

If internet access is an option for you. Please check out the link below for all lessons, pictures and video updates related to 'Ike Hawai'i: <https://tinyurl.com/wpk79xy>

5th Grade 'Ike Hawai'i Lesson #1

Welina mai kākou! Greetings to you all! Aloha e nā haumana a me nā makua. Aloha to all the parents and the students. It's Kumu Nick Francisco from your Pāhoa Elementary 'Ike Hawai'i-Hawaiian Culture-Based enrichment program. We are in some very challenging times with the Coronavirus pandemic affecting us all world wide. I hope that you are all safe and trying to keep at home or at a safe distance from others when out in public. AND PLEASE WASH YOUR HANDS!

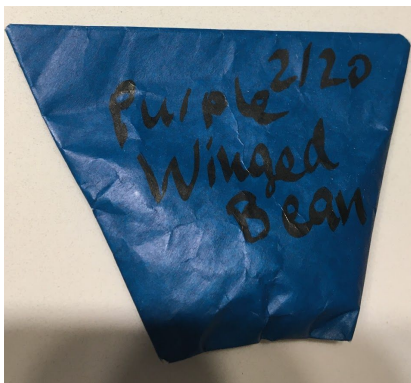
Throughout the year, our students have been learning many things. For example, we have learned about the importance of a healthy soil ecosystem for growing healthy food crops. We have also learned about how our kūpuna (our Native Hawaiian ancestors) here in Puna used the principles of decomposition to create soil and grow food. We learned how our kupuna practiced "Kilo" (or the practice of deep environmental observation and study)... just like a scientist, to help them observe the world around them to notice the smallest details.

My hope is that you can use what you have learned in class to grow your own food at home.

LET'S GET STARTED!!!!

All 5th grade students who went on our field trip to Ike Honoka'a to the Kohala Center's Agricultural Test Farm received seed packets filled with beans like the one below.

We also began an experiment testing the effects of natural fertilizers on Purple Winged Beans. Purple Winged Beans are a very delicious climbing bean which can be prepared and cooked like regular green beans you can buy at the grocery store or at any of our farmers markets.



This first enrichment lesson will continue the "Purple Winged Bean" experiment we began at school.

As a class, we "germinated" or started growing our seeds at school, but never transplanted them into our larger pots. We also did not get to build our trellis and did not get to harvest and weigh our beans.

I will be doing the experiment at home and hope that you can try a similar experiment with the bean seeds you got (or anything else you can grow at home to feed your family). You are welcomed to try to re-create this experiment at home or try the "Student Home Challenge" at the bottom of this document. The "Student Home Challenge" has questions and instructions for you if you would like to create and conduct your own experiment at home.

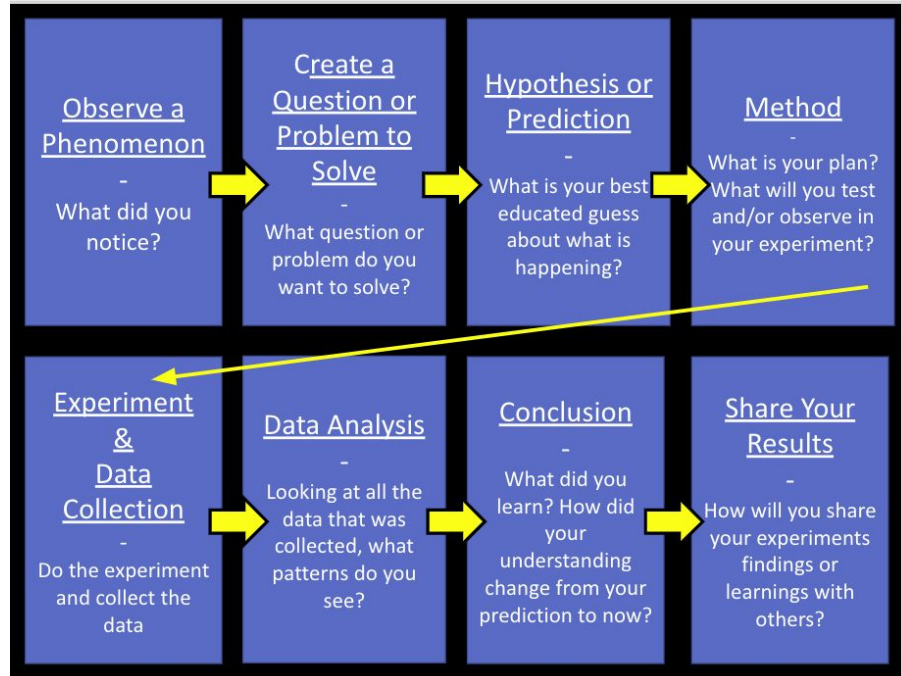
You do not have to do things in this experiment the exact same way that I am! Please use what you have at home, don't go out and buy things. Please stay home if you can!!!! Plant what you can with what you have at home.

If you learn anything from me this year I hope it is that in Puna we "use what get!"

Let's Review Our Experiment!

The Scientific Method:

Every scientist and engineer, even our kūpuna years ago, all follow a process to solve problems or questions that we notice in our world. These steps today are called the scientific method. In class we learned about it with a visual tool like this one:



What's a "phenomenon"?

A phenomenon is any observation or thing that we notice happening in nature.

(ex. Water drying when the sun is out, rainbows appearing when there is both rain and sun at the same time, etc.)

In class we observed some phenomenon related to the bean seeds we got from our field trip by watching some videos.

The links are below if you have internet access and would like to re-watch them.

- <https://www.youtube.com/watch?v=w77zPAtVTul>
- <https://www.youtube.com/watch?v=EKx4ZwoJqXY>



Purple Winged Bean Experiment:

*****THIS IS AN ONGOING EXPERIMENT*****

This experiment will take multiple months so I will be adding pictures and updates to this Google document as well as to this shared folder for you to look and see our class results!

Phenomenon: The phenomenon that we observed and discussed was:

- **Seeds are sleeping plants**
- **Beans grow tendrils to help them climb**

What's a **tendrils**?

***Tendrils:** the curly vine stem tips that plants send out to grab onto things and help a plant grow and climb up things



Question/Problem: Create a problem or a question to solve

- **What type of organic homemade fertilizer will help beans grow the most bean pods by weight?**

As a class we choose the 3 fertilizers that we either made, collected or that we were learning about:

1. **Mulch-** a layer of any material (preferably plants) that is used to cover the soil around a growing plant, like a blanket.
2. **Compost-** decomposed organic matter. Dead plants that have been broken down by decomposers such as fungi, mushrooms, bacteria and other decomposing animals like earthworms.
3. **Worm Castings-** the decomposed plant material that worms have eaten and pooped out.



Mulch Example:

Mulch from our school mala- here we used dead Ti leaves and shredded banana stumps



Worm Castings Example: Vermiculture Bin and Worm castings created at Pahoia Elementary by 5th graders with shredded paper and food scraps.



Compost Example:

Compost is broken down organic material.

Hypothesis or Prediction: Your best guess about what will happen during the experiment

*I know you already did this in your notebook at school. Please find something to write on and with at home and create your own prediction like the one below!

Student Work: Write your own prediction using the sentence frame below and share what you think will happen and why:

I predict that the Purple Wing Bean plant that is fertilized with ___(Write the name of the fertilizer that you think will work best)___ will grow the most bean pods by weight because ___(Write your reason why? Why do you think that type of fertilizer will work best)_____.

Method- What is our plan?

Student Work: Draw a Method flow map (or a sequence of boxes with arrows that show pictures and words) that explain what we did for each of the following steps *** See example below

1. First, soak bean seeds overnight in water



2. Second, fill pot with soil



3. Third, use your index finger to make a hole in the soil. Make hole deep enough to cover your fingernail ($\frac{1}{4}$ " to $\frac{1}{2}$ " deep)



4. Fourth, put seed in the hole and cover seed with soil



5. Fifth, add water each afternoon and wait until seed “Germinates” or begins to sprout and grow up out of the soil



6. Sixth, add fertilizers to each pot or into the ground area where you will be planting.
 - a. One pot with compost mixed into soil



- b. One pot with worm castings mixed into soil



- c. One pot with just soil and apply a thick layer of mulch on top



7. Seventh, after bean sprout has grown multiple leaves, carefully remove the seedling and replant in a larger pot or in the ground





Purple= Soil + Compost

Green= Soil + Worm Castings

Yellow= Soil + Mulch (shredded paper)

Black= Just Soil : The Black pot is our “CONTROL” plant. A “control” is a part of a science experiment where nothing is done. This gives us something to compare our data from the fertilizers to. How will the different fertilizers compare to the soil with nothing added? We will have to wait and see!

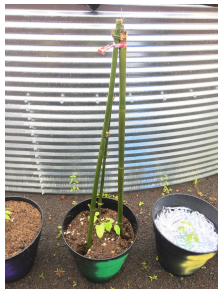
8. Eighth, build **trellis** with sticks and string (use anything you have- don't buy)



Use Bamboo or



Use Waiwi sticks



To the left is an example of a trellis built with bamboo and a grocery store produce twist tie (from some spinach I think)



The trellises were made with materials that I found at my house or in my neighborhood.

At time of transplant all plants were 5" tall. This will be the starting point of our data collection

9. Ninth, water all plants the same amount of water (only if it is dry)

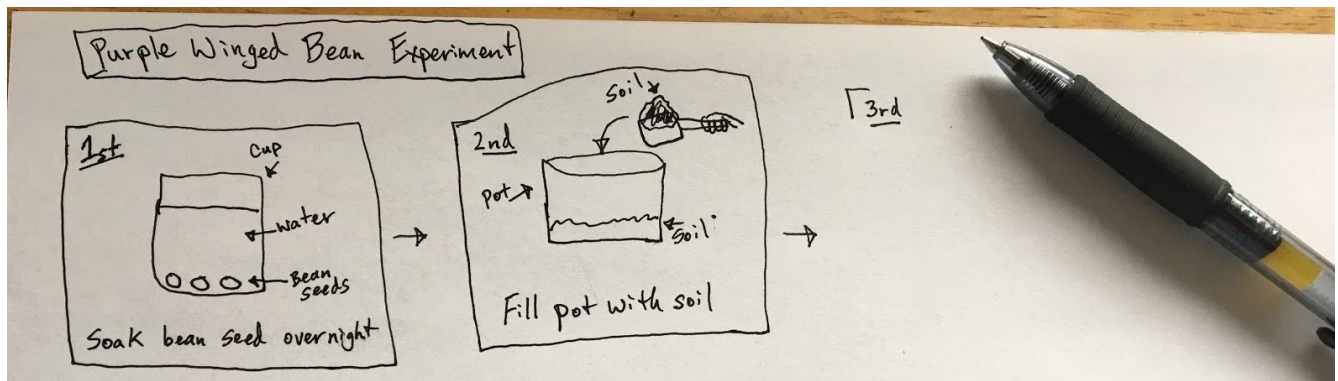
10. Tenth, kilo* (observe) and collect data in notebook

*Just a reminder. **"Kilo"** is *the close observation of nature using our 5 senses.*

Our kūpuna practiced kilo to help them become Scientific experts in the environment around them and to help them survive.

*** Method Flow Map Example ***:

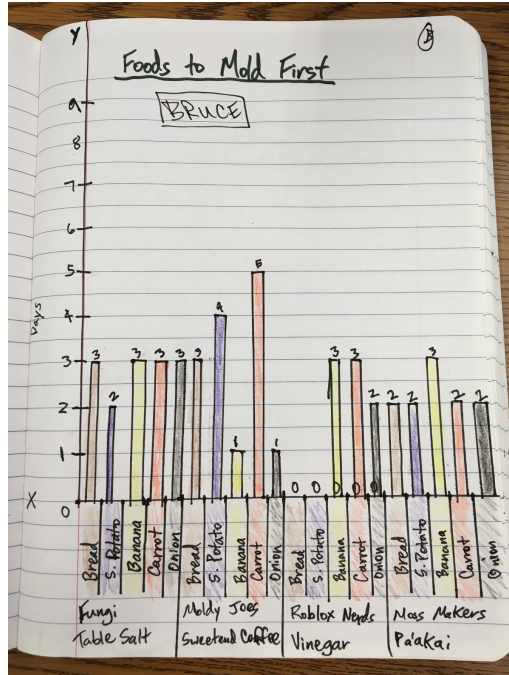
Here is an example of what the "Method" flow map you need to draw could look like. I only started it so that you could have an example to start from.



Experiment & Data Collection

Student Work: Draw & Write your Kilo observations

- What changes do you notice when you kilo your plant each day?
- What do you observe?
- How tall is your plant? Can you chart it's growth each week? How will you organize your data?
 - One option: Create a bar graph like we did in class-
 - Y axis would be Inches... X axis would be Fertilizer
 - See BAR GRAPH example below from our Mold Experiment



*****Remember...** As a class we decided that when harvesting, all “fruits” bean pods (smallest to largest) need to be removed and weighed on the same day at the same time.

Data Analysis

- What does the evidence that you collected and observed tell you?
- Which fertilizer was the best at growing the most purple wing beans by weight?

Conclusion

- What did you think would happen? What was your hypothesis or

Share your Results

- Tell a family member at home or via phone call, email, text or video chat what you did during your experiment. Teach them what you learned with the class

Student Home Challenge:

What seeds do you have at home that you can plant to feed your family?

Did you plant the bean seeds that they received from the Kohala center?

If you have them plant them! Or plant some other food crop seeds that you have at home.

Design your own experiment at Home!!!

What kind of experiment could you design and do at home to evaluate how your plants could grow best?

Here are some experiment question ideas:

Could you test...

- Which area of your yard makes the same plant grow best?
- The effects of different natural fertilizers on the same plant?
- Can you plant one seed in potting soil (if you have) and the other in what little soil you can scrape up in your yard or around your neighborhood?
- What else could your test?
- What questions do you have that you could design?

Other things to consider...

How will you measure the effects of your experiment?

Questions:

If you have questions please don't hesitate to email me and ask @ nifranci@ksbe.edu