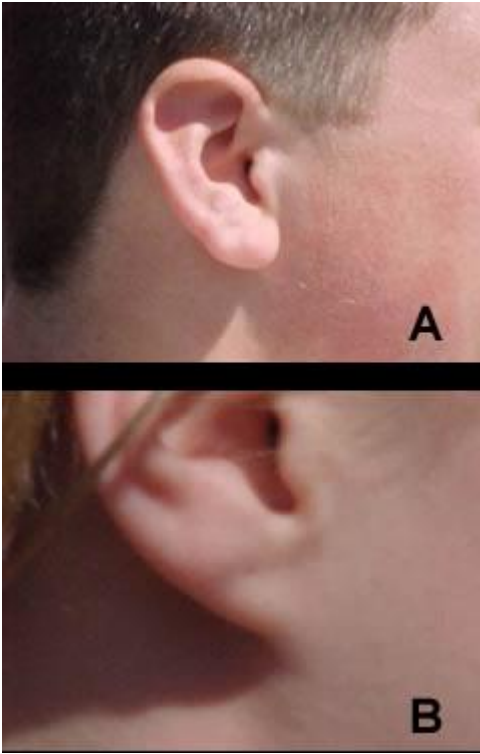









Name: _____ Class: _____ Date: _____

Paper Family

In this activity you and your partners will be investigating inheritance by creating a paper family. In this activity you will need to know the following vocabulary: Gregor Mendel, genetics, heredity, Punnett Squares, phenotype, genotype, homozygous, heterozygous, DNA, offspring, mitosis, meiosis, allele, and traits. Be sure you have these words on the correct page in your science notebook.

The Paper Family will focus on the 6 distinct traits shown in the chart.

Trait	Variations
Ear Lobes	 <p>Free (picture A) EE or Ee</p> <p>Attached (picture B) ee</p>
Eyelash Length	 <p>Long (bottom picture) LL or Ll</p> <p>Short (top picture) ll</p>

<p>Hairline</p>	 <p>Images courtesy of GregPC</p> <p>Widow's Peak (left picture) PP or Pp</p>	 <p>Straight (right picture) pp</p>
<p>Hair Type</p>	 <p>Straight (left picture) cc</p>	 <p>Curly/Wavy (right picture) CC or Cc</p>
<p>Freckles</p>	 <p>Freckles (left) FF or Ff</p>	 <p>No Freckles (right) ff</p>
<p>Gender</p>	<p>Male XY</p>	<p>Female XX</p>

THE PARENTS

1. Create parents that are heterozygous for all of the traits except gender. Fill in the tables below to show each parent's genotype and phenotype for each trait.

Father's Name _____

Trait	Genotype	Phenotype
Ear Lobes		
Eyelash Length		
Hairline		
Hair Type		
Freckles		
Gender	XY	Male

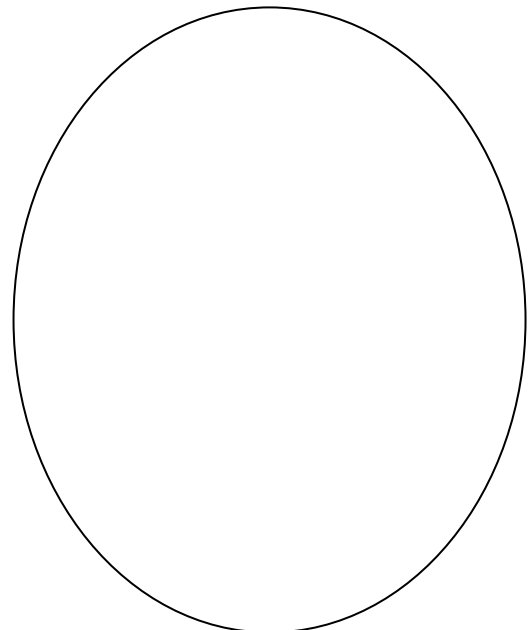
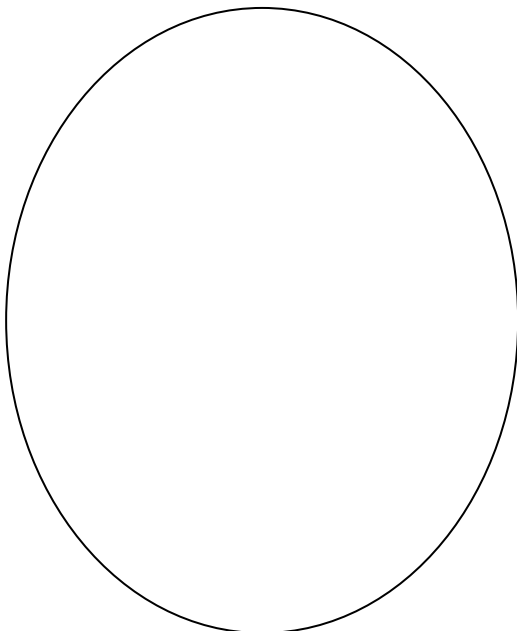
Mother's Name _____

Trait	Genotype	Phenotype
Ear Lobes		
Eyelash Length		
Hairline		
Hair Type		
Freckles		
Gender	XX	Female

2. Use the two ovals below to represent the faces of the two parents. Draw the appropriate traits on each oval.

Father: _____
Gender: XY (Male)

Mother: _____
Gender: XX (Female)



THE OFFSPRING

3. Now, your parents will combine alleles to create four offspring. To determine which allele is passed from the father and which allele is passed from the mother, you will flip a penny. Heads represents a dominant allele, tails a recessive. Example: For the first offspring, you flip heads and then tails. Your baby has the genotype Ee. Two heads would have been EE and two tails would have been ee. You'll repeat this for each trait. BEFORE flipping the coin and making the four offspring, please answer questions 4 and 5.

