

Ne'epapa Ka Hana 2.0
Seventh-Grade Mathematics Resources
STEMD² Book Series

STUDENT ACTIVITIES

LET'S

TAKE CARE OF THE LO'I

STEMD² Research & Development Group
University of Hawai'i at Manoa



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<http://stemd2.com/>

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Ne'epapa Ka Hana Seventh-Grade Mathematics Resources

Let's Take Care of the Lo'i

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Unit 2: Ratios and Proportional Relationships

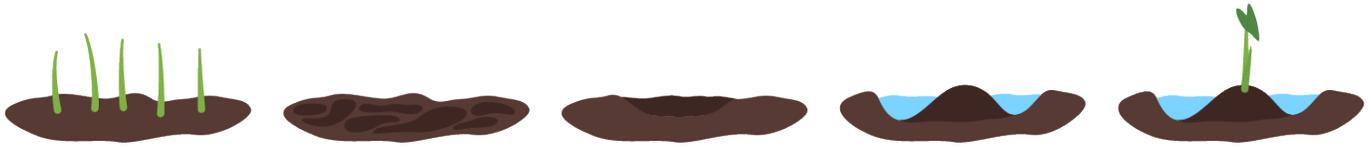
In this unit, we'll learn how to recognize and describe proportional relationships and use ratios and rates to solve problems through farming lo'i kalo and u'ala (sweet potato). There are three activities in this unit. *Module 4* involves using ratios and proportionality to explore how farmers build Lo'i. *Module 5* focuses on evaluating how a 'uala grows through the seasons with the help of proportions and percents. The final activity is cumulative and incorporates concepts from each of the previous activities in this unit.



Module 4: Ratios and Proportionality Activity

Turning undisturbed ground into a kalo lo'i takes a lot of work.

First, you have to pull all of the weeds out. Then, you need to stomp until the unwanted plants die, and the dirt turns into mud from the moisture in the ground. Then, you have to push the mud into mounds. If you do it correctly, the space around the mound will start to pick up water. Only then can you begin planting your kalo.



Building a kalo mound in a lo'i

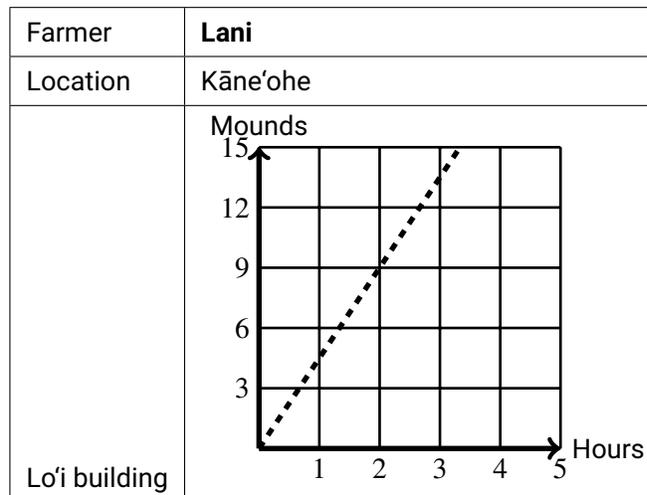
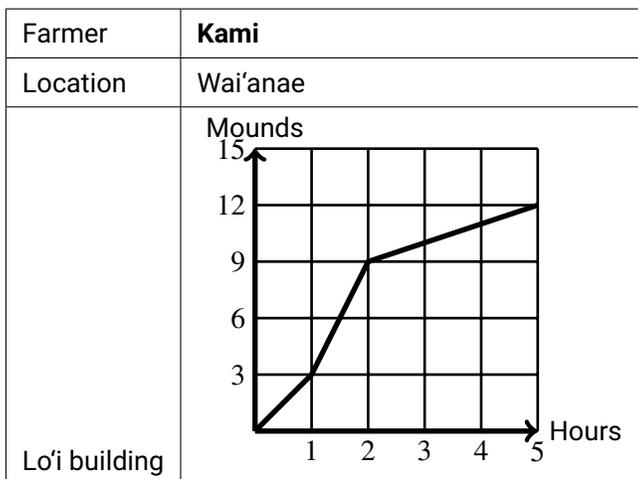
The amount of time it takes to build a lo'i often depends on how skilled the farmer is. However, it can also depend on the location of the lo'i. Let's take a look at a few farmers who are building a lo'i from scratch. We will pay attention to rate that they make a mound for the kalo.

Farmer	Kawika
Location	Kapolei
Lo'i building	Kawika can build 10 mounds every 4 hours.

