Challenge Based Learning Activities

The descriptions of the problem based learning challenge activities are listed below. Please read and then complete the attached form to choose which activity your teacher 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 preference.

What Happens if the Cars of the Future go Rogue?
How can we stop a Google car with the least damage to the car and its passengers? Participants will explore how autonomous cars function, find their way around and avoid obstacles. They will consider two scenarios – causing a “safe” collision, considering motion, dynamics and materials, AND Shutting down the car or re-instating the original programs.
These scenarios both consider communication, remote control and programming/robotics
Subject Focus: Physics, programming, communication
Activity Excursion: The Adelaide Royal Show

There’s Gold in Them Thar Hills!
You work for a mining company that has just taken over the lease of an old gold mine in the Adelaide Hills. Technology to do with mineral exploration, mining and refining has improved remarkably since this area was last mined for gold. Legislation around how mines operate have also changed resulting in the need for Environmental Impact Statements.
You will be part of a multi-disciplinary team that is searching for new gold deposits so will have an option to be part of the exploration team, the mining engineering team; or the environment impact team. You will be required to work collaboratively to achieve your goals – find the deposit, mine the deposit, and make sure environmental requirements are adhered to. You will be making your own metal detectors and participating in an excursion to two old gold mines in the Adelaide Hills.
Subject Focus: Geophysics, environmental science, electronics.
Activity Excursion: Jupiter Creek in Adelaide Hills.

Inspirational Anatomy
Have you ever wondered about what is inside you? This challenge will help you learn, with a visit to an anatomy museum to gain inspiration for their installation.
You also dissect parts of animals e.g. chicken wing, heart, brain, kidney to delve deeper into their structure and function.
Your ultimate challenge is to create a model/artwork/other format which demonstrates your knowledge, understanding and creativity of your anatomy.
Subject Focus: Human Anatomy
Activity Excursion: Anatomy museum

Fibonacci’s Mosaics
This challenge allows you to explore the intersection between Art and Maths. Specifically you will visit a mosaic gallery to gain inspiration and understanding about creating a mosaic tile, and design your biodiversity themed mosaic that will be displayed somewhere around the school. Fibonacci’s sequence.
Subject Focus: Biodiversity/Maths- with Practical Art Skills aspect.
Activity Excursion: - Mosaics by Design gallery
Rocket Subs!

Your challenge is to design and build rocket powered submarines. These vessels will be propelled through a long piece of water filled guttering which has a mesh covering. The winning submarine will travel the furthest distance using a fixed class rocket.

Subject Focus: The physics of streamlining submarines
Activity Excursion: Hopefully the Adelaide Submarine Corporation!!

Solving Inner-city Problems in Adelaide

Students will investigate case studies that have solved inner-city problems in Adelaide, including the redesign of Adelaide Oval and the relocation of the Royal Adelaide Hospital. They will choose an inner-city problem to design a solution for, incorporating current trends in architecture, materials science, politics and laws, and environmental sustainability. These problems could include the design of an inner-city school proposed for Frome Street, improving inner-city traffic and transport options, improved usage of the Parklands or a student-initiated problem. Students will create a proposed solution to the problem using design and technology skills such as technical drawing, 2D or 3D modelling, and/or 3D printing of prototypes.

Subject Focus: Design & Technology, Politics, Environmental Science
Activity Excursion: Adelaide Oval Roof Climb.

Trash Pirates

Journey to several salvage yards, gather any variety of items, and recycle them to create/release a treasure hidden in the trash.
Cut, drill, saw, hammer, paint, bleed, sweat, cry, and laugh with us! No experience with tools necessary!
Find an old wiry thing, some wooden sticks, or license plates and turn them into an outdoor sculpture.
Find a little cabinet door, adhere 20 hinges onto it, attach some other random bits, and call it a masterpiece.
Find a container that needs some love and character to create a planter for your porch.

This Challenge Based Learning Project is for you if you love to reuse, repurpose, refresh, recycle, refurbish, and reinvent things!!

Subject Focus: Sustainability, Art, Technology, Creation
Activity Excursion: Salvage Yards

Art

The Australian Indigenous art movement is becoming more recognised globally. Aboriginal art transcends decoration/aesthetics and has more meaning around culture, law, belonging, country, religion.

Can we use ancient techniques to tell our contemporary stories?

The group will bridge time and cultural barriers by exploring Indigenous art via a visit by an Aboriginal artist Elizabeth Close (you can look up her art work on Facebook – Elizabeth Close Aboriginal Artist) who will explain a range of techniques and methods. She will explore the ideas of Country, Dreaming, and symbolism as a means of communication.

Research will be undertaken into a variety of traditional and contemporary indigenous art techniques and the media used in their creation. Students will present their own interpretation of these themes and techniques in their individual art work which they will take home with them.
“The way that the Anangu tell their stories is through art, and the students can tell their own stories using the techniques we show them - and that isn't, how to dot, but how they can use symbology and iconography that THEY create, to tell THEIR OWN stories, not to try and re-tell my stories with my techniques.” So in summary, students will create work reflecting their lived experience rather than just replicating Aboriginal Art.

The final activity will focus on preparing, making and presenting an art piece utilising our knowledge of indigenous art techniques. There will be a gallery walk of the art to gain an understanding of the work others have done.

Subject Focus: Australian indigenous art, culture, history and science.

Activity Excursion: Flinders University Art Gallery and South Australian Museum

**Choose Your Own Adventure**

Students choose anything that they would like to work on / investigate / have a go at making / designing / investigating / thinking. First day, students set their own challenge, identifying realistic outcomes and what they will present, and how it relates to the theme. Then work over the next couple of days to make a presentation explaining to the group what they have found / made / done.

Previous successful projects included a model computer virus & scanner, 3D printed ocarinas, technologically mixed music, a great presentation on tesseracts, a model Stirling engine, progress on an Arduino satellite… the possibilities are endless!

Subject Focus: Engineering/Maths/Science/Depends on students!

**B-Girl Zowi Dance Off**

So you think you can dance?

Bust a groove this ISF by building and programming Zowi the cute, hackable, 3D printed robot. The combination of big feet, strong ankle joints, and clever programming let the cute little bot stand on one leg, do a moonwalk, and even hop. This challenge will give you the opportunity to experiment and experience a range of skills including dance, design, choreography, 3D printing, 3D modelling, DJ’ing, programming and electronics. You will have the opportunity of working in Flinders University state-of-the-art Robotics and Automation laboratories previewing the high-tech learning spaces including a demonstration by the Baxter humanoid manufacturing robot. The b-girl course will conclude with a dance off competition between all robots, respect will be given to creativity, programming skill, and musicality.

Subject Focus: STEM, Robotics, Human Movement

Activity Excursion: Flinders University Robotics and Automation Laboratories