Genes R Us

1. **DESCRIPTION**: Teams will demonstrate an understanding of traits that may or may not be inherited, be able to explain why organisms share similarities and differences and use Punnett squares to predict inheritance patterns of certain characteristics.

2. **ESSENTIAL STANDARDS ALIGNMENT**: 2.L.2, 5.L.3

3. **TEAM OF UP TO**: 2

4. **MAXIMUM TIME**: 60 min.

5. **TEAMS**: Teams must bring writing instruments. **Teams may not bring resources to this event.**

6. **EVENT LEADERS**: Event leaders will provide an event with all necessary objects, materials, questions, and response sheets for participants to complete each exam.

7. **SAFETY REQUIREMENTS**: None

8. **IMPOUND**: No

9. **THE COMPETITION**: The competition will consist of an exam that covers any or all of the following topics.

    a. Define/use the following words: genes, alleles, genotype, phenotype, chromosomes, DNA, homozygous, heterozygous, dominant, and recessive.
    b. Identify life processes or species characteristics that members of a population share and if they are likely inherited (including instinctive behavior) or learned (example: cheetah spots are inherited, but their hunting skills are learned).
    c. Understand why certain organisms are present in certain habitats, including a basic understanding of adaptation based on inheritance (example: walruses have thick blubber to protect them from hypothermia in arctic habitats).
    d. Identify the following common human inheritable traits and the pattern of inheritance: earlobe attachment, tongue rolling, cleft chin, dimples, ACHOO syndrome and colorblindness.
    e. Make/analyze a Punnett square to determine genotype and phenotype of offspring with known parental genotypes and/or phenotypes (only Mendelian monohybrid crosses).
    f. Understand that dominant alleles mask recessive alleles.

10. **SCORING**: Points will be awarded for the accuracy of responses. Ties will be broken by the accuracy or quality of responses to preselected questions by the event leader.

11. **EVENT RESOURCES**:
    See the Event Resources tab on our website (ncscienceolympiad.ncsu.edu) for instructions, videos and more.