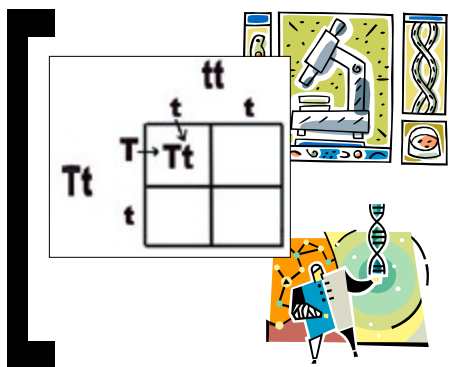


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*Accept our connectedness to events. It is not unknown forces that cause our problems.
We are the cause and the cure. We create our own reality and we can change it.*

Measurement Topic 16

The Genetics of Life



1. Mendelian Genetics
2. Human Genetics
3. BioTechnology

2012-2013

New Smyrna Beach High School

Working together with parents, school personnel and community members, New Smyrna Beach High School students will graduate with the knowledge, skills and values to be positive contributors to society.

Mendelian Genetics

Reading Comprehension Worksheet

Background Reading: Chapter 6

Mendel and Genetics

1. The **Father of Genetics**, who laid the groundwork for our understanding of Genetics was an Austrian Monk named _____. What is Genetics? _____
_____ Did Mendel know what chromosomes or genes were? _____
2. Why is the garden pea a good subject for studying heredity? _____

4. Mendel chose seven traits of the pea plant to follow. Explain what the **'either-or'** characteristics of the pea plant means & give some of the examples.

5. What does the term **purebred** mean? _____
*Purebred is "of only one kind." It's a mix of only ONE species or thing. Hybrid is that two or more things were mixed to create something. For example, a purebred dog is a Poodle, while a hybrid is a Labradoodle
6. Explain & describe what a **'cross'** is in genetics. _____

7. What is meant by the terms:
P generation _____
F₁ Generation _____
F₂ generation _____

Mendelian Genetics

Reading Comprehension Worksheet

Background Reading: Chapter 6

Traits, Genes, and Alleles

1. What is the relationship between **chromosomes, genes,** and **locus** (loci is plural) _____

2. What is the relationship between **genes** and **alleles**? _____

3. Distinguish between **homozygous** and **heterozygous**. _____

4. Distinguish between **genotype** and **phenotype**. _____

5. Distinguish between **dominant** and **recessive**. _____

Mendelian Genetics

Reading Comprehension Worksheet

Background Reading: Gator book, Chapter 6

Traits and Probability

1. What is a **Punnett square**? _____

2. What do the **axes of the grid** represent? _____

3. What do the **grid boxes** represent? _____

4. What is a **monohybrid cross**? _____

5. What is a **testcross**? _____

6. What is a **dihybrid cross**? _____

Genetics Practice

1. For each GENOtype below, indicate whether it is HeTeROzygous (He) or HOMOzygous (HO).

A. AA _____

E. Ee _____

I. II _____

B. Bb _____

F. Ff _____

J. Jj _____

C. Cc _____

G. GG _____

K. *kk* _____

D. DD _____

H. *hh* _____

L. LL _____

2. For each of the GENOtypes given below, write the PHENOtypes that would be possible. You must determine whether or not the PHENOtype is HOMOzygous or HeTeROzygous.

A. PURPLE flowers are DOMINANT to white flowers. _____ BROWN eyes are dominant to blue eyes.

1) PP _____

4) BB _____

2) Pp _____

5) Bb _____

3) pp _____

6) bb _____

B. ROUND seeds are DOMINANT to wrinkled seeds. _____ Bobtails are recessive in cats.

1) RR _____

4) TT _____

2) Rr _____

5) Tt _____

3) rr _____

6) tt _____

3. For each PHENOtype below, write the GENOtypes. Remember to use the first letter of the DOMINANT trait.

A. STRAIGHT hair is DOMINANT to curly. _____ POINTED heads are DOMINANT to round.

1) _____ STRAIGHT

4) _____ POINTED

2) _____ HEteROzygous Straight

5) _____ HEteROzygous Pointed

3) _____ curly

6) _____ round

Genetics Practice, cont.

4. Set up Punnett squares for each of the crosses listed below. **Note:** In pea plants, ROUND seeds are DOMINANT to wrinkled seeds

A. $RR \times rr$ What percentage of the offspring will be ROUND? _____

Genotype	Phenotype

B. $Rr \times rr$ What percentage of the offspring will be ROUND? _____

Genotype	Phenotype

C. A HOMOzygous round seed plant is crossed with a HeTeROzygous round seed plant.
What percentage of the offspring will be ROUND? _____

Genotype	Phenotype

D. Two HeTeROzygous round seeded pea plants are crossed.
What percentage of the offspring will be ROUND? _____

Genotype	Phenotype

Sex Linked Inheritance

Reading Comprehension Worksheet

Background Reading: Chapter 7

SEX LINKED TRAITS

- Recall that we have 46 chromosomes—23 pair total—22 pair are referred to as autosomes—the last pair are called sex chromosomes. So an autosome is a chromosome other than an _____ or _____ sex chromosome.
- A sex-linked gene is located only on the _____ or _____ chromosome. Most sex linked traits are carried on the _____ chromosome and are recessive.
- The male sex chromosomes are called _____ and the females are _____.
- Color Vision is a sex-linked trait as is Hemophilia and are exhibited like:

