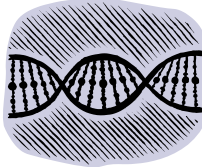


<p><b>Mitosis</b></p> <ul style="list-style-type: none"> <li>• Growth &amp; repair</li> <li>• Produces 2 genetically identical cells</li> <li>• Cells are diploid (full chromosome set), 2n</li> <li>• Occurs in somatic (body) cells</li> </ul> <p><b>Meiosis</b></p> <ul style="list-style-type: none"> <li>• Production of gametes (sperm &amp; egg)</li> <li>• Produces 4 genetically different cells</li> <li>• Cells are haploid (half chromosome set), n</li> <li>• Occurs in testes &amp; ovary</li> </ul>	<p><b>The big picture</b></p> <ul style="list-style-type: none"> <li>• Chromosomes are made up of DNA</li> <li>• The chromosomes carry genes along them</li> <li>• Genes code for proteins</li> <li>• DNA is triplet code; 3 bases = one amino acid</li> <li>• Some bases are stop / start, others are nonsense (don't code for anything we know!)</li> <li>• Sequence of bases determines the protein produced – which gives the characteristic / trait</li> <li>• Small differences in DNA sequence of a gene = alleles (result by mutations)</li> </ul>	<p><b>Genetics terms</b></p> <ul style="list-style-type: none"> <li>• Homozygous – 2 alleles the same e.g. BB or bb</li> <li>• Heterozygous – 2 different alleles e.g. Bb</li> <li>• Pure breeding – individual which always produces offspring which all resemble the parent / is homozygous (for a trait)</li> <li>• Dominant – characteristic that <u>always shows</u> if the dominant allele is present</li> <li>• Recessive – characteristic that only shows if there is no dominant allele present</li> <li>• Dominant allele masks the recessive allele</li> </ul>
<p><b>How meiosis causes variation / new combinations of genes in the gametes</b></p> <ul style="list-style-type: none"> <li>• Crossing over – bits of homologous chromosomes are exchanged (swapped) during meiosis</li> <li>• Independent assortment; it is random which one of a pair of homologous chromosomes goes into a gamete after they line up in pairs during meiosis</li> </ul>	<h1>GENETICS</h1>  <p><b>SURVIVAL SHEET</b></p>	<p><b>Punnett squares</b></p> <ul style="list-style-type: none"> <li>• Gametes written at side / top – single letters</li> <li>• Genotype – combination of alleles</li> <li>• Phenotype – physical appearance/feature</li> <li>• Ratio 1 BB : 2 Bb : 1 bb or 3 brown : 1 blue</li> <li>• Punnett square predicts “possible” outcomes and probability but NOT exact numbers</li> <li>• Fertilisation is random (which sperm &amp; which egg) so we don't EXACTLY get predicted ratios</li> <li>• The larger the number of offspring the closer the results will be to the predicted ratios</li> </ul>
<p><b>DNA structure &amp; replication</b></p> <ul style="list-style-type: none"> <li>• Sugar &amp; phosphate backbone</li> <li>• “ladder” of bases</li> <li>• A=T and C≡G / complementary base pairing</li> <li>• Nucleotide = sugar &amp; phosphate + base</li> <li>• DNA unwinds and opens up, exposing BASES, new nucleotides come in (join A=T and C≡G, nucleotides joined by enzymes, DNA winds up again)</li> <li>• DNA has to be accurately copied to ensure that the daughter cells created have the same DNA as the parent cell</li> </ul>	<p><b>Mutation</b></p> <ul style="list-style-type: none"> <li>• Permanent change in DNA sequence or number of chromosomes</li> <li>• Difference in base sequence → (may produce a) different amino acid sequence → different protein</li> <li>• Change in order = slightly altered gene</li> <li>• Alternative form of same gene is called an allele (Remember “a” for “alternative”)</li> <li>• Mutations can only be passed on if they are in a gamete / sex cell</li> </ul>	<p><b>Natural selection – e.g. disease resistance</b></p> <ul style="list-style-type: none"> <li>• Genetic diversity is due to meiosis</li> <li>• Disease which affects one individual may not affect all the individuals because of the different combination of genes</li> <li>• Some individuals are more resistant to disease than others due to differences in genetic material</li> <li>• These individuals can survive &amp; breed</li> <li>• Resistance may be passed on</li> <li>• If it is useful it can lead to evolution</li> <li>• Survival of the fittest (better suited = survival)</li> </ul>