

# INTERNATIONAL SC13NC3 FA1R 2023

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**Monday 4 September to Friday 8 September 2023**  
**Australian Science and Mathematics School, Adelaide**  
**Space to Innovate**

## Challenge Based Learning Activities

The descriptions of the Challenge Based Learning activities are listed below. Please read and then complete the attached form to choose which activity your **teacher(s) and students** wish to participate in.

We will endeavour to provide all participants with their first preference but if many participants choose the same activity, we may need to allocate some participants with their second or third preference.

**Space to Innovate: Artificial Intelligence** - Unlock the transformative power of Artificial Intelligence and explore its impact on humanity, while carefully considering the ethical and cultural implications of its implementation and the promotion of equity. This challenge provides the opportunity to experiment with cutting-edge technology and develop creative, innovative solutions in physical and virtual spaces.

**Space to Innovate: Astronomy** - There is renewed interest in, competition for and investment in space exploration and expansion. What innovations will help us learn more and go further? What implications are there for life on Earth? How can we work to ensure that everyone in the world benefits from the innovations in space?

**Space to Innovate: Palaeontology/Archaeology** - In this challenge, you will consider questions about our understanding of the past and its lessons for our future innovation. What can archaeology teach us about the history of human innovation, and its impact? What can palaeontology teach us about innovation in the animal world, and how has this supported survival? What contemporary technological (and other) innovations are scientists using to deepen our archaeological and palaeontological understanding? What spaces are these innovations in archaeology and palaeontology taking place in? What new and innovative fields are emerging within these broader areas (e.g. space technology - it's a thing!).

**Space to Innovate: Microscopy** - The microscope was invented in 1590 and every major field of science has benefited from the use of some form of microscope since. Today microscopy goes way beyond using our eyes to view a magnified image. Modern technologies, such as electron microscopy allow us to see individual atoms and have moved from the scale of micrometres to the scale of nanometres and are allowing innovation on smaller and smaller scales. You will have the opportunity to see, learn more about, and analyse images from, a range of microscopy technologies and the role they play in our developing understanding of everything from novel materials, such as those we might use in future space flight, to what's happening on the smallest scales in living organisms. (25 students max for engagement with Flinders Microscopy).

**Space to Innovate: Biomedical Engineering** - Recently the skull of a woman dead nearly 5,000 years was discovered with a prosthetic eye made of tar and animal fat. Generally, in the past prosthetics were made from wood and leather however, nowadays the development of innovative materials such as titanium, thermoplastics, computer interfaces and silicon-based skins have driven the evolution of prosthetics and assistive devices into a new realm. Where could this go next, and how can we help all people to have the opportunity to be successful in their chosen pursuits? In this challenge, you will investigate and experiment a range of personal challenges to emphasise with a stakeholder in order to design and create an innovative solution that builds equity for all.



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**Space to Innovate: The future of flight** - Flight is not new; there is reference to flight in ancient mythologies and early attempts at building flying devices were documented 1500 years ago. Kites were first documented in the 5th century BCE and hot air balloons were tested in the 3rd century BCE. Inventors such as Leonardo Da Vinci drew designs for flying machines and parachutes in the 15th century and the 19th century saw steam powered monoplanes, and the invention of gliders. Control and power problems were solved in the early 20th century when the Wright brothers made the first sustained, controlled flight of a heavier than air aircraft. Since then, there have been significant advances in flight, and drones are readily available. So what's next? What will future innovation in flight look like, and how can it best serve humanity?

**Space to Innovate: Indigenous art** - Take a deep dive into indigenous art. Learn how to critically analyse and understand art. With the help of experts, learn how to interpret and understand a range of artworks to make sense of them. After you have learnt some critical skills, you will have the space to creatively innovate art of your own and display it while identifying meaning to your own experience – how could this innovate our personal perspective of the space around us?

**Space to Innovate: Living with Fire and Flood** - Over the last 10 years Australia has had an escalating experience of dramatic and often devastating weather events. As we move into the future, we need to face a range of questions concerning how we learn to live with these events. How can we utilise technology to mitigate the impacts of climatic change? What tools of spatial analysis will allow better decision making? How can we create sustainable and safe living spaces? What innovations can assist emergency services effectively manage climate crisis events?

**Space to Innovate: Forensic Science** - Magic, religion and superstition were common tools used to determine guilt or innocence of the accused in antiquity. Starting with the scientific revolution, the techniques of forensic science have developed and been refined in ways that couldn't have been imagined. This does, however, come with a cost – innovation in forensic science and in public policy contain their own biases. Where are vulnerable people in this space of innovation, and how can we make space for equitable treatment of everyone?

**Space to Innovate: Your own innovation** - In this Challenge, you will identify the innovation you want to see in your world and make it happen. What solutions currently exist? What are their downfalls? Why is your solution better?

