

DRAGON GENETICS LAB

-- Principles of Mendelian Genetics--

PROCEDURE

1. Choose a partner carefully. You and your spouse will share the grade for this lab. Your instructor does not care which partner worked the hardest. This is a no divorce classroom.
2. Each partner must pick up five chromosomes (popsicle sticks) -- one of each color of autosome (green, orange, yellow AND white), and one sex chromosome (blue OR pink). Each side of a stick represents a chromosome, and the two sides together represent a pair of homologous chromosomes.
3. You will toss each chromosome in the air so that it lands on your lab table. The side of the chromosome (stick) that is facing up represents the chromosome that is passed on to the baby. Record the alleles (genotype) from each pair of homologous chromosomes (popsicle sticks) on the data chart on pages 3-4.
4. The decoding chart on page 2 will tell you what phenotype is caused by the genotypes you collect. Record the trait produced by each pair of alleles should be recorded in the data chart. Remember that a CAPITAL letter is dominant over a small letter [recessive] unless the decoding chart indicates those traits are codominant, sex-influenced, or sex-limited.

STEPS 1-4 ARE FOR CP 1! ONCE YOUR DATA CHART IS COMPLETE GET IT CHECKED!

5. You will then create a picture of your dragon baby. You may cut out the traits for your baby and then fit them together and produce a picture of the baby. Or you may trace/draw the traits to produce your baby's picture. You can then color your dragon baby. **CP 2**

CP 3 Questions (answer in your SNB)

1. What is the sex of your baby dragon?
2. Are there any traits that are affected by the sex of your baby dragon? Which traits does your dragon have that are affected by its sex?
3. What is Mendel's Law of Segregation?
4. What part of the lab modeled this law?
5. What is Mendel's Law of Independent Assortment?
6. What part of the lab modeled this law?
7. The gene for fangs is recessive, yet most of the dragons have fangs. How can this happen? [Hint: The genes that cause dwarfism (achondroplasia) in humans and polydactyly (extra fingers/toes) are dominant.]
8. Identify any mutations, gene deletions or inversions, in the chromosomes you have. Did any of the mutations cause issues with your baby dragon's traits?
9. Which traits are *more likely* to be found in males?
10. How might these be an advantage to this sex? [Be creative in your answers.]
11. Which traits are *more likely* to be found in females?
12. How might these be an advantage to this sex? [Be creative in your answers.]

DRAGON GENOME: DECODING CHART

<u>CHROMOSOME</u>	<u>DOMINANT GENES</u>	<u>RECESSIVE GENES</u>
Green Autosome	A. no chin spike B. nose spike C. three head flaps D. no visible ear hole E. [see below]	a. chin spike b. no nose spike c. four head flaps d. visible ear hole
Codominant traits		
EE. eye pointed at each end	ee. round eye	Ee. eye round at front, pointed at back
White Autosome	F. long neck G. no back hump H. no back spikes I. long tail J. flat feet	f. short neck g. back hump h. back spikes i. short tail j. arched feet
Orange Autosome	K. red eyes L. spots on neck M. [see below] N. no fang O. spots on back	k. yellow eyes l. no spots on neck n. fang o. no spots on back
Yellow Autosome	P. no spots on thigh Q. green body R. small comb on head [see below] S. [See below] T. [See below]	p. spots on thigh q. purple body r. large comb on head
Sex-limited traits		
R or r Only males have the comb on the head.		
Incomplete Dominant Traits		
SS. Red spots	ss. yellow spots	Ss. orange spots
Sex-influenced traits		
Male:		
M. no wings	m. wings	
T. no elbow spike	t. elbow spike	
Female:		
	M. wings	m. no wings
	T. elbow spike	t. no elbow spike
Sex Chromosomes	U. regular thigh V. four toes W. no chest plate	u. pointed thigh v. three toes w. chest plate
X Chromosome Only	X. no. tail spike Z. long arms + fire breather	x. tail spike z. short arms - ice breather
Y chromosome only	XY. male sex	XX. female

Baby Dragon's Genetic DATA CHART

Green Autosomes

	GENOTYPES		Baby:		TRAIT---Phenotype of Baby
	MOM	DAD	Egg	Sperm	
A					
B					
C					
D					
E					

White Autosomes

	GENOTYPES		Baby:		TRAIT---Phenotype of Baby
	MOM	DAD	Egg	Sperm	
F					
G					
H					
I					
J					

Orange Autosomes

	GENOTYPES		Baby:		TRAIT---Phenotype of Baby
	MOM	DAD	Egg	Sperm	
K					
L					
M					
N					
O					

Yellow Autosomes

	GENOTYPES		Baby:		TRAIT---Phenotype of Baby
	MOM	DAD	Egg	Sperm	
P					
Q					
R					
S					
T					

Sex Chromosomes (pink=female, blue=male)

GENOTYPES		Baby:		TRAIT---Phenotype of Baby
MOM	DAD	Egg	Sperm	
U				
V				
W				
X				
Z				
+/ -				
Y				

Sex of Baby:

Baby Dragon's Name: