

## Sickle Cell Anemia Explanation

Name\_\_\_\_\_

Per.\_\_\_\_\_ Date\_\_\_\_\_

You are discussing the disease sickle cell anemia with your older sister, Leah. You explain that it is genetic, caused by a single mutation that causes a life-threatening condition where red blood cells (RBCs) are malformed and block small blood vessels. People with two normal alleles have normal RBCs. A person homozygous for the sickle cell allele has life-threatening sickle cell disease. Heterozygotes function normally most of the time, but when blood oxygen levels are low, experience some symptoms of the disease.

You show Leah a map of the distribution of the sickle cell allele and she is surprised. Because it is a deadly disease she expects it to be low everywhere, but she notices that there are big differences in the frequency of the allele in different parts of Africa. In some areas it is close to zero, while in others it is as high as 20%. Leah asks, "Why is the frequency of the sickle cell allele so different in different areas of Africa?" ***Using our model, answer Leah's question completely and coherently. Why is the frequency of the sickle cell allele so different across different parts of Africa? Why is it almost zero in some areas, and much higher in others?***

### Frequency of the Sickle Cell Anemia Allele

