



# A Level Biology Induction Task

**Introduction:** Biology is an exciting and highly relevant subject. It is rarely out of the news, and it is an area which is undergoing rapid advances, especially in molecular biology, genetics and neuroscience. The A level course is perfect for anyone who has a natural fascination about the world around us, particularly the function of the human body, causes of disease and advances in medicine.

You will be expected to carry out a number of practical experiments and to write experiment reports competently. Biology is a demanding subject that requires strong study skills and an analytical approach at A level. You will need to work independently, and be able to read, analyse and write about scientific topics. As a part of your course you will also be given the opportunity to take part in a three day field trip to collect and then analyse data.

We hope that your GCSE results are all that you expect and we look forward to working with you in September.

Course studied: Edexcel Biology A (Salters-Nuffield)

- Task:**
1. Design a leaflet which will inform the reader, members of the general public without any particular science specialism, about cardiovascular disease. The leaflet should be an A4 folded leaflet produced using ICT. It should explain:
    - The nature of CVD, i.e. what is meant by the term CVD
    - Causes of CVD
    - How can individuals reduce their risk of developing CVD?
    - Treatments for CVD
    - Use illustrations to help communicate your ideas.
    - The leaflet should be easy to read, don't make it too technical.
  2. Complete the two AS-level (Year 1) exam questions on the 'Biology 6<sup>th</sup> Form Induction Questions' worksheet.
    - Use a pen of one colour to answer questions with your current knowledge
    - Use a pen of a second colour to add detail to your answers that you found from conducting additional research.

**Additional:** Biology 6<sup>th</sup> Form Induction Questions worksheet  
No additional resources are needed from school to complete this task

**Due:** Bring to your first Biology lesson next term.

**Set by:** If you have any queries regarding the task set please contact; Mr Mayo (Curriculum Leader for Science) [DJM@hardenhuish.wilts.sch.uk](mailto:DJM@hardenhuish.wilts.sch.uk)

**Expected Time Commitment:** 2-3 hours

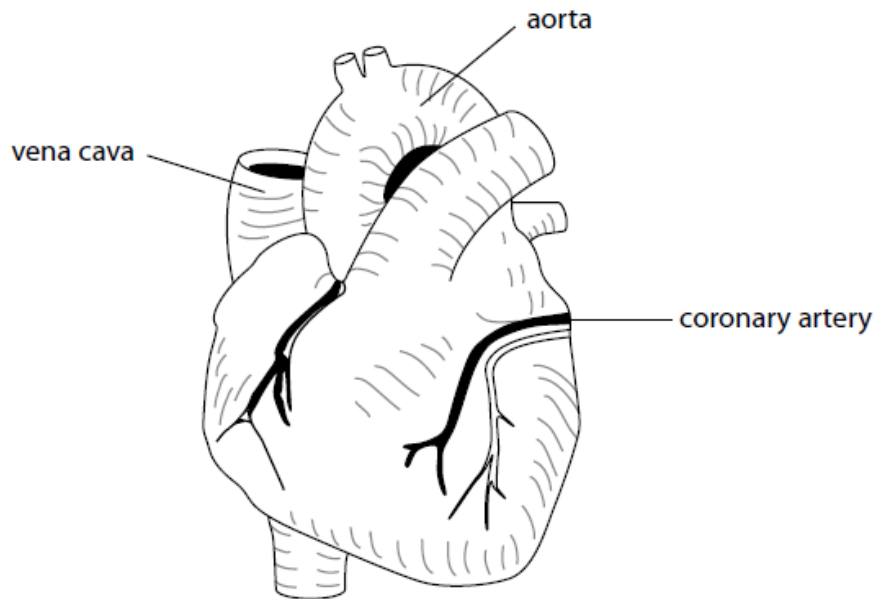
## Biology 6<sup>th</sup> Form Induction Questions

### Instructions:

- Use a pen of one colour to answer questions with your current knowledge.
- Use a pen of a second colour to add detail to your answers that you found from conducting additional research.

### Q1.

A student studied the external view of a mammalian heart, as shown in the diagram.



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(a) The student wanted to compare the size of the aorta and the vena cava of this heart.

She determined the cross-sectional area of the aorta, which was 72.22 mm<sup>2</sup>.

She also measured the diameter of the vena cava which was 17.0 mm.

- Calculate the difference in the cross-sectional area of the vena cava and the aorta.

(2)

Answer ..... mm<sup>2</sup>

- ii. The student also compared the thickness of the aorta wall of this heart with the thickness of the aorta wall in a giraffe. The thickness of the aorta wall in this heart is 3 mm and in a giraffe it is 15 mm.

Give one reason why the aorta wall in a giraffe is much thicker.

(1)

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(b) Blood clots can reduce the cross-sectional area of arteries and lead to cardiovascular disease (CVD). Thromboplastin is a catalyst in the blood clotting process.

- i. Which of the following shows the reaction catalysed by thromboplastin?

(1)

- A fibrinogen converted to fibrin
- B fibrin converted to fibrinogen
- C prothrombin converted to thrombin
- D thrombin converted to prothrombin

- ii. Which of the following shows the ions involved in the blood clotting process?

(1)

- A calcium
- B iron
- C nitrate
- D sodium

(Total for question = 5 marks)

**Q2.**

The diagram shows a shrew, a small mammal.



Source: <http://museum2.utep.edu/archive/mammals/DDshrew.htm>

Different species of shrew have different mean body masses. An investigation was carried out to find the relationship between mean body mass and oxygen consumption during respiration.

The table below gives the results for five species of shrew.

Species of shrew	Mean body mass / g	Oxygen consumed during respiration / $\text{cm}^3 \text{g}^{-1} \text{h}^{-1}$
<i>Sorex cinereus</i>	2.5	10.8
<i>Sorex vagrans</i>	4.5	8.6
<i>Sorex montereyensis</i>	6.5	7.2
<i>Sorex sonomae</i>	11.5	5.2
<i>Blarina brevicauda</i>	20.0	4.0

(a) Analyse the data to explain the correlation between body mass and oxygen consumption.

(3)

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(b) (i) Calculate the oxygen consumed in one day by one *Sorex cinereus* shrew.

(2)

Answer ..... $\text{cm}^3$

(ii) Explain why the oxygen consumption was measured per gram per hour.

(2)

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(c) Mammals, such as shrews, need lungs that provide efficient gas exchange. Explain how the lungs of mammals are adapted for efficient gas exchange.

(3)

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(Total for question = 10 marks)