

Name \_\_\_\_\_

Period \_\_\_\_\_

Regents Biology

Date \_\_\_\_\_

**LAB \_\_\_\_: PAPER PET GENETICS**

1. Given the list of characteristics below, you will create an imaginary pet and then breed it to review the concepts of genetics. Your pet will have the following possible characteristics:

Characteristic	Trait (phenotype)		
Gender	male (hat)	or	female (hair bow)
Skin color	green	or	orange
Eyes	round	or	square
Nose	triangle	or	oval
Teeth	pointed	or	square

2. The genetics of these characteristics and their traits are summarized in the table below:

Characteristic	Trait (Phenotype)	Genotype	
Gender	male	<b>XY</b>	
	female	<b>XX</b>	
Skin color	green	<b>FF</b>	or <b>Ff</b>
	orange	<b>ff</b>	
Eyes	round	<b>EE</b>	or <b>Ee</b>
	square	<b>ee</b>	
Nose	triangle	<b>NN</b>	or <b>Nn</b>
	oval	<b>nn</b>	
Teeth	pointed	<b>TT</b>	or <b>Tt</b>
	square	<b>tt</b>	

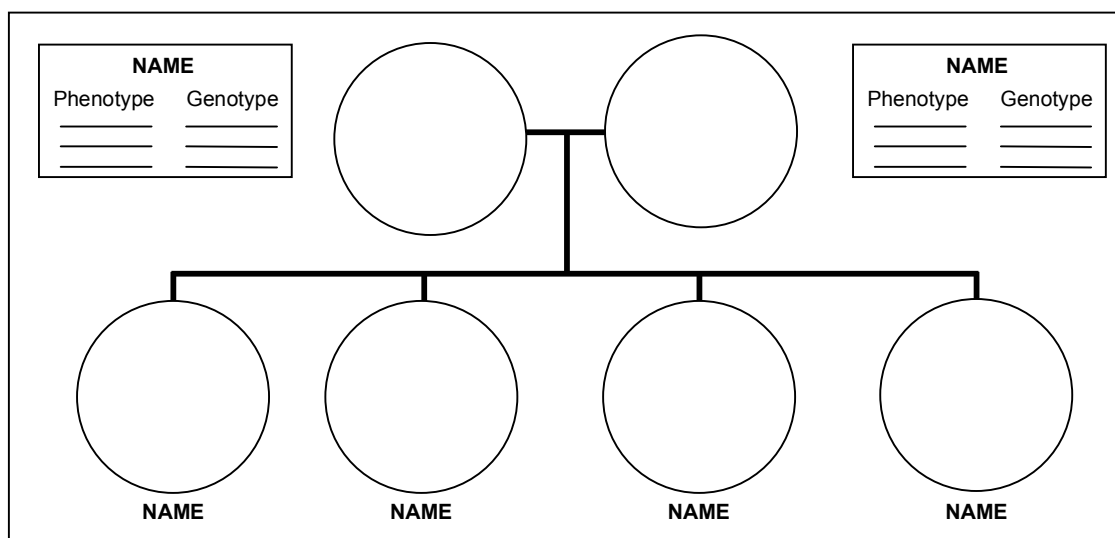
3. Work in **teams of two**. Each person needs to design her or his own pet for the original **parents**. You will get to mate them later 😊. Determine the genotype for each of the characteristics for your pet in the following manner: **To simulate the random way chromosomes are divided up during meiosis into egg and sperm, you will flip a coin to determine what kind of allele for each trait your pet inherits from each parent.**

**THE RULES: HEADS = Dominant allele | TAILS = Recessive allele**

4. Each of you will be filling out your chart **SEPARATELY**. Each of you will have **DIFFERENT** information. One of you will be the **male** pet of the pair and one of you will end up being the **female** pet of the breeding pair. Just flip a coin to decide this. But for all other traits you must use the coin flipping rules from the previous page. Flip the coin for each allele for each trait in the chart below to determine the genotype and phenotype of your new pet, and then write it in the chart.

Characteristic	Allele from Pet's Dad	Allele from Pet's Mom	Genotype of Pet	Phenotype of New Pet
Skin color				
Eyes				
Nose				
Teeth				
Gender	X	X		

5. Place the information from your chart on index cards, so we can start making a poster of your new pet family.
6. Follow this template for the final poster:



7. Your pet now mates with your partner's paper pet. There are **four offspring** in the new family. For each characteristic, use a Punnett square on the next page to determine all of the possible genotypes of the offspring.
8. To choose which one of the squares in your Punnett square is the trait for each of your pet's **four offspring** use this coin toss system:
- **Toss a coin a first time:**  
If heads, the offspring is in the top row of the Punnett square.  
If tails, the offspring is in the bottom row of the Punnett square.
  - **Toss a coin a second time:**  
If heads, the offspring is on the left side of that row in the Punnett square.  
If tails, the offspring is on the right side of that row in the Punnett square.
9. Summarize the traits for each pet offspring in the chart below. You will repeat this coin toss method 4 times: Once for each of the paper pet's **four offspring** in the new family.

		Gender (Sex)	Skin color	Eyes	Nose	Teeth
<b>Offspring 1</b>	genotype					
	phenotype					
<b>Offspring 2</b>	genotype					
	phenotype					
<b>Offspring 3</b>	genotype					
	phenotype					
<b>Offspring 4</b>	genotype					
	phenotype					

10. Use colored paper, scissors, and glue to create the **parents and four offspring** in your paper pet's new family. Glue the index card with the parent's information to the poster as well. Name each pet and give the whole family a family name.

Name \_\_\_\_\_

1. Trait: **SKIN COLOR**

phenotype:

\_\_\_\_\_ x \_\_\_\_\_

genotype: \_\_\_\_\_ x \_\_\_\_\_


2. Trait: **EYES**

phenotype:

\_\_\_\_\_ x \_\_\_\_\_

genotype: \_\_\_\_\_ x \_\_\_\_\_


3. Trait: **NOSE**

phenotype:

\_\_\_\_\_ x \_\_\_\_\_

genotype: \_\_\_\_\_ x \_\_\_\_\_


4. Trait: **TEETH**

phenotype:

\_\_\_\_\_ x \_\_\_\_\_

genotype: \_\_\_\_\_ x \_\_\_\_\_


5. Trait: **GENDER**

phenotype:

\_\_\_\_\_ x \_\_\_\_\_

genotype: \_\_\_\_\_ x \_\_\_\_\_


**QUESTIONS**

1. Explain what is meant by the term, “homozygous dominant”.

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2. Explain what is meant by the term, “heterozygous”.

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3. Explain what is meant by the term, “dominant”.

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4. Explain what is meant by the term, “recessive”.

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5. Explain what an individual would have to have genetically to show the recessive trait.

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6. Do all your pet’s offspring look the same? If no, then explain why they look different.

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7. Using a Punnett square and an explanation describe if a square-eyed pet mates with another square-eyed pet, can they have any round-eyed offspring.

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8. Using a Punnett square and an explanation describe if an orange pet mates with another orange pet, can they have any green offspring.

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9. Using a Punnett square and an explanation describe if a green pet mates with an orange pet, can they have any orange offspring.

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10. Why did we use coin-flipping as a method to choose traits for the parent pets and the offspring pets?

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11. Explain how coin-flipping simulates the events of meiosis and the production of sperm or eggs.

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