



Rocks, Minerals and Elements: Exploring the Data

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Geoscience Australia

Abstract

This hands-on workshop explores the essential role of rocks, minerals and elements in the development and manufacture of everyday items. Modelled on activities delivered through Geoscience Australia's Education Centre, the session uses accessible resources and familiar objects to help participants connect classroom geoscience with real-world materials, technologies and clean-energy systems. Participants will investigate how critical minerals and strategic materials support renewable energy generation and other technologies central to a sustainable future. The workshop is designed to be practical, interactive and readily adaptable: educators will leave with classroom-ready ideas, supporting resources and materials lists that can be modified for their own learners. By linking fundamental rock and mineral knowledge to contemporary resource challenges, the session demonstrates how geoscience education can build scientific literacy and relevance across primary and secondary contexts.



Discover the Hidden World Beneath Our Feet!

Dr Hannah Moore

Australian Earth Science Education (AusEarthEd)

Abstract

Almost everything we rely on — phones, cars, buildings, food systems and renewable energy technologies — begins in the ground as minerals, rocks, soils or other Earth materials. This interactive workshop invites participants to step into the role of geologists and geophysicists as they explore how vital mineral resources are located and understood. Using accessible, everyday materials, participants will investigate techniques such as geological mapping, exploration drilling, magnetic and gravity surveys, and electrical and electromagnetic methods. The session also introduces Australia’s Critical Minerals List and examines why these resources are central to emerging technologies, resilient supply chains and the transition to a low-carbon future. Designed for practical classroom use, the activities help students connect Earth science concepts with real-world resource challenges and everyday decision-making.



EarthBank in the Classroom: Crystal Clear - Helping Kids See the Magic Inside Rocks

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Abstract

Looking at rock thin sections under cross-polarised light can be one of the most memorable ways for students to encounter the hidden structure and beauty of Earth materials. However, transporting petrographic microscopes to schools is expensive and logistically difficult. This showcase presents the use of 3D-printed slide viewers that allow students to examine rock thin sections in cross-polarised light without access to a specialised petrographic microscope. Developed through outreach with thousands of Year 2 to Year 12 students across Victoria, the approach uses simple, portable and engaging tools to make microscopic rock textures accessible in classroom and outreach settings. Additional 3D-printed teaching aids support hands-on exploration and discussion. The session demonstrates how low-cost fabrication and creative design can expand access to authentic geoscience experiences and help students connect mineral-scale observations with broader Earth science concepts.



Geoscience for a Sustainable Future

Dr Indrani Mukherjee

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Abstract

This session explores how geoscience can support a sustainable future through topics including the UN Sustainable Development Goals, critical minerals and renewable energy, geohazards and community resilience, Earth systems thinking and deep time. The activity is designed to engage participants with complex and sometimes contested Earth science issues, demonstrating the nuance required to evaluate evidence and develop informed positions. Students are introduced to rock and mineral specimens and consider their broader roles in everyday life before researching a topic of interest using credible sources. They then present arguments that support their chosen stance, encouraging critical thinking, evidence evaluation and communication. By linking fundamental geological knowledge with major societal challenges, the session demonstrates how Earth science can help learners understand resource use, environmental risk and long-term planetary change. The activity has been successfully implemented with first-year students at UNSW and has proved popular with learners.



How Geoscience Knowledge Has Been Constructed

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Abstract

This activity explores how geoscience knowledge has developed from ancient ideas about the Earth through to contemporary scientific understanding. Using images and short historical case studies, participants examine key moments in the construction of knowledge about the planet and the processes that shape it. The session emphasises that scientific ideas rarely emerge from isolated flashes of inspiration; instead, they are built through collective, cumulative and often anonymous work over long periods of time. Participants also consider how past “scientific errors” can reflect the limits of available evidence, theory and technology, and how changing perspectives may lead to major advances. The activity promotes careful observation, data analysis, hypothesis building, information searching and evidence-based argument. Designed with easily printable JPG or PDF materials, it offers educators a flexible way to teach the history, philosophy and practice of Earth science.



Low-Barrier Digital Technologies for Authentic Tertiary Geoscience Teaching and Assessment

Dr Melinda McHenry

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Abstract

Tertiary geoscience programs are navigating several converging pressures: increasing demands for student affordability and access, shifting perceptions of geoscience market relevance, and the rapid integration of GenAI tools in both assessment and industry practice. These forces are reshaping student expectations and the skills they need to succeed, making it more important than ever for educators to adopt flexible, engaging, and future-ready teaching approaches.

This workshop introduces practical, low-barrier teaching tools that respond directly to these challenges. Participants will explore:

- Open-source geospatial data-collection tools and mobile rock-identification apps
- StoryMaps and concise, high-impact social-media style communication strategies for communicating geoscience concepts
- Mobile FieldMaps workflows for generating large student datasets that support assurance-of-learning requirements

These tools will be demonstrated through applied examples drawn from geoconservation and geotourism, which are areas where student interest is rapidly growing and where geoscience skills can be taught in accessible, industry-relevant contexts. Together, we will complete two adaptable activities: a fire-consequence assessment for a cave system, and a geotrail planning exercise for a former mine-closure landform.

All activities are designed to work in large or small classes, in online or in-person modes, and require no prior technical skill from educators or students. They are also fully compatible with AI-supported learning and assessment workflows. The focus is on providing practical, classroom-ready methods that broaden student engagement, strengthen geoscience capability, and support educators as the discipline continues to evolve.



What's Shaking Down Under?

Dr Sima Mousavi

AuScope / Australian National University

Abstract

This session introduces ways to bring real earthquake data into the classroom through the Australian Seismometers in Schools (AuSIS) program and associated online resources. Participants will explore how seismic waves, earthquake location, hazard awareness and Earth systems thinking can be taught using real-time data, interactive tools and simple classroom models. The session highlights Australian examples, including the 1989 Newcastle earthquake and the 2021 Woods Point earthquake, to challenge the misconception that earthquakes do not occur in Australia. Teachers will work with live and archived datasets from AuSIS, Geoscience Australia and global sources, and will test activities such as reading waveforms, identifying P- and S-waves, mapping earthquakes and modelling seismic processes. By combining authentic data with accessible hands-on tasks, the session supports inquiry-led learning and helps students connect geoscience with natural hazards, monitoring networks and community resilience.



Exploring the Solar System: Interactive Murals for Geosciences

Facson Vargas

Liceo José Antonio Carvajal

Abstract

This workshop presents a low-cost, scalable approach to geoscience outreach through interactive Solar System murals for schools and public learning spaces. The murals represent rocky planets, gas giants and dwarf planets, with QR codes linking to short videos about each body's composition, atmosphere, geology, orbit and scientific significance. The activity uses comparative planetology to connect planetary processes with Earth-based challenges, including climate change, sustainability and mineral resources. Examples include Mercury's core as a window into planetary formation, Venus as a model for greenhouse warming, and asteroids and dwarf planets as contexts for discussing future resource use. Participants will explore how QR-linked videos, open web resources and simulations can support active learning, collaborative problem-solving and critical thinking. Adaptable across primary, secondary and outreach settings, the activity encourages learners to see astronomy and geoscience as connected ways of understanding Earth and its place in the Solar System.



Learning From Extinction: Teaching Earth System Resilience Through Deep Time

Gabriel Guy

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Abstract

Mass extinction events provide powerful examples of Earth system disruption, ecological collapse and long-term recovery. This interactive workshop explores how deep-time extinction and recovery can help students understand resilience, adaptation, environmental management and the interconnectedness of Earth systems. Participants will trial collaborative classroom simulations based on selected Phanerozoic extinction events, including the end-Devonian and end-Permian crises. Through evidence-based tasks, educators will model how changes in climate, ocean chemistry, tectonics and biodiversity can destabilise ecosystems and shape recovery over millions of years. Rather than treating extinction only as catastrophe, the session emphasises resilience, adaptation and the long-term processes that rebuild ecological systems. Participants will leave with adaptable strategies for using deep-time case studies to support systems thinking, data interpretation and discussion of contemporary environmental change across upper primary, secondary and tertiary contexts.



Climate Change: Using Technology to Visually Communicate

Kelly Sharrad

Open Access College

Abstract

Climate change is one of the most significant challenges facing society, yet its causes and impacts can be difficult for learners to visualise when they occur over long timescales or in places far from students' everyday experience. This workshop explores how digital technologies can be used to communicate climate change evidence and impacts in accessible, visually compelling ways. Participants will consider examples that act as hooks and conversation starters, supporting students to ask questions, interpret evidence and take a more active role in their learning. The session aligns with Version 9 of the Australian Curriculum and the new South Australian Curriculum, with particular links to scientific dispositions such as curiosity and environmental responsibility. Designed for Years 5, 9 and 10, the approach positions teachers as facilitators and uses visual communication to support understanding, discussion and informed action.



Outback STEM: Geology and Palaeoenvironments

Leah Lynham

EduRock

Abstract

This workshop shares approaches for connecting outback learners with the geology and palaeoenvironments that surround them. Designed especially for children living near resource-mining regions, the activities build a picture of landscape evolution while linking local geology to curriculum concepts and real-world resource contexts. The sessions are highly hands-on and require very few tools beyond basic local knowledge, inexpensive materials and an enthusiasm for place-based learning. By investigating the rocks, landscapes and environmental history of their own region, students gain a stronger sense of connection to Earth science and a clearer understanding of how geological knowledge underpins resource industries and future workforce pathways. The workshop demonstrates how local landscapes can become powerful teaching resources, sparking curiosity and helping students see geoscience as relevant to their communities, futures and Australia's resource needs.



Earth Detective Kits

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Abstract

Earth Detective Kits are classroom-ready and informal learning resources designed to spark curiosity and build observational and problem-solving skills in primary-aged students. Each kit is story-driven, inviting learners to become “Earth Detectives” who solve a simple geological mystery. Participants will explore a kit firsthand through hands-on investigations, simple experiments, worksheets, samples, educational posters and a motivational letter to young Earth Detectives or Earth Guardians. Existing themes include the rock cycle and sedimentary rocks, supported by tools such as a grain-size identification card. The kits align with curriculum outcomes in inquiry skills, Earth materials, landscapes and landforms, and geologic time. They can be adapted for single lessons, extended units, informal education, homeschooling and rural or remote contexts. Through tactile, visual and narrative-based activities, the kits offer an accessible pathway for young learners to see themselves as scientists investigating a changing planet.



Linking Rocks, Critical Minerals and Plate Tectonics

Phil Gilmore

TESEP

Abstract

This workshop showcases TESEP’s hands-on rock kit, critical minerals kit, plate tectonic poster and integrated online resources as practical tools for Earth science education. Participants will explore activities that investigate rock and mineral properties, the rock cycle and plate tectonics, with links to topics across the Australian Curriculum and state and territory syllabi. The resources can be adapted for learners from primary through secondary levels and across a range of STEM contexts, including states of matter, magnetism, groundwater, chemical reactions, critical minerals, natural hazards, local landscapes and resource use. The workshop demonstrates how tactile, specimen-based activities can make abstract Earth science concepts visible and memorable. By connecting rocks and minerals with plate tectonics, critical minerals and everyday applications, the session provides teachers with flexible strategies for inspiring future Earth scientists and strengthening geoscience understanding across the curriculum.



Beyond the Test: Using StoryMaps for Integrated Learning and Assessment in Secondary Geoscience

Prof Sharon Locke

STEM Center, Southern Illinois University Edwardsville

Abstract

This hands-on workshop explores how StoryMaps, a free digital tool within Esri's ArcGIS suite, can support integrated learning and authentic assessment in secondary geoscience. By combining maps, spatial data, multimedia and narrative prose, StoryMaps enable students to create digital products that communicate complex ideas through evidence-based storytelling and visualisation. Participants will examine how everyday classroom tasks — including data analyses, reflective writing, concept maps, photographs and other artefacts — can build toward a culminating StoryMap portfolio that students are proud to share. The outward-facing nature of the final product can encourage ownership, purpose and motivation beyond a conventional test. The workshop will introduce practical strategies for scaffolding StoryMap projects, developing rubrics for integrated learning and using iterative feedback to support student growth. Participants will leave with ideas for transforming assessment into a richer window into students' geoscience thinking.



Interactive Notebooks for Geophysics Education

Prof Stuart Clark

UNSW Sydney

Abstract

Engaging students in physics and geophysics can be challenging, particularly when learners must work with equations, calculations, images and models across multiple software platforms. This workshop demonstrates how interactive notebooks can consolidate theory, videos, worked solutions, images, interpretation tasks and exercises in a single learning environment. Students can replicate notebooks, add their own notes, explore parameter changes and share solutions with educators and peers. The approach supports scaffolded learning at different stages of teaching, from preparation materials to activities that perform initial calculations before asking students to tackle more complex problems. Delivered using Team-Based Learning, the workshop will show how interactive notebooks can build confidence, support peer-to-peer learning and reduce cognitive load by keeping core resources and tasks together. Examples from geophysics will illustrate how notebooks can be used to connect calculations, interpretation and collaborative discussion.



CoRE Games

Suzy Urbaniak OAM

CoRE

Abstract

CoRE Games use contextual, technology-driven learning to connect Earth science with real-world experiences and career pathways in the resources industry. This workshop introduces the CoRE Learning Model and demonstrates how digital games can engage students from Years 3 to 12 in interdisciplinary science. Participants will explore Resource, Response and Rescue, a Minecraft-based game in which students undertake emergency response training to manage natural disasters affecting a mining town and its mine. They will also examine Old as Dirt, which follows the minerals value chain from the formation of iron ore through to export. The workshop will demonstrate how curriculum content is embedded within these games and how educators can use them to support Earth science learning, teamwork, problem-solving and career awareness. By linking geoscience to authentic industry contexts, the session highlights the importance of Earth science in the twenty-first century.