

Emoji Genetics – REFERENCE

Vocabulary

A **gene** (*jeen*) is a set of instructions to make part of you.

Your **genotype** (*JEE-no-type*) is your genetic code.

Your **phenotype** (*FEE-no-type*) is how the code shows in you physically

Humans have two copies of each gene - one from your mum and one from your dad.

Alleles (*al-EEL*) are different forms of the same gene (eg to make your eyes blue, green or brown).

Different combinations of different alleles of all of your genes are what make you unique.

Alleles can be **dominant** or **recessive**. A **dominant allele will always show** in your phenotype. A **recessive allele needs two copies** to show in the phenotype.

Dominant alleles are shown by capital letters. Recessive alleles by lower case letters.

Example:

The emoji gene for mouth shape has a dominant allele for a big smile (**S**), and a recessive allele for a small smile (**s**). Mum & dad both have big smiles (phenotype) but their genes are actually one of each allele (their phenotype is **Ss**).

parent	mum	dad
genotype	Ss	Ss
phenotype		

The children get ONE copy from EACH parent. The children therefore could be ...

children	1	2	3	4
genotype	Ss	ss	sS	SS
phenotype				

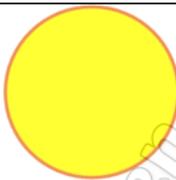
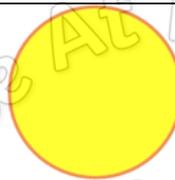
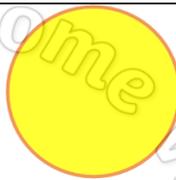
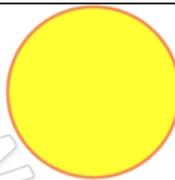
Remember - The dominant one will always show up in the phenotype. The recessive one must have two copies to show up.

Write the allele from mum first and the one from dad second to be certain that you have found every possible combination.

Emoji Genetics – SOLVE THE PUZZLES

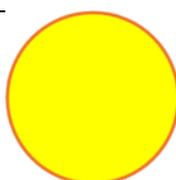
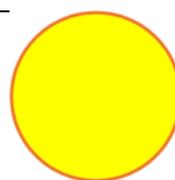
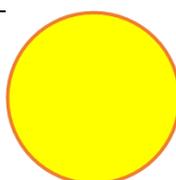
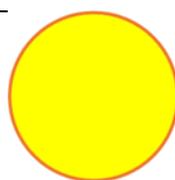
Work out the possible children.

parent	mum	dad
genotype	Hh	hh
phenotype		
	Heart eyes are dominant	

children	1	2	3	4
genotype				
phenotype				

Work out the possible children.

parent	mum	dad
genotype	Ff	ff
phenotype		
	Freckles are recessive	

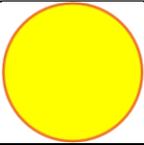
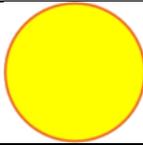
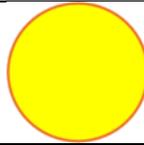
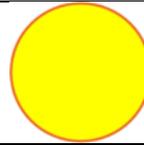
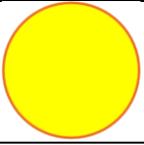
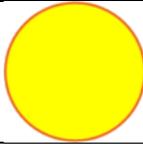
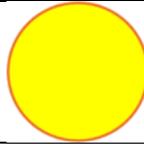
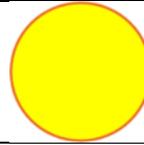
children	1	2	3	4
genotype				
phenotype				

Remember - The dominant one will always show up in the phenotype. The recessive one must have two copies to show.

Now it gets trickier!

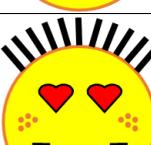
parent	mum	dad
genotype	Hh ff	Hh Ff
phenotype		

How many combinations of children can you find?

genotype				
phenotype				
genotype				
phenotype				

Expert level...

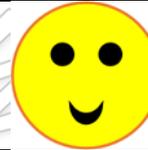
If this what the child looks like (phenotype), what could their parents' genotypes be? There will be more than one correct answer.

child phenotype	child possible genotype	mum genotype	dad genotype
			
			
 'Wig' is dominant to 'bald'			
			

Emoji Genetics - ANSWERS

Work out the possible children.

parent	mum	dad
genotype	Hh	hh
phenotype		
	Heart eyes are dominant	

children	1	2	3	4
genotype	Hh	hh	Hh	hh
phenotype				

H or h from mum. Two possible h from dad

Work out the possible children.

parent	mum	dad
genotype	Ff	ff
phenotype		
	Freckles are recessive	

children	1	2	3	4
genotype	Ff	ff	Ff	ff
phenotype				

Remember - The dominant gene will always show up in the phenotype. The recessive one must have two copies to show.

Now it gets trickier!

parent	mum	dad
genotype	Hh ff	Hh Ff
phenotype		

How many combinations of children can you find?

genotype	Hh ff	HH ff	hh ff	hH ff
phenotype				
genotype	Hh ff	HH ff	hh ff	hH ff
phenotype				

TOP TIP – Always write the mum's allele first & dad's 2nd, for clarity

Expert level...

If this what the child looks like (phenotype), what could their parents' genotypes be? There will be more than one correct answer.

child phenotype	child possible genotype	mum genotype	dad genotype
	<i>hh</i> <i>ff</i> <i>SS or Ss</i>	<i>Can't be HH</i> <i>Can't be FF</i> <i>At least one parent must have S</i>	<i>Can't be HH</i> <i>Can't be FF</i>
	<i>HH or Hh</i> <i>FF or Ff</i> <i>SS or Ss</i>	<i>At least one parent must have H, one must have F, one must have S</i>	
 Wig is dominant	<i>HH or Hh</i> <i>ff</i> <i>SS or Ss</i> <i>WW or Ww</i>	<i>Can't be FF</i>	<i>Can't be FF</i>
	<i>hh</i> <i>FF or Ff</i> <i>ss</i> <i>WW or Ww</i>	<i>Can't be HH or SS</i>	<i>Can't be HH or SS</i>

Any combinations that match the rules are correct. There are many possible correct combinations!