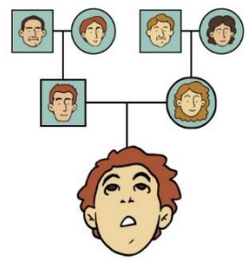
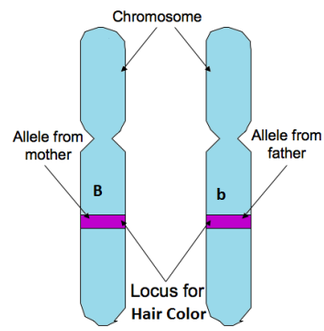
Name _____ Class_____ ***GENETIC NOTES & WORKSHEETS**

DAY 1: Mendelian Genetics Vocabulary

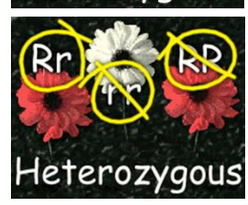


A. **Genetics**- Study of _____
B. **Heredity**- The passing on of characteristics (traits) from _____ to _____
C. **Trait** – A particular _____that can vary from one individual to another. Ex: _____
D. **Fertilization**- Joining of male and female _____ (reproductive cells) during _____reproduction
E. **Genes**- Section of a chromosome that determine the trait we will inherit Ex: Sally has the gene for brown hair
F. **Alleles**- _____ of one gene
Ex: Brown, red, or blond hair are all different forms the hair color gene
G. **Dominant Gene**- _____ expressed if present for a trait
   - Dominant allele = capital letter (B); the stronger of a pair of genes
H. **Recessive Gene**- Only expressed if _____ _____ are present for that trait; the weaker of a pair of genes
   - Recessive allele = lowercase letter (b)



PRACTICE! Use the term Dominant or Recessive to identify the type of trait shown.

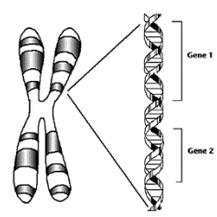
1. TT_____ 4. SS_____
2. tt _____ 5. ss_____
3. Tt_____ 6. Ss_____



I. **Homozygous**- Organisms have _____ alleles for a trait
   - Ex: RR (BIG/BIG) or rr (small/small)
J. **Heterozygous**- Organisms have _____ alleles for a trait
   - EX: Rr (BIG/small)

PRACTICE! Use the term Homozygous or Heterozygous to identify each of the following:

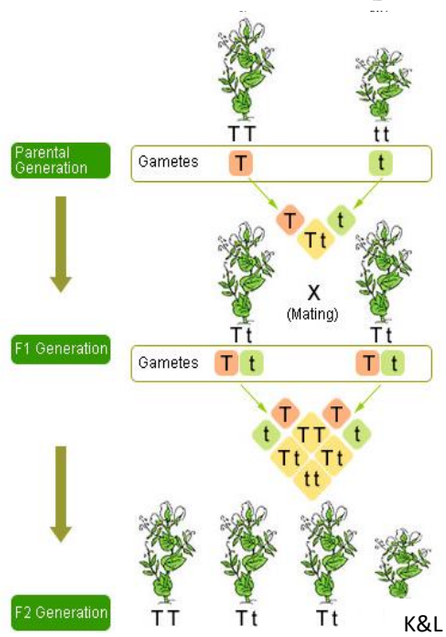
1. AA _____ 4. gg _____
2. Aa _____ 5. GG_____
3. Mm_____ 6. Gg _____



K. **Genotype**- the genetic makeup (_____) or combination of _____ _____ (one from mom and one from dad)
   - Ex: QQ, Qq, qq

L. **Phenotype**- _____ characteristics of the trait
   - Ex: Brown Hair (what you see) **Gregor Mendel (1822-1884)**

A. Austrian Monk
B. The "_____ _____ _____"
C. Cross Bread common _____ to study the inheritance of traits through each generation.



