PROJECT MALAMA KA ‘AINA

“Sowing the Seeds of Wonder”

Angie Glass and Heather Townsend

INTRODUCTION:

At Maui Preparatory Academy, as we establish a culture of excellence focused on building RELATIONSHIPS, fostering EMPOWERMENT, and ensuring RELEVANCE, we will embrace the Vision and Mission as our driving force and overarching themes.

Relationships, Empowerment, Relevance

CONCEPT: Interdependence

Children's learning journey involves developing an awareness of the interconnectedness between themselves and their environment, along with their individual role within it. By observing the life cycle of plants and the requirements for a flourishing garden, children gain valuable insights into the relationships within nature. They understand how nutrients from decaying plants contribute to rejuvenating soil, nourishing new seeds. Through hands-on experience, children learn to appreciate the joys of harvesting and enjoying fresh produce from the garden. This fosters a connection between growing healthy foods, consuming them, and maintaining a healthy body. Gradually, children become responsible custodians, valuing and safeguarding precious resources like water and clean soil.

TOPIC: Plant Life Cycle

“How does my fruit turn into dirt?” ~June was a question asked by one of our 4 year-olds, during group snack-time. There were numerous varied responses, answers and hypotheses. This became the driving question for our unit on Malama Ka ‘Aina.

Children will be introduced to ‘aina based learning opportunities through the use of our outdoor classroom and preschool garden area. Following children's innate curiosities and wonderings, we will

aim to promote a lifelong love of learning by making real world connections and fostering deeper knowledge through hands-on experiences and activities. This unit also aims to promote collaboration and respect among children, as they work together to build a community of scientific thinkers by adopting the mindset of observation, inquiry, collecting and analyzing data and sharing discoveries.

INTENDED LEARNING OUTCOME, ILO:

1. Children should begin to develop a connection to and an appreciation of our island home and environment (land around them).
2. Children should begin to gain an understanding that all living things are interconnected and rely on each other for survival.
3. Children should begin to identify what plants need to survive and ways to preserve and protect our island resources.
4. Children should begin to utilize the scientific inquiry method through making observations, generating questions, collecting data, analyzing data and sharing outcomes.

FACTS:

- Plant life cycle: seed, roots, sprout, plant, decomposition
- Essentials for growing plants/food: sun, water, nutrients, space (needs vs. wants)
- Living (organic) vs. nonliving things (inorganic): living organisms need nutrients, water, sun; they grow and reproduce
- Requirements for compost: greens (nitrogen) , browns (carbons), water and air

ASSESSMENT:

- Children's ability to identify compostable (organic) vs. non-compostable (inorganic) items
    - Children's ability to sort what is in our rubbish bin: compost/worm bin, reuse/upcycle project bin, recycle bin and trash (land-fill)
    -Children are able to independently add organic items to compost bin during snack/lunch times
    -Display upcycle masterpieces during Art Night for community viewing
- Data collection (photos, drawings) of compost jars, life cycle of pumpkins, needs vs. wants
- Recorded/dictated reflections from the children
- Presentation of plant life-cycle and composting to Kindergarten and 1st grade Classes

MAJOR LEARNING EXPERIENCES/OPPORTUNITIES:

- Garden Observation
- Malama ka aina super sorters activity
    - recycle, idea box, compost, trash
- Soil Investigation
    - Soil Sample Study
    - Make Soil Experiment
    - Growing Theories
    - Mud Pie Mandalas
- Composting: Children will create and observe different methods of composting. -

Compost in a jar experiment
- Subterranean Composter
- Garden composting
- Compost wheel

- Build a Wormery
  - Worm observations
- Life Cycles
  - Plants
  - Insects
  - Water
- Seed Investigations
  - Buffet Study
  - Seed Taste Test
- Living vs Nonliving ID
- Collaborative Trash Sculpture

RESEARCH TRIPS

- Learning walk around campus
- Uncle Landon's Pumpkin Patch
- Napili Farmers Market
- Napili Community Garden
- Hawaii Regenerative Agriculture tour Tour
- Hua Momona Farms

RESOURCES

Hanahau'oli Natural Scientist Resources

- Living Earth Systems
- Living Earth Systems - YouTube
- Regenerative Education Centers
- Life Lab » School Garden Resources
- Grow Some Good Video Resources
- Kokua Hawaii Foundation
- AINA Resources : Kokua Hawaii Foundation
- Local Harvest
- Kids Gardening
- Grow Some Good
- Roots In the Ground

Videos:

Make the Most of Compost!

What is composting? (for kids)

Composting for Kids

Worms Are Wonderful | Amazing Animals | Backyard Science | SciShow Kids How to Make a Worm Trap to Collect Composting Worms from Your Local Environment

- *What's the Dirt on ... Dirt?*
- *Soil Is Alive! | SciShow Kids*
- *Where Does Soil Come From?*

Books:
Compost Stew (Mary McKenna Siddals)
Superworm (Julia Donaldson)
Diary of a Worm (Doreen Cronin)
Be a Friend to Trees (Patricia Lauber)
Little Acorn (Melanie Joyce)
How Many Seeds in a Pumpkin (Margaret McNamara)
Dirt: The Scoop on Soil (Natalaie Myra Rosinsky)
Soil (Sally M. Walker)
What is Soil Made of (Ellen Lawrence)
Up in the Garden & Down in the Dirt (Kate Messner)

Songs:
The worms crawl out,
The worms crawl in,
They crawl all over the worm bin.
They eat the goop,
That makes them poop,
The plants complete the nutrient loop.
Ahooom, Ahooom!

PRE-LEARNING ASSESSMENT PLAN
Garden Observations
"Nourishing our Children Curiosities"

What will children do during the lesson?
- Explore our preschool garden
- Make observations and discoveries.
- Go on a nature scavenger hunt

What will the teacher do?

Facilitate discussion: "What do you see/think/wonder?"

Record answers to inquiry questions: video and voice recording, notes, pictures
Record the children's hypothesis and the children's ideas of potential ways to prove/disprove their hypothesis.

Where will the lesson take place? Will it affect the learning? If so, how? What resources/materials will be needed/used?

The lesson will take place in our preschool garden. Children will be surrounded by nature and will have the opportunity to observe the daily changes and growth of our fruits/vegetables/plants. They can observe the stages of decomposition and growth (life cycle) of our pumpkins in the planter box. Children will also be able to observe different animals and insects that visit and live in our garden habitat.

The weather and time of year (crop cycle) will affect the learning. The various ages and development of individual children as well as their prior knowledge will also shape their inquiry.

Resources/Materials:
Observation and collection tools: shovels, buckets, sticks, spray bottles, magnifying glasses
Documentation materials: Journal/iPad's/paper and drawing materials

What do you intend for children to take away from this learning opportunity? How will you know?

The children should start learning to make conscious observations and formulate questions/inquiry.
The children should be able to start making real world connections about the impact that each one of the children can have on keeping our earth healthy (malama 'aina).

(Continuation of Earth Day discussion: "The Earth Book" by Todd Parr. "I can do little things every day to make a BIG difference." "If we take care of it, it will take care of us." Record the children's thoughts and ideas.)

Begin to identify the needs of plants in order for them to grow.

STEM LEARNING PLAN LESSON
Composting in a Jar Experiment
"Compost Stew"

What will children do during the lesson?

The children will make an organic compost jar and an inorganic compost jar:

-Identify compostable items: greens (nitrogen) e.g. banana peels, apple core, egg shells, carrot, celery; browns (carbon) e.g. dried leaves, grass, paper, cardboard

- Collect and sort items for each jar: from snack and lunch times-banana peels, orange peels, apple cores, plastic wrappers, applesauce tops, etc.

- Prepare collected items: cutting, tearing

-Document weekly observations: compost level in each jar, day number, serial pictures of what the contents looks like

- Ask the children "how do you want to record"...drawings, project journal, iPad photos

What will the teacher do?

- Present resources (listed below)
- Facilitate discussion: “What do you see/think/wonder?”
- Record answers to inquiry questions: video and voice recording, notes, pictures
- Record the children’s hypothesis and how/what they might do to prove or disprove their hypothesis
- Facilitate layering/recipe for organic compost jar

Where will the lesson take place? Will it affect the learning? If so, how? What resources/materials will be needed/used?

The lesson will take place in our indoor and outdoor learning area. Outdoors, children will be surrounded by our garden and have the opportunity to observe the daily changes of decomposition in our garden. Inside, the children will be able to observe the changes in their compost jar and document changes over time.

Resources:

Video: Make the Most of Compost!

Books:

“Compost Stew” by Mary McKenna Siddals

“Diary of a Worm” by Doreen Cronin

Song: The Worm Song

Materials:

Mason jars, utensils, scissors
Compostable materials: greens, browns, air, water
Observation and collection tools
Documentation materials: Journal/iPad’s/paper and drawing materials

What do you intend for children to take away from this learning opportunity? How will you know?

How “our fruit turns into dirt.”
How they can each reduce/renew/recycle.
Presentation at morning meeting to peers.
The impact each one of the children can have on keeping our earth healthy (malama ‘aina).

STEM LEARNING PLAN LESSON IN PROGRESS

Soil Investigation

“The Dirt on Dirt”

What will children do during the lesson?

- Collect soil samples from various locations around campus
- Observe samples and sort materials found within the samples
- Observe "Compost Jar" after two weeks
- Make their own soil
- Use samples from soil, compost and home-made soil to grow fava beans.
- Make hypothesis as to which soil will grow the tallest fava bean plant
  -Decide how to measure and record their observations

What will the teacher do?

- Take children on learning walks to collect samples.
- Facilitate discussion: "What do you see/think/wonder?"
- Record answers to inquiry questions: video and voice recording, notes, pictures
- Record the children's hypothesis and how/what they might do to prove or disprove their hypothesis

Where will the lesson take place? Will it affect the learning? If so, how? What resources/materials will be needed/used?

- Outdoor learning area. Children will be surrounded by our garden and have the opportunity to observe the daily changes and growth of the fava beans.

Resources:

Videos:

What's the Dirt on ... Dirt?

Soil Is Alive! | SciShow Kids

Where Does Soil Come From?

Books:

"Dirt: The Scoop on Soil" by Natalaie Myra Rosinsky
"Soil" by Sally M. Walker
"What is Soil Made" of by Ellen Lawrence
"Up in the Garden & Down in the Dirt" by Kate Messner

Materials:

Soil collection materials: buckets, shovels
Observation and collection tools: fava beans, pots, trays, tweezers, magnifying glasses, labels, pen, tape, paper
Documentation materials: Journal/iPad's/paper and drawing materials

What do you intend for children to take away from this learning opportunity? How will you know?

Data analysis of fava bean growth: bar graph of fava bean heights
Healthy soil creates healthy plants that create healthy people!

-Take the children on a learning walk to a garden patch they visited last year. Review their pictures and videos from a year ago and then make observations on how/what has changed.
-Take a walk through our campus and observe the various gardens, forests and landscaping to identify what does and doesn't grow in certain areas, the colors/quality of the leaves of the plants, visual difference in soils and any other observations the children take note of.

Reflection:

We designed our unit of study around observations from student inquiry while exploring our outdoor garden and learning area. A child posed the question, “How does my fruit turn into dirt?” This prompted us to investigate decomposition and plant life cycle. By observing our decomposing and flowering pumpkin vines in our garden, the students documented plant life cycles with drawings that they shared with their peers. Our launch lesson was a compost jar. We started with a discussion on recyclables, reusables, upcycling, composting, and trash. The children began to identify organic and inorganic items. The children were tasked with cutting, tearing and chopping items for our compost jar. We assessed student growth and understanding through their data recordings of compostable items and completion of our classroom Compost Recipe Book. The children came up with the process to document the days that had elapsed since starting their compost jar and the height of the compost in the jar. The assessment of their knowledge of the life cycle of a plant and their ability to sort compostable and noncompostable items allowed us to move deeper into discussions about the needs of plants, how all living things are connected and that we have a responsibility to take care of our ‘aina.

We found it challenging at times to have meaningful conversations with 32 children in our classroom. This led us to break-out into smaller groups and take them to our outdoor learning environment. We started a soil investigation, however we ran out of time to compare the growth of plants in various soil quality.

Potential future discussions were numerous: How does the health of the soil affect the growth of plants? What is pollination? Why is it necessary? What pollinators can we find in our garden? What can we plant to attract pollinators? How can caterpillars destroy our lilikoi and milkweed plants? What is the life cycle

of caterpillars? How do seeds travel throughout our garden? And investigations into the insects we observe.

CLICK HERE TO VIEW HEATHER AND ANGIE'S REFLECTION PRESENTATION (23 SLIDES)

IMPACT MAPPING ACTIVITY – EVENT/EXPERIENCE/HUAKAʻI

Heather Townsend

Living Earth Systems

What did I sense – see, feel, hear, experience – from this place?	What did I learn and now know from this place?
I felt a sense of amazement. We started in a large, barren, packed dirt area with piles of dry trees, grasses and wood chippings. As we moved through the "compost islands" and the various stages of decomposition, each garden was in a different stage of fruitfulness. The groves of coconut trees and mango trees led to spaces of "enchantment" to quote Eddy Garcia, the founder of Living Earth Systems. We took home carrots and Ethiopian kale that Eddy pulled right from the ground.	I learned the term "regenerative agriculture". That there is a system in which specific crops planted in a certain order can sustain and nourish the soil that will in turn provide rich nutrients for the next crop. I have to think outside the box and got a first-hand look that gardens don't have to grow in neat little rows! I was amazed at the cycle of composting that required very little irrigation and relied mostly on rain. Eddy carved into the grade of the hill a way to trap the silt run off to provide rich minerals to his composting islands AND keep the silt from running off and covering the reef. Ponds that were put in place specifically to attract pollinators! Not to mention aquaponics too.
What questions did this experience leave me with? How can we apply "regenerative agriculture" to our preschool garden? Can we introduce worm bins directly into our raised garden beds? How can we reduce our water consumption for our garden?	What will I share from this experience when I return to my school/place? Living Earth Systems website and resources: https://www.livingearthsystems.com/about IG page: @livingearthsystems Site tours, newsletters Create a sense of wonder…I wonder how and what we can implement on our campus to create regenerative agriculture??

IMPACT MAPPING ACTIVITY – EVENT/EXPERIENCE/HUAKA'I

Write your school/place name in the center then answer the questions

What did I sense – see, feel, hear, experience – from this place?

I noticed Eddy's enthusiasm, energy, and excitement to share all about regenerative farming! His "farm" did not look like my image of "conventional farming." His more established garden area was magical and enchanting, little gems and plants were tucked everywhere! I left his tour excited to learn more about regenerative farming, to share this resource with everyone I know, lol. And to start regenerative farming at our school!

What did I learn and now know from this place?

So many "aha" moments. I learned that we can make our own soil! That regenerative farming is better for our earth. It is more cost efficient and uses natural resources. And we can do it in a relatively short amount of time. No more buying bags at the hardware store! I learned to be more intentional with what I put into the trash. And that creating healthy soil creates healthy plants which makes a healthy me:) I have gained a better understanding of the interconnectedness of things and am excited to share that with the children.

Place Name:

LIVING EARTH SYSTEMS
Regenerative Farm Tour
Olowalu Sight

What questions did this experience leave me with?

Oh, so many!
What worms will we attract? How often should I test the soil? What test kits should I use? What plants should I plant to help create healthy soil and manage nutrient deficiencies (vetiver, maringa, peanuts, etc…) What plants will grow best in our area (shade/ cook pine trees) Am I doing this right? How do I get the school on board with creating a more sustainable campus? How can I take on and manage the school's excess (cardboard, shredded paper, food scraps)?

What will I share from this experience when I return to my school/place?

We have already begun to implement some of Eddie's regenerative agriculture practices into our garden! We have created "islands in the sun" by piling sticks, leaves, plant materials and other debris into large piles around the perimeter of our garden area. We then built worm traps and have added these to the piles and other various locations around our garden. After a few months, when the piles are ready, we will have made our own soil! We will be able to plant veggies and plants that will also serve as a natural boundary to the preschool garden area.

We have also shared Eddie's information with our entire school community. He is a great resource for teachers and some have already reached out to him.