

Miss Johnston 6th Grade Science
Distance Learning Packet Week 5 (5/18-5/22)

We did it! We have made it to the last week of school. Congratulations! We're almost to the finish line.

This week students will complete the final activity for the Genetics and Heredity distance learning unit. Please complete the Harry Potter Genetics worksheet pages. Since it is the last week of school, the work from this week is for practice and will not be turned in for a grade.

I am so proud of you. Thank you for a wonderful year that I will truly never forget. Thank you for all your hard work, your determination, and your patience during this time. I can not wait to see all of you next school year. Have a wonderful summer. Please reach out via email if you need anything. I will always be here for you.

Your 6th Grade Science teacher,

Miss Johnston

HARRY POTTER Genetics

MS-LS3-2 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

Rules of Inheritance

_____ is the simple inheritance of dominant and recessive genes.

Complex traits follow different patterns of inheritance and involve multiple genes and other factors.

These patterns include:

_____ or Blended Dominance

Codominance

Codominance results in a phenotype that shows _____ of an allele pair.



(Red Flower + White Flower = Red and White Spotted Flower)

If mermpeople have tail color alleles B(blue) and G(green) that follow the codominance inheritance rule, what are the possible genotypes and phenotypes?

Genotypes	Phenotypes

Incomplete Dominance

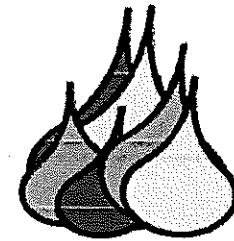
Incomplete Dominance results in a phenotype that is a _____ of a heterozygous allele pair.



(Red Flower + Blue Flower = Purple Flower)

If the Dragons in Harry Potter have fire power alleles, F (strong fire) and f (no fire), that follow incomplete dominance, what are the phenotypes for the following dragon-fire genotypes:

Genotypes	Phenotypes
FF	
Ff	
ff	



Multiple Alleles

Multiple alleles have more than _____ variations.

For example, human blood has 3 different allele variants: A, B, and O.

Genotypes	Phenotypes
AA, Aa	A Blood Type
AB	AB Blood Type
BB, Bb	B Blood Type
OO	O Blood Type

If parents have A(AO) and B(BB) blood types, what are the possible genotypes and phenotypes of their children?

A	O
B	
B	

Genotypes	Phenotypes

Regulatory Genes

- Regulatory genes _____ the expression of other genes.
- A regulatory gene may _____ another gene from expressing its dominant trait.
- The Manx cat has no tail because it has a regulatory gene that silences the tail gene. The tail silencing gene is dominant.
- s-Silences tail gene-no tail (Manx cat)
- s-Does not silence tail gene-has tail (non-Manx cat)

Hagrid's Height

Hagrid's father was a wizard and his mother was a giantess. The normal height of a giant is about 20 feet and the normal height for a wizard is between 5 and 6 feet.

Given that Hagrid is described to be about 12 feet, what type of genetic inheritance may be at work for Hagrid's height?

Magical Ability

Complex Traits

In the Harry Potter series, characters are born with or without magical ability. Those with magical ability also show very strong, normal or weak ability.

Assuming the magical ability is inherited, identify the possible phenotypes and genotypes of the following characters: Harry, Hermione, Ron, Dumbledore, Aunt Petunia, and Mr. Flich.

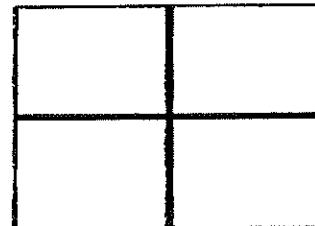
Hint: Start by identifying phenotypes which will provide possible genotypes. Also consider whether simple Mendelian or complex traits apply to the magical ability traits.

Character	Magical Ability Possible Phenotypes
Harry	
Hermione	
Ron	
Dumbledore	
Aunt Petunia	
Mr. Flich	

Find the probability using a Punnett Square. The possible alleles for the tail silencing gene are:

S(dominant)-no tail

s(recessive)-has tail



Harry's Eyes

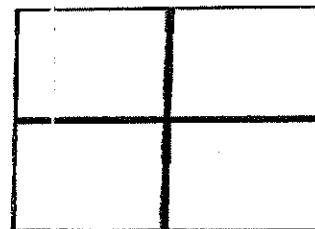
Eye color in humans has multiple alleles:

B-Brown (Codominant with green)

G-Green (Codominant with brown)

b-Blue (Recessive to both brown and green)

Draw a Punnett Square with Harry's parents. Assume Lily has green eyes (G/G) and James has hazel eyes (B/G).



What is the genotype for Harry's eye color? If he had any siblings, what might their eye colors be?

What are possible genotypes for the phenotypes of expressed and not expressed magical ability?

Expressed
(Witches & wizards) _____

Not expressed
(Muggles) _____

What are possible genotypes for the phenotypes of the strength of magical ability?

Strong ability _____

Average ability _____

Weak ability (i.e. squibs) _____

What are the possible genotypes for each character?

Character	Possible Genotypes
Harry	
Hermione	
Ron	
Dumbledore	
Aunt Petunia	
Mr. Flich	

Magic Runs in Families

Question 1: Hermione's possible genotypes are MMss or MMsS. What are possible genotypes of Hermione's parents who are Muggles?

Question 2: Harry Potter married Ginny Weasley. Will all of their children have magical ability?

Question 3: Could Dudley Dursley potentially have children with magical ability?