital processes and how they influence life on Earth, meteorites, stars including the Sun, our Moon etc. The workshop also compares the geology and landforms of Earth with other planets and moons, and examines the challenges for humans to live in space and explore other planets.
- The attendees were able to touch a piece of the Moon) and handle many of the meteorites in the GA collection. They were also visited by a dinosaur as part of Christmas festivities.
- 5 teachers and laboratory technicians from 5 schools attended





Attendees with a 'dinosaur' and samples from the meteorite collection. Note the bottom photo includes staff from the GA Education Centre – Shona Blewett (left), Dominic Iffland (front) and Emily Robson (second from right), and Phil Gilmore (right).

Thursday 12/12/2024 – McAuley Catholic College in Tumut and Adelong

- 1 x 2-hour field trip to Adelong Falls and outside Adelong Museum to learn basic geological mapping and rock description techniques. The ~431 Ma foliated, non-magnetic Wondalga Granodiorite exposed at Adelong Falls, and the massive, magnetic Adelong Norite in the town of Adelong (partially polished samples out the front of the Adelong Museum were examined) made for two contrasting rock types. In addition, the Wondalga Granodiorite hosts hard rock (quartz reef) gold as well as alluvial gold in Adelong Creek – with excellent signage explaining the history and the ruins of the gold workings – all in a lovely setting with the cascading creek. The Adelong Norite is a well-known decorative stone (e.g., Qantas House, Fred Hollows memorial in Bourke) and features in the National Rock Garden in Canberra.
- 1 x 2-hour professional development workshop was presented at McCauley Catholic College in Tumut on the TESEP rock kit, local geology, plate tectonics, the rock cycle, and critical minerals.
- 1 x 2-hour professional development workshop was presented at McCauley Catholic College in Tumut on the 'How Geology influences Biology and the Big 5 Extinctions'.
- 6 teachers and laboratory technicians from 2 schools attended.
- McAuley Catholic College were presented with a TESEP rock kit and plate tectonics poster.





On the rocks at Adelong Falls and in from t of Adelong Museum. Photos by Cressida Gilmore.

Feedback

Via feedback form

- 15 responses (at time of writing)
- Question: Please make any other comments - for example interesting and/or useful aspects of the course.
 - *Really fun and interesting! Thank you.*
 - *Good to get hands on with some samples*
 - *Phil was a friendly and knowledgeable presenter; he was able to keep teachers with varied experience and understanding interested. Info presented was interesting and well communicated . This was a worthwhile PL for me.*
 - *Wonderful learning information and i hope to attend more in the future*
 - *Great to update my knowledge about current theories and evidence. Also, great learning and assessment resources.*
 - *Excellent, very interesting, loved the use of the tape measure (for geological time and evolution / extinction events)*
 - *The fact that extinctions were from more than 1 event*
 - *Really appreciated that Phil allowed us to ask lots of questions.*
 - *It was definitely aimed for high schoolers (from a primary school teacher who attended 'our place in space').*

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