



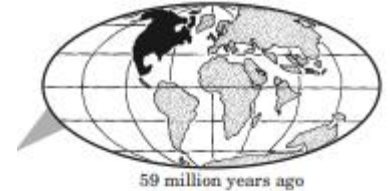
Plate Tectonics: a Slow Motion Lab

Lab #2

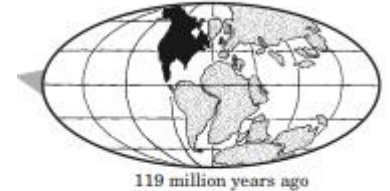
Plate tectonics: a theory that Earth's crust has more than a dozen major pieces that can move slowly over the mantle over time. The plate tectonic theory is used to explain many phenomena about the surface of our planet. For example, many scientists have noticed that the continents are like pieces of a giant jigsaw puzzle that could be fit together. These scientists believe there have been several times in Earth's past when all the continents were mashed together into a single super continent. Most plates are composed of both oceanic crust (more dense) and continental crust (less dense). Because oceanic crust is more dense, it sinks lower into the mantle leaving room above for all the oceans. The plates move at a rate of about 5 cm per year on average. According to the Physical Setting / Earth Science Reference Tables (NYS 2011 edition, South America and Africa were still joined together 119 million years ago and probably separated about 100 million years ago. In this lab, we will use conversion factors (unit cancellation or dimensional analysis) to calculate time and distances of plate movement.

For each calculation below, be sure to show all units and cancellations.

- 1. Calculate how many years it will take a plate to move 230 centimeters.



- 2. In the space below, calculate in meters how far a plate moves over a 1000 year space of time?



- 3. Calculate how far (in kilometers) it is between Natal Rio Grande do Norte Brazil to Malabo Africa given that the two continents were in contact 100 million years ago (according to the NYS PS/ESRT).



- 4. Find the percent error in the value calculated above given that the actual distance between Malabo and Natal Rio Grande do Norte is 5013 km.

