

# Lab 17 Genetics lab

Name \_\_\_\_\_

Seat number \_\_\_\_\_

## Objectives:

- A. Baby dragon
- B. Some questions
- C. Dominant traits in humans
- D. Punnett squares

## A. Baby dragon

1. For this lab, you must have 2 people in your lab group. One of you will be the mother dragon and one will be the father dragon. You decide which sex you will be.
2. Each lab group, will need 10 Popsicle sticks. The popsicles are painted on one side and blank on the other side. Get two (2) popsicles of each of the following five (5) colors: **pink, green, red, orange, and brown.**
3. The female must have a pink stick (X) and only the male drops his stick on the table (pink side X and blank side Y), to see if the baby is a boy or a girl. The pink Popsicle sticks represent sex chromosomes. The green, red orange and brown chromosomes, in comparison, represent autosomes with dark colors representing dominant.
4. Each Popsicle stick represents a pair of homologous chromosomes. Each side of a stick represents a single chromosome of the pair. For each color of Popsicle sticks, each "parent" will drop your sticks on the table. Determine whether each stick lands with the painted side up, or the blank side up. For example, if you started with green sticks you might see both sticks with green up (AA), both sticks with blank up (aa), or one stick with green up and the other with blank up (Aa).
5. Your job is to drop your chromosomes on the table (i.e. mate) and record the resulting genotype and phenotype (trait) in the appropriate data table on page 2. You must do this for all the traits listed below. The alleles from each pair of homologous chromosomes will be recorded in the data chart.
6. DRAW your baby dragon once you and your partner have figured out its phenotype (next lab). Be prepared to share your drawing with the class!
7. Answer the analysis questions at the end of this lab.

*Remember that a CAPITAL letter is dominant over a lowercase letter; or, in other words, the lowercase letter is recessive to the capital letter.*



