Developing a STEM Lab

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Who are we?

- Karen (Pedagogical mentor and academic)
- Shanika (Educational leader)
- Monash Vale ELC
- Family operated for 25 years
- Exceeding all areas NQS 2018

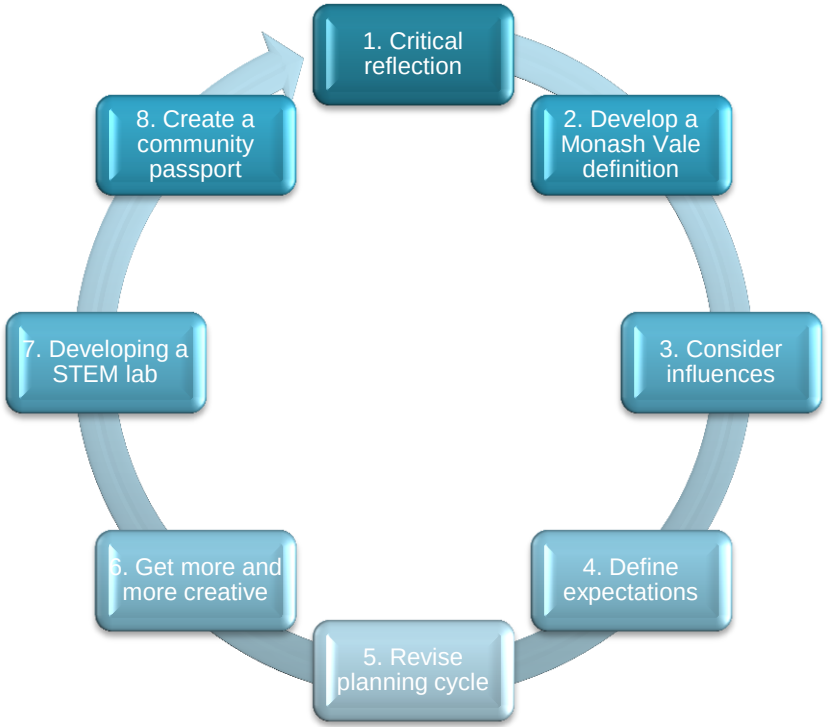
Little Scientists Award: Water Harvest Project

- National Winners for Little Scientists Award in 2018.






Great we won… now what?



1. What does inquiry learning mean?

- Emerging from child's interest and building upon observations.
- Learning that is directed by the children.
- The children take on the role of the researcher and the educator becomes an active partipant in the child's learning.
- Inquiry learning can be short term and long term, the project can be open-ended or come to a natural close.
- Social learning between peers, educators, families, and community.
- Inquiry learning is not defined by age.
- Inquiry learning can be explored individually, small group and through larger group discussion and experiences.

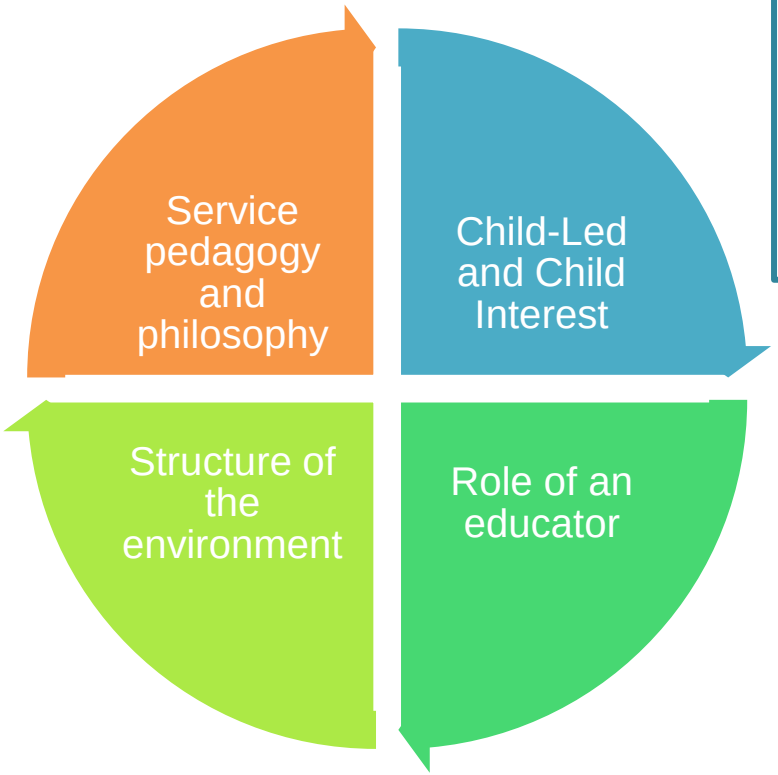
2. Our STEM Strategic goals

- To equip our children with foundational skills, knowledge and confidence to enhance their future.
- To increase children and family engagement with STEM discoveries through curiosity and inquiry-based pedagogy.
- To strengthen and optimise children's learning of STEM areas to enhance their future education.

2. Our STEM Objectives

- To create opportunities for the learning and engagement of STEM through a holistic pedagogical approach.
- To establish STEM learning to support children and families and respond to local and community contexts.
- To engage with STEM practice, development and innovation across the EC sector.

3. What influences the inquiry learning?



Child-led interest and investigations

- Through the constructivist model the children are urged to be actively involved in their own process of learning.
- Play is freely chosen by the child and under their control. The child decides how to play, how long to sustain the play, what the play is about, and who to play with. Play is creative, open-ended and imaginative. It requires active engagement of the players and can be deeply satisfying. To support and extend this:
  - Children can play on their own or with others both indoors and outdoors
  - Play with a range of open-ended resources imaginatively to extend ideas
  - Ability to talk and develop conversations as they play.
  - Educators to use this to think about ways to extend children's play and use it as a starting point for following children's interests and planning for adult-led activities

Reflect upon your own service

- What opportunities are there for children's play in your service?
- How do you support and extend children's play?
- Are children excited, motivated and involved in their play?
- Do the children have a belief in themselves as thinkers and learners?

4. Define expectations

What is STEM through the ages?

Children aged 0-18 months

SCIENCE

- Closely observes what animals, people and vehicles do.
- Watches toy being hidden and tries to find it.
- Move their whole bodies to sounds they enjoy, such as music or a regular beat.

TECHNOLOGY

- Looks around a room with interest; visually scans environment for novel, interesting objects and events.
- Repeats actions that have an effect, e.g. kicking or hitting a mobile or shaking a rattle

ENGINEERING

- Becomes absorbed in combining objects, e.g. banging two objects or placing objects into containers.
- Knows things are used in different ways, e.g. a ball for rolling or throwing, a toy car for pushing.

MATHEMATICS

- Notices changes in number of objects/images or sounds in group of up to 3.
- Develops an awareness of number names through their enjoyment of action rhymes and songs that relate to their experience of numbers

What is STEM through the ages?

Children aged 18 months to 3 years

SCIENCE

- Explores objects by linking together different approaches: shaking, looking, feeling, tasting, mouthing, pulling, turning and poking.
- Learns that they have similarities and differences that connect them to, and distinguish them from, others.

TECHNOLOGY

- Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car.
- Shows interest in toys with buttons, flaps and simple mechanisms and beginning to learn to operate them.

ENGINEERING

- Uses blocks to create their own simple structures and arrangements.
- Notices simple shapes and patterns in pictures.
- Beginning to categorise objects according to properties such as shape or size.

MATHEMATICS

- Creates and experiments with symbols and marks representing ideas of number.
- Begins to make comparisons between quantities.
- Uses some language of quantities, such as ‘more’ and ‘a lot’.

What is STEM through the ages?

Children aged 3 to 4 years

SCIENCE

- Explores what happens when they mix colours.
- Experiments to create different textures.
- Understands that different media can be combined to create new effects.
- Manipulates materials to achieve a planned effect.

TECHNOLOGY

- Uses ICT hardware to interact with age-appropriate computer software.
- Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.

ENGINEERING

- Selects a particular named shape.
- Can describe their relative position such as ‘behind’ or ‘next to’.
- Orders two or three items by length or height.
- Orders two items by weight or capacity.

MATHEMATICS

- Counts actions or objects which cannot be moved.
- Counts objects to 10, and beginning to count beyond 10.
- Counts out up to six objects from a larger group.
- Beginning to use everyday language related to money.

5. Monash Vale Planning Helix

As a child enters our service (Monash Vale Early Learning Centre), from the initial orientation we gather information with the children and families.

This is the start of the planning cycle, but at our service the cycle never ends and from the 1st Orientation to transition to Primary School, the child is on a journey with us.

Our cycle is about observing and working with the child and families, planning for experience and opportunities with the child and families and reflecting and evaluation and building upon those reflection for more engagement.

Monthly plan and map on inquiry based learning

Monthly Emerging interest/learning

Shared thinking

Inquiry documentation

Curriculum evaluation

6. How can we engage with STEM around us?

What could we do with something simple as ribbon?

What could we do with something simple as a photo frame?


#SENSORY

Voice. Choice. Empowerment

- In 2018, our family and child committee was developed, with parents representative from throughout the service.
- In reflection, we looked at ‘family and child’ committee and began to focus on the ‘child’ component, which led to the development of the ‘Child Committee’.
- The children have created subgroups which work to provide feedback from other children on their areas such as ‘The Indoor Squad’ or ‘STEM force’.

7. Developing a STEM lab

- In developing our space, we submitted a proposal plan to our team and management with the support of our families and the voice of the children's ideas.
- With the children, we began to map and plan where things would go and what we would like to have. The child's voice was at the central to design.
- The development and set up of the lab went for 2-3 weeks with the children assisting in setting up the spaces as well as our educators.

BEFORE

- Our undercover area has been used as a multipurpose area in the past. We have used the space for Yoga and an Art space.
- The area is part of the outdoor space and located on the other side of the outdoor area.

BEFORE

BEFORE

AFTER

- Our undercover area has been converted into a STEM based exploration and inquiry space for our 4 year old children.
- The floor converted, heaters installed and door screen for usage in colder weather.

AFTER

AFTER

AFTER

How we use it?

- The STEM Lab is used by our 3-4 Year Old Pre-School children.
- It is open during intentional times of the day, open-ended and for project work.
- The areas is a living environment growing with the children's learning.

Impact on children and educators

- The impact of the STEM lab has been phenomenal. We have seen the space providing the children opportunity to investigate, manipulate and discover through a range of materials and resource. They are give then the opportunity to build their problem solving skills, develop their logical thinking and build foundational concepts and skills and applying through their play and interactions.

8. Our STEM community passport!

MONASH VALE
Early Learning Centre

STEM
discoveries

STEM lab

EXCEEDING

FOLLOW US MONASHVALEELC

What do we want to achieve?

- We would like to achieve a foundational knowledge in STEM, skills that can help in engineering, mathematical, scientific and technological skills.
- To promote the development of problem solving skills, critical thinking and creative thinking.
- Ensure our children are encouraged to challenge their thinking in STEM areas to be innovative future thinkers.

What next… more critical reflection!
Questions?

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