

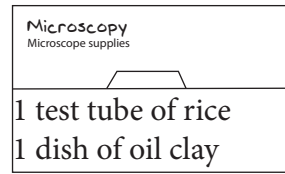
G4 Patterns Can Transfer Information

Earth Science NGSS 4-ESS2-1 Observe and describe weathering and erosion. Make observations and/or measurements to provide evidence of the effects of weathering.

Before Class Prep:



1



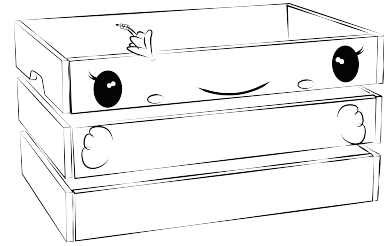
Microscopy Koa

2



Microscopes

3



From Kea- Petri dishes & Tweezers

4

Before the Lab:

Read some or all of the Patterns in Information article in The STEMTaught Journal or on-line.

Running the Lab (55 min): Some classes may need additional time

1. Show the in-class movie (5 min).

2. Student volunteer to fill in a 4 space binary (using 2 letters or numbers) on the board (5 min) - With their lab sheet (pg 77) and on the smart board have some volunteers demo how to fill in a 4 space pattern. After a few students come up and enter in binary patterns using only 2 numbers have the class work at filling out the lab sheet. If students finish early have them help others.

3. Demonstrate Microscope coding on rice grains - Let the class know they are going to make their own pit tags like the biologists used in the movie using rice grains. They may need to sharpen their pencils. Demonstrate how they will place a little bit of clay in their petri dish to hold a rice grain. Then they can look through their microscope while they try and write a binary code on the grain. Show them that they will need to be careful scientists and to raise their hands if they need help. Challenge them to code all the rice grains on their sheet. They can even write binary messages on their grains.

4. Students get Microscopes and supplies (3 min) - Let half the class stand up to get their microscopes while the other half comes to a table to get a petri dish with some rice grains, a little piece of clay to hold the rice grain still, and some tweezers.

5. Coding time - Let students have the time to be real biologists working with their tools to code their rice grain pit tags with binary patterns. Some students may need help with focusing the microscope. Students get so excited and some make very long and tiny codes.

6. Optional Coding Necklace - In the microscopy Koa their will be small vials for students to put their rice grains in and you can tie some yarn around it so they can show off their amazingly small codes.