

Topics	Notes, Diagrams, Drawings
<b>Sexual reproduction</b>	<ul style="list-style-type: none"> <li>Type of reproduction in which the genetic material from two different sex cells combine, producing an offspring</li> <li><b>Sex cells:</b> <ul style="list-style-type: none"> <li><b>Egg cell:</b> female sex cell, forms in the ovary</li> <li><b>Sperm cell:</b> male sex cell, form in the testis</li> </ul> </li> <li><b>Fertilization:</b> egg cell and sperm cell join together to form a new cell called a <b>zygote</b> which develops into an organism</li> </ul>
<b>Diploid cells</b>	<ul style="list-style-type: none"> <li>Following fertilization, the zygote goes through mitosis and cell division</li> <li>Organisms that reproduce sexually produce two kinds of cells: <ul style="list-style-type: none"> <li>Body cells: have 46 chromosomes: diploid</li> <li>Sex cells: have 23 chromosomes: haploid</li> </ul> </li> <li><b>Diploid</b> cells: cells that have pairs of chromosomes <ul style="list-style-type: none"> <li>23 pairs in humans: 46 chromosomes</li> <li>39 pairs in dogs: 78 chromosomes</li> </ul> </li> </ul>
<b>Chromosomes</b>	<ul style="list-style-type: none"> <li>Homologous chromosomes: pairs of chromosomes that have genes for the same traits arranged in the same order <ul style="list-style-type: none"> <li>One chromosome is inherited from each parent, so the chromosomes are not the identical</li> </ul> </li> </ul>
<b>Haploid cells</b>	<ul style="list-style-type: none"> <li>Sex cells, egg and sperm</li> <li><b>Haploid</b> cells: cells that have only one chromosome from each pair</li> <li><b>Organisms that reproduce sexually produce sex cells during a process called meiosis</b></li> <li>Meiosis: one diploid cell divides and makes 4 haploid sex cells</li> </ul>
<b>Phases of meiosis</b>	<ul style="list-style-type: none"> <li>2 divisions of the nucleus and cytoplasm</li> <li>Meiosis I</li> <li>Meiosis II</li> <li><b>Result:</b> 4 haploid cells with <b>half</b> the number of chromosomes as the original cell</li> </ul>

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<b>Meiosis I</b>	<ul style="list-style-type: none"> <li>• <b>Interphase:</b> DNA is copied, cell grows</li> <li>• Prophase: <b>chromosomes</b> condense</li> <li>• Metaphase: <b>chromosomes</b> at middle</li> <li>• Anaphase: <b>chromosomes</b> pull apart</li> <li>• Telophase: <b>two daughter cells</b></li> </ul>
<b>Meiosis II</b>	<p>Two cells formed during meiosis I go through a second cell division (nucleus and cytoplasm)</p> <ul style="list-style-type: none"> <li>• Prophase: chromosomes visible</li> <li>• Metaphase: <b>sister chromatids</b> at middle</li> <li>• Anaphase: <b>sister chromatids</b> pull apart</li> <li>• Telophase: <b>4 haploid sex cells</b></li> </ul>
<b>Importance of meiosis</b>	<ul style="list-style-type: none"> <li>• Forms sex cells with the correct haploid number of chromosomes and thus ensures that the zygote will have the correct number of chromosomes when sex cells join</li> <li>• Creates genetic variation (4 sex cells are genetically different)</li> </ul>
<b>Comparing mitosis and meiosis</b>	<p><b>Mitosis:</b></p> <ul style="list-style-type: none"> <li>• Body cell (i.e skin cell) <b>divides once</b></li> <li>• Result: <b>2 identical cells</b></li> <li>• <b>Growth, repair, replacement of damaged tissue</b></li> <li>• A form of asexual reproduction for some organisms</li> </ul> <p><b>Meiosis:</b></p> <ul style="list-style-type: none"> <li>• Reproductive cell <b>divides twice</b></li> <li>• Result: <b>4 non-identical cells</b>, each with half the number of original chromosomes as the original cell</li> <li>• <b>Forms sex cells for sexual reproduction</b></li> <li>• Happens in reproductive organs (of multicellular organisms)</li> </ul>

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<p><b>Advantages of sexual reproduction</b></p> <p><b>Genetic variation</b></p> <p><b>Selective breeding</b></p> <p><b>Disadvantages of sexual reproduction</b></p>	<ul style="list-style-type: none"> <li>• Offspring inherit half their DNA from each parent</li> <li>• Different DNA means that each offspring has a different set of traits <ul style="list-style-type: none"> <li>• <b>Individuals within a population have slight differences</b></li> <li>• <b>These differences may be an advantage if the environment changes (ie. drought, disease, severe cold)</b></li> </ul> </li>   <li>• Used to develop many different types of animals and plants with desirable traits</li>   <li>• Takes time and energy <ul style="list-style-type: none"> <li>• Organisms have to grow and develop until they are mature enough to produce sex cells</li> <li>• Then they have to form the sex cells</li> <li>• Before they reproduce, organisms must find a mate (take time &amp; requires energy)</li> <li>• The search for a mate might expose those individuals to predators, disease, harsh environmental conditions</li> </ul> </li> </ul>