

CLASS SET *Done w/ or after*

Super Hero Project *Probability lesson*

Part 2

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"

** Make Sure students know that Capital letters will go first.*

Procedure:

1) Students will create their Super Heroes /Villains 15 genes by writing the GENOTYPE on their Chromosomes. (see Example 1)

Example 1

Your super hero's Alleles

TRAIT	PARENT 1 ALLELE 1:	PARENT 1 ALLELE 2:
PARENT 2 ALLELE 1:	<i>A</i>	<i>A</i>
PARENT 2 ALLELE 2:		

Your partner alleles

Model Your Example

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 and one partner's genotype will represent the vertical.

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)

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 your 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.

* Need to Model Gene Drop Better.

* Make sure students keep track of whose gene is Dominant + Recessive for heterozygous cross.

* Only one ~~one~~ square will be circled for the baby.

* Explain Co-Dominance (for this project)

Explain Blended traits (for this project).

Explain that this is not the correct explanation, but only happens in Super heroes.

Need to model Probability a lot better for students.

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

Fill out large example have students follow along

1. Parents Alleles.
2. Fill out Punnett Square
3. Write down prob for each of

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

Example 3

TRAIT	PARENT 1 ALLELE 1: A	PARENT 1 ALLELE 2: A
PARENT 2 ALLELE 1: A	AA (1/4) Gen <u>1/4</u> Phen <u>1/4</u>	AA (1/4) Gen <u>1/4</u> Phen <u>1/4</u>
PARENT 2 ALLELE 2: a	Aa (1/4) Genotype <u>1/4</u> Phen <u>1/4</u>	Aa (1/4) Gen <u>1/4</u> Phen <u>1/4</u>

off spring's genotype

4. Write down prob for each phenotype
5. Show how to add the genotype prob together
6. Show how to add Phen prob together

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.****

Genotype: AA = $1/4 + 1/4$

Aa = $1/4 + 1/4$

AA = $1/2$

Aa = $1/2$

Phen: AA $1/4 + 1/4$

Aa $1/4 + 1/4$

$1/2 + 1/2$

100% Dominant

Too confusing

* Show Recessive Example to hybrid cross

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		

	4 – Exceeds	3 – Meets	2 – Approaching	1 – Below
Punnett Squares	15 Punnett Squares are created	14-10 Punnett Squares are created	9-5 Punnett Squares are created	4-1 Punnett Squares are created
Genotype	15 Genotypes of the baby are created and shows a ratio or percentage for the Genotype	15 Genotypes of the baby are created	14-10 Genotypes of the baby are created	9-5 Genotypes of the baby are created
Phenotype	15 Phenotypes of the baby are created and show a ratio or percentage for the Phenotype	15 Phenotypes of the baby are created	14-10 Phenotypes of the baby are created	9-5 Phenotypes of the baby are created

Rubric

Extra Credit for completed the Dihybrid cross for your super baby

Explain E.C. After Dihybrid cross lecture

Period: _____

Date: _____

Name: _____

TRAIT 1 <u>label</u>	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 6 <u>trait</u>	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 11	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

need to add traits + Probability. + initials

TRAIT 2	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 7	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 12	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 3	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 8	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 13	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 4	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 9	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 14	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 5	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 10	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

TRAIT 15	PARENT 1 ALLELE 1 _____	PARENT 1 ALLELE 2 _____
PARENT 2 ALLELE 1 _____		
PARENT 2 ALLELE 2 _____		

Use two of your Super Heroes / Villains traits to create a Dihybrid Cross for your Super baby
(This will be **EXTRA CREDIT**)

