Harry Potter and the Recessive Allele

How Are Wizards Made?
How Are Wizards Made?

• Being a wizard or a muggle is all decided by genetics

• All humans including wizards receive one allele from each parent
How Are Wizards Made?

• The allele for wizarding ability is m

• Wizards have the alleles mm
How Are Wizards Made?

- The allele for muggleness is M

- Muggles have the alleles Mm or MM

- M is dominant to m so you can only be a wizard if you have no M allele
The Malfoys are a ‘pure blood’ family
All their ancestors are wizards so they must have the alleles mm
Both Harry’s parents had magical ability so they must both have been mm.

They passed these alleles on to Harry.
The Weasleys are pure blood wizards so they all have the alleles mm.
Hermione is a powerful witch so she must be mm

Both her parents are muggles so they must be Mm so they can give her a m allele each
Tom Riddle is a ‘half blood’.

His mother was a witch (mm) and his father was a muggle.

His father must have had the alleles Mm so he could give him the other m allele.
Filch is a ‘squib’

Both his parents are mm so he should be too because he can’t get an M allele from either parent but he can’t do any magic ?!? So why do you think that is??

Either he has a mutation so his wizarding powers don’t work or the man he thinks is his father isn’t really and his mother had an affair with a muggle!
What wizarding alleles would Ron and Hermione’s children have?

Ron (mm)  Hermione (mm)

Children

( m  m  )
Their children could only get the m allele from both parents so they would all be wizards.

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What wizarding alleles would Ginny and Dudley’s children have?

If Dudley is Mm

Ginny mm

Children

Dudley Mm

m M or m m
Half of their children would be likely to get the m allele from both parents so they would be wizards. The other half would be likely to get an M allele from Dudley and would be muggles.
What wizarding alleles would Ginny and Dudley’s children have?

If Dudley is MM

Ginny mm  

Children

Dudley MM

m  M
Their children would get the m allele from Ginny and the M allele from Dudley so they would all be muggles.
What wizarding alleles would you expect Hermione’s brothers and sisters to have?
The Granger’s children have a one in four chance of getting m alleles from both parents and having magical ability.

They also have a one in four chance of getting M alleles from both parents and being a muggle.

They could also get only one m from their mother or father and still be a muggle.