## AUSTRALIAN STEM VIDEO GRME CHALLENGE

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# 2024 THEME **STRRS**

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# 2024 THEME **STRRS**

The stars are mansions built by Nature's hand.

## William Wordsworth



Stars are everywhere, but not just in space

### Space

Stars are big, bright blobs in the sky, fusing hydrogen and generating incredible amounts of energy.

### Mathematics

Stars are geometric shapes that USUALLY have 5 or 6 points... but what are the other options?

### Our theme this year is stars

We want you to build a game that incorporates one (or more) of these aspects of stars. Or, maybe you can think of another way you can use the idea of a star to help get your game going.

The starry night Vincent van Gogh

# BREAKING DOWN THE THEME... BUILDING GAMES WITH STARS

Let's take a look at each of these different ways of thinking about stars, and how they might help you in building your game.

### Space

As Douglas Adams once said, 'Space is big. Really big.' And when thinking about stars in space, there are a lot of different things you might consider.

There is the life cycle of stars – the processes that stars go through from birth to death. Star death is especially interesting. You may have heard of exploding stars or supernovas, red giants, white dwarfs, neutron stars, pulsars or black holes. Perhaps you could build a game that features some of these aspects of a star's life, as a central feature of the game or maybe as part of the background to the action that takes place in your game.

What goes on inside stars? Hydrogen atoms fuse into other, larger atoms in a process that leads to the atoms that make up you and everything around you. Gravity and nuclear fusion combine and fight against each other to create unbelievable temperatures and pressures. What might that be like? Perhaps you could build a game that travels into a star and find out.

We find stars all throughout the sky, but there are patterns and groupings to their positions. There are multiple star systems, including what are called binary stars, as well as larger collections of stars called galaxies and globular clusters. From here on Earth many different cultures have built pictures from the stars that we call constellations. There are shooting stars, that aren't stars at all. And we look at stars through a huge range of different telescopes – optical, refracting, reflecting, radio, infrared, ultraviolet, x-ray, space.

And with all these stars in the sky why is it dark at night? This is the dark night sky paradox (sometimes called Olbers' paradox from German astronomer Heinrich Olbers) How could you use some of this as a part of your game?

And of course, although we can't get to stars yet, we can certainly imagine getting to them. Maybe your game could incorporate exploration of stars, travelling to stars, navigating your way to particular stars, or avoiding particular stars.



#### Mathematics

Maybe space isn't your thing. Maybe you'd like to build a puzzle game or a game that focuses on stars as shapes instead of stars in space.

The shape of a star – not the ball in space, but stars that we can draw – brings us to the part of mathematics called geometry. Stars are a type of polygon and you might like to consider how you could include them into your game.

Star shapes can be drawn with 3, 4, 5, 6, 7 or many points, and can be drawn with intersecting lines or not.

Stars can be included as part of tesselations or tiling patterns, which might form the background of a game, or part of the game's focus.

Geometrical stars can be described using Schläfli symbols, a way of describing geometrical shapes without actually drawing them. You could use these descriptions as part of a decoding puzzle game, or perhaps a matching game.

And there's a whole lot of other stars in geometry, including heptagrams and Moravian stars (also known as augmented rhombicuboctahedra). Could you make one of these as a part of the goal of your game? Or make one of these turn into something else? Or have game characters use these as part of the game?

## I have loved the stars too fondly to be fearful of the night.

## Sarah Williams

## **BUILDING YOUR STAR GAME**

Of course, we're not suggesting that these are the only ways of thinking about stars. Your starting point might be to just let your imagination go crazy, and if you come up with something we hadn't even thought about, that would be great.





