Name:

Tutor group:

Summer work

Year 10 Biology (Y9 student going to Y10)

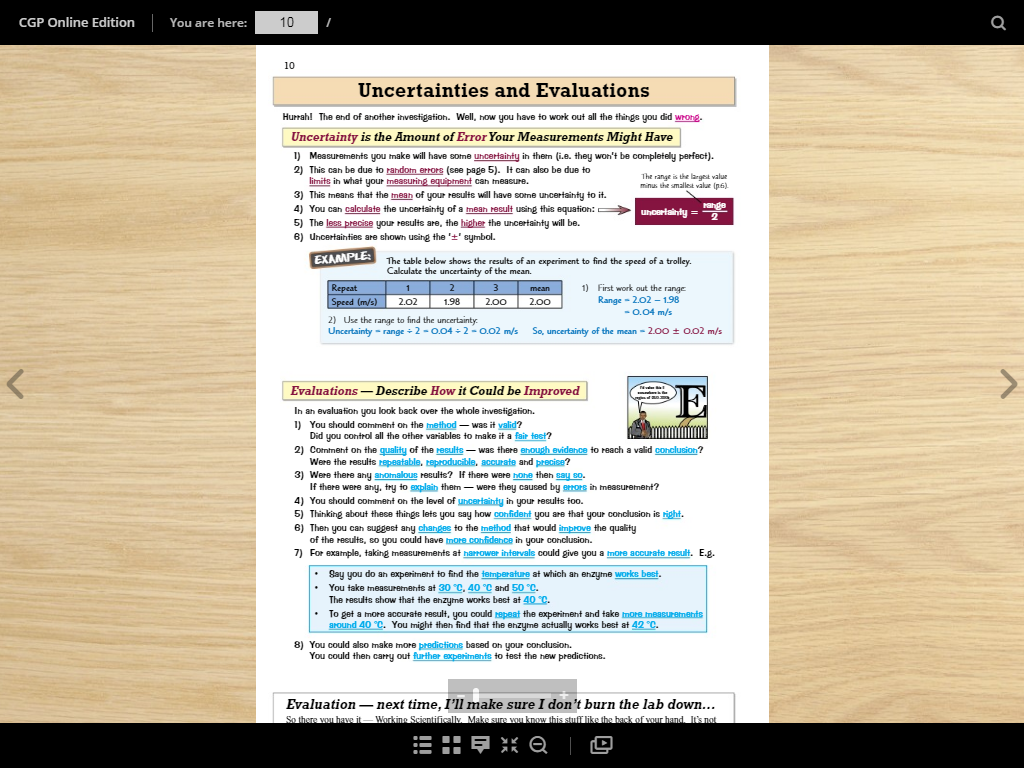
Term 1

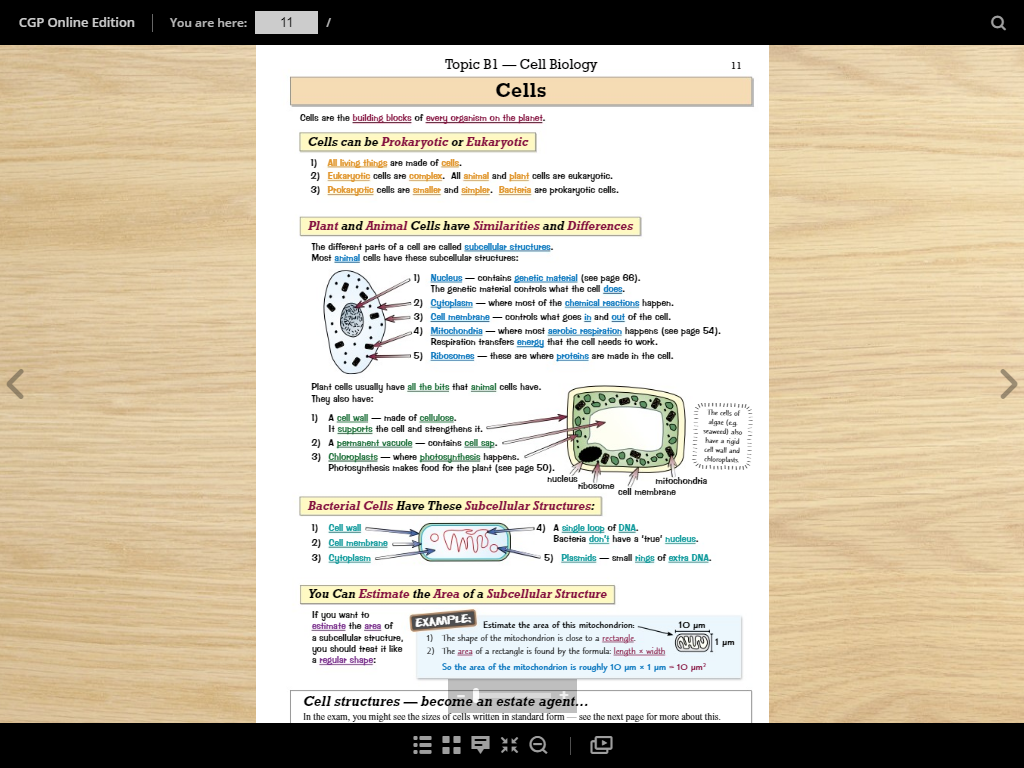
This workbook contains exam questions, checklist, success criteria and condensed notes on topics 1- 4

