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## Designing Games in STEM

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Games have been used more and more in education to provide engaging learning experiences with students in different year levels in education. Video games offer immersive learning opportunities through technologies such as Virtual and Augmented Reality (VR/AR). Similarly board games provide the opportunity to engage with discipline specific STEM concepts and skills in fun and unusual contexts, but often in an economical way that does not rely on cumbersome digital technologies. Some of the benefits include:

- Simulations such as Pandemic offer players the opportunity to learn about the Nature of Science (NOS) and what roles different people in STEM play in medical emergencies;
- Historical re-enactments such as On the Origin of Species allow students to engage with the History of Science (HOS) where the game focuses on decisions made on contemporary understand of STEM concepts;
- Games can offer the opportunity to engage with entrepreneurship where STEM ideas are used to develop the narrative. Games such as Nefarious: The Mad Scientist Game engage players to be the best mad scientist they can be;
- Representations of concepts can be demonstrated in games where illustrations and metaphors are employed to accurately represent STEM ideas. Games such as Organ Attack! and Go Extinct! use accurate representations of bodily systems and evolution, respectively;
- Role Play allows students to engage with Social and Emotional Learning (SEL) strategies whereby students get to take on roles to understand what is involved with STEM roles, but to act in a way they might not normally in their everyday world.

Games such as Pandemic ask students to think like a pilot or medical technician, giving them more confidence acting in ways different to their everyday lives.

In this workshop we will focus on designing games with the intention of teaching within and across the disciplines of STEM. Using dice, cards and other board game materials we will work in groups to identify concepts and skills we want to teach. We will develop these ideas using physical materials, narrative, and gameplay to learn STEM concepts with a sense of fun!