Honors Biology Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_  
NDHS Per: \_\_\_\_\_ Date: \_\_\_\_\_\_

**Alternat Patterns of Inheritance**

Not everything in genetics is as clear cut as Mendel’s idea of dominance. Many traits are controlled by several other types of inheritance patterns.

**Incomplete Dominance**:

* neither trait is dominant so

Different Rules:

Key: Use a

Use a

Sometimes it is just the R and W

Red X white

|  |  |
| --- | --- |
|  |  |
|  |  |

Genotypic:

Phenotypic:

Cross Pink with Pink

|  |  |
| --- | --- |
|  |  |
|  |  |

Genotypic Ratio:

Phenotypic Ratio:

**Codominance**:

Both traits are equally

Ex:

* looking closely at the fur = #’s of red hairs and white hairs

KEY:

Function the same way as incomplete dominance

CR = red

CW = white

Codominance Crosses

Red with White

|  |  |
| --- | --- |
|  |  |
|  |  |

Genotypic:

Phenotypic:

Roan with Roan

|  |  |
| --- | --- |
|  |  |
|  |  |

Genotypic:

Phenotypic:

**Multiple Alleles**:

instead of just , there are more

gives multiple factors to consider:

which alleles are

which are

which are

Ex: Rabbit Fur

* Full color dominant over chinchilla
* Chinchilla dominant over Himalayan
* Himalayan dominant over Albino

Key for Multiple Allele Problems

Large Letter for

Superscript for - only

Cross a heterozygous full/chinchilla with a heterozygous Himalayan/albino

|  |  |
| --- | --- |
|  |  |
|  |  |

Genotypic:

Phenotypic:

**HUMAN BLOOD TYPE**

Importance:

|  |  |  |  |
| --- | --- | --- | --- |
| Blood Type | Genotype | | Can Receive Blood From: |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |  |
| --- | --- |
|  |  |
|  |  |

Genotypic:

Phenotypic:

|  |  |
| --- | --- |
|  |  |
|  |  |

Genotypic:

Phenotypic:

.

Blood type is “+” or “-” based on a second surface protein called the

.

* If the factor is the person is “ ” – this occurs in about 85% of the population
* If the factor is absent (recessive), the person is “ ”.
* If a Rh- person receives blood from an Rh+ person then nothing will generally happen – the first time. The Rh- person will then develop

“ “. If exposed to Rh+ blood again, the

**Epistasis**: One gene at a different locus (location) alters the expression of another gene

Mice Coloration:

HOWEVER:

Also dependent upon the

Determine Colors:

BbCc:

BBcc:

bbCC:

bbcc:

Cross heterozygous male with a heterozygous female (not 9:3:3:1)

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Genotypic:

Phenotypic:

**Polygenic Traits**: one characteristic is controlled by the cumulative effect of many genes

Ex: Human height and skin color - each controlled by at least three gene pairs

**Human Height:**

T - tallness

t - shortness

TTTttt - medium height

TtTtTt - medium height

TTTTTT - tall

tttttt- short

TtTtTt x TtTtTt

* many different combinations

**Human Pigmentation**:

same basic process

- gene codes for

- all humans have the of pigment producing cells in their skin

- the

-

-

**Environmental Conditions affect the expression of the phenotype.**

Hydrangeas: Certain types have blue or pink flowers based on the pH of the soil  
 Blue flowers in   
 Pink flowers in

Change the soil pH = Change the flower color

ACID (AlSO4) Neutral BASE (Lime Dust)

**Bimbleflick Traits**:

Regular Dominant:

Incomplete Dominant:

Co-dominant:

Multiple Alleles:

Polygenic Inheritance: