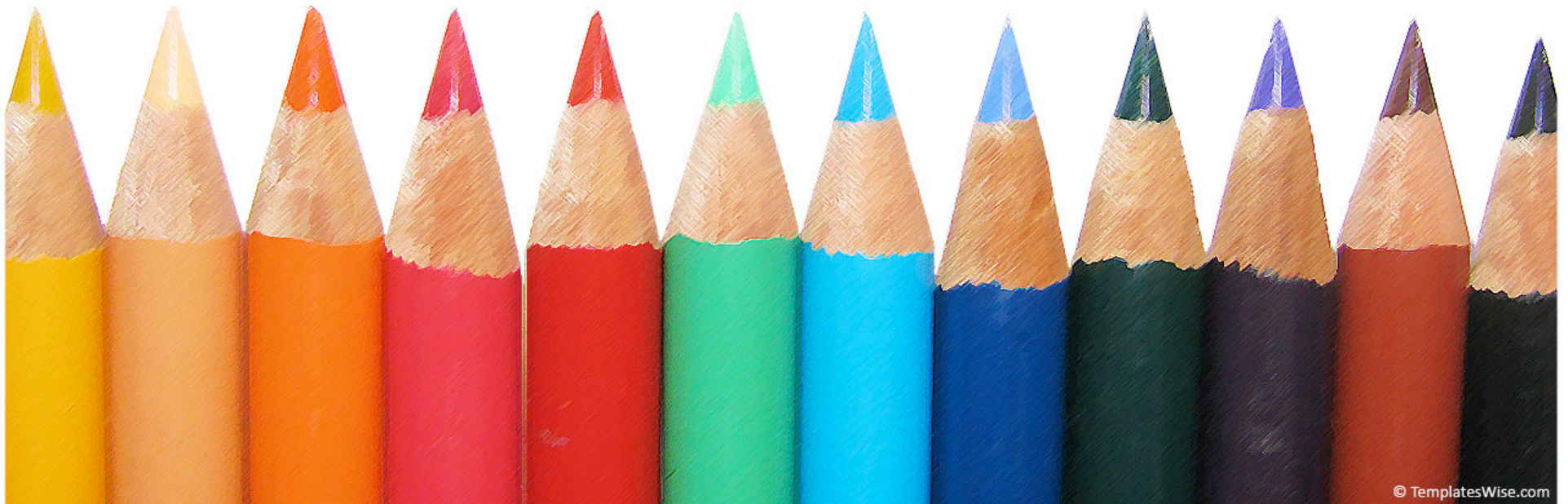


Non-Mendelian Genetics

By: Lauren Beggs



Agenda 2/25/2013

- Turn in “Make a Baby Lab”
- **HW:** Quiz corrections, 7.2 Reading KT's and 1-6, Punnett square wkst
- **Quest Genetics Part 1: Friday 3/1/2013**

Bellringer 2/25/2013

Kate Hudson has **green** eyes.
Her father has **hazel** eyes
(brown eyes with green flecks)
and her mom has **blue** eyes.

How can Kate have a trait that is
different from both her mom
& her dad?



Monohybrid Cross

A black male horse is homozygous for black hair (B). This horse is mated with a female who is homozygous for white hair (b). Predict the **genotypes** and **phenotypes** of their potential offspring.



x



Genotype sire: _____

Genotype dam: _____



Monohybrid Cross

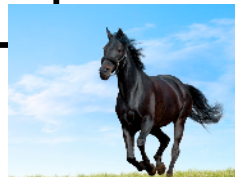


	B	B
b	Bb	Bb
b	Bb	Bb

Predicted F₁ generation:

Genotype: Bb

Phenotype: 100% Black hair
0% White hair



Bb



Bb



Bb



Bb



Monohybrid Cross

P_1 generation



After 11 months, the foal was born and its DNA was sequenced. The colt (baby male horse) had a genotype of Bb, but the phenotype was blue roan. How is this possible?

F_1 generation



Codominance



Codominance: Both alleles of a gene are expressed completely. Neither allele is dominant or recessive.



Blue roan: mix of white hairs and black hairs

Monohybrid Cross

A male snap dragon is homozygous for red petals (R).
A bee comes along and pollinates a female that is homozygous for white petals (r). Predict the **genotype** and **phenotype** of their offspring.

P₁ generation



x



Genotype male: _____

Genotype female: _____



Monohybrid Cross

P₁ generation



	R	R
r	Rr	Rr
r	Rr	Rr

Predicted F₁ generation:

Genotype: Rr

Phenotype: 100% Red flowers
0% White flowers



Monohybrid Cross

P_1 generation



After a few months the flowers of the snap dragon plant emerged, and all of the flowers were pink.
How is this possible?

F_1 generation



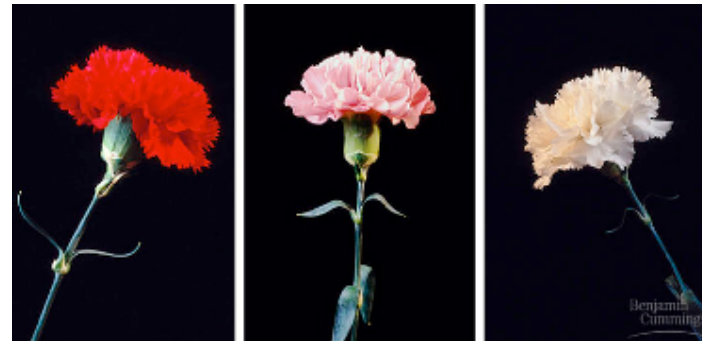
Non-Mendelian Genetics

Incomplete Dominance: A heterozygous phenotype is somewhere between the two homozygous phenotypes.

-Mixing traits together.



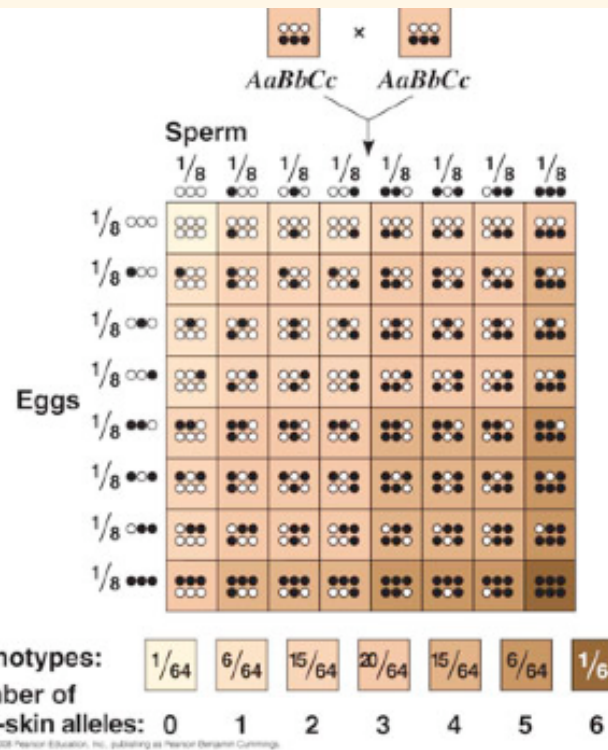
*Neither allele is completely dominant/recessive to the other.



Non-Mendelian Genetics

Polygenics: 2 or more genes for 1 phenotypic trait

AaBbCc



Skin color is
Affected by at
least 3
different genes



Polygenics

Two genes encode for the coat color in labrador retrievers.

B= black color
b= brown color

gene 1

E= express pigment (dark dog)
e= no dark pigment (yellow dog)

gene 2

A yellow male Labrador Retriever has a genotype of $bbee$ and is mated with a black Labrador with a genotype of $BbEe$. Predict the **genotypes** and **phenotypes** of the offspring.



Polygenics

Dad: bbee x mom: BbEe

b_1e_1

b_1e_2

b_2e_1

b_2e_2

B_1E_1

B_1e_2

b_2E_1

b_2e_2



Polygenics

Dad: bbee x mom: BbEe

	b_1e_1	b_1e_2	b_2e_1	b_2e_2
B_1E_1	BbEe	BbEe	BbEe	BbEe
B_1e_2	Bbee	Bbee	Bbee	Bbee
b_2E_1	bbEe	bbEe	bbEe	bbEe
b_2e_2	bbee	bbee	bbee	bbee



Polygenics

*All "ee" = yellow

	b_1e_1	b_1e_2	b_2e_1	b_2e_2
B_1E_1	BbEe	BbEe	BbEe	BbEe
B_1e_2	Bbee	Bbee	Bbee	Bbee
b_2E_1	bbEe	bbEe	bbEe	bbEe
b_2e_2	bbee	bbee	bbee	bbee

_____ yellow lab: _____ chocolate lab: _____ black lab



Polygenics

*All "ee" = yellow



	b_1e_1	b_1e_2	b_2e_1	b_2e_2
B_1E_1	BbEe	BbEe	BbEe	BbEe
B_1e_2	Bbee	Bbee	Bbee	Bbee
b_2E_1	bbEe	bbEe	bbEe	bbEe
b_2e_2	bbee	bbee	bbee	bbee

__8__ yellow lab: __4__ chocolate lab: __4__ black lab