

UNIT OVERVIEW: DIABETES AND YOU

<p style="text-align: center;">OUTCOMES</p> <p>A student:</p>	<p style="text-align: center;">UNIT INDICATORS</p> <p>A student indicates achievement of the outcome when they:</p>	<p style="text-align: center;">TEACHING ACTIVITIES</p> <p>Students will:</p>	<p style="text-align: center;">RESOURCES</p>
<p>5.8 relates the structure and function of living things to models, theories and laws.</p>	<p>5.8.1.a explain that systems in multicellular organisms serve the needs of cells</p> <p>5.8.4.a describe the role of, and interaction between, coordination systems in maintaining humans as functioning organisms</p>	<ul style="list-style-type: none"> • complete the revision worksheet comparing multicellular & unicellular cells (page 9 & 10) • complete the links in the pathway of a glucose molecule in the digestive system (page 11) • demonstrate the importance of simple sugars and carbohydrates as an energy source • complete a mix and match exercise that describes the main hormone producing glands in the endocrine system, and identify those involved with controlling glucose levels (page 13 & 15) • draw a flow diagram that describes the feedback system that controls glucose levels (page 14, 16 & 17) • identify how changes such as eating and exercising are handled by the glucose feedback system (page 19 & 20) • read accounts of the two types of diabetes mellitus (page 25 & 26) • identify on student flow diagrams where the defects or problems are that produce the two types of diabetes (page 16 & 17) 	<ul style="list-style-type: none"> • Activity: One cell or lots of cells. • Activity: Absorption of glucose in the digestive system. • Activity: Keeping glucose on the straight and narrow • Activity: How systems interact • Chapter 16, <i>Coordination</i>, Science Spectrum Bk. 3. • Section 1, Part 5, <i>The Nervous System</i>, Essential Science, Bk. 3. • Unit 1, Chapter 1, <i>Control of the Body</i>, The World of Science, Bk. 4.

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	<p>5.8.1.c identify that abnormal cell function may result in disease</p> <p>5.8.4.b describe some responses of body systems to infectious and non infectious diseases</p> <p>5.8.2.e identify the role of genes and environmental factors in determining the features of an organism</p> <p>5.8.2.d identify that genes are part of DNA</p>	<ul style="list-style-type: none"> • associate the defects they have shown in the glucose control flow diagram with abnormal cell function. • comprehension based activity explaining the abnormal cell function • gather information about the symptoms of each type of diabetes (page 33 & 34) • explore the environmental effects on Type 2 diabetes using a case study of Sumo wrestlers or Australian Aboriginals and the dependence of insulin resistance upon central abdominal fat deposits (page 36 & 45) • using the statistics students should develop the idea that diabetes is a multi- factorial disease (page 40) • explain what a gene is • develop the idea of a genetic contribution to diabetes (page 48) • linking the above points to develop the idea of ‘predisposition’ • use twin studies to show the influence of genetic and environmental factors in developing diabetes (page 54) • identify the causes of the two types of diabetes (page 34) 	<ul style="list-style-type: none"> • Section 1, Part 7, <i>How the body Fights Disease</i>, Essential Science, Bk. 3 Activity: Position is everything Activity: Environmental contributions to diabetes Activity: Diabetic study on the Australian Aboriginal Activity: Contribution of genes to diabetes

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A student:	A student indicates achievement of the outcome when they:	Students will:	
	<p>Optional content</p> <ul style="list-style-type: none"> • Explain why the same genetic information is not equally expressed in all cells • Explain the role of DNA in controlling cellular activity and producing proteins • Describe evidence to support the theory that genetic information is passed on from generation to generation 	<ul style="list-style-type: none"> • DNA codon code activity • Diagram of protein synthesis and explanation • Explain how mutations form and their effect on the genetic code. • Use pedigrees to explain how the genes for diabetes are passed from generation to generation. 	

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<p>5.3 evaluates the impact of applications of science on society and the environment</p> <p>5.5 analyses how current research might affect peoples lives</p> <p>5.12 describes scientific principles underlying some common technologies</p>	<p>4 / 5.3.a identify and describe examples of scientific concepts and principles that have been used in technological developments</p> <p>4 / 5.3.c identify and describe examples where technological advances have impacted on science</p> <p>5.5.a describe some recent scientific contributions made by male and female scientists, including Australians, and discuss the effect of their contributions</p> <p>5.12.a identify that simple machines make tasks easier or more convenient</p>	<ul style="list-style-type: none"> • Make an information poster e.g. symptoms, causes and treatments (page 32) • Make a historical timeline to show the development of treatments for diabetics (page 29) • Outline the contributions the Garvan have made to diabetic research, other institutions and other Australian scientists (page 53) • Research Assignment on Scientists and Technology in the field of diabetic research (page 54) 	<p>Activity: Diabetes awareness</p> <p>Activity: Diabetes research- the institutions</p> <p>Activity: Diabetes research- the scientists</p>

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<p>5.3 evaluates the impact of applications of science on society and the environment</p> <p>5.12 describes scientific principles underlying some common technologies</p> <p>5.5 analyses how current research might affect peoples lives</p> <p>5.4 discusses evidence supporting different viewpoints</p>	<p>4 / 5.3.d give reason why society should support scientific research</p> <p>5.5.d identify possible career paths in science</p> <p>5.5.b evaluate the potential impact of some issues raised in the mass media that require some scientific understanding</p> <p>5.5.c identify scientific skills that can be useful in a broad range of careers</p> <p>4 / 5.4.a discuss viewpoints about some issues with a major scientific component</p>	<ul style="list-style-type: none"> • Debate issues in diabetes treatment and research (page 53 & 59) • Flow diagram of people earning a living from diabetes (page 54) • Collection of 5 Articles from sources e.g. newspaper and journals. Using the articles evaluate the scientific content & approaches to science & target audience (page 31) • Write an article to alert school students about diabetes awareness (page 32) 	<p>Debate: Genetically engineered human insulin vs. other methods of treatment of diabetes.</p> <p>Activity: Careers and fields involved in diabetes.</p> <p>Activity: Diabetes in the news.</p>