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Date: \_\_\_\_\_

Unit VII  
Biology – Heredity  
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# VII

## A Genetics Game

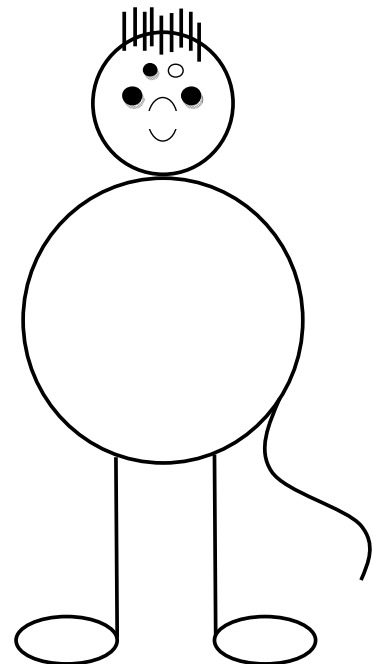
By LaDawn Haws and Scott Bauer from *The American Biology Teacher* Volume 63, Number 7 – September 2001

Vocabulary – allele, gene, dominant, recessive, incomplete dominance (mixing), homozygous, heterozygous, genotype, phenotype, mutation

Purpose – To demonstrate the transfer of alleles from generation to generation, to simulate the effects of mutations on the development of new traits and to review the vocabulary of genetics.

Rules –

1. Each critter displays five traits (the **DOMINANT** trait is shown in bold, uppercase letters)
  - a. Hair (curly or **STRAIGHT**)
  - b. Body Shape (**CIRCULAR** or square)
  - c. Eyes (**2** or 4) – this trait mixes
  - d. Legs (**LONG** or short)
  - e. Tail (**LONG** or short) – this trait mixes
2. Your initial card distribution will include two cards for each trait. One card from Parent 1 and one card from Parent 2. Complete the table on Critter Sheet #1. Use this table to determine your genotype (the alleles on both of your cards). Then, figure out how the critter will look (phenotype - the expression of those alleles) by completing the drawing of your critter. This critter is a member of the Parent Generation.
3. Randomly select your partner for the first round by drawing a playing card from the partner deck and finding your match. Examine the pictures that represent both critters in the pair. Decide what possible outcomes for the offspring can be predicted from these drawings. Record your predictions before moving on to the next step.
4. Place your cards face down on the table. Your partner will do the same. Select one card for each trait from each parent. Record this information on the table for Offspring F1. Return all cards to the original owner and repeat the process. Record the new set of information on the table for Offspring F1 on your partner's sheet. Determine the phenotype from the table and draw the critter as the cards dictate. This is the F1 generation. How does your actual phenotype compare to what you predicted in Step 3?
5. Take your F1 sheet and the allele cards that represent it. Then, select a new card from the playing card deck to determine who the new partner for your F1 critter will be. Use the same procedure in step four to determine the genotype and then the phenotype of the F2 generation.



Parent \_\_\_\_\_

Genotype _____
-------------------

Trait	#1	#2	Phenotype
Hair			
Body			
Eyes			
Legs			
Tail			

F1 \_\_\_\_\_  
Parent 1 / Parent 2

Genotype _____
-------------------

Trait	#1	#2	Phenotype
Hair			
Body			
Eyes			
Legs			
Tail			

F2 \_\_\_\_\_  
Parent 1 / Parent 2

Genotype _____
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Trait	#1	#2	Phenotype
Hair			
Body			
Eyes			
Legs			
Tail			

# Analysis

1. What are the GENOTYPES of the Parent, F1 and F2 generations? \_\_\_\_\_

\_\_\_\_\_

How are they similar? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

How are they different? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Describe your critter in terms of the five traits (body shape, hair, leg length, tail length, number of eyes) in your model. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Look at the drawings you made. Considering only these five traits for your critter, how does the phenotype of the critter change from the parent to the F1 generation? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

How does the phenotype change from the F1 generation to the F2 generation? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What differences do you notice between the original parent and the F2 generation? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Where do these changes come from? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

