Super Hero Project

**Day 2: Activity** – creating your super baby

**Objective**: To predict the probability of offspring of your super heroes / villains by using a monohybrid cross with a Punnett Square.

**Materials**:

1. Graphic Organizer

2. Punnett Squares

3. “Genes”

**Procedure:**

1) Students will create their genes by cutting out the three chromosomes and folding and taping them together

2) With a partner, students will fill out all 15 monohybrid Punnett squares by using the genotypes you created last class. One partner’s genotype will represent the horizontal axis and one partner’s genotype will represent the vertical axis. (See Example 1)

*Example 1*

|  |  |  |
| --- | --- | --- |
| TRAIT | PARENT 1  ALLEL 1:  **A** | PARENT 1  ALLEL 2:  **A** |
| PARENT 2  ALLEL 1:  **A** |  |  |
| PARENT 2  ALLEL 2:  **a** |  |  |

3) Complete the Punnett square showing the GENOTYPE and PHENOTYPE of your super baby. Each individual student will fill out their OWN Punnett square that will represent their super baby. (see example 2)

*Example 2*

|  |  |  |
| --- | --- | --- |
| TRAIT | PARENT 1  ALLELE 1:  A | PARENT 1  ALLELE 2:  A |
| PARENT 2  ALLELE 1:  A | **AA** | **AA** |
| PARENT 2  ALLELE 2:  a | **Aa** | **Aa** |

4) For each trait, find the probability for the Genotype and the Phenotype. (see example 3)

*Example 3*

|  |  |  |
| --- | --- | --- |
| TRAIT | PARENT 1  ALLELE 1:  A | PARENT 1  ALLELE 2:  A |
| PARENT 2  ALLELE 1:  A | AA  **(1/4)** | AA  **(1/4)** |
| PARENT 2  ALLELE 2:  a | Aa  **(1/4)** | Aa  **(1/4)** |

Genotype: AA (1/4) + AA (1/4) = 1/2

Aa (1/4) + Aa (1/4) = 1/2

Phenotype: A = dominant

a = recessive

AA (homozygous Dominant)

1/4 + 1/4 = 1/2

Aa (heterozygous)

1/4 + 1/4 = 1/2

**\*\*BOTH PHENOTYPES SHOW DOMINANT TRAIT SO THE DOMINANT TRAIT WILL SHOW 100% OF THE TIME.\*\***

**5. Students will drop their genes to find which gene is passed on from your super hero / villain parents to your super baby. You will use the genes you cut out, and drop the corresponding gene to you parent genotype. For example, if you have a homozygous dominant gene for your super hero / villain’s hair, you will drop your homozygous dominant gene. If you partner’s super hero has a heterozygous gene for their super hero / villain’s hair, they will drop their heterozygous gene. Whatever side land facing up is what is passed on to you and your partner’s super baby. Circle that trait in your Punnett square.**

**Questions:**

1. What kind of Super trait did your super baby inherit from your super hero?

2. What kind of Super trait did your super baby inherit from your partner’s hero?

3. Why did your super baby gain or lose Super traits?

4. How would you explain your super baby’s co-dominant trait? Look up and write down an additional example of organism with co-dominant trait.

Additional Example:

5. How can you explain the chance of having a boy or girl is always 50-50?

|  |  |  |
| --- | --- | --- |
| TRAIT | PARENT 1  ALLELE 1  X | PARENT 1  ALLELE 2  Y |
| PARENT 2  ALLELE 1  X |  |  |
| PARENT 2  ALLELE 2  X |  |  |