**Assessment Task 1 - Developing a Teaching and Learning Resource**

**Part A: Big Ideas in Biology starting with a CoRe (content representation)**

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| *VCE YEAR LEVEL 11. Unit 2* | BIOLOGY IDEA: |
| **Physiological Adaptations (*Nelson biology VCE Units 1 & 2*, 2006)** |
| **What you intend the students to learn about this idea.** | **Organisms can tolerate a range or normal conditions**   * Normal range for tolerance * Importance of maintaining a relatively constant internal environment * The factors that can contribute to the failure of homeostasis * The negative feedback mechanism * An example of what happens in extreme cases when the normal range is exceeded   **Nerve control is used in complex organisms**   * Parts of the nervous system * To be able to distinguish between a nerve, neurone and nerve fibre * To be able to summarise the different kinds of neurons * To be able to distinguish between motor functions and visceral functions * Receptors ability to detect stimuli   **Hormone control is used in organisms**   * To learn about the endocrine system * To learn about the major endocrine glands, the hormones they secrete and the function of the hormones as related to homeostasis * To be able to compare the hormonal and nervous control systems   **Organisms can regulate their water balance and control their temperature**   * To learn the difference between endotherms and ectotherms * To learn the definitions for homeothermic and poikilothermic |
| **Why it is important for students to know this.** | In general, it important for students to learn about how animals and plants have physiological adaptations that allow them to live in different environments. This is important to consider with regard to environmental changes that may occur because of global warming. It is important for students to understand their bodies’ better and hormonal control. It is important for students to learn about homeostasis, feedback mechanisms, stimuli, receptors and negative feedback, with regard to the study of disease that may occur in the future, especially if they pursue studies in health, nursing and medicine.  The nervous system is one of the two systems for monitoring changes and coordinating responses.  The endocrine system is one of the two systems for monitoring changes and coordinating responses.  Students learn that organisms can occupy specific spots in ecosystems due to adaptations. |
| **What else you know about this idea (that you do not intend students to know yet).** | Disease mechanisms  Behavioural and reproductive adaptations will be covered later.  Specific details about all the endocrine glands, hormones and target tissues/organs. |
| **Knowledge about students’ thinking**  **/difficulties connected with teaching this idea.** | Students should have had some exposure to these ideas from science in years 7 to 10.  The lay terms for endothermic and exothermic which are “warm blooded” and “cold blooded” may lead to confusion. |
| **Teaching procedures**  **(and particular reasons for using these to engage with this idea).** | Look at the example of a person who nearly died from competing in a fun run on an extremely hot day. This activity puts the learning in perspective.  Perform an experiment looking at the effect of various conditions on body temperature. This creates an understanding of experimental practice.  Field trip to Barwon Heads Geelong to look at the intertidal zone and the adaptations of various intertidal organisms (field trip also relates to other big ideas in adaptations).  Answer the review questions from the textbook (*Nelson biology VCE Units 1 & 2*, 2006).  Students add key words to their glossary of words.  Create a concept map for the topic homeostasis – this requires students to review and integrate their knowledge. |
| **Specific ways of ascertaining students’ understanding or confusion around this idea**  **(include likely range of responses).** | Work through the answers from the review questions with the class.  Get students to work through the answers from the **Apply understandings** question from the textbook and then present the answers to the class (*Nelson biology VCE Units 1 & 2*, 2006). Have a group discussion about the answers.  Test on adaptations is preparation for the external exam that occurs in VCE unit 4.  There is likely to be a wide range of responses. Some students will need to do revision while others will be ready to progress to the next topic. |

**Appendix 1**

VCE Biology consists of four units of study as follows:

* Unity and diversity (Unit 1)
* Organisms and their environment (Unit 2)
* Signatures of life (Unit 3)
* Continuity and change (Unit 4)

Each unit of study has two study areas. These study areas are:

* Cells in action
* Functioning organisms
* Adaptations of organisms
* Dynamic ecosystems
* Molecules of life
* Detecting and responding
* Heredity
* Change over time

The big ideas in the study area, adaptations of organisms, are as follows:

* Environmental factors
* Structural adaptations
* Physiological adaptations
* Plant tropisms
* Behavioural adaptations
* Reproductive adaptations
* Techniques to monitor environmental change and species distribution

**References**

*Nelson biology VCE Units 1 & 2*. (2nd ed.)(2006). South Melbourne, Vic.: Thomson Nelson.