**Math, Genes, and You**

Week 4, Day 2: Mendelian Inheritance

**Plan for today**

Genetics news

Lecture: Mendelian Inheritance

Group projects

**Definitions**

**Phenotype** – The observable characteristics of an organism

**Additive** – A trait where AB individuals have an intermediate phenotype between AA and BB. Example: Hair color.

**Dominant** – A trait where individuals one (Aa) or two alleles (AA) have the same phenotype. Example: Blood type A vs O.

**Recessive** – A trait where individuals need two alleles (aa) to have the phenotype. Example: Blood type O vs A.

**Complex** – A trait that is influenced by many genes. Example: height. Also called **polygenic**.

**Examples**

**Example 1:** Assume ABO blood type is determined by genotype at a multi-allelic variant with alleles A, B, and O in the following fashion:

|  |  |
| --- | --- |
| Genotype | Phenotype |
| AA | Blood type A |
| AB | Blood type AB |
| AO | Blood type A |
| BB | Blood type B |
| BO | Blood type B |
| BO | Blood type O |

What would be the expected results of a cross between a type A and a type O individual?

If type A individual is AA:

|  |  |  |
| --- | --- | --- |
|  | **A** | **A** |
| **O** | AO | AO |
| **O** | AO | AO |

All offspring will be type A.

If type A individual is AO:

|  |  |  |
| --- | --- | --- |
|  | **A** | **O** |
| **O** | AO | OO |
| **O** | AO | OO |

½ of the offspring will be type A, ½ will be type O.