Mendel's Pea Plant Experiment

A. P1 – _____
B. F1- _____
C. F2- _____

Mendel's Conclusions:

A. Biological Inheritance is _____ from one _____ to the next.

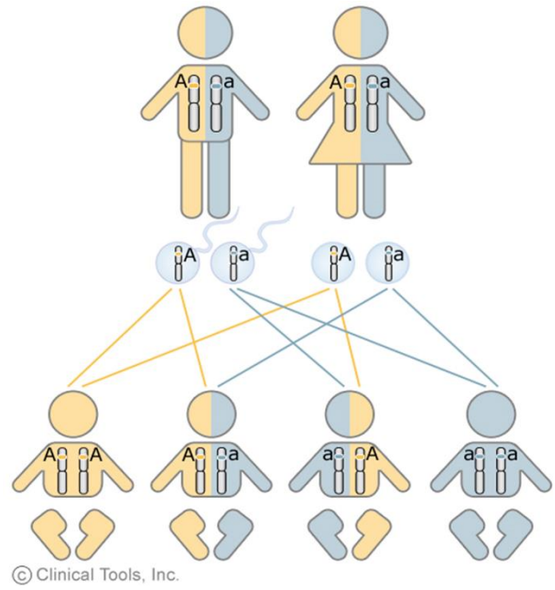
- Ex: your traits were determined by your parents' genes that were passed onto you.

B. Law of _____

- During _____, the pairs of _____ _____ so that each gamete receives only one gene for each trait

C. Law or Principal of _____

- Some alleles are _____ and some are _____.
- Recessive traits will only show up if dominant is _____ present



<u>Punnett Squares following Mendelian Rules of Genetics</u>

A. A Punnett Square is a _____ used to _____ the outcome of a particular cross or breeding experiment

B. Used to determine the _____of _____offspring's genotypes and phenotypes

C. This does _____determine how many offspring will be produced or exactly what the offspring's genotype and phenotype will be…just the chances!

D. There are five steps (you must always show your work)

1. **Key**- List the trait, Both alleles, and which phenotype corresponds with each allele
2. **Parents**- List the genotypes of each parent
3. **Draw** the Punnett square
4. Determine the **genotype** ratio
5. Determine the **phenotype** ratio

Complete the following Punnett squares <u>using all 5 steps</u>

<u>SAMPLE PROBLEM:</u> Wavy hair is **dominant** to straight hair. Cross **two heterozygous** parents.

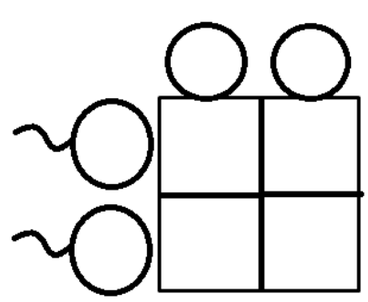
1. Key:

2. Parents: ____X_____

4. Genotype:

5. Phenotype:

3. Punnett Square



For each phenotype below, list the POSSIBLE genotypes (remember to use the letter of the dominant trait).

Brown eyes are dominant to blue eyes

_____Homozygous Brown

_____Heterozygous Brown

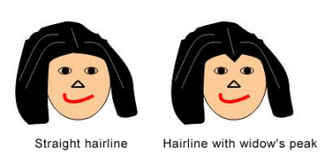
_____blue

Widow's peak is dominant to straight hair line

_____Widow's peak

_____Widow's peak

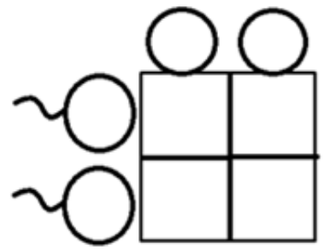
_____straight hair line



1. In rabbits, black hair color is dominant to white. Cross **homozygous black rabbit with a white** rabbit.

   1. Key:
   2. Parents: _____X_____
   4. Genotype:
   5. Phenotype:

   3. Punnett Square



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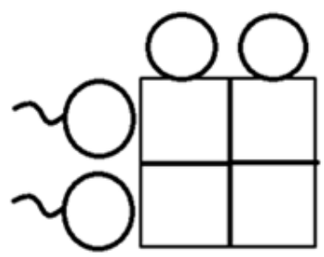
2. In roses, **red** is **dominan**t to yellow. Cross a **homozygous red** rose with a **heterozygous red** rose

