**Gene Action Study Guide**

* Know the relative sizes of a nucleotide, nucleic acid, nitrogen base, and DNA strand (which is bigger and which is smaller).
* Know what substitution, deletion, and insertion mutations look like in a strand of DNA.
* In sickle cell disease, under what conditions is the hemoglobin molecule affected?
* What are characteristics of RNA that differ from DNA?
* What is a chromosome made of?
* Who first discovered the existence of DNA?
* Where in the cell does transcription take place?
* Describe transcription.
* Describe translation.
* What are the different cellular components involved in translation?
* If a DNA strand is 30% thymine, what percent adenine, cytosine, and guanine is it?
* Are mutations always harmful?
* In what circumstances could a mutation have no effect on an organism?
* Why did you add dish soap to the buffer in the DNA extraction lab?
* How many base pairs (approximately) are in the human genome?
* What is the name of the shape of DNA?
* What do you call a specific segment of DNA that codes for a product?
* What is the term for errors in deleting, adding or misreading a strand of DNA when it is being replicated?
* What are different versions of the same gene known as?
* What is a three letter sequence of DNA or RNA known as?
* Who first identified the shape of DNA as a helix?
* What are the three components of a nucleotide?
* What is mutated in sickle cell disease?
* Know how to write complementary DNA and RNA sequences
* What does complimentary base pairing mean?
* Know how to use a codon chart to identify an amino acid sequence from a mRNA sequence.
* If you see a diagram of a translation, be able to identify: codon, tRNA, amino acid, mRNA, peptide bond, anticodon
* What is the central dogma of biology?