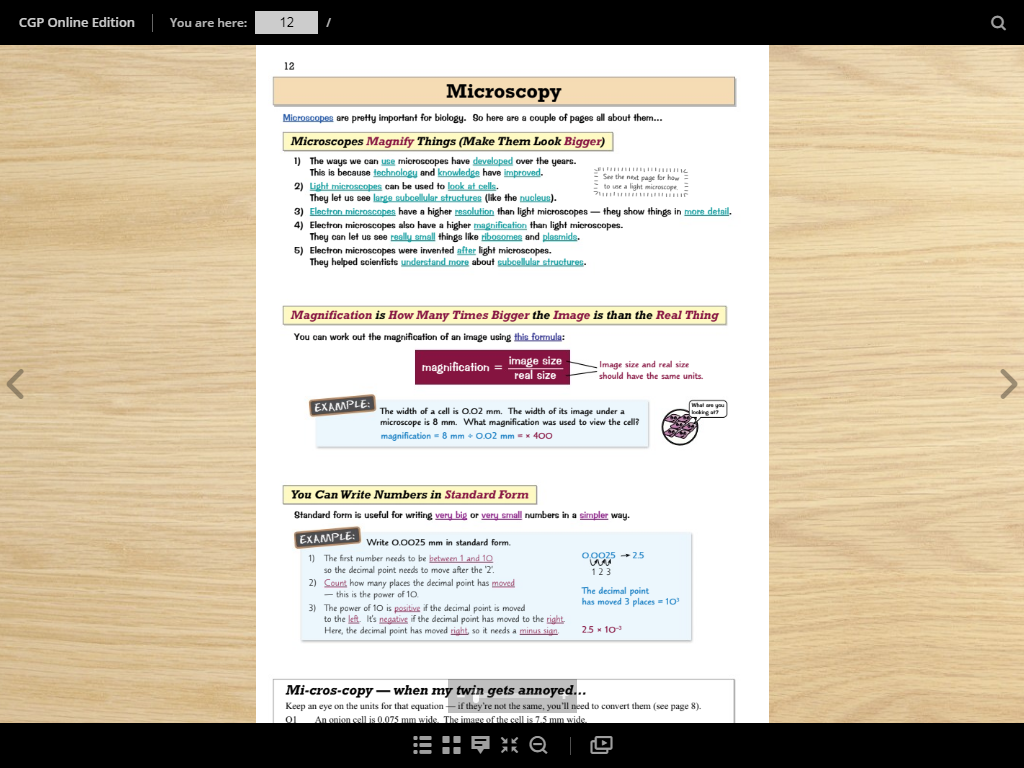
|  |  |
| --- | --- |
| 1 | Characteristics and Classification of living organisms. |
| 2 | Size of specimens |
| 3 | Energy flow and ecosystems |
| 4 | Nutrient cycles |

**Preparing for the Exams in Biology**

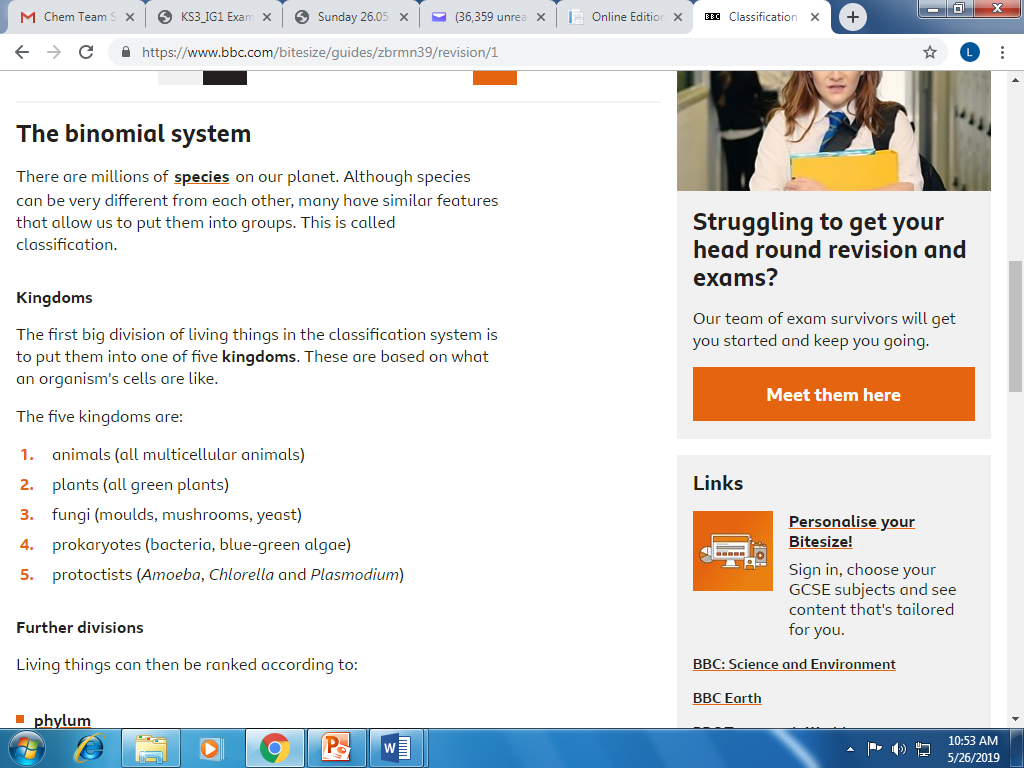
1. Find the Cambridge Syllabus that was given to you at the beginning of the year.
   1. Write a note or draw a diagram to illustrate (answer) every single syllabus point. Use your text book and exercise book to help you.
   2. Include examples of how to answer questions;
2. When you have finished the notes use them to make a second draft. It is important not to just copy the text book – think hard about what it means and put it into your own words.
3. Now your notes are in your own words make one last version – challenge yourself to write the shortest sentences and turn most of it into diagrams.
4. **Using other revision books is no substitute for writing your own notes – it is the act of writing in your own words and diagrams that synthesises and embeds the knowledge, as well as confirming to you that you really do understand it. More importantly – if you can’t write a short note it tells you that you don’t really understand it yet!**
5. At the end of each set of notes for a topic do practice questions. There are unused exam questions in the text book at the end of each chapter, and in the Biology Workbook.

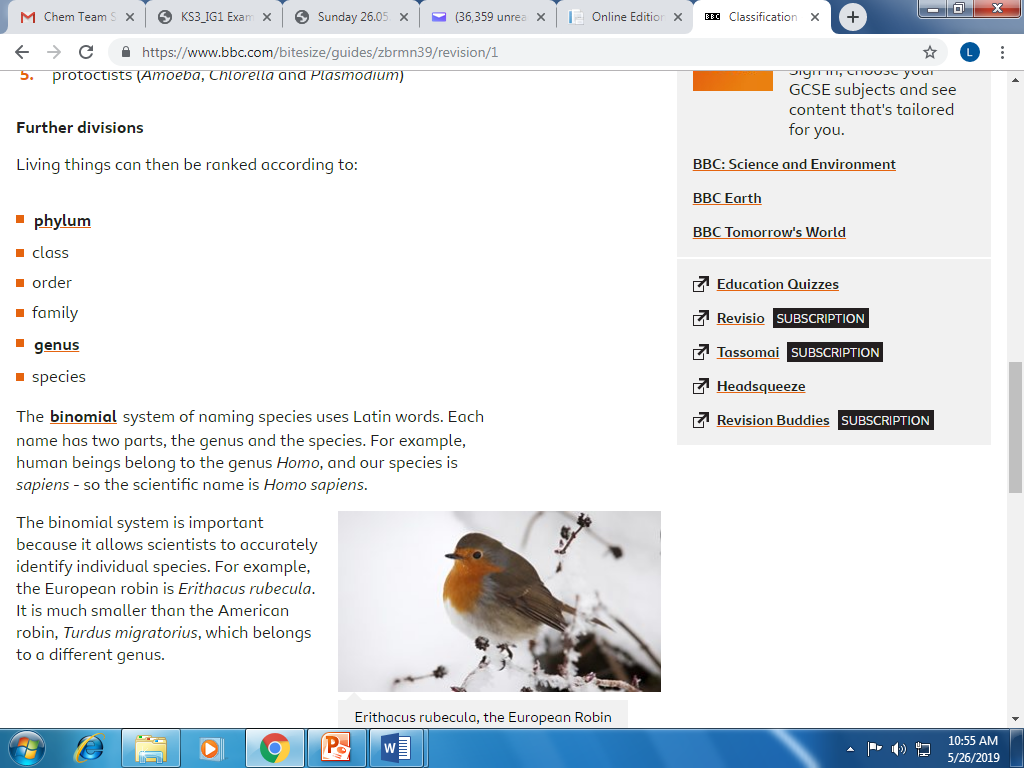


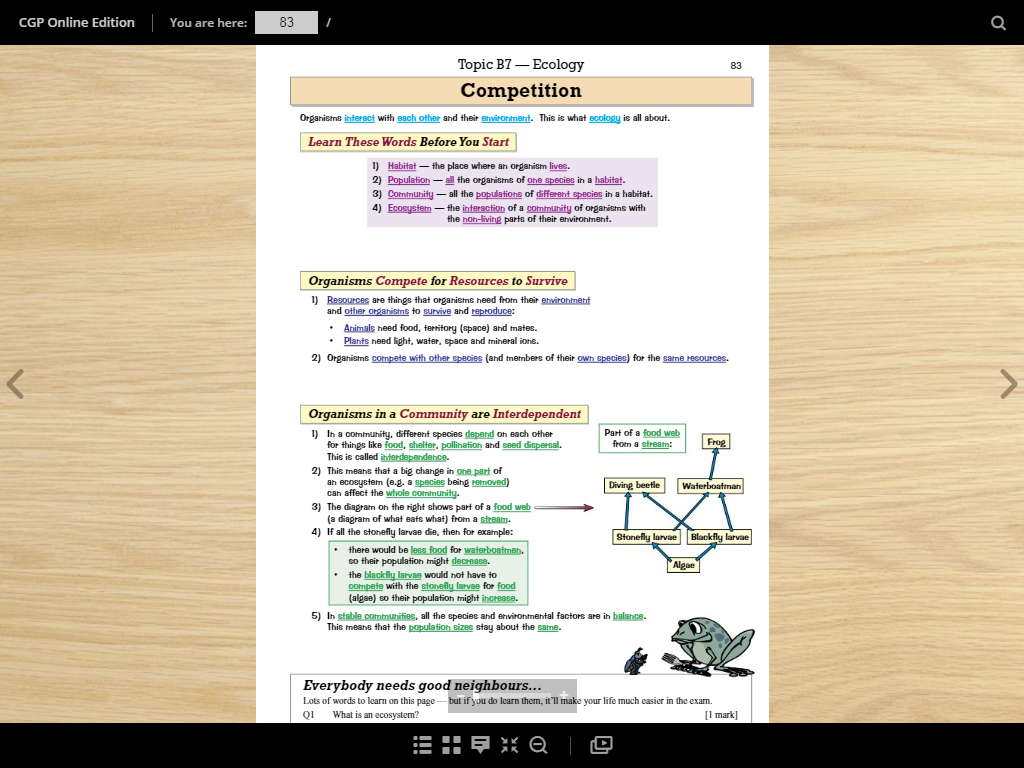




**Classification of living organisms**

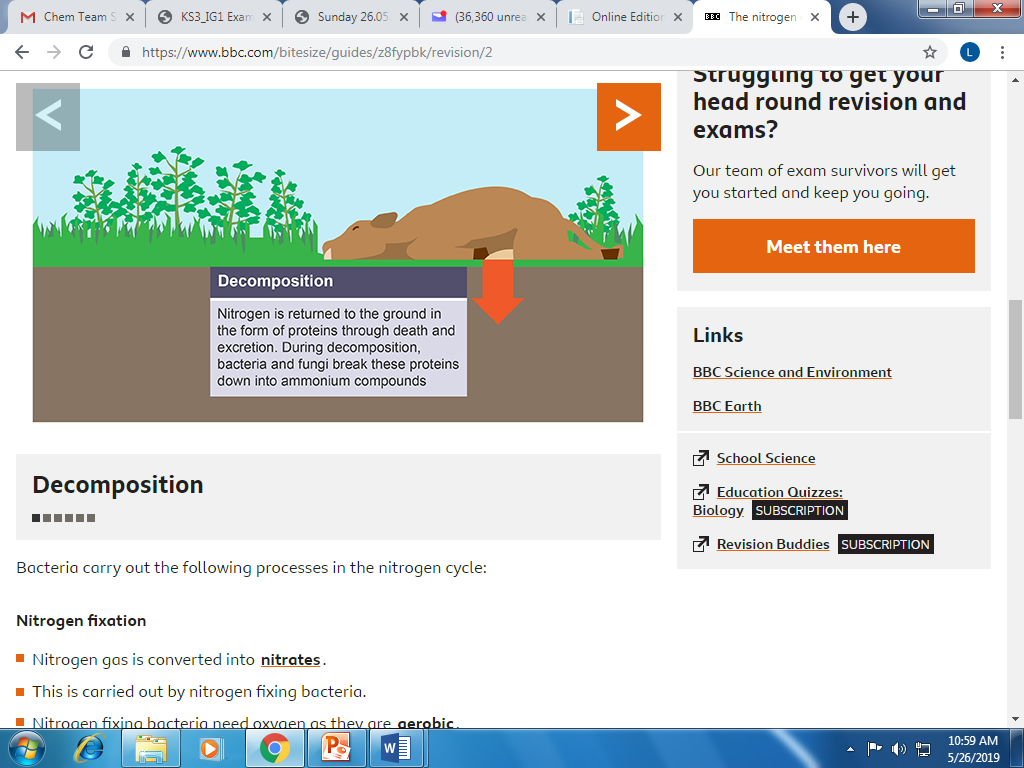


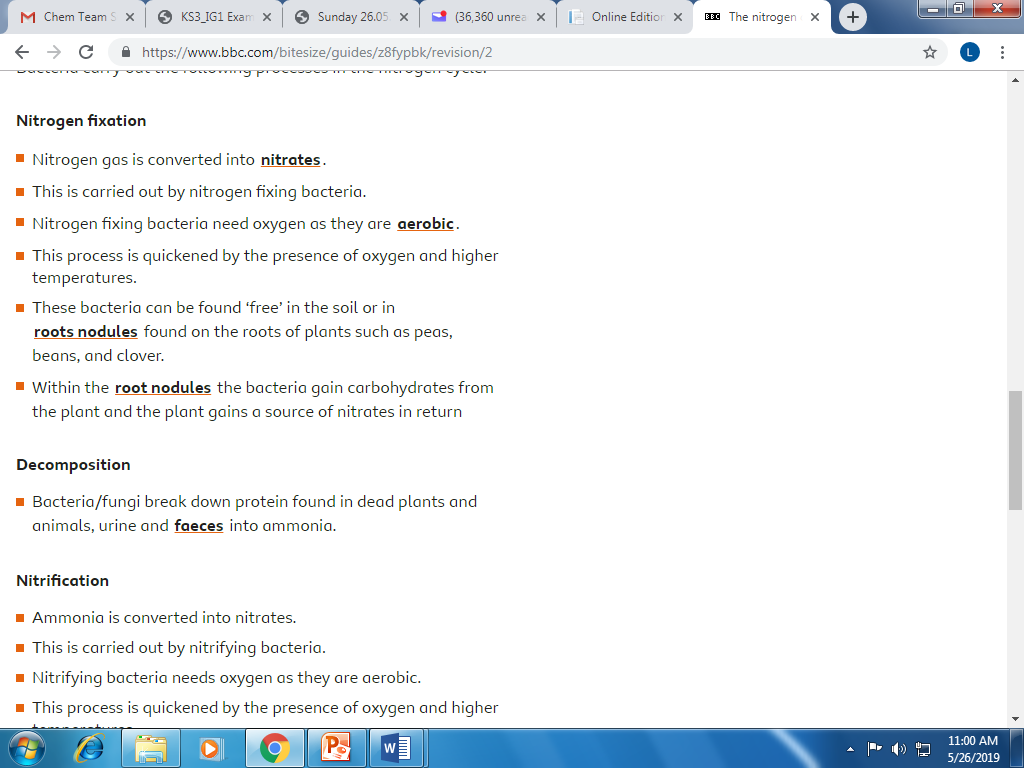


