

## Welcome to **Environmental Science**.

We would like to help you to prepare for your new A level course.

### Essential Science knowledge from GCSE for A level Environmental Science

You must understand the implications of basic science principles from your GCSE course

#### Biology

- Understand the processes of **photosynthesis** and **respiration** and their implications for life
- Be able to write word equations for photosynthesis and respiration

#### Chemistry

- Understand what an **element** is, and the properties of the most common elements found in biological compounds
- Be able to write a paragraph using all these words in correct context: - **solution, solute, solvent, dissolve, temperature, precipitate**. (Use NaCl as an example)

#### Physics

- Physical **properties of water**
- **Electromagnetic spectrum**, especially ultra violet, visible light and infra-red radiation
- 1<sup>st</sup> & 2<sup>nd</sup> laws of **thermodynamics**
- **Energy efficiency**

#### Geography (from Key Stage 3)

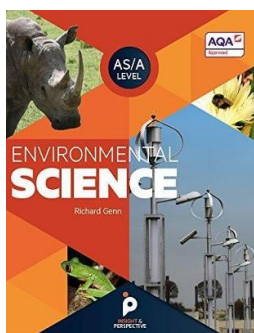
- The **water cycle**
- **Latitude** related to climate, latitudes of the **equator & the tropics**, latitudes of UK and Europe

#### Geology (covered in GSCE Science/ Chemistry)

- The three main **types of rock** and how they are formed

#### Mathematics

- Calculating %
- Calculating proportions (scaling down/up)
- Calculating mean



At A-level you will be following the [AQA Specification](#) and will study the following topics:

- The Living Environment
- The Physical Environment
- Energy and Pollution
- Biological Resources
- Sustainability
- Scientific Methods

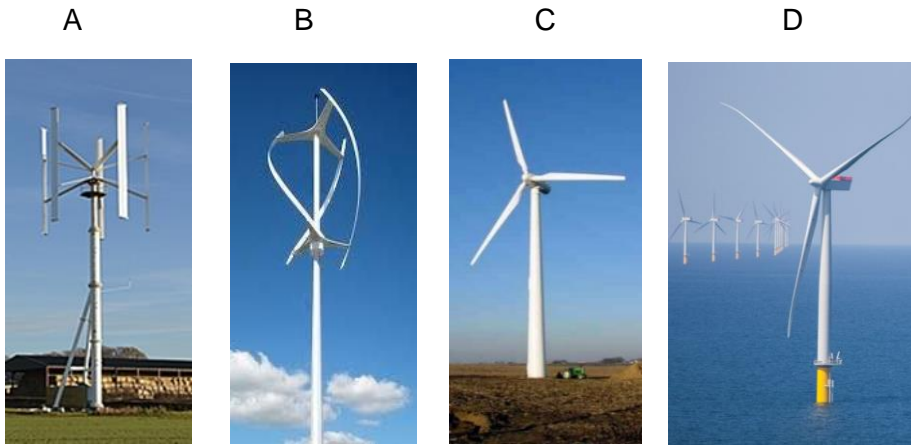
The text book will be issued on loan to you from College, or can be purchased from the [publisher, Amazon](#) or sometimes eBay.

*Publisher: Insight & Perspective*

*ISBN: 9781912190072*

**New technology in electricity generation** Name .....

1. One of the challenges facing environmental engineers is to develop technology which can harness the energy in **renewable sources**, such as wind.



<http://www.dpaonthenet.net/article/106769/Power-train-optimisation-for-vertical-axis-wind-turbines.aspx>

a) (i) Match the wind turbines in the pictures above to their descriptions.

Description of turbine	Letter
Horizontal axis aerogenerator, off-shore	
Vertical axis aerogenerator	
Horizontal axis aerogenerator, on-shore	
Helical vertical axis aerogenerator	

(3 marks)

(ii) Which type(s) of wind turbine is most commonly used generate electricity?

..... (1 mark)

b) (i) What are the advantages of horizontal axis wind turbines (HAWT) over vertical axis wind turbines (VAWT)?

.....  
 ..... (2 marks)

(ii) Suggest the type of location where VAWTs may be used and why.

.....  
 ..... (2 marks)

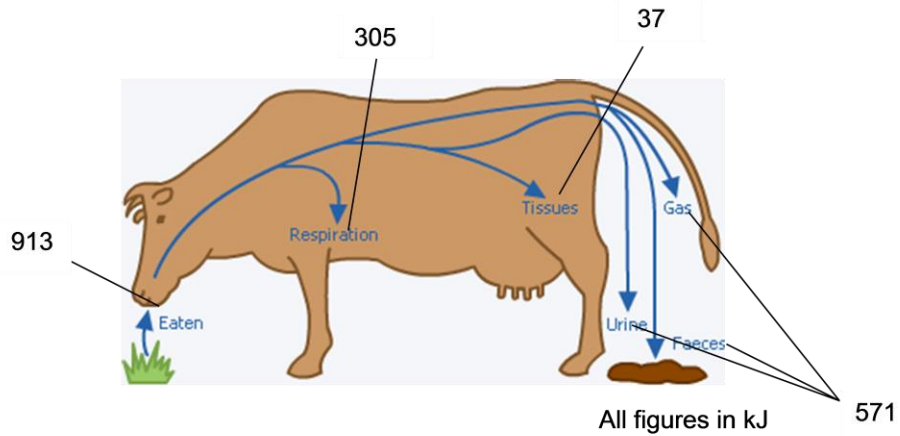
c) Describe two environmental problems which wind turbines can cause.

.....  
 .....  
 .....  
 ..... (2 marks)

Total 10

**The impacts of eating meat, dairy products and fish**

a) Calculate the efficiency of a cow, in producing meat or milk, from the data given below.






[http://target.raf.mod.uk/v2/furniture/factfiles/FK\\_Bio\\_Ser\\_2.gif](http://target.raf.mod.uk/v2/furniture/factfiles/FK_Bio_Ser_2.gif)

$$\text{Energy Efficiency} = \frac{\text{energy output (milk or meat)}}{\text{energy input (grass/ feed)}} \times \frac{100}{1}$$

.....% (2 marks)

b) Some animals are more efficient than others at producing meat. The table shows how much edible meat is produced from one Kg of feed for three farmed species.

Farmed animal species	Silver carp	Chicken	Beef cattle
			
Edible meat (Kg) produced per Kg of feed	0.45	0.20	0.03

(i) Which species has the greatest growth efficiency? ..... (1 mark)

Producing high quality food to feed the human population is very demanding on the Earth's energy resources, especially if we feed as secondary consumers.

c) Use the information on this page and your own knowledge to discuss the implications for the Earth's resources of human beings eating large quantities of meat.  
(Use own paper) (5 marks)

d) There are nutritional reasons for eating a range of foods.  
Give two **environmental** reasons for raising livestock.

.....  
 .....  
 ..... (2 marks)

Total 10