Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_ Mods: \_\_\_\_\_

**Dragon Genetics – A review of human inheritance**

**http://demo.geniverse.concord.org/#**

**TRAINING:**

Case 1 Enter the Drake:

1. How many chromosomes do dragons have (IOW: what is their diploid number of chromosomes found in all of their somatic cells?): \_\_\_\_\_\_\_\_\_\_\_\_
2. How many chromosomes would they have in their gametes (assume the chromosomes assort just like human chromosomes do!): \_\_\_\_\_\_\_\_\_\_
3. Assume dragon genes/chromosomes have the same characteristics as ours. Describe the difference between male and females chromosomes. How do the chromosomes differ between the genders?
4. How does the **phenotype** differ between the genders? There is a sex specific characteristic (not “sex-linked!); how do the genders differ in terms of how they look?
5. In terms of sex-chromosome inheritance, which gender is XX \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is XY \_\_\_\_\_\_\_\_\_\_\_\_\_\_?
6. Circle the dominant allele for **each** pairing below:

Metallic/nonmetallic Forelimbs/no forelimbs

Wings/no wings Hindlimbs/no hindlimbs

1. Which gene is sex-linked? (choose one letter)
2. Nose spikes /no spikes
3. Metallic/nonmetallic
4. Wings/no wings
5. Forelimbs/no forelimbs
6. Hindlimbs/no hindlimbs

Case 2 My, Oh Sis!

1. Gamete making involves which version of nuclear/cell division?
   1. Mitosis B. Meiosis
2. Name the meiosis phase where the homologous pairs of chromosomes line up together in the “middle” of the cell
3. Metaphase I B. Metaphase II
4. Name the meiosis phase where the homologous pairs of chromosomes separate from each other
5. Anaphase I B. Anaphase II
6. Name the meiosis phase where the individual chromosomes split at the centromere and the chromatids separate from each other
7. Anaphase I B. Anaphase II
8. REMEMBER: In which phase of meiosis does “crossing over” (the event when homologous chromosomes can exchange portions of their chromatids) occur?
9. Why don’t any of the *eggs* have a “Y chromosome”?

APPRENTICE:

Case 6: The Horns Dilemma

1. Which is the dominant allele - Horns or No Horns?

GENE TO PROTEIN GENIE:

1. Which is a broader (more inclusive) term – gene or allele?
2. What are the four letters we use to represent DNA nucleotides?
3. Where does transcription happen in a eukaryotic cell?
4. When transcribing, DNA is rewritten into mRNA. What are the RNA base pairing rules?
5. What is the corresponding codon (on the mRNA) for the DNA sequence “TTT”?
6. What is the corresponding anticodon (on the tRNA) for the codon “AAA”?
7. If reading a **codon chart** to determine which amino acid to add to the growing polypeptide chain in translation, will you be looking at mRNA or tRNA?