

Geoscience Pathways Project Newsletter

(April - #23)

WE ARE STILL IN BUSINESS

Despite the Corona virus pandemic the Geoscience Pathways Project (GPP) will continue to support geoscience education in South Australian schools in various ways. Only our face-to-face teacher workshops and mentoring of field investigations have been put on 'hibernation'. We apologise to those teachers who enrolled in our planned school holiday workshops on rock and mineral identification. Unfortunately, these have needed to be cancelled. Thanks to the generosity of our sponsors we continue to offer support as indicated here.

We are a 'not-for-profit' incorporated body of like-minded teachers, academics and geoscientists. We work together to support the teaching and learning of Earth in Space (R-10) under the Australian Science Curriculum and senior secondary (SACE) Earth and Environmental Science (EES). Thanks to the generosity of our sponsors we continue to offer unique and timely support as described on these pages.

New Sponsorship

We are delighted to announce that **BHP Olympic Dam** has recently become our newest sponsor. In addition to providing funding support, a number of their geologists have agreed to visit SACE Earth and Environmental classes, by invitation, to support teachers in their presentation of the *Earth's Resources* topic. One such possibility, (subject to negotiation with teachers), might be as follows:



The Story of Copper: What is *Copper*, where is it found, how is it mined, processed and used? Why is *Copper* important for society? How might this be used to address *Science as a Human Endeavour*.

Expressions of interest in this offer are invited and should be directed to our project coordinator Len Altman: lenaltman9@gmail.com

More Schools teaching SACE Earth and Environmental Science

This year, more secondary schools teach, or are planning to teach, EES in South Australia. These schools include Adelaide High School, the Australian Science and Mathematics School, Adelaide Botanic High School, Marden Senior College, the Open Access College, Urrbrae Agricultural High School, Henley Beach High School, Underdale High School, Thebarton Senior College and Northern Adelaide Senior College. If you are not a teacher at one of these schools you might consider offering this exciting new SACE subject, at your school in the future. There are many good reasons to do so.

Arguably, there has never been a more critical time for students to experience a taste of the science of the Earth and its environment. The 'big issues', including 'climate change' and 'sustainability', need to be better understood and more effectively addressed by the next generation. Consequently, there is pressing need for student access to appropriate courses, at the senior secondary level, particularly here in South Australia where schools lag behind in the take-up of EES, relative to the take-up in most other Jurisdictions.

The SACE EES curriculum provides opportunity for students to experience a 'multi-disciplinary' scientific approach. Students experience applications of each of the traditional sciences and mathematics, together with the unique opportunity to engage in a real, hands-on project, (in the manner of 'citizen science'), with the potential to generate new scientific knowledge and bring tangible benefit to the wider community. The course also introduces students to pathways to STEM careers, such as in the resources industry, geology, geophysics, geochemistry and environmental science, with a clear focus on sustainability and responsible citizenship.

Teaching a new subject is always a challenge, for teachers and schools, however teaching EES is strongly supported by a network of practicing teachers in our Geoscience Pathways Project, as well as a wide array of teaching and learning resources as sampled on these pages. **Please Join us**

Please share your teaching experience with your colleagues.

If you have particular favorite resources that you have found useful in your teaching of SACE EES topics, or in your teaching any geoscience topic at any year level of the *Earth and Space* sub-strand of the Australian Science Curriculum (R - 10), please share these resources with other teachers by:

- emailing your resources or useful links to: lenaltman9@gmail.com
- Joining our Project: geoscience.pathways@gmail.com (Joining is free)
- subscribing to our newsletter (also free), and/or
- attending our occasional workshops: www.geosciencepathways.org.au

FREE Rock & Mineral hand specimens for schools

Free class sets for up to 20 students, comprising 280 specimens and designed to meet the both the needs of the Year 8 science unit and the requirements of SACE EES. Strictly only one kit can be provided per school, on application. Valued at \$500, they are particularly useful for teachers of the Year 8 Rocks and Minerals topic. Kits will be built according to demand, thoroughly checked by a geologist and dispatched for free delivery to your school, by courier. Priority is given to schools considering (or planning to teach) SACE Earth and Environmental Science (EES).

Only one kit (of 280 specimens) can be provided per school. Applications should be emailed to our project coordinator: lenaltman9@gmail.com

Teachers who order these kits will be offered the following free, 'hands-on' PD workshops, to be on dates as yet undetermined because of the covid-19 virus pandemic.

FREE PD WORKSHOPS for Primary and Secondary teachers

These workshops will be useful for both **Year 8 Science** and **SACE EES** teachers.

