Harry Potter and the Recessive Allele

How are wizards made? It is quite simple. Being a wizard or muggle is all decided by genetics! All humans, including wizards, receive one allele from each parent.

Part I: Genotypes
The allele coding for muggleness is M, while the allele coding for wizard ability is m.

1. What would be the genotype(s) for muggles?

2. What would be the genotype for a wizard? Is it possible for a wizard to have an M allele?

3. Based on this information, which trait is dominant? Which trait is recessive?

Part II: Meet The Wizards

The Malfoys are a ‘pure blood’ family and always brags that all of their ancestors were wizards. Also, both Harry Potter’s parents had magical abilities.

1. Create a Punnett Square for both Draco Malfoy and Harry Potter to demonstrate how they each inherited their magical abilities.
Hermione is a powerful witch so she must have the genotype mm. However, both of her parents are muggles, so how is it possible that she inherited her magical abilities?

2. Create a Punnett square to demonstrate how she could have inherited her magical alleles from her non-magical parents.

- How did she inherit her powers from her non-magical parents? Explain.

Tom Riddle is a ‘half blood’. His mother was a witch and his father was a muggle, so how did Tom inherit his magical powers?

3. Create a Punnett square to show how Tom, the half-blood, inherited magical abilities, although his father was a muggle.

- What were the chances of his parents having a child with no magical powers? Explain.
Part III: What If?
Read the following scenarios in order to predict the future generation of wizards and see more about their families…

1. If Hermione’s parents are both muggles, but she is a witch, could her brothers and sisters have magical powers as well? Create a Punnett square to show if the rest of her siblings could possess magical powers.

2. After graduating from wizard school, Draco Malfoy falls in love with a nice girl, and the two decide to become married. However, she is a muggle, and his parents are very upset that they will have a grandson that cannot become wizard. Are his parents right? Demonstrate through Punnett square(s) to show if Draco and his new wife can have a wizard son.

• Could her brothers or sisters be wizards or witches? Why/why not? Explain.

• Is there a chance to have a son or daughter that has magical powers? How so? (Hint - his wife)