Genetics Student Worksheet #2

1. Without looking in the bag, remove 20 beads from the bag.
2. Lay them in pairs, in order of how you pull them out, on the chart.
   Do not move or organize your pairs.

Each bead is a gene, and each pair of genes represents a species of grasshopper from the state of Kansas.

3. Read about Dominant and Recessive Genes.

Green is dominant over brown genes and red genes.

- A dominant trait is one that is most seen across a species. For example, some dominant traits in humans include dimples, free earlobes, freckles, right-handedness, and the ability to roll your tongue.

The brown and red genes are co-dominant.

- This means that when a grasshopper has the brown and red gene pair, they appear brown with red spots. They would exhibit both traits.

Dominant and Recessive Genes

Dominant - a gene in one strand of DNA that is stronger than the corresponding gene in another strand of DNA.

Recessive - a gene in one strand of DNA that is weaker than the corresponding gene in another strand of DNA.

Individuals receive two versions of each gene, known as **alleles**, from each parent. If the alleles of a gene are different, one allele will be expressed; it is the *dominant* gene. The effect of the other allele, called *recessive*, is masked.

4. What kinds of grasshoppers have you put together?

In the grasslands of Kansas, *it is easier for predators to see the red grasshoppers*. The green and brown grasshoppers camouflage easily in the tall grasses.

5. If you have any red grasshoppers (<u>both genes are red</u>), put them back in the bag (they have been eaten by predators). These are called homozygous because they have two identical alleles of a particular gene.

6. Create a second generation from the beads left remaining on your chart. Mix up the beads you have laying out and randomly create new pairs.

7. Because all your red homozygous grasshoppers are gone, *the brown and red co-dominant heterozygous grasshoppers are now more visible to the predators*. Remove any pairs that are red and brown (co-dominant) and put them back in the bag. These grasshoppers have now been eaten too.

8. Create a third generation from the beads left remaining on your chart. Mix up the beads you have laying out and randomly create new pairs.
   Which co-dominant heterozygous grasshoppers do you think are now the most visible to predators? Place any green and red grasshoppers away in the bag. They have been eaten by predators too.

9. Start your last generation by mixing your remaining beads and randomly creating.

10. When you have completed this 4th generation, leave the beads where they are so the WOW! volunteer can ask questions.

11. Carefully put all the beads back in the bag. Return pages and bags to the WOW! volunteer before beginning your next activity.