

## UNIT 8 Reproduction and Genetics

	Learning Outcomes	Suggested Teaching Activities	Online Resources	Other resources
	<p>10 (a) Define a gamete as either a sperm or an egg, having half the number of chromosomes found in body cells</p> <p>10 (b) Define sexual reproduction</p>	<p>The students should be given a sheet of definitions for this Unit including;</p> <ul style="list-style-type: none"> <li>• Gamete (sperm and egg)</li> <li>• Sexual reproduction</li> <li>• Fertilisation</li> <li>• Implantation</li> <li>• Inheritance</li> <li>• Gene</li> <li>• Chromosome</li> <li>• allele</li> <li>• Meiosis</li> <li>• Mitosis</li> <li>• Dominant</li> <li>• Recessive</li> </ul> <p>To either fill in gaps or find and write up definition from text or inter-net or the teacher as and when they are needed.</p>		<p>P. Gadd pg. 136</p> <p>D. Mackean pg 100</p>
	<p>10 (c) Describe and identify from a drawing the structure of the male and female reproductive systems, as seen in side section</p> <p>10 (d) State the function of testis, sperm duct, prostate gland, urethra, ovary, oviduct, uterus, cervix and vagina.</p>	<p>Students should be given a diagram of the male and female reproductive systems, in side section to label and annotate from either text books, internet, video or teacher directed from a OHT/poster.</p> <p>A front view is also useful in helping students understand the arrangements of organs.</p>	<p><a href="http://sciencekit.com/category.asp?c=533389">http://sciencekit.com/category.asp?c=533389</a></p> <p>CD ROMs with virtual dissection for purchase</p>	<p>P. Gadd pg. 136-139; fig 15.1, 15.3, 15.7, 15.6</p> <p>D. Mackean pg 100-101; figs. 15.1, 15.2, 15.3, 15.4</p>
	<p>10 (e) Describe the menstrual cycle and the production of ova (eggs).</p> <p>10 (f) Describe the functions of oestrogen and progesterone in the menstrual cycle and in pregnancy.</p>	<p>Students should draw a cycle of events during the menstrual cycle over 28days, illustrating the major events and the role of oestrogen and progesterone, from either text books, internet, video or teacher directed from a OHT/poster.</p>	<p><a href="http://www.clearblue.info/uk/SnippetMenstrualCycle.cfm">http://www.clearblue.info/uk/SnippetMenstrualCycle.cfm</a></p> <p>Stepwise through the hormonal changes</p> <p><a href="http://health.howstuffworks.com/menstruation.htm">http://health.howstuffworks.com/menstruation.htm</a></p> <p>Animation of hormonal and physical changes</p>	<p>P. Gadd pg. 144; fig 15.21</p> <p>D. Mackean pg 108; fig 15.20</p> <p>P. Gadd pg 143 summary table</p>

<p>10 (g) Define fertilisation and implantation 10 (h) Describe the development of the foetus in terms of dependence on the placenta for exchange of food materials, oxygen, urea and carbon dioxide between the maternal and foetal blood; describe the placenta as a barrier, separating maternal and foetal red blood cells; describe the passage of nicotine, alcohol and some viruses from mother to foetus through the placenta 10 (i) Indicate the protective function of the amniotic fluid, in terms of even distribution of pressure around the foetus</p>	<p>Students should update definition sheet from above.</p> <p>Students should be given diagrams of foetus in uterus and large scale diagram of placenta to label and annotate from text, internet, OHT/poster. Students should write a summary description of the passage of materials to and from the placenta, from text, internet, OHT/poster.</p>	<p><a href="http://www.bioscience.org/atlas/ases/fert/htm/figures/plac1.htm">http://www.bioscience.org/atlas/ases/fert/htm/figures/plac1.htm</a> Placenta description/pics/photos</p>	<p>P. Gadd pg. 140; fig 15.11 D. Mackean pg 103; fig 15.11</p> <p>P. Gadd pg. 140-142; figs. 15.15 and 15.16 D. Mackean pg 104-105; Figs. 15.13e, 15.15 and 15.16</p>
<p>10 (j) Describe the three stages of birth: opening (dilation), delivery and afterbirth</p>	<p>Students should see a video sequence of birth and be given a set of diagrams of the stages of birth to annotate with the events at each stage. , from text, internet, OHT/poster. If possible they should hear a midwife/health care worker talk and give advice on the care of the mother and child through labour and relate it to the local resources available for delivery.</p>	<p><a href="http://www.anatomy-resources.com/human-anatomy/sh410.htm">http://www.anatomy-resources.com/human-anatomy/sh410.htm</a> Birth models for purchase (pics quite useful) <a href="http://www-medlib.med.utah.edu/nmw/mod2/Tutorial2/norm_birth.html">http://www-medlib.med.utah.edu/nmw/mod2/Tutorial2/norm_birth.html</a> Pictures of birthing model, may be useful for the more 'squeamish'</p>	<p>P. Gadd pg. 142-143; figs. 15.18 and 15.19 D. Mackean pg 106</p>
<p>10 (k) Describe family planning as a means of limiting the number of children in a family and spacing births, thus giving both mother and children a better chance of receiving adequate nutrition and other resources and of developing good health. 10 (l) Explain methods of birth control, stating practical advantages and disadvantages; rhythm (safe period), condom (sheath), cap; intrauterine device (IUD, coil and loop), oral contraceptive pill, sterilisation (vasectomy for males and tying of oviducts</p>	<p>Students should engage in discussion about the disadvantages of a woman having pregnancies too close together and the problems associated with caring for several children.</p> <p>The class should brain storm the ways that conception can be avoided and then create a table organising the different methods of birth control in order of their action. This can be given to them as a skeleton framework for them to fill in the details of how they work; their relative efficiencies;</p>	<p><a href="http://www.addenbrookes.org.uk/serv/clin/women/fpc/contents.html">http://www.addenbrookes.org.uk/serv/clin/women/fpc/contents.html</a> Comprehensive treatment of different methods.</p>	<p>P. Gadd pg. 147-150; D. Mackean pg 109</p>

	for females).	disadvantages and advantages. The condom should be advocated as a means of avoiding contracting HIV. Where possible the students should see examples of the methods, e.g. a condom, IUD, cap. Students could look at health leaflets produced locally about birth control; the health worker maybe could visit and give a talk.		
	<p>10 (m) Define inheritance as the transmission of genetic information (genes) from one generation to the next.</p> <p>10 (n) Define a gene as a length of DNA coding for a particular characteristic and distinguish clearly between the terms gene and allele.</p> <p>10 (o) State that genes are carried on thread-like structures, made of protein and DNA, called chromosomes.</p> <p>10 (p) State the function of ribosomes in cells in the formation of protein.</p>	<p>Students should update definition sheet from above.</p> <p>Students should watch video/animation sequence of protein synthesis to show function of ribosomes and to link the different parts of the process.</p>	<p><a href="http://www.eolas.ca/Micro_2.htm">http://www.eolas.ca/Micro_2.htm</a> Protein synthesis animation</p> <p><a href="http://www.lewport.wnyric.org/jwanamaker/animations/Protein%20Synthesis%20-%20long.html">http://www.lewport.wnyric.org/jwanamaker/animations/Protein%20Synthesis%20-%20long.html</a> A step-by-step journey through protein synthesis</p> <p><a href="http://www.eurekascience.com/ICanDoThat/protein_syn.htm">http://www.eurekascience.com/ICanDoThat/protein_syn.htm</a> A simplified and 'fun' animation!</p>	<p>P.Gadd pg 153; fig 16.1</p> <p>D. Mackean pg 164</p> <p>D. Mackean pg 167 fig 20.15</p> <p>P.Gadd pg 160; fig 16.14</p>
	<p>10 (q) Define mitosis as a nuclear division resulting in the formation of two nuclei with the same chromosome number, and the same genetic content, as the original nucleus.</p> <p>10 (r) Define meiosis as a nuclear division resulting in a halving of the chromosome number and the production of variation during the formation of gamete cells.</p>	<p>Students should update definition sheet from above.</p> <p>Students should draw out a "flow chart" of mitotic division. Showing the constancy of chromosome number.</p> <p>These should be kept as simple as possible and given by the teacher.</p> <p>Students should draw out a "flow chart" of meiotic division. Showing the halving of the number of chromosomes.</p> <p>Looking at pictures of stages of cell division might help to understand what is happening at the cellular level and putting a set of pictures in order will help in this.</p>	<p><a href="http://www.cellsalive.com/mitosis.htm">http://www.cellsalive.com/mitosis.htm</a> Animation of mitosis which can be played, stepped through or stages jumped to. Also linked to actual film of real cell dividing.</p> <p><a href="http://www.biology.arizona.edu/cell_bio/tutorials/cell_cycle/cells3.html">http://www.biology.arizona.edu/cell_bio/tutorials/cell_cycle/cells3.html</a> Animation in QuickTime</p> <p><a href="http://www.sci.sdsu.edu/multi-media/mitosis/">http://www.sci.sdsu.edu/multi-media/mitosis/</a> Excellent animations and films, all interactive, a must</p>	<p>D. Mackean pg 160 fig 20.2</p> <p>D. Mackean pg 170 fig 20.18</p> <p>P.Gadd pg 153 fig 16.3 Summary table pg 155</p> <p>P.Gadd pg 154 fig 16.4 and 16.5</p> <p>D. Mackean pg 163 fig 20.9 Pg 161 fig 20.3 and 20.4</p>

		Also students could look at microscope slides of growing tissues such as root tips stained to show chromosomes. Students should be given or copy a summary table comparing the two processes.	see!	
	10 (s) Define the terms dominant and recessive. 10 (t) Using symbols, draw and interpret diagrams to show the genetic characteristics of the offspring from a monohybrid cross.	Students should update definition sheet from above The teacher should take students through worked examples of classic monohybrid crosses e.g. eye colour to explain the use of symbols and the rules to draw out crosses either using Punnett square and/or "arrow" type diagrams Several exercises should be attempted by students to practise the ideas.	<a href="http://www.biology.arizona.edu/mendelian_genetics/problem_sets/monohybrid_cross/monohybrid_cross.html">http://www.biology.arizona.edu/mendelian_genetics/problem_sets/monohybrid_cross/monohybrid_cross.html</a> Monohybrid problems on screen from University of Arizona <a href="http://www.people.virginia.edu/~rjh9u/monohyb.html">http://www.people.virginia.edu/~rjh9u/monohyb.html</a> Simple Punnett Square animation linked to Mendel's actual data! <a href="http://biology.clc.uc.edu/courses/bio105/geneprob.htm">http://biology.clc.uc.edu/courses/bio105/geneprob.htm</a> More interactive genetics problems.	P.Gadd pg 162 summary of terms D. Mackean pg 175  P.Gadd pg 155-157 fig 16.7 and pg 158 fig 16.12 D. Mackean pg 176-177 fig 21.1 and 21.2
	10 (u) Using symbols, draw and interpret diagrams to show the inheritance of sex.	The teacher should take students through the theory of sex inheritance for the students to copy down.		