Workshop 1: Mineral Identification – Updated date – Later this year (TBA)

In this workshop teachers will be guided in the pedagogy, knowledge and skills required to teach identification of minerals as outlined in SACE EES curriculum outline. Teachers will be given resources (PowerPoints) that describe the main mineral identification techniques that can be used in their classrooms to support students in the process. This is a hands-on workshop with a quick introduction from Kelly. A majority of the workshop will be spent with teachers learning how to identify minerals. A light lunch will be provided.

Workshop 2: Rock Classification – Updated date Later this year (TBA)

In this workshop teachers will be guided in the pedagogy, knowledge and skills required to identify rocks as outlined in SACE EES. Teachers will be given resources (PowerPoints) that will outline the main rock identification techniques that can be used in their classrooms to support students in the process. This is a hands-on workshop with a quick introduction from Kelly. A majority of the workshop will be spent with teachers learning how to identify rocks.

CLIMATE CHANGE for YEAR 10's

This year, a major focus of our work will be the development of a new unit of work on 'Climate Change', designed to meet the requirements of the **Year 10 Australian Science Curriculum**.

We hope to be able to launch this resource material at a workshop as early as possible in 2021.

EXPRESSIONS of INTEREST in PARTICIPATION

Teachers interested in participating, either as a writer (paid, see below), contributor, feedback provider (on drafts) or in any other ways, please contact our project coordinator:

Course writers required - a call for expressions of interest

The Geoscience Pathways Project is looking for one or two appropriately qualified writers to draft a **Climate Change Unit**, for students (and teachers) of Year 10 Science. The Unit must address all of the requirements of the Australian Science Curriculum for Year 10. Payment for this work will be negotiated on the basis that approximately 10 – 15 hours might be needed to research and write an appropriate 5-week unit.

Expressions of interest should be *no more than one page* and should outline relevant qualifications, experience and enthusiasm to take on this important task. EoI's should be directed to the Coordinator (, Geoscience Pathways Project, by email (jenaltman9@gmail.com) and received no later than 5:00 pm on Friday 8th May.



EES Implementation Workshop

In February we provided our third **SACE Earth and Environmental Science Implementation Workshop** for teachers. The workshop, held at the Tonsley Drill Core Library facility, launched a range of newly prepared EES resources. The focus was on a range of ideas for teachers to implement the externally assessed "Earth Systems Study", required in the Stage 2 Course. Ten speakers provided a wealth of ideas, and each teacher participant receiving a take-away USB containing most of the materials presented. These resources are now

freely available on the GPP website (<http://geoscience.msc.sa.edu.au/Content.aspx?p=1069>) and PowerPoints are available for free via the webmaster (geoscience.pathways@gmail.com).

Speakers at the workshop included *Robyn Pillans* (SACE Curriculum Officer), *Cesca McInerney* (University of Adelaide), *Steve Walker* (NRM Education/ Frog Watch), *Mike Yeo* (Adelaide Botanic Gardens), *Rod Austin* (geophysics technician), *Kelly Sharrad* (EES teacher/curriculum writer), *Jeremy Gramp* (DEW/NRM Education Officer), *Bob Hill* (Environment Institute at the Univ. of Adelaide), *Peter Reeve* (Groundwater Hydrology PhD candidate at Flinders University), *Amanda Vernik* (GPP webmaster), and *Len Altman* (GPP Coordinator). The MC was *Bernd Michaelsen* (DEM)

We are hopeful of offering another **EES Implementation Workshop** in February 2021, together with a launch of our proposed new unit on **Climate Change for Year 10's**. This will of course depend on the situation regarding the Coronavirus pandemic, at that time.

Helpful links

The call was put out to our committee members of any useful links that could be used to help support 'remote learning' at this hard time. Below is a list that was collected to share:

- The Geoscience Pathways website provides a complete workbook for SACE Stage 1 Earth and Environmental Science (EES) and an extensive set of course notes for SACE Stage 2 EES.
<http://geoscience.msc.sa.edu.au/Content.aspx?p=1069>
- Mike Sammartano: This is a great YouTube channel that supports many 8-10 concepts;
https://www.youtube.com/channel/UCBOBwExgkuaHOIIY_ffb3MQ
- Stage 1 & 2: The following open source CC pdf books – very free and distributable to students;
 - Physics Geology – Steven Earle
<https://opentextbc.ca/geology/>
 - Laboratory Manual for Introductory Geology
<https://oer.galileo.usg.edu/geo-textbooks/1/>
 - Environmental Biology - Matthew R. Fisher, Editor
<https://openoregon.pressbooks.pub/envirobiology/>
 - Sustainability: A Comprehensive Foundation
<https://legacy.cnx.org/content/col11325/latest> (download icon on right hand side)
- PBS learning materials have curated FREE, standards-aligned videos, interactives, lesson plans, and more just for teachers.
<https://www.pbslearningmedia.org>
- CK-12.org (Earth Science for Middle school - 8-10)
<https://flexbooks.ck12.org/cbook/ck-12-middle-school-earth-science-flexbook-2.0/>
can be downloaded as pdf with other texts with questions and solutions, sign up as a teacher
- Total “earth science” list for CK-12
<https://www.ck12.org/fbbrowse/list/?Language=All%20Languages&Subject=Earth%20Science&Grade=All%20Grades>
- John Mignone has freely provided this extensive and valuable resource book, based on his many years of experience as a geoscience educator in South Australian schools. It contains 80 excellent practical and research activities for science students from years 5-12. Chapters are available from our GPP website but the entire book can be freely downloaded from:
http://www.energymining.sa.gov.au/minerals/knowledge_centre/stem_in_earth_science/teaching_resources
- NASA STEM @ home for students
<https://www.nasa.gov/nasa-at-home-for-kids-and-families>

- National Centres for Environmental Information past climate and environmental data, derived from natural sources such as tree rings, ice cores, corals, and ocean and lake sediments, extend the archive of weather and climate from over hundreds of millions of years in the past.
<https://www.ncdc.noaa.gov/data-access>
- *Climate.gov* enables students to explore a range of easy-to-understand climate maps in a single interface. Featuring the work of NOAA scientists, each “snapshot” is a public-friendly version of an existing data product.
<https://www.climate.gov/maps-data>
- The TROP ICSU project collects and curates educational resources for teachers and self-learners to learn about Climate Change. The quality of life of future generations is largely dependent on the quality of education that we impart to today’s students.
<https://climatescienceteaching.org>
- South Australian National Parks
 - National Parks and Wildlife Service SA
<https://www.parks.sa.gov.au/Home>
 - Adelaide & Mt Lofty Ranges NRM - Schools in Parks
<https://www.naturalresources.sa.gov.au/adelaidentloftyranges/land/our-parks/schools-in-parks>
 - Adelaide & Mt Lofty Ranges NRM - NRM Education resources including loan library
<https://www.naturalresources.sa.gov.au/adelaidentloftyranges/education/for-educators>
 - NatureMaps
<https://data.environment.sa.gov.au/NatureMaps/Pages/default.aspx>
 - Atlas of Living Australia
<https://www.ala.org.au/>
 - Adelaide & Mt Lofty Ranges NRM - Monitoring and evaluation
<https://www.naturalresources.sa.gov.au/adelaidentloftyranges/about-us/our-regions-progress/monitoring-and-evaluation>

If you have any links that you feel other teachers would benefit from please email the Amanda to get them added to the resource link on the website: geoscience.pathways@gmail.com

Keep your eye on our Teacher's Resources, Aids and Links page
<http://geoscience.msc.sa.edu.au/Content.aspx?p=17>

2019/2020 Committee Members

The following are the 14 members of our new **Geoscience Pathways Management Committee** elected at our AGM on 24th July:

Len Altman (Geoscience educator, GPP Coordinator)
 Carol Aldous (Flinders University Education lecturer)
 Rod Austin (Geophysicist/ TRT/ teacher mentor)
 Dillon Brown (PhD student, University of Adelaide)
 Dylan Irvine (Flinders University, Groundwater Hydrologist)
 Luke McKay (Teacher-geologist)
 Cesca McInerney (University of Adelaide)
 Bernd Michaelson (Geologist DEM)
 John Mignone (Geoscience educator/)
 Cynthia Pyle (Geoscience educator)
 Peter Reeve (PhD student, Flinders University)
 Christian Riebeling (Henley High School)
 Kelly Sharrad (Teacher-geologist, Treasurer)
 Jan Varga (PhD student, University of SA)
 Amanda Vernik (GPP Webmaster, GPP Secretary)

Thank you to our members for their dedication and support to the Geoscience Pathways Project.



NOTE:

Our next Committee meeting will be a 'virtual' meeting using Zoom (or similar), on Wed. 27th May 2020,

Our AGM is scheduled for **22nd July**, but **may** need to be **postponed**.
Watch this space for details of these meetings.

New membership and casual attendance at our Committee meetings are very welcome, please email lenaltman9@gmail.com

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