

KU Mayfield Preschool

Becoming Little Scientists



Early Childhood Australia
A voice for young children

Celebrating **80** years

EARLY CHILDHOOD AUSTRALIA NATIONAL CONFERENCE 2018

BE THE DIFFERENCE
FOR CHILDREN AND FAMILIES



Paper Plane Project: Becoming Little Scientists

This presentation will showcase a project about paper planes that became the catalyst for children and educators delving deeper into Science Technology Engineering and Maths (STEM) to become a certified 'Little Scientists House'.

After hearing about the project and children's learning there will be an opportunity for participants to explore the STEM concepts through making paper planes themselves.

“Education is not the learning of facts but the training of the mind to think”
- *Albert Einstein*

Why STEM?

- ▶ It's how young children naturally learn
- ▶ A couple of educators already had a strong interest in science and technology
- ▶ We have a connection with a local primary school through our shared interest in science
- ▶ From industry to innovation

It all began with Science

- Research shows that most children have formed an opinion about science (either positive or negative) by the time they reach the age of 7
- **Explorers** and **Researchers**
- Inquiry-based learning and research methods
- Research, design and innovation are the key to sustainability

*“Equipped with his five senses, man explores the universe around him and calls the adventure Science”
- Edwin Powell Hubble*



Preschool relationships – inquiry based learning



Community relationships – mutually interesting projects



Celebrating Science Week together

Paper Planes project: **Investigating aerodynamics and engineering**



The early stages of our project emerged from a common interest in paper planes. It began with the children asking adults to make paper planes for them to play with, as it has in previous years, and in previous early childhood learning environments.

The project progressed into an investigation of aerodynamics because educators took the time to think about the learning opportunities this interest presented.



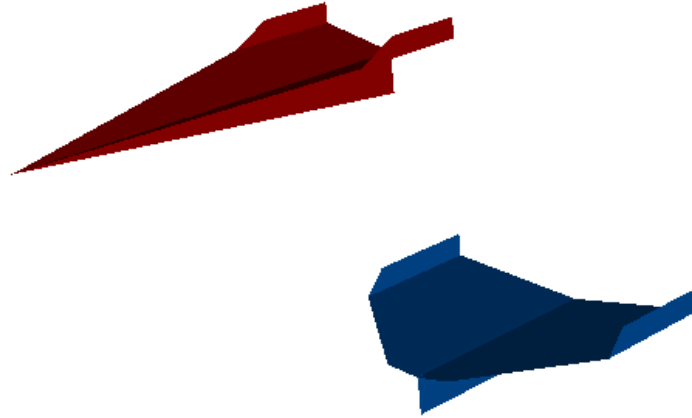
I wonder what it is that attracts so many of the children to **paper planes**?
To transform a two dimensional piece of paper into a three dimensional flying machine
is almost magical for young children.

Every year a few children go through a stage of wanting to make them.
This year the **paper plane** craze spread ...and has continued.



Making **paper planes** is a simple paper craft with enormous learning benefits for children. Even at its most basic, it's a clear hands-on example of geometry, symmetry and how shapes fit together. The children's ongoing interest this year has given us lots of learning opportunities - including learning about some aspects of aerodynamics.

The project developed into a search for the "best" paper plane, so we were able to make comparisons regarding distance, speed and aerobatics. The children used books, iPads/internet and visiting experts to research the best designs. Because the children were self-motivated to learn they were very interested in the process, and we had lots of fun following instructions and testing these designs out.





The Inquiry Based Learning Cycle

Educational Approach
Little Scientists Australia
Inquiry-based learning in STEM:
science, technology, engineering
and mathematics p.31





The name aerodynamics is a combination of the Greek terms *aer*, meaning “air,” and *dynamis*, meaning “power.” Our **paper plane** project is really an exploration of the power of the air, and how the children themselves can control it.



Do you know why **paper planes** fly?
They fly because of the forces that affect movement on earth. These forces are thrust, drag, lift and weight. The children have had the opportunity to learn about these forces in a practical and fun way.

"Well I'd like to say that paper aeroplanes are fun. We learnt that making paper aeroplanes is hard sometimes and we need help".



"The Jart flied super super super dooper fast".

We continued to search for "the best" paper plane comparing the various models and their different flights. We talked about comparing distance, altitude and acrobatics.



Our investigation and testing to find “the best paper plane” led to several answers. We discovered that the paper plane that can fly the fastest and furthest is the *Nakamura Lock*. We explored some paper planes that could go a long way, like the *Floater*, and that could do spins and loops, like the *Return To Me*, but the Nakamura Lock was the overall “best” (as evaluated by the children).





"I love paper airplanes".

We'd like to find a space big enough to hold our very own paper plane 'celebration' where we can all throw our favourite paper planes at the same time!



The children were included in this development. They wanted to “do experiments” because they have done lots here at preschool and they find STEM learning fun. The children were included in the preparation and conversations as this project emerged. They brought in books from home and paper planes they’d made with family members.

“Dad teached me. I try to make my paper planes. I learned how to fold and then I can do it myself.”



We entered this competition and to everyone's excitement we were one of the runners up. It was such a great opportunity for the children to show their friends and families what they were learning at preschool. As an educator I found it was also a fantastic way to highlight STEM learning in early childhood education and the success of play-based learning.



The paper planes project involved children across the preschool so adult support varied depending on age and ability. There was lots of peer support and cooperation too as children began to help one another with folding the more familiar designs. A number of girls were involved, and we were happy to promote this and ensure they were represented in our documentation.

We were thrilled to have one of our parents, who has an interest in paper planes and lots of engineering knowledge, become involved. This parent partner remained part of the project and has donated time, materials and, most importantly, his enthusiasm. We were able to share our learning at Newcastle Museum as part of The Hunter Science Week celebrations.

Children from the wider community joined educators and preschool families in hands on paper plane fun at the museum.

Why STEM in Early Childhood?

Because integration is what we do best

- ▶ The focus in ECE is on the whole child
- ▶ EC Educators understand that learning doesn't happen in isolation

Because hands-on learning is our focus

- ▶ Following children's interests is at the core of our planning
- ▶ Engagement with the activities to construct knowledge is what we do

Because positive dispositions are what we develop

- ▶ Children in the early years develop long-term habits of learning

Dr Pauline Roberts

Edith Cowan University

Centre for Research in Early Childhood (CREC)

ECA Conference, 2016

So What is STEM



- STEM education is the learning of science, technology, engineering and mathematics in an integrated approach through inquiry-based and project-based learning.
- Play-based learning programs give children opportunities to revisit experiences so there is a spiral of learning.
- Play can expand children's thinking and enhance their desire to know and to learn, promoting positive dispositions towards learning.



Together we can amplify children's natural curiosity
and ignite their passion for lifelong learning!

**STEM as part of our day
... every day**













KU MAYFIELD PRESCHOOL IS A CERTIFIED
LITTLE SCIENTISTS HOUSE

Awarded in 2016

as part of the Little Scientists Local Network Partner
SMART PROGRAM - UNIVERSITY OF NEWCASTLE

A not-for-profit initiative of FROEBEL Australia Limited in cooperation
with the "Haus der kleinen Forscher" Foundation in Germany.







Celebrating: Being a Little Scientists

After all the excitement, we've now had time to reflect on what this certification means – for the preschool, for the children, and for us as educators.







The big paper plane celebration



We are Little Scientists



“Play is the highest form of research”
-Albert Einstein