$X^C X^C$ = Female, HOMOzygous color blind

$X^C X^c$ = Female, Carrier

$X^c X^c$ = Female, Color-Blind

$X^C Y$ = Male, color blind

$X^c Y$ = Male, color blind

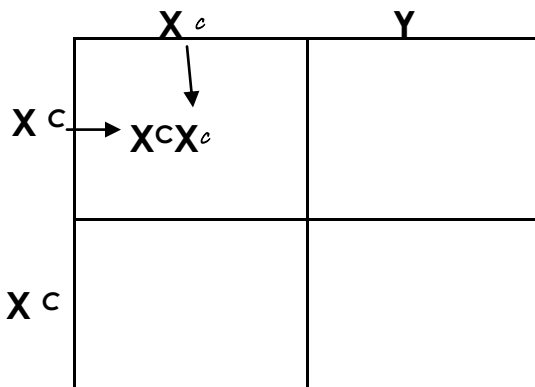
$X^H X^H$ = Female, HOMOzygous Normal Blood Clotting

$X^H X^h$ = Female, Carrier

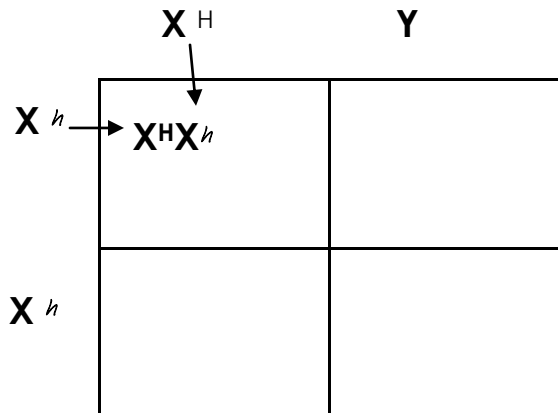
$X^h X^h$ = Female, w/ Hemophilia

$X^H Y$ = Male, normal blood clotting

$X^h Y$ = Male, hemophiliac



Genotype	Phenotype



Genotype	Phenotype

Complex Patterns of Inheritance

Reading Comprehension Worksheet

Background Reading: Chapter 7

INCOMPLETE DOMINANCE

1. In some organisms, an individual displays a phenotype that is intermediate between two parents and is known as _____. There is no complete dominance or complete recessiveness—the traits MIX.
2. Examples are with the flower called a snapdragon: _____ AND with hair type in people:

RR = Red snapdragons
Rr = Pink snapdragons
rr = white snapdragons

SS = Straight hair
Ss = wavy hair
ss = curly hair

Complex Patterns of Inheritance

Reading Comprehension Worksheet

CO-DOMINANCE

1. Sometimes, both alleles of a gene are expressed completely—neither allele is dominant or recessive. It means that both traits are _____
2. One trait that exhibits co-dominance is **blood types** I^A , I^B or i are the 3 alleles. The genotypes & phenol types for blood type are written below:

$I^A I^A$ or $I^A i$ = HOMOzygous Type A or HeTErOzygouse Type A
 $I^B I^B$ or $I^B i$ = HOMOzygous Type B or HeTErOzygouse Type B
 $I^A I^B$ = Type AB
 ii = Type O

Complex Patterns of Inheritance

Reading Comprehension Worksheet

POLYGENIC INHERITANCE

1. What is **polygenic inheritance**? _____
2. Examples of polygenic traits in humans include _____

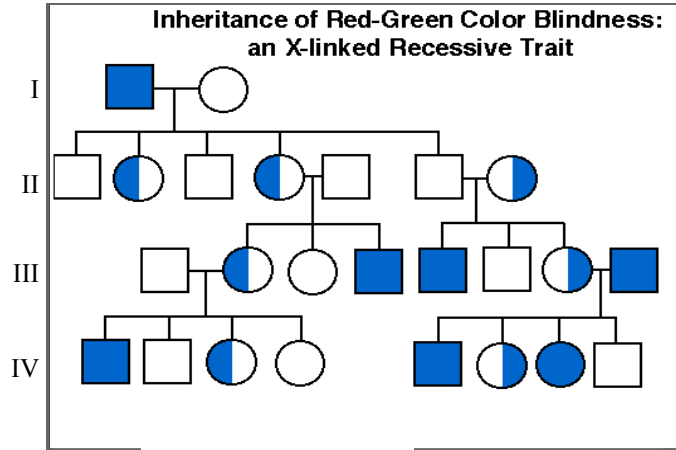
Tracing Genes & Chromosomes in a Family

Reading Comprehension Worksheet

Background Reading: Chapter 7

1. What is a **pedigree** and what is it used for? _____

2. Label the Pedigree below:



3. What is a **Karyotype** and what is it used for? _____

4. Which one is of a female? Male? Normal? Abnormal?

