An Exploration Combining Multiplication Tables and Punnet Squares

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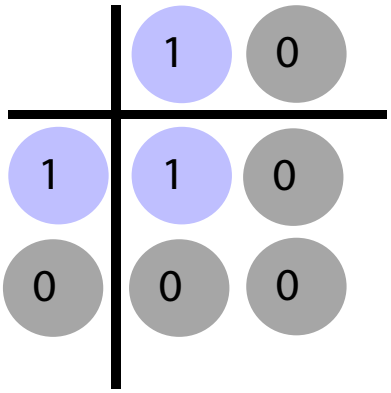
Punnet Squares

If we take any multiplication table and give it rules to follow that are similar to Punnet Squares, we can begin to explore the genetic multiplicitive traits of numbers.

Here is a table that demonstrates zero's dominance to one in the case of multiplication.

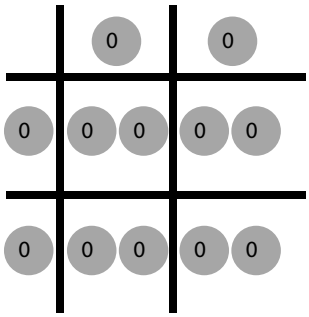


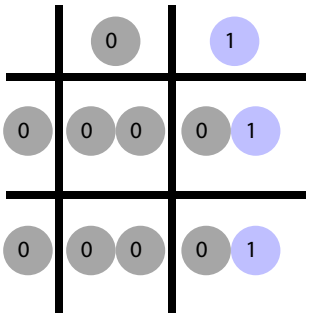
One has a genotype of (1,1) and a phenotype of 1.

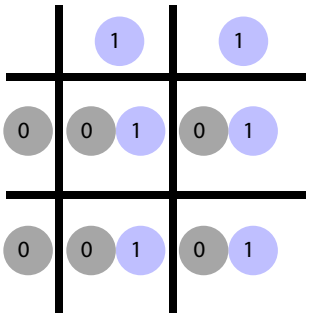
Zero has a genotype of (0,0) and a phenotype of 0.

This chart demostrates 4 possible offspring when zero and 1 multiply together and in every case we get an offspring that appears to be a zero. But each of these zero's carries the recessive trait of a one inside of it.

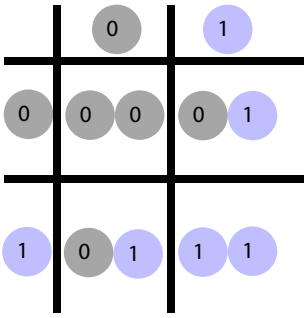
Variations



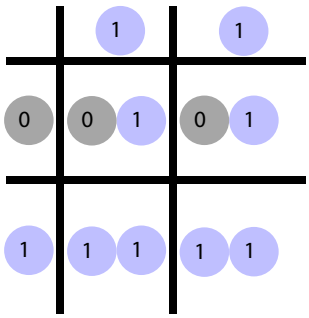




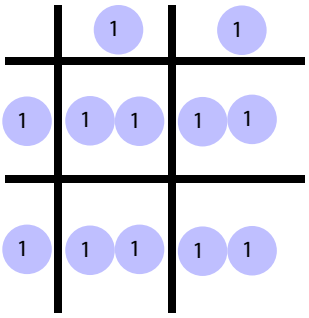
All of the above tables represent all offspring with attributes (phenotypes) of zero.



Here's an example where we have a 1 in 4 chance of two phenotype zero's multiplying to get a 1.

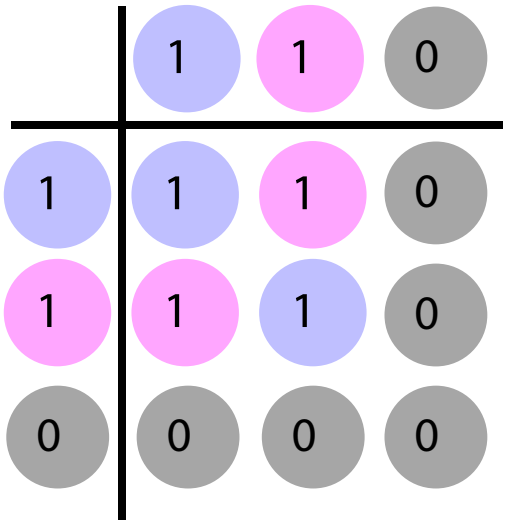


Notice that in the above example we have a 50/50 chance of getting a phenotype 1 or zero from multiplying a one with a zero.

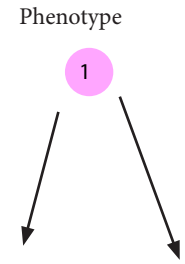


Mutations

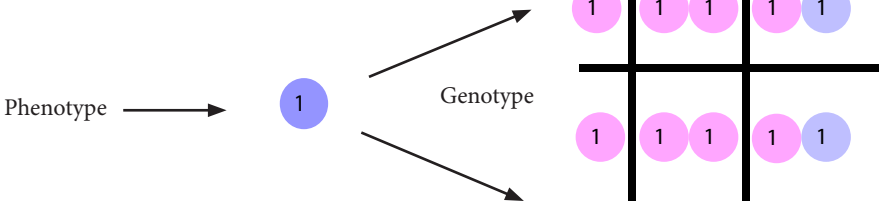
Mutations are inspired from this second mulitiplication table and the concept of negative numbers. This series presents the a numerical characteristic of positive numbers multiplying with negative numbers and the rules associated with this process. I take a leap and label this process as similar to that of mutation. Mutative genes can be labeled as negative ones here. I use pink to represent negative one's. We can look at the multiplication table below to generate our logic for mutative genes. A mutative with a zero is of course a zero. A mutative with a one will give us a mutative. But here is where an interesting occurence happens. A mutative with a mutative seems to make a recessive one. I'm going to say that this one is only a phenotype, meaning it only appears as a one. The genotype for this type of number would be a mutative and a mutative, or (-1,-1) while the phenotype is 1.



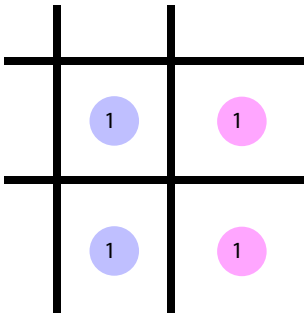
This negative one has a genotype of (-1,1) and a phenotype of -1.



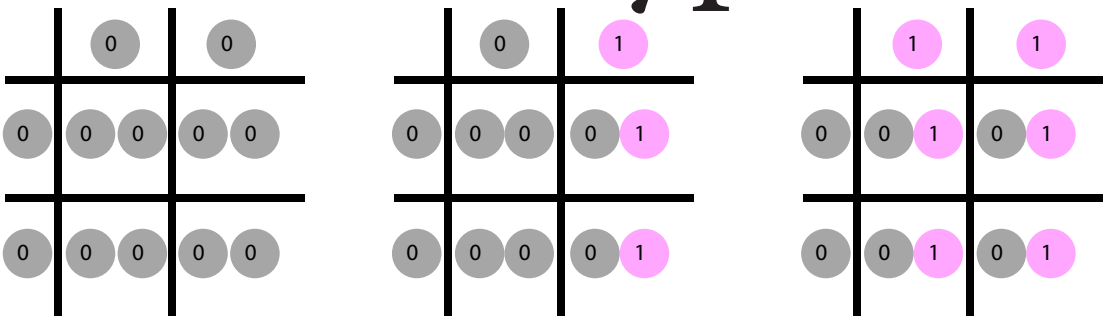
This one has a genotype of (-1,-1) but a phenotype of 1. It carries two mutative genes which makes it appear as a normal 1.

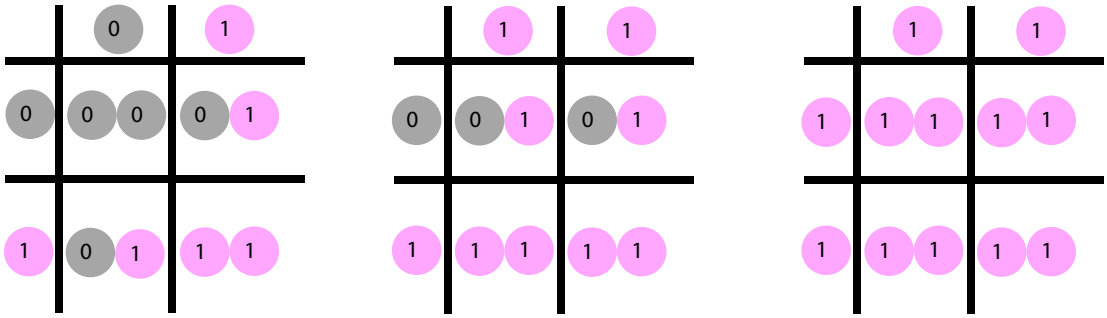


The above chart demostrates the 4 possible genotype offspring when these two numbers multiply with one another. The below chart demonstrates the phenotype (or actual characteristics) of the same 4 possibilities.

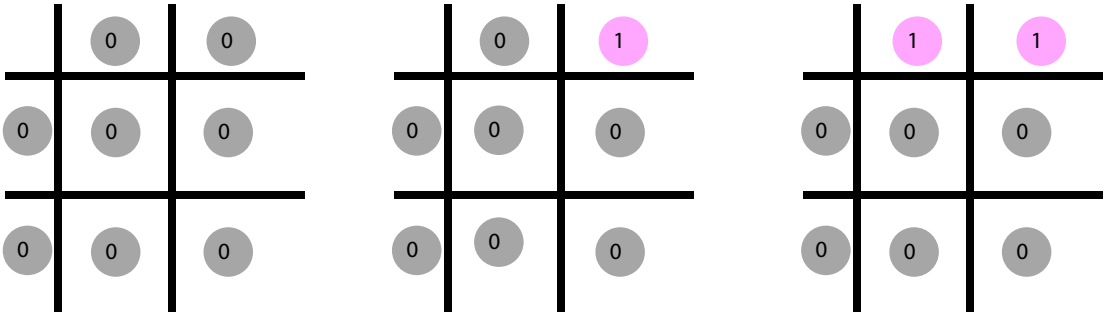


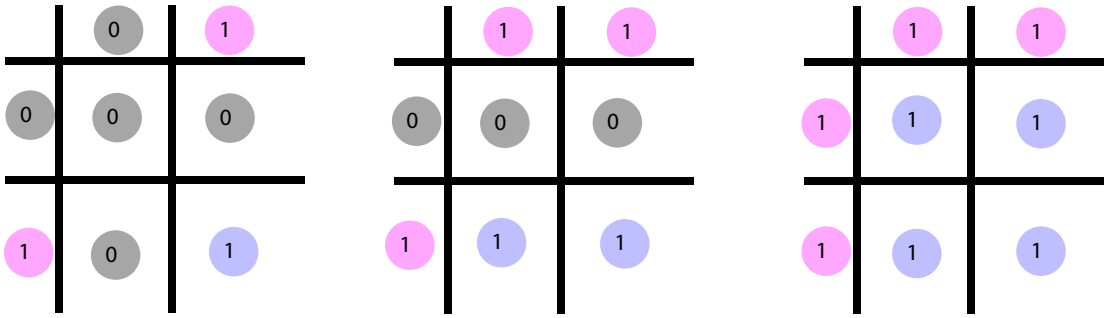
Genotype



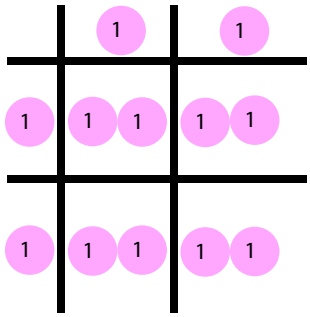


Phenotype

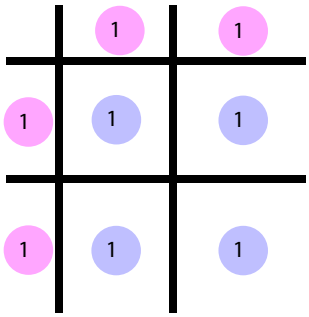


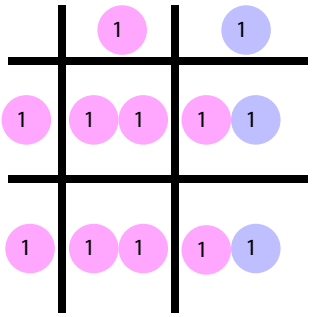


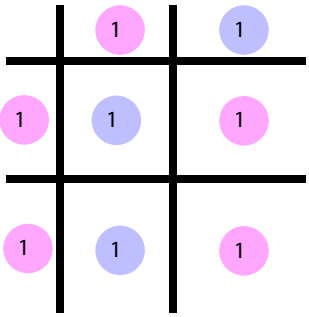
Genotype

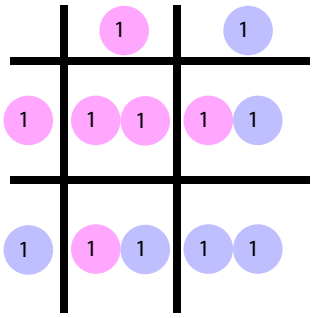


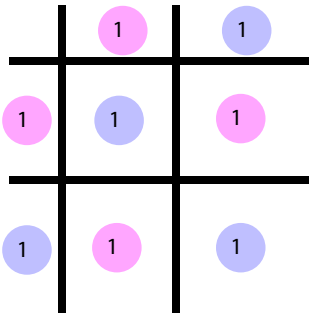
Phenotype

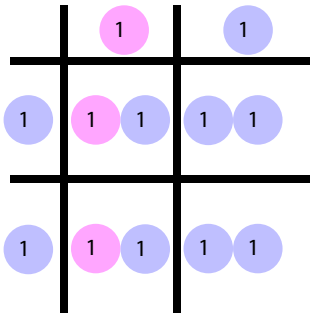


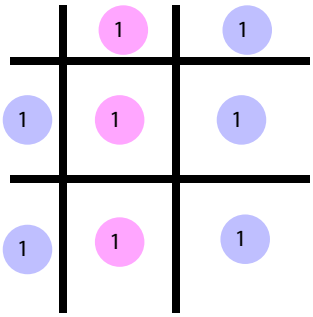


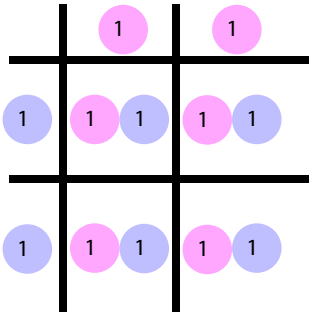


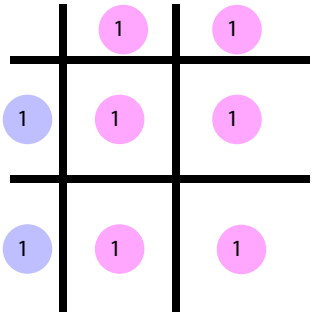


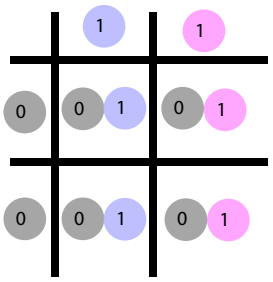
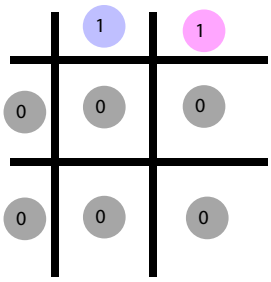
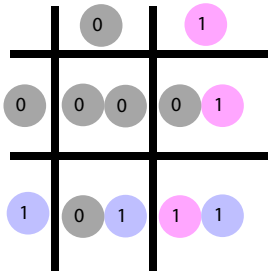
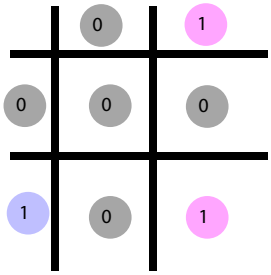
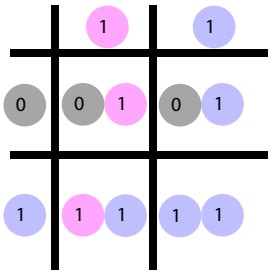
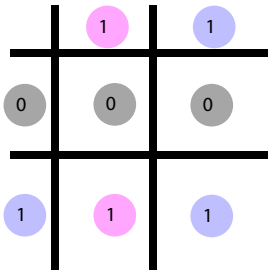
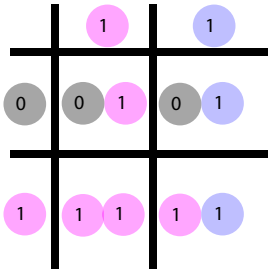
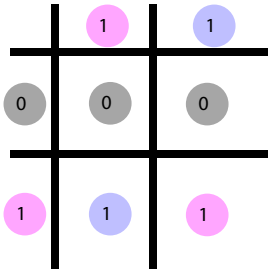
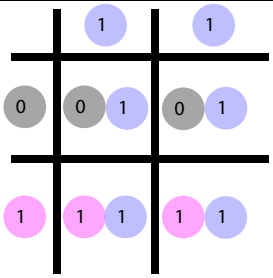
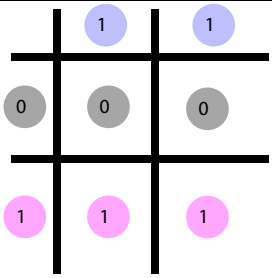
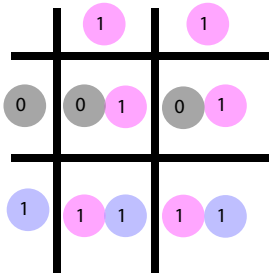
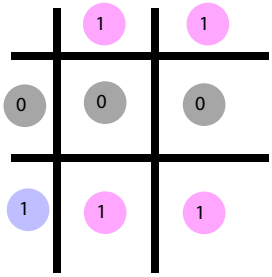










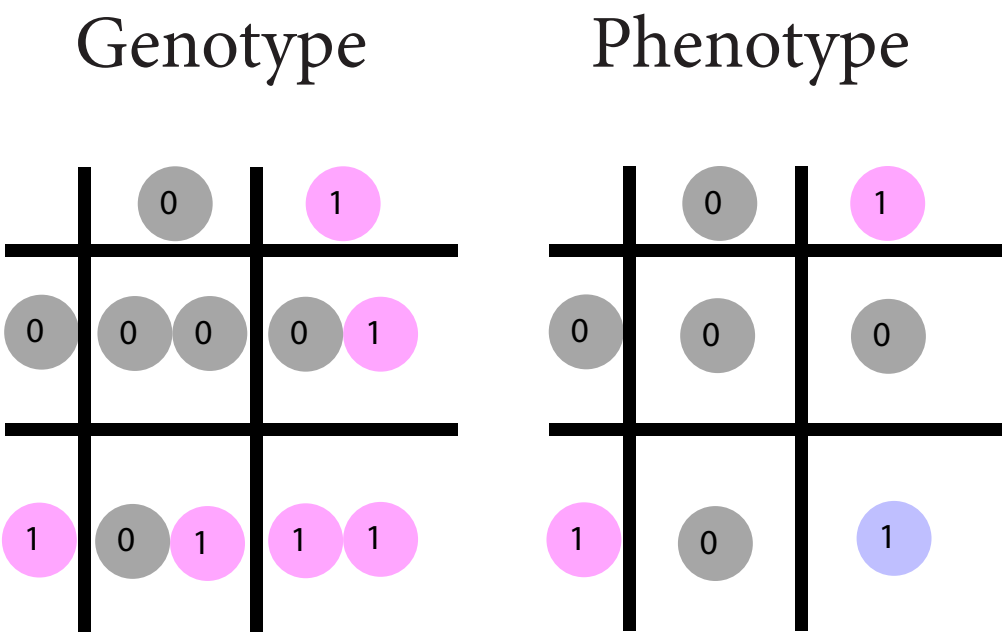
Genotype	Phenotype
	
	
	
	
	
	

One fun and interesting thing to play with when looking at multiplication in terms of punnet squares is the possibilities of hidden traits. The below example shows a phenotype of zero and zero, but when multiplied together we get a 1 in 4 chance of producing a recessive phenotype or a positive 1. But the positive 1 phenotype is actually made from 2 mutative genes that appear to be positive (a negative times a negative equals a positive). So even though it appears as though we might have a One, it actually might have the programming of two Negative Ones.

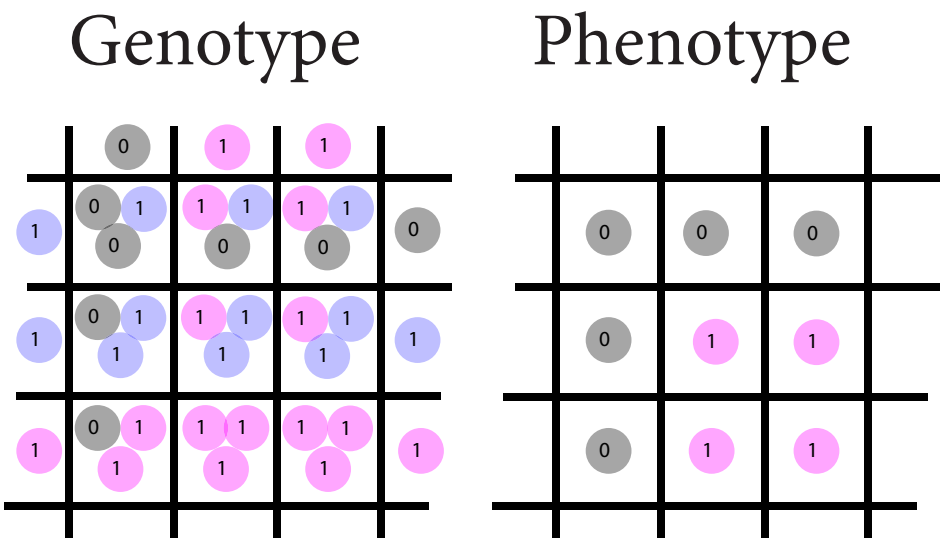
I wonder what an entire number system created from these kinds of traits might look like?

Could we ever construct it so that arithmatic could be performed.

And if it is possible to create a number system that can perform arithmatic, how closely would it actually represent our real world biological mechanisms for genetics?



Here I quickly play with triples. However, with a triple gene, we can have a fully genotype (-,-,-) which would also express a phenotype of mutative (negative). Below is an example of tripples.



But once we allow for triples, the order of them starts to matter. Below is the same genotype as above but the right side set of 3 is ordered differently, producing a different set of phenotypes. So, it seems as though communativity is lost when trying sets of three. But maybe there is a way to structure these punnet squares to maintain commutativity even with triples. Perhaps it has to do with structuring in 3 dimensional space instead of 2?

And I wonder if this has anything to do with why organisms do not transfer DNA three ways at once. I have never heard of any kind of life that requires a copulation of 3 organisms to reproduce.

I wonder what such a species might look and act like? Maybe life on another planet?