

Name _____ # _____

8th Grade

Genetics Families – Inheritance Patterns

Chapter 12

Most traits do not follow the simple pattern of 1 gene & 2 alleles. Instead, they follow a _____ of _____.

Below are the more complex patterns that you will be incorporating into your family. Define each pattern below and give an example to describe it.

| <u>Pattern of Inheritance</u> | <u>Definition</u> | <u>Example</u> |
|--------------------------------------|--------------------------|-----------------------|
| 1) Incomplete Dominance | | |
| 2) Codominance | | |
| 3) Multiple Alleles | | |
| 4) Polygenic Inheritance | | |

Patterns of Inheritance – Skin Color

Incomplete Dominance

Directions: Choose 2 colors that can be mixed together for your P Generation Parents. For example, if you mixed black and white, you would get grey. Color in the boxes for the phenotype. Use the Alleles C & F.

| <u>Genotypes & Phenotypes for the P Generation</u> | | |
|---|--------------------|----------------------|
| | Male Parent | Female Parent |
| Genotype | | |
| Phenotype | | |

P Generation Punnett Square **Incomplete Dominance**

Skin Color

Male →
Female ↓

| | | |
|--|--|--|
| | | |
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When a trait is expressed by **incomplete dominance**, the offspring of *homozygous* parents with different phenotypes will be _____ with a blend of both phenotypes.

All of the offspring in the F₁ Generation will be _____ and _____.

F₁ Generation – Skin Color

Incomplete Dominance

| <u>Genotypes & Phenotypes for the F₁ Generation</u> | | |
|---|--------------------|----------------------|
| | <u>Male</u> | <u>Female</u> |
| Genotype | | |
| Phenotype | | |

F₁ Generation Punnett Square

Incomplete Dominance

Skin Color

Male →
Female ↓

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

| Trait | Genotype | Heterozygous or Homozygous | Phenotype | Probability |
|-------------------|-----------------|---|------------------|--------------------|
| Skin Color | | | | |
| | | | | |
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Patterns of Inheritance – Hair Color

Codominance

Directions: Choose 2 colors for the hair color of your P Generation. Color in the boxes for the phenotype. Alleles are written using a superscript – S^G and S^K .

| <u>Genotypes & Phenotypes for the P Generation</u> | | |
|---|---------------------------|-----------------------------|
| | <u>Male Parent</u> | <u>Female Parent</u> |
| Genotype | | |
| Phenotype | | |

P Generation Punnett Square Codominance

Hair Color

Male →
Female ↓

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When a trait is expressed by **codominance**, the offspring of *homozygous* parents with different phenotypes will be _____ with a combination of both phenotypes being expressed

All of the offspring in the F₁ Generation will be _____ and have hair that is both _____ and _____.

F₁ Generation – Hair Color

Incomplete Dominance

| <u>Genotypes & Phenotypes for the F₁ Generation</u> | | |
|---|--------------------|----------------------|
| | <u>Male</u> | <u>Female</u> |
| Genotype | | |
| Phenotype | | |

F₁ Generation Punnett Square

Codominance

Hair Color

Male →
Female ↓

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

| Trait | Genotype | Heterozygous or Homozygous | Phenotype | Probability |
|-------------------|-----------------|---|------------------|--------------------|
| Hair Color | | | | |
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Patterns of Inheritance – Eye Color

Polygenic Inheritance

Directions: Each parent has 2 genes that control their eye color. Use the allele A for one gene and D for the other. Remember: each gene has 2 alleles

| <u>Genotypes & Phenotypes for the P Generation</u> | | |
|---|---------------------------|-----------------------------|
| | <u>Male Parent</u> | <u>Female Parent</u> |
| Genotype | | |
| Phenotype | | |

P Generation Punnett Square **Polygenic Inheritance**

Male →
Female ↓

| | | | | |
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Patterns of Inheritance – Eye Color

Polygenic Inheritance

| <u>Genotypes & Phenotypes for the F₁ Generation</u> | | |
|---|--------------------|----------------------|
| | <u>Male</u> | <u>Female</u> |
| Genotype | | |
| Phenotype | | |

| <u>F₁ Generation Punnett Square</u> Polygenic Inheritance | | | | |
|---|--|--|--|--|
| Male → Female ↓ | | | | |
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Patterns of Inheritance – Eye Color

Polygenic Inheritance

| | Genotype | Number of Dominant Alleles | Phenotype | Probability |
|-----|----------|----------------------------|-----------|-------------|
| 1) | | | | |
| 2) | | | | |
| 3) | | | | |
| 4) | | | | |
| 5) | | | | |
| 6) | | | | |
| 7) | | | | |
| 8) | | | | |
| 9) | | | | |
| 10) | | | | |

| # of Dominant Alleles | Phenotype | Probability | |
|-----------------------|-----------|-------------|--|
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