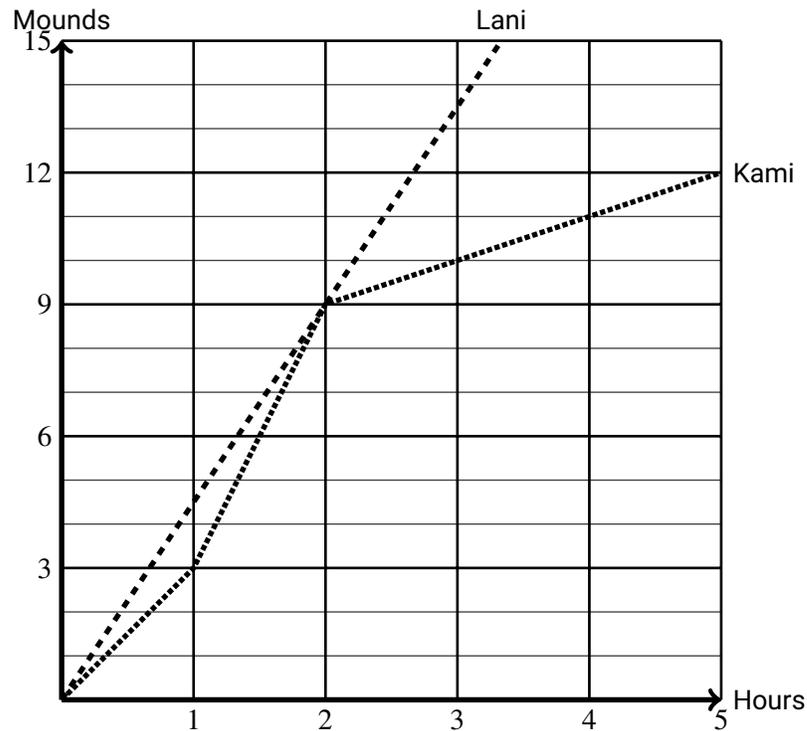
Farmer	Kalani
Location	Waiau
Lo'i building	After t hours, Kalani builds $3.5t$ mounds

Farmer	Kekoa	
Location	Waimānalo	
Lo'i building	Hours	Mounds built
	0	0
	1	8
	2	12
	3	14
	4	15
	5	15.5

Farmer	Mina	
Location	Mililani	
Lo'i building	Hours	Mounds built
	0	0
	2	6
	4	12
	6	18



3. Graph and label the data for all six farmers. Two of them have already been done for you. Make sure to draw lines, especially when you are given data from a table. Make sure that your lines do not stop before reaching the edges of the graph.



4. Rank the farmers from highest to lowest number of mounds made after 5 hours.
5. Why do you think some environments are harder to build a lo'i on than others? Share and discuss your thoughts with your partner or in the online comment section. 

In some villages on Hawai'i Island, the 'uala is considered to be very beautiful. Traditionally, the villagers would gather their best 'uala and decorate the side of the road when a neighboring chief came to visit. Before the chief arrived, the villagers would put the 'uala on the right side of the road. Then, they would move it to the other side of the road so the 'uala would still be on the right side when the chief left.

3. A chief is visiting your village. You decide to give 21 square feet of your best 'uala that survived the summer to decorate his arrival. What percent of your 120 square feet 'uala did you give away?

4. Of all the plants that you eat, which one do you think is the prettiest and why? Please share with your partner or in the online comment section. 

Unit 2: *Cumulative Activity*

In one year, a typical 12 feet by 12 feet lo'i patch can produce 50 kalo.

1. Assuming that this rate is proportional, write the rate of kalo to square feet as a *simplified* fraction.

$$\frac{\text{kalo}}{\text{square feet}}$$

2. Find the total area of 5 lo'i patches. Remember each lo'i patch is 12 by 12 feet.
3. How many kalo can be produced by 5 lo'i patches?
4. How many kalo can a 12 by 18 feet patch produce in one (1) year?
5. A farmer named Kaliko has a lo'i patch that is 16 feet wide by 18 feet long. How many kalo can he typically produce in one (1) year?
6. Kaliko wants to break apart and rebuild his lo'i patch from part 5. He wants to produce 25% more kalo. What is the area of new lo'i that he needs?

7. Work with a partner and draw at least three possible lo'i that have the area needed in part 6. Be sure to label the lengths of each side.

8. Most of us have no idea how the food we eat made it to our tables. Describe a fruit or vegetable that you enjoy eating or have eaten recently. Now, imagine and share a story of how this plant might have gotten to your dinner table. Talk about where you think it was planted, who planted it, how it got to you, etc. Share with your partner or in the online comment section. 