4. What happens if your parent does not have the dominant allele? Should you still flip the coin?

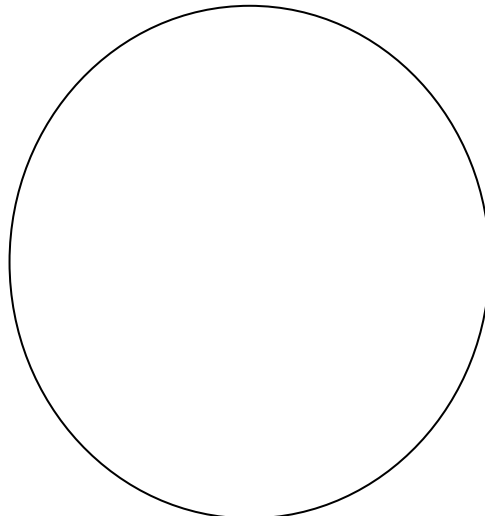
5. What process makes cells with $\frac{1}{2}$ the number of chromosomes?

MAKING THE OFFSPRING

6. Fill in the tables below to show each offspring's genotype and phenotype for each trait and then sketch the traits on the offspring's oval.

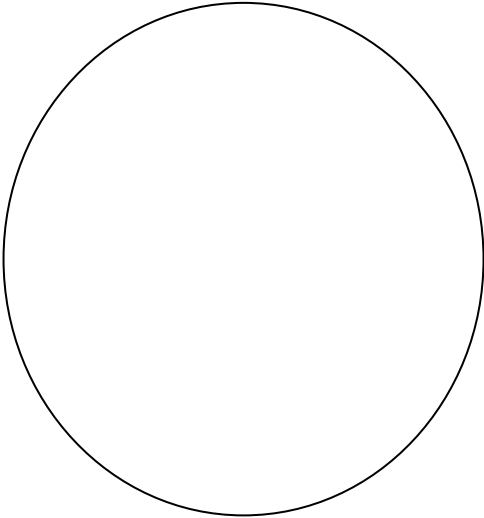
Offspring #1 Name _____

Trait	Genotype	Phenotype
Ear Lobes		
Eyelash Length		
Hairline		
Hair Type		
Freckles		
Gender		



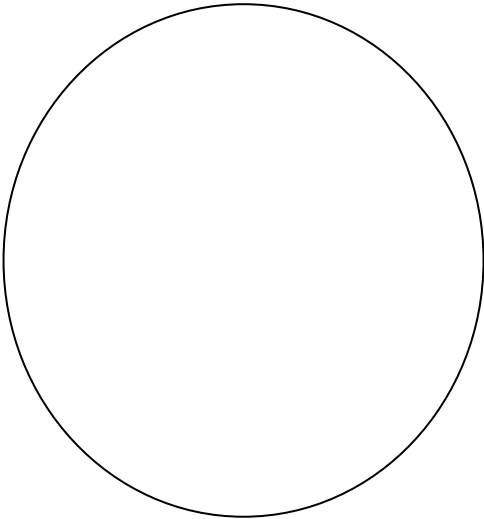
Offspring #2 Name _____

Trait	Genotype	Phenotype
Ear Lobes		
Eyelash Length		
Hairline		
Hair Type		
Freckles		
Gender		



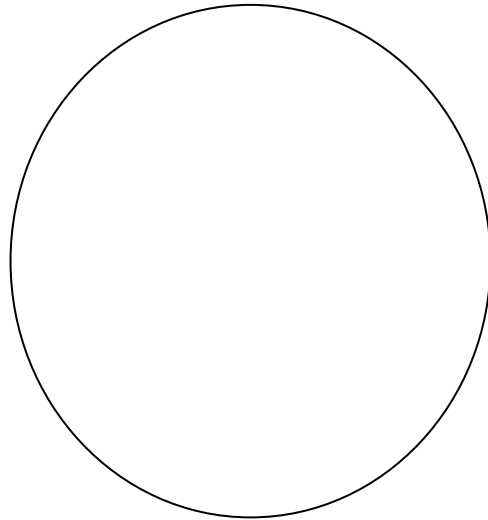
Offspring #3 Name _____

Trait	Genotype	Phenotype
Ear Lobes		
Eyelash Length		
Hairline		
Hair Type		
Freckles		
Gender		



Offspring #4 Name _____

Trait	Genotype	Phenotype
Ear Lobes		
Eyelash Length		
Hairline		
Hair Type		
Freckles		
Gender		



QUESTIONS

Please answer the following questions:

7. Why did you flip a penny to determine the traits?

8. How many alleles for each trait came from the father? How many alleles for each trait came from the mother?

9. Why is meiosis important in creating offspring through sexual reproduction?

PUNNETT SQUARE PRACTICE:

10. On a separate sheet of paper, draw and fill in the Punnett square for each cross given below. Determine the percent chance of having an offspring with each genotype and phenotype.

1. Ee x ee

2. Ll x Ll

3. Pp x Pp

4. FF x ff