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: