

GENETICS

Cells reproduce to create new cells. There are a few ways that cells can reproduce and mitosis and meiosis are two of them.

	MITOSIS	MEIOSIS
Used for what kind of reproduction?		*remember that this makes the CELLS (gametes) for this type of reproduction but meiosis does not create new organisms
Sketch of the process INCLUDING chromosomes		
How many cells at the end?		
Are cells different or the same as the original cell?		
Does it have all the chromosomes or half the chromosomes at the end?		

For sexual reproduction, the **gametes** (*sex cells = sperm + eggs*) that are created in meiosis can be combined with an opposite gamete to create **offspring** (*babies*). Because the information is being combined from two parents, the **genes** (*genetic information in codes in DNA*) are mixed together to create a unique offspring.

Traits are the different *features an organism can have* and there are *different versions of the genes for that trait* called **alleles**. The alleles can be **dominant** (*the one that shows up*) or **recessive** (*the one that gets masked*). For example, a trait might be eye color and the alleles are dominant *B* for brown and recessive *b* for blue. The letters that make up the trait for an organism come from mom and dad, so each trait has 2 letters to represent the alleles. For example, BB, Bb, or bb for eye color. The *pairs of letters* are called the **genotype** and *represent the alleles given by the parents*. The *features you see in the organism* are called the **phenotype**. Here are some examples

homozygous = *same alleles*

Genotype	Phenotype
BB	brown eyes
bb	blue eyes

heterozygous = *different alleles*

Genotype	Phenotype
Bb	brown eyes, because the <i>b</i> gets masked by the <i>B</i>

What happens to the genes when two parents create an offspring? **Because each of the parents' gametes** (*sex cells = sperm + egg*) **has HALF of their DNA**, we can predict what features their offspring will have using a Punnett square.

	B	b
B		
b		

Complete the Punnett square for the following situations:

A bug has a gene for the shape of its wings. The dominant shape is rounded, which has R for the allele. The recessive shape is pointy and has r for its allele. Because it is regular dominance, the bugs with heterozygous genotypes have the dominant phenotype.

Complete the Punnett square for two bug parents, where one is **homozygous recessive** and the other parent is **heterozygous**.

Possible Genotypes	Possible Phenotypes	Probability

A grass plant has a gene for a trait for leaf color. In this plant, the trait is co-dominant, so there are *two dominant alleles* (**codominance**). One allele, G, is for the color green. The other allele, Y, is for yellow. **When both alleles are present the color is striped green and yellow.**

Complete the Punnett square for two plant parents, where one has a **green color** and the other parent has a **yellow color**.

Possible Genotypes	Possible Phenotypes	Probability