   1. Key:
   2. Parents: _____X_____
   4. Genotype:
   5. Phenotype:

   3. Punnett Square



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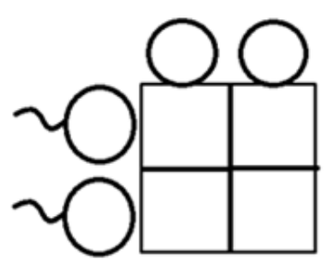
3. In cats, long tails are dominant to short tails. Cross **two heterozygous** long tail cats.

   1. Key:
   2. Parents: _____X_____
   4. Genotype:
   5: Phenotype:

   3. Punnett Square



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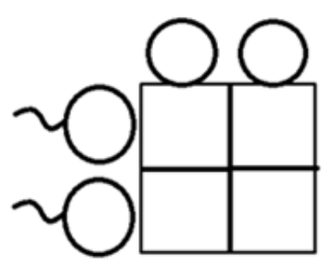
4. In lizards, green skin color is dominant to purple. Cross a heterozygous green lizard with a purple lizard.

   1. Key
   2. Parents:
   4: Genotype Ratio:
   5: Phenotype Ratio:

   3. Punnett Square



Match the terms with the definitions.

1. _____ Genetics	A. the weaker of a pair of genes
2. _____ Dominant	B. when the pair of genes are identical
3. _____ Genes	C. the study of heredity
4. _____ Homozygous	D. the passing of traits from parents to their offspring
5. _____ Gamete	E. the stronger of a pair of genes
6. _____ Recessive	F. sex cells (reproductive cells), whether male or female
7. _____ Heterozygous	G. segment of DNA that codes for a particular protein
8. _____ Heredity	H. the physical appearance of an organism
9. _____ Phenotype	I. the actual genetic make-up of an organism
10. _____ Genotype	J. when the pair of genes are different

1. In humans, a widow's peak is dominant to a straight hair line. Cross homozygous widow's peak with a straight hair line.

1. Key:

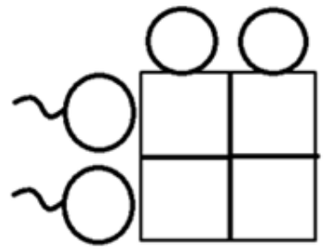
2. Parents: _____X_____

4. Genotype:

5. Phenotype:

3.

Punnett Square



2. In humans, a widow's peak is dominant to a straight hair line. Cross a straight hair line with a straight hair line.

1. Key:

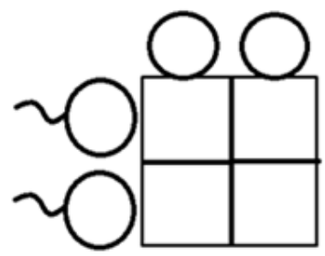
2. Parents: _____X_____

4. Genotype:

5. Phenotype:

3.

Punnett Square



3. Mendel discovered that yellow pea color is dominant to green pea color. Cross a green pea plant with a heterozygous yellow pea plant.

1. Key:

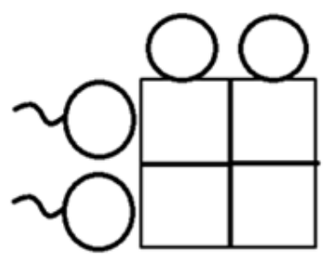
2. Parents: _____X_____

4. Genotype:

5. Phenotype:

3.

Punnett Square



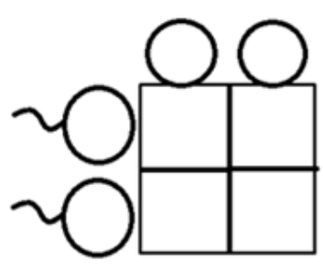
4. Using Mendel's information about pea plants, (yellow is dominant to green) cross a homozygous yellow pea plant with a heterozygous yellow pea plant.

1. Key:

2. Parents: _____X_____

4. Genotype:

5. Phenotype:

3.

Punnett Square