

The first sign of madness is said to be hairs on the palm of your hand



Hair on the second joint of one or more fingers is thought to be controlled by a single gene. The genetics of mid-digital hair is a curious but interesting phenomenon. Since many physical features of the human body are determined by the autosomes, the genetics behind mid-digital hair is also controlled by them.

The frequency of people with mid-digital hair is 75% in northern European. 25% have no hair here. This 3:1 ratio of hair phenotypes would suggest that the feature is controlled by a single gene with two alleles, and the allele (H) for mid-digital hair is dominant over the allele (h) for no hair.

Using letters to represent Genes

It is conventional to represent a single gene by a single letter. The dominant allele takes the capital and the recessive allele the lower case letter.

For mid-digital hair we can use H & h.

Genotypes: HH or Hh	Phenotype = mid-digital hair
Genotype: hh	Phenotype = no mid-digital hair

Check your fingers now. Can you find any hair? Read the information box on genetic symbols.

Two parents who have mid-digital hair want to know whether all their children will inherit this characteristic. Both their genotypes are Hh.

Use a Punnett square to work out all the possible offspring genotypes:

	H	h
H		
h		

What do you predict to be the ratio of the different genotypes? _____

and the ratio of different phenotypes? _____

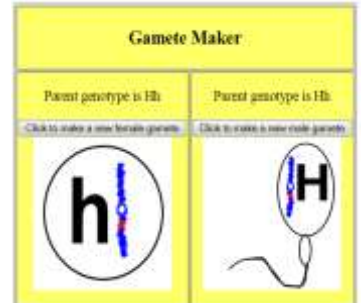


We can model this inheritance using a random gamete generator.

When both parents are heterozygous, and the gene is found on the autosomes there is a 50:50 chance of getting the H allele in a gamete or a h allele.

Use [the online gamete maker](#) to make ten gamete pairs.

Record the results in the table below.



Trial Number	Sperm gamete allele	Egg gamete allele	Genotype	Phenotype
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Calculate the totals of the two phenotypes: mid-digital hair & no hair.

—

What ratio did you get of the two phenotypes.?

—

Compare these experimental results with the theoretical ratio.

—
