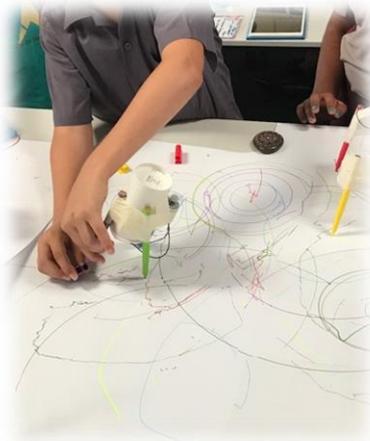


# APS STEM EXPO

## 27 June 2018



When participating in STEM activities, students develop skills such as collaboration, communication, persistence, resilience, problem solving as well as critical and creative thinking. Providing students with opportunities to develop their problem solving skills through creative STEM design is vital to building learners who will be able to adapt in a job market that is constantly evolving.

At Aveley Primary School this term, the amazing students in Years K-6 have been creatively solving problems and are ready to show off some of their fabulous solutions.

**Aveley Primary School Undercover Area.**

**2:30 – 3:30pm**

## What to see and do at the expo?

### Kindergarten

**Problem:** All term the children in Kindy have been learning about insects. They talked lots about how insects can camouflage and hide themselves from predators like birds. But when the Kindy kids were given a whole new environment they noticed that the insects they had studied wouldn't be able to camouflage in that environment very well.

**Inquiry Question:** Can you design and make an insect that will camouflage in this environment safely.

### Pre-Primary

**Problem:** Term 2 has been a very rainy term and teacher's teddy bears had been accidentally left out in the rain. The students wanted to help keep the teddy bears dry from all the rain. Together they brainstormed lots of different materials that the teddy could wear to keep dry. They then investigated these materials.

**Inquiry Question:** Can you design and make a protective piece of clothing to keep a teddy bear dry?



### Year 1

**Problem:** This semester the Year One's read *The Very Hungry Bear* and in Science they investigated different materials and their properties. At the end of these units the students were asked what would make a good house warming present for a bear. They decided he needed a new chair. The students identified different types of chairs found in areas of the school. The children used tablets to take photos to identify different uses and purposes of chairs. They viewed the story 'A Chair for Bear' and looked at what makes a good chair. The students discussed the size, shape and weight of their bear, and analysed the requirements for a suitable chair for their bear.



**Inquiry Question:** Can you design and make a chair that is comfortable, safe and the right size for a bear? The only materials available are recycled paper and/or newspaper and masking tape. The chair has to be sturdy and hold the bear.

### Year 2

**Problem:** Mrs Boardman likes to go out for cake with her friends. She finds that some places do not display very attractive/delicious looking cakes. The year 2 T6 class had to come up with a way to make and design a display sign and a cake which would appeal to Mrs Boardman (entice to purchase).

**Inquiry Question:** Can you and your partner design a cake with a display sign which will appeal to Mrs Boardman and convince her to purchase this from a cake shop display?

**Problem:** As a class the Year 2 students in T7 and T8 have been researching healthy foods and were asked to design a healthy sandwich. After researching which foods are healthy they used the school's vegetable garden to grow the food themselves. While they were making these sandwiches, they noticed some students in their class were absent and the classes felt upset that they had missed out. When problem solving a way to get their friends a sandwich they decided they need a delivery service.

**Inquiry Question:** Can you design an algorithm to deliver a sandwich to your friend's house?

**Problem:** We could not plant our cress in Mr Longbottom's garden as it was over grown from the holidays. This was a problem for the students as they then needed to design and construct an alternate garden bed for their cress. They spent some time looking at and drawing how Mr Longbottom built his garden bed so we could use those ideas when designing and constructing our own.

**Inquiry Question:** Can you design and make a container suitable for growing cress considering the materials you choose and if they are suitable for growing seeds?

### Year 3



**Problem:** After reading about refugees in camps around the world, the Year 3 students realised that one major problem for refugees was the lack of footwear. These people had no shoes and limited materials available to them, no money to purchase shoes or way of getting new shoes. This was a problem for them as no shoes meant they were walking on rough and hot surfaces and they often had to walk long distances when seeking safety. The year 3 students read stories about refugees who had walked for months at a time. They also spoke to a Sudanese woman who had experienced some of these conditions.

**Inquiry Question:** Can you design and make a pair of shoes using the limited materials refugees would have access to in their refugee camp and considering what features would be important in a shoe for a refugee walking long distances?

### Year 4

**Problem:** The Year 4 students have been investigating the 21st century problem of the unhealthy effects of digital technology on their lifestyles. Children have been researching one of the playgrounds at school to investigate how they can improve it to encourage more participation on physical activity. In teams, children collaborated to use a design process to design a play environment that is exciting and stimulating. They investigated the properties of materials and how to choose materials that suit different purposes for their playground design.



**Inquiry Question:** Can you design a stimulating and exciting piece of playground equipment that will solve the problem of children spending too much time on non-physical activities? Consider the needs of your fellow students and justify the materials you have chosen in your design.



### Year 5

**Problem:** The Year 5 students had been discussing the importance of evacuation drills and why muster points are chosen. After completing an evacuation drill themselves using probability to be given a random location in the school they discovered that the time for each class was inadequate to get to the muster point promptly and safely. They decided to take it upon themselves to research what muster point would be more suitable depending on your location at Aveley Primary School and the type of problem you are evacuating from.

**Inquiry Question:** Is our evacuation policy at school the most effective it could be? Are you able to design an evacuation route and muster point which will get all members of the school to safety promptly? You need to consider: What makes a safe evacuation route? What allows classes to get there quickly and what areas need to be avoided to ensure the problem doesn't escalate during the evacuation?

## Year 6

**Problem:** After investigating different types of creators and destroyers in Science, the Year 6 students identified environmental, economic and physical impacts of a natural disaster and how important the collecting and retrieving of data is from a disaster zone, however this is sometimes very difficult to do.



**Inquiry Question:** Can you design and create a vehicle that is able to sustain the high and volatile temperatures located in volcanoes to collect data? The vehicle should incorporate the use of technology to transmit information such as; temperature, location, environmental samples and must be able to be controlled from an offset location.

## Happy Kids Club

**Problem:** During Term 1 on this year, the Happy Kids club along with Mr Coci and Mr Longbottom spent many sessions preparing the garden beds and planting seeds in the school's vegetable garden. They did lots of research around how to grow their plants. This term, as pests and wildlife threaten their growing crop they had another problem to solve.

**Inquiry Question:** Investigate, design and construct an effective solution to protecting our plants from pests and wildlife that are attacking our crops?

## CoderDojo Club

**Problem:** During the after school CoderDojo club, students were given a number of Inquiry questions to explore in small groups. They had access to a range of resources such as robots, drones, 3D printers and construction materials.

1. Your friend has an art project due for Ms Solig but they have broken their arm and are unable to draw. Create a solution for them to this problem.

2. Your friend is stuck on the other side of a double wall and you need to send them a message. On your side of the wall there is a 15 cm by 15 cm hole to your left and on your friend's side there is a 15 cm by 15 cm hole to their left. You need to find a way to pass a message to your friend.



3. You and your friend went for a walk at Bell's Rapids. As you were walking on the rocks you fell down and hurt yourself. An ambulance couldn't reach you; create a solution to get you help.

4. The wheels that came with the Lego WeDo were not large enough for our Moonscape 4 wheel drive course. How are you going to create a solution to this problem?

**Thank you all for coming!**