4 State Mandated Living Environment Labs

**Diffusion through a Membrane**

* Know how to use indicators to determine the presence/absence of a substance
	+ Starch indicator, glucose indicator
* Know the set-up of the “model cell” and the results



* Understand reasons for why some molecules can diffuse through a membrane while others cannot
	+ Size, Selectivity, Concentration, etc
* Know how to make a wet-mount slide and the procedure for adding salt water or distilled water to that slide



* Know that the salt water solution causes the cell membrane to shrink, and the distilled water causes the cell to go back to its original size (or expand)



**Beaks of Finches**

* Be able to read and interpret the “Finch diagram”



* Determine how some finches are able to coexist successfully on the island while others are not
* Understand the Beaks of Finches lab as an example of natural selection
	+ Explain using:
		- Competition
		- Survival of the fittest
		- Adaptation
		- Variation
		- Inheritance
* Be able to identify other traits besides beak characteristics that would allow a finch to feed successfully
* Know what each of the following pieces of the lab represented:
	+ Different tools
	+ Different sized seeds

**Relationships and Biodiversity**

* Be able to transcribe and translate a piece of DNA to mRNA to a protein
	+ Know what a codon is
	+ Be able to compare sequences to determine similarities
* Know the procedure for chromatography



* + Separates based on color
	+ Be able to identify common mistakes when performing chromatography
* Know the procedure for gel electrophoresis



* + **Restriction enzymes** cut DNA into fragments based on cutting at a specific sequence (eg ATTCG)
	+ Separates based on size (largest bands towards top, smallest bands towards bottom)
	+ Be able to interpret results to compare for similarities
* Be able to read and interpret an evolutionary tree to identify relationships



* + More similar they are, the closer they appear on the tree
* Know why molecular similarities are more accurate than physical similarities when determining relationships
	+ Know specific examples of each type
* Understand why (plant) species would be compared in rainforests, what could we use them for?

**Making Connections**

* Be able to create or interpret a histogram
	+ Be able to come up with labels for x or y axis, titles
* Understand the relationship between circulatory and respiratory systems
	+ How will an increased heart rate affect other body systems (muscular, respiratory, etc)
* Know how to set up an experiment (scientific method)
	+ Know control, constant, independent and dependent variable
* Be able to calculate an average pulse rate