

DATA *Nugget*

Finding a Foothold

Featured scientists: Darrel Nash & Sarah Hall from Kentridge High School, Washington

Research Background:

Have you ever noticed that the ground at a beach has rocks of many different sizes? These rocks, sand, and dirt are all called **substrates**. The types of substrate we see are described by the size of the particles that cover the ground. These can range from large boulders down to fine grains of sand and dirt, with many sizes in between. No matter what type of substrate you see at the beach, you can find organisms that will live in or on it. Just like there are different types of substrates, there are different types of organisms that can live there. How can we determine which types of organisms prefer which types of substrates? That is the job of field researchers!

Students and teachers at Kentridge High School have made many field trips to the beach and have seen lots of organisms. Normally, they just noticed what they could see easily in front of them. Students became interested to know how the type of substrate influences which organisms will live there. They noticed that the snails in the aquarium at school like to stick to the glass walls of the tank. Do snails and other shelled mollusks found near the ocean, like chitons, periwinkles, whelks and limpets, also like to live on large, stable substrates? The students went to beach to find out!

Mollusks have a "foot" which may be able to attach more securely to larger substrates, such as boulders, and allow them more room to move. So, the students expected to find more mollusks on boulders than on other types of substrates. To gather the data needed to answer this question, the students went to a



Students collecting mollusk data on different beach substrates

local beach. They looked at sections of the beach with substrates of all types. On these different substrates, they kept track of all the different types of organisms that were present. They measured the frequency that they observed four types of mollusks (chitons, limpets, whelks, and periwinkles) on the following substrates: boulder, gravel, pebble, logs, sand, and shell debris. Frequency was measured as the proportion of times that a particular organism was present on a substrate type, out of the total number of observations. For example, if they observed 2 boulders and saw limpets on 1, the frequency would = $\frac{1}{2}$ or 0.5.

Scientific Question: What types of substrates are most commonly inhabited by mollusks?

What is the hypothesis? Find the hypothesis in the Research Background and underline it. A hypothesis is a proposed explanation for an observation, which can then be tested with experimentation or other types of studies.

Scientific Data:

Use the data below to answer the scientific question:

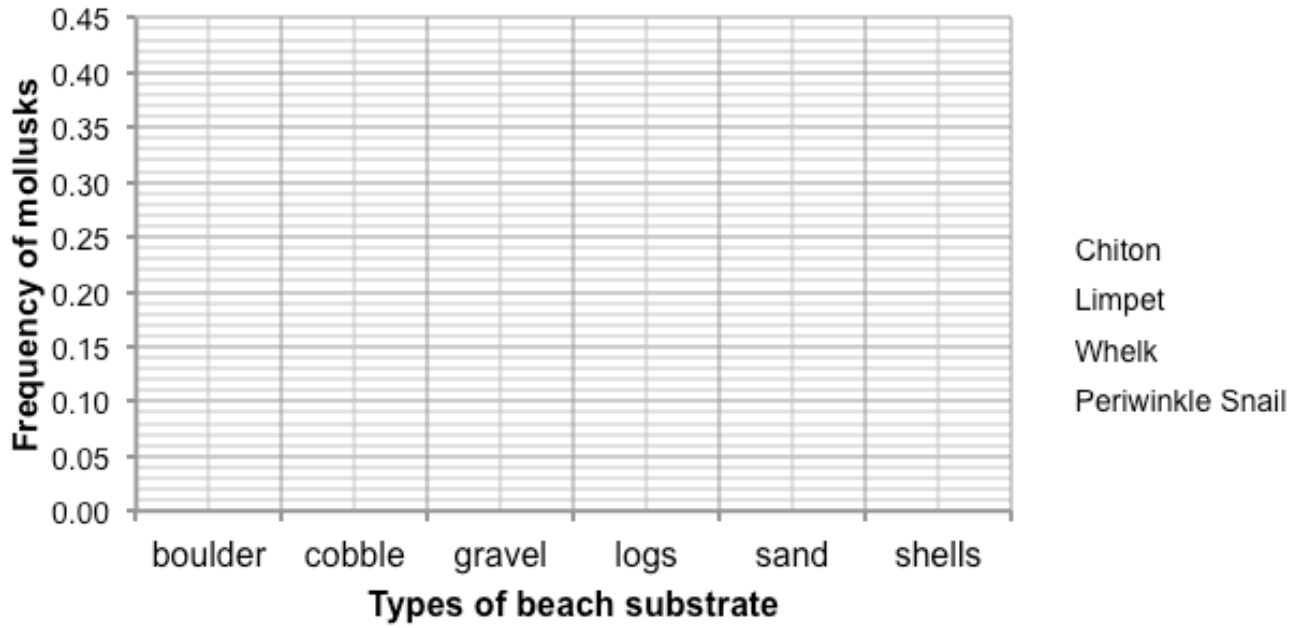
Substrate	Chiton	Limpet	Whelk	Periwinkle Snail
boulder	0.00	0.26	0.00	0.13
cobble	0.02	0.41	0.17	0.21
gravel	0.02	0.32	0.06	0.07
logs	0.00	0.14	0.00	0.07
sand	0.01	0.19	0.07	0.10
shells	0.00	0.12	0.02	0.04

What data will you graph to answer the question?

Predictor variable: _____

Response variable: _____

Graph the data below:



Interpret the data: Make a claim based on the evidence that helps answer the original research question. Connect the pattern in the data to a pattern in the natural world. Justify your reasoning using data.

Name _____

Your next step as a scientist: Science is an ongoing process. Did this study fully answer your original question? What new questions do you think should be investigated? What future data should be collected to answer them?