

Ne'epapa Ka Hana 2.0  
Sixth-Grade Mathematics Resources  
STEMD<sup>2</sup> Book Series

## STUDENT ACTIVITIES

LET'S GO FROM

# MAUKA TO MAKAI

STEMD<sup>2</sup> Research & Development Group  
University of Hawai'i at Manoa



STEMD<sup>2</sup> Research & Development Group  
Center on Disability Studies  
College of Education  
University of Hawai'i at Mānoa

<http://stemd2.com/>

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Ne'epapa Ka Hana Sixth-Grade Mathematics Resources

**Let's Go from Mauka to Makai**  
*Student Activities*

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Project Director

Kaveh Abhari

Content Developers

Robert G. Young  
Justin S. Toyofuku

Creative Designer

MyLan Tran

Publication Designer

Robert G. Young

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## Unit 2: Number Operations

In this unit, we'll learn how to use positive integers, fractions, and decimals to solve problems through exploration of invasive species and evaluating Hawai'i's ecosystem. There are three activities in this unit. *Module 4* involves tracking and evaluating the coconut beetle through the use of operations with fractions. *Module 5* focuses on operations with decimals by evaluating the rain fall on a ahupua'a. The final activity is cumulative and incorporates concepts from each of the previous activities in this unit.





## Module 4: Operations with Fractions Activity

A  $13\frac{1}{2}$  acre forest has been attacked by invasive coconut rhinoceros beetles. A team of 8 researchers have decided to spread out and check on the health of the forest.



Coconut rhinoceros beetle

- Each of the 8 researchers have been assigned an equal share of the  $13\frac{1}{2}$  acres of forest. This means that they have to watch  $1\frac{11}{16}$  or  $\frac{27}{16}$  acres of forest each. How did they come up with this number? Please show all of your work below.

Sometimes, we have different ways to describe the same thing. For example, when we say that “we lost half of our money,” we can describe this by taking the amount of money we had and **dividing** by 2. We can also take the money we had and **multiply** by  $\frac{1}{2}$ . It’s the same thing.

- After watching the forests for several years, each researcher saw that their part has gotten smaller. They wrote down a **number** that describes how much the forest has changed, but they didn’t write down whether you are supposed to **multiply or divide** by that number. Write down the missing sign ( $\times$  or  $\div$ ) that makes the forest size ( $\frac{27}{16}$ ) **smaller**. Find the size of the smaller forest part. Give your answer as a mixed number.

(a) Researcher 1:  $\frac{27}{16} \bigcirc \frac{4}{3} = 1\frac{17}{64}$

$$\begin{aligned}\frac{27}{16} \div \frac{4}{3} &= \frac{27}{16} \times \frac{3}{4} \\ &= \frac{81}{64} \\ &= 1\frac{17}{64}\end{aligned}$$

(b) Researcher 2:  $\frac{27}{16} \bigcirc \frac{16}{25} =$

(c) Researcher 3:  $\frac{27}{16} \bigcirc \frac{8}{15} =$

(d) Researcher 4:  $\frac{27}{16} \bigcirc \frac{27}{20} =$

(e) Researcher 5:  $\frac{27}{16} \bigcirc \frac{18}{5} =$

(f) Researcher 6:  $\frac{27}{16} \bigcirc \frac{25}{24} =$

(g) Researcher 7:  $\frac{27}{16} \bigcirc \frac{16}{21} =$

(h) Researcher 8:  $\frac{27}{16} \bigcirc \frac{21}{20} =$

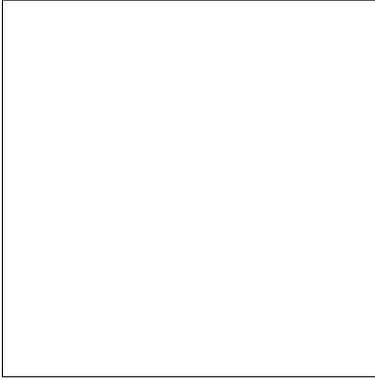
## Module 5: Operations with Decimals Activity

If you have taken a trip around a Hawaiian island, you may have noticed that the weather changes between different ahupua'a. Even neighboring ahupua'a can have very different amounts of wind, rain, and even sunlight. Let's look at three different ahupua'a on a day that has been raining on and off. We recorded the time of each rain shower and the total amount of rain that fell by the end of the day.

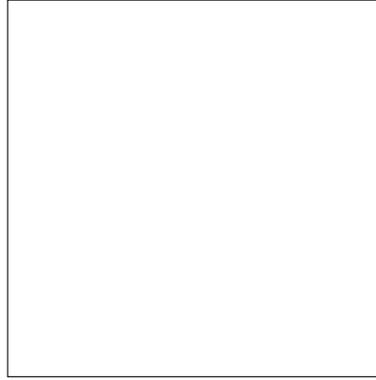
Ahupua'a 1		Ahupua'a 2		Ahupua'a 3	
Rain times	1.55 hours 0.12 hours 1 hour	Rain times	0.2 hours 5.15 hours 9.8 hours	Rain times	0.8 hours 0.5 hours 0.2 hours
Rain amount	2.1 inches	Rain amount	4.0 inches	Rain amount	2.9 inches

- On which ahupua'a did the most rain fall?
- For each ahupua'a, calculate the total rain time. Then rank each ahupua'a from **least to greatest** total time spent under rain.
- The **rain intensity** tells us whether it is raining lightly or whether it is raining heavily (known as "raining cats and dogs"). **Rain intensity** can be found by dividing the total amount of rain by the total rain time. Find the rain intensity for each ahupua'a. Round to two decimal places. Be sure to label your answer in inches per hour.

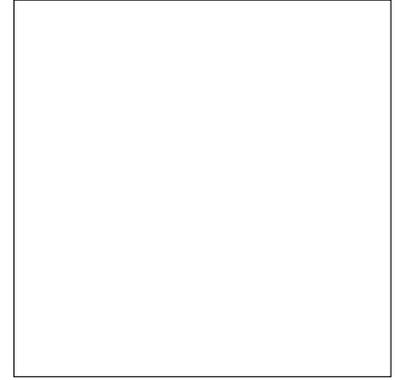
4. Discuss with a partner which ahupua'a has the lightest rain and which has the heaviest.
5. For each ahupua'a, draw a picture of it raining outside. Make sure it matches your discussion from part 4.



Ahupua'a 1



Ahupua'a 2



Ahupua'a 3

## Unit 2: Cumulative Activity

The coconut rhinoceros beetle is an invasive beetle that is spreading and killing both coconut and palm trees. As of 2019, the rhinoceros beetle has been found in the 'Ewa moku of O'ahu, mostly around Pearl Harbor. (A moku is a group of ahupua'a.)



Coconut rhinoceros beetle

You are monitoring a small palm forest on O'ahu that is under attack by the rhinoceros beetle.

1. The forest originally had a size of 10 acres. (An acre is a little smaller than the size of a football field without the end zones.) A year ago, the beetle killed  $\frac{11}{8}$  acres of the forest. How many acres of the forest are still alive? Give your answer as an improper fraction or a mixed number.
2. To learn more about the beetle, scientists went into the remaining parts of the forest (from part 1) and placed a number of beetle traps. They decided to place at least one beetle trap every  $\frac{3}{4}$  acres of living palm trees. What is the minimum number of traps they would need to place? (Please show your work.)



Beetle trap

3. As the beetles continued to spread, another 3.025 acres of palm trees died in this forest. What is the size of the forest now? Give your answer as a decimal.