Parent 1 Allele

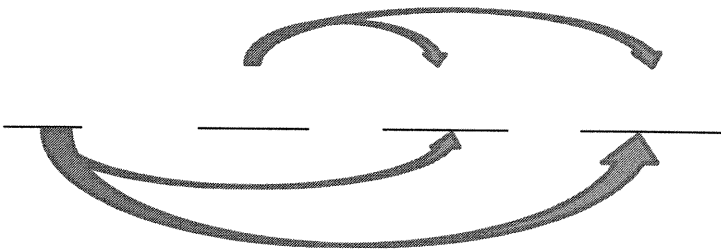
Parent 1 Allele

First (1) = _____

Outside (2) = _____

Inside (3) = _____

Last (4) = _____



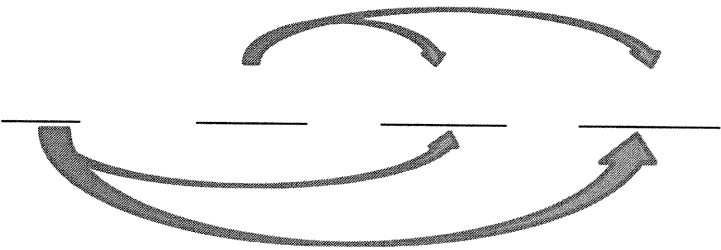
Parent 2 Allele

First (1) = _____

Outside (2) = _____

Inside (3) = _____

Last (4) = _____



Trait	Parent 1 Allele	Parent 1 Allele	Parent 1 Allele	Parent 1 Allele
Parent 2 Allele				
Parent 2 Allele				
Parent 2 Allele				
Parent 2 Allele				

TRAIT 1	PARENT 1 ALLELE 1	PARENT 1 ALLELE 2
PARENT 2 ALLELE 1		
PARENT 2 ALLELE 2		

TRAIT 6	PARENT 1 ALLELE 1	PARENT 1 ALLELE 2
PARENT 2 ALLELE 1		
PARENT 2 ALLELE 2		

TRAIT 11	PARENT 1 ALLELE 1	PARENT 1 ALLELE 2
PARENT 2 ALLELE 1		
PARENT 2 ALLELE 2		

TRAIT 2	PARENT 1 ALLELE 1	PARENT 1 ALLELE 2
PARENT 2 ALLELE 1		
PARENT 2 ALLELE 2		

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PARENT 2 ALLELE 2		

TRAIT 12	PARENT 1 ALLELE 1	PARENT 1 ALLELE 2
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PARENT 2 ALLELE 2		

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PARENT 2 ALLELE 1		
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PARENT 2 ALLELE 1		
PARENT 2 ALLELE 2		

TRAIT 10	PARENT 1 ALLELE 1	PARENT 1 ALLELE 2
PARENT 2 ALLELE 1		
PARENT 2 ALLELE 2		

TRAIT 15	PARENT 1 ALLELE 1	PARENT 1 ALLELE 2
PARENT 2 ALLELE 1		
PARENT 2 ALLELE 2		

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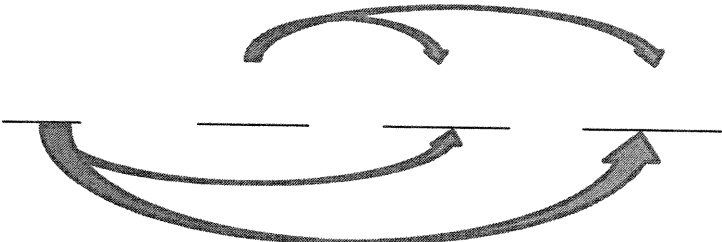
Parent 1 Allele

First (1) = _____

Outside (2) = _____

Inside (3) = _____

Last (4) = _____



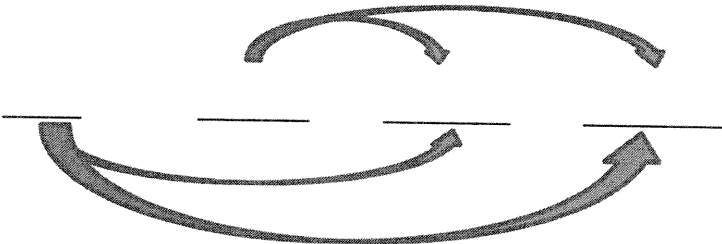
Parent 2 Allele

First (1) = _____

Outside (2) = _____

Inside (3) = _____

Last (4) = _____



Trait	Parent 1 Allele	Parent 1 Allele	Parent 1 Allele	Parent 1 Allele
Parent 2 Allele				
Parent 2 Allele				
Parent 2 Allele				
Parent 2 Allele				

	Initials	HOMOZYGOUS DOMINANT	
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	Initials	HOMOZYGOUS DOMINANT	
--	----------	------------------------	--

	Initials	HETEROZYGOUS	
--	----------	--------------	--

	Initials	HETEROZYGOUS	
--	----------	--------------	--

	Initials	HOMOZYGOUS RECESSIVE	
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--	----------	-------------------------	--

	Initials	HOMOZYGOUS DOMINANT	
--	----------	------------------------	--

	Initials	HOMOZYGOUS DOMINANT	
--	----------	------------------------	--

	Initials	HETERZYGOUS	
--	----------	-------------	--

	Initials	HETEROZYGOUS	
--	----------	--------------	--

	Initials	HOMOZYGOUS RECESSIVE	
--	----------	-------------------------	--

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--	----------	-------------------------	--