**Review Worksheet: Blood Gas Homeostasis**

**Name: ……………………………………………………………..**

*Do these questions, using your learning resources. Look at the “marks” to give you an idea of the level of detail required in the response (formative only – does not count towards your grade). At the end, mark your work, correct it, and fill in the reflection section. Questions marked \* require you to use reasoning, inferring and application of knowledge, or perhaps extra research to get the answer. It won’t be right there in the text.*

1: How does oxygen get from the air outside of the body to the cells?\*

(3 marks)

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2: How does carbon dioxide get from the body cells to the external environment?\*

(4 marks)

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3: How is carbon dioxide transported in the blood?

(3 marks)

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4: What effect does increased carbon dioxide intake have on blood acidity levels and pH?

(5 marks)

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5: Where are the chemoreceptors for carbon dioxide concentration located? Indicate whether they respond to dissolved CO2, pH or both.

(3 marks)

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| **Chemoreceptor Location** | **What does it respond to?** |
|  | CO2 levels / pH levels / both |
|  | CO2 levels / pH levels / both |
|  | CO2 levels / pH levels / both |

6: Draw an annotated homeostatic feedback loop (steady state control diagram) for regulation of blood gas concentration when CO2 levels rise.

(15 marks)

7: Draw an annotated homeostatic feedback loop (steady state control diagram) for regulation of blood gas concentration when CO2 levels fall.

(15 marks)

8: Describe the physiological response that occurs when O2 levels become dangerously low.

(4 marks)

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9: Describe the neural (nerve) pathway involved in voluntary control of breathing.

(2 marks)

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10: David, a two-year old boy, decides to hold his breath in an attempt to frighten his mother into giving him more ice cream. Should David’s mother be worried that he will die from lack of oxygen? Explain your answer.\*

(10 marks of 15 possible marks)

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11: Kim and Meredith are having a competition to see who can hold their breath under water for the longest. They decide to float face-down near the shallow end of the pool and hold their breath for as long as possible, then stand up when they need to breathe. Before they begin, Kim breathes very rapidly for 30 seconds, and then both Kim and Meredith float face down. After a while, Meredith surfaces and realises she has lost the competition. After a moment, she realises Kim is unconscious. Meredith pulls Kim out of the pool, calls an ambulance on her phone and starts CPR. Thankfully, Kim is able to start breathing again and recovers in hospital.   
  
Using your understanding of homeostatic control of blood gas concentration, explain what happened to Kim. \*

(10 marks)  
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12. Which part of the peripheral nervous system matches each of the following descriptions?

(6 marks)

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| **Description** | **Part of the Peripheral NS** |
| Cell body located in the dorsal root ganglion of the spinal cord |  |
| Cell body in the spinal cord, synapse in the chain ganglia near spinal cord, second unmyelinated neuron to effector. |  |
| Releases Noradrenalin at the effector tissue |  |
| Exits spinal cord at ventral root ganglion, synapse in ganglia close to the target organ. |  |
| Cell body in spinal cord, myelinated axon extends to target tissue. No additional synapses. |  |
| Under voluntary control |  |

Go back and mark your work using the marking key provided. What score did you get? /80

*I included enough detail in my answers.*



*I was able to find information in the text/powerpoint presentation.*

*I was able to reason and infer where the information wasn’t directly in the text (questions with \*).*

*I marked my work and wrote down any answers where I missed marks.*