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Green Autosomes

Genotype		Phenotype

Orange Autosomes

Genotype		Phenotype

Red Autosomes

Genotype		Phenotype

Brown Autosomes

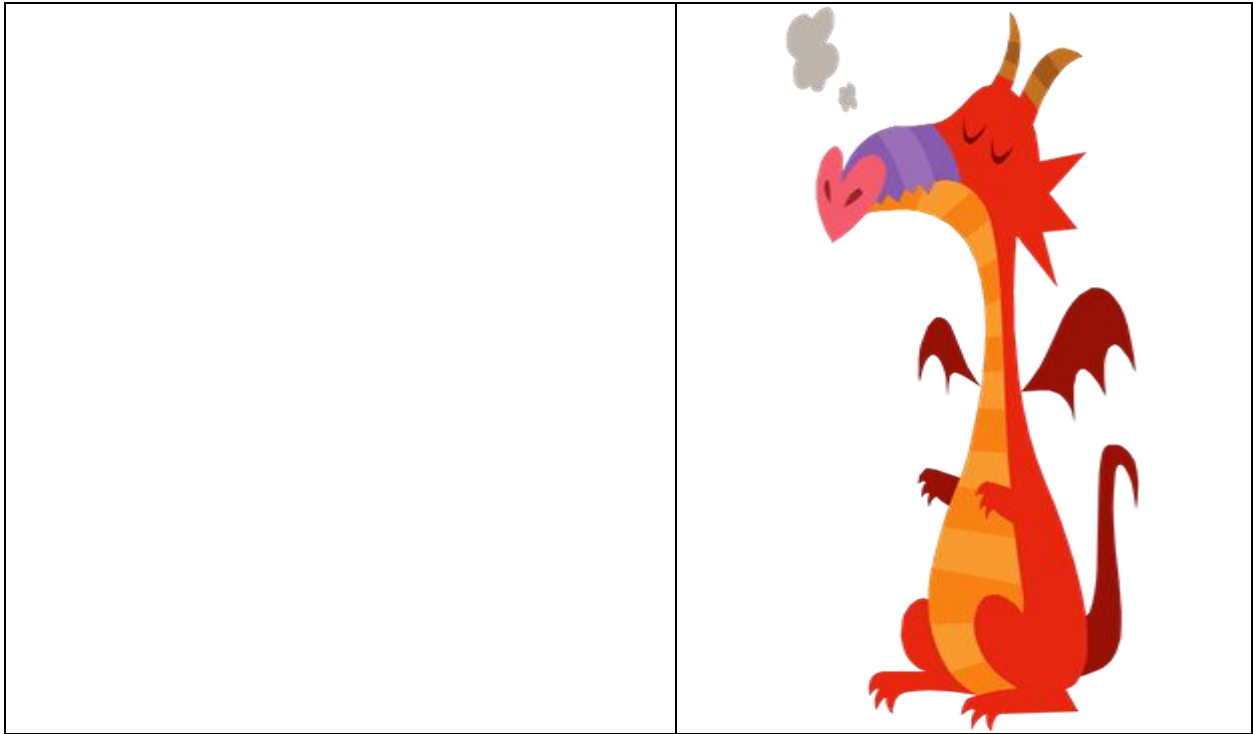
Genotype		Phenotype

Sex chromosomes

Genotype \_\_\_\_\_ Sex of baby \_\_\_\_\_

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What will your baby dragon look like?



### B. Some Questions

- 1) Look at another groups' baby dragon drawing. How does your dragon compare? Find and list one trait on your neighbors' dragon drawing and list the possible genotype(s) for that particular trait.
- 2) What is the difference between genotype and phenotype? (please use definitions in your answer)
- 3) What is the difference between a sex chromosome and an autosome?
- 4) 4. If you found a short necked, dragon with red eyes, a nose spike and a purple body what are ALL the possible genotypes it could be?

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### C. Dominant traits in humans

Go through each of the following DOMINANT traits. Determine if you have these traits or do not have these traits.

Trait Description	Is your phenotype Dominant (D) or Recessive (R)?
Tongue rolling	
Bent little fingers	
Widow's peak	
NO Hitchhiker's Thumb is dominant	
Hand clasping, left over right thumb	
Arm folding - fold your arms across your chest/abdomen which one is on top? Right on top is dominant	
Free (unattached) earlobe	
NO Chin cleft is dominant	
Hair on ANY joints of fingers	
Short big toe	
Ear points (Darwin's tubercle on helix)	
Round face	
Curly/wavy hair	
P.T.C Taster	
Eye Color (only blue is recessive)	

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## D. Punnett squares

Do a Punnett square for each problem and fill in the table

### Monohybrid

1. In rats black color in fur is dominant to white fur color. A homozygous black rat is mated with a white rat. What are the genotypes and phenotypes of this cross?

<u>phenotype</u>	<u>genotype</u>

2. If two of the f1 generation from the cross in question 1 were allowed to mate and produce offspring. What are the genotypes and phenotypes of this cross?

<u>phenotype</u>	<u>genotype</u>

3. In flowers, long anthers (A) are dominant over short anthers (a). Cross a homozygous recessive and a heterozygous flower to give offspring. Show your work in a Punnett Square. Also, indicate the genotypic and phenotypic ratios for this cross.

<u>phenotype</u>	<u>genotype</u>

4. In most mammals, brown/dark eyes are dominant over blue eyes. Is it possible for 2 brown eyed parents to produce blue-eyed offspring? Is it possible for 2 blue-eyed parents to produce brown-eyed offspring?

Show your work to make your point.

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## Dihybrid Cross

1. In foxes, long fur (F) is dominant over short fur (f) and striped tails (T) are dominant over solid color (t) tails. A homozygous long fur fox with a striped tail is mated to a fox with short fur and a solid colored tail. What are the genotype and phenotypes of the F1 generation?

$$FFTT \times fftt$$

F1 generation will be \_\_\_\_\_ genotype and their phenotype will be \_\_\_\_\_

2. Two of the F1's from question 1 were allowed to mate and produce offspring. What are the genotypes and phenotypes of the offspring? Make a 16 box Punnett Square and Make a chart of phenotypes and genotypes.

I have started the table for you. Please complete it.

Phenotype	All possible genotypes
9)	
3) Long fur, solid tail	FFtt, Fftt
3)	
1)	