Student Name _____

Date _____

Class Period _____

Teacher's Magic Runs in Families

Instructions: Use the genetic concepts and terms you have learned to find answers and explain your answers to the following three questions.

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

- *Hermione's genotype is MMss.*
  - *For Hermione's inherited ss, both of her Muggle parents must have Ss.*
  - *For Hermione's inherited MM, both parents may have MM or MM', but neither parents can have M'M' allele pair.*
- *Hermione's parents' possible genotypes are:*
  - *MMSs, or MM'Ss*

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

- *Parents' magical genes:*
  - *Harry's genotype is MMss.*
    - *Ginny's genotype may be MMss or MM'ss.*
- *Harry's and Ginny's children's genotypes:*
  - *Since Harry and Ginny each has an ss allele pair, they can only pass s alleles to their children. Therefore, all of their children having inherited ss allele pair, have magical ability.*

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

- *Dudley's parents' genotypes:*
  - *Vernon Dursley is about as magic-less as one can get. So let's assume Vernon's genotype is M'M'SS.*
  - *Petunia's sister Lily Potter had magical ability. So, Petunia can have a genotype of SS or Ss allele pair.*
- *Dudley's genotypes:*
  - *If Dudley inherited S allele from both parents, he cannot have kids with magical ability.*
  - *If Dudley inherited an s allele from Petunia, he can have kids with magical ability with a Muggle with an Ss allele pair, or a witch possessing an ss allele pair.*