Zoo Matchmaker - Genetic Diversity Simulation
Students simulate selective breeding of four generations of captive tigers with the goal of maintaining the maximum amount of genetic diversity within the population of captive tigers. Ultimately the goal could be to repopulate the wild with tigers that were bred in captivity. Maximizing genetic diversity would help to insure that tigers released to the wild would have the diversity to survive the unknown rigors of the jungle. Students must also be aware, however, of inbreeding in their population. A high total inbreeding score could result in an unhealthy population of tigers.

Procedure
Complete the four generations of simulated tiger breeding, selecting tigers for the maximum diversity based on mean kinship and the relationship scale. While one would probably breed tigers that were the least related, this might not always be the best pairing for the entire population. On a separate worksheet, keep track of the parents and offspring for each generation. Write down each tiger's shared genes % and which tigers are "matched".

Important Concepts:

- Mean kinship (also called shared genes) is the average relatedness of an individual to all other individuals in the population.

- The relationship scale shows the relationship between tigers that are to be bred. Specifically, it shows the likelihood that the two tigers selected will pass on identical genetic material to their offspring. (A 25% chance for full siblings, etc.).

When you have completed four generations of breeding and produced four sets of 12 offspring each, study the final graph of your results.

1. What is the pattern between your breeding selections and your results?
2. Compare your breeding selections and the degree of inbreeding at the end of four generations.
3. Compare your breeding selections and the level of diversity at the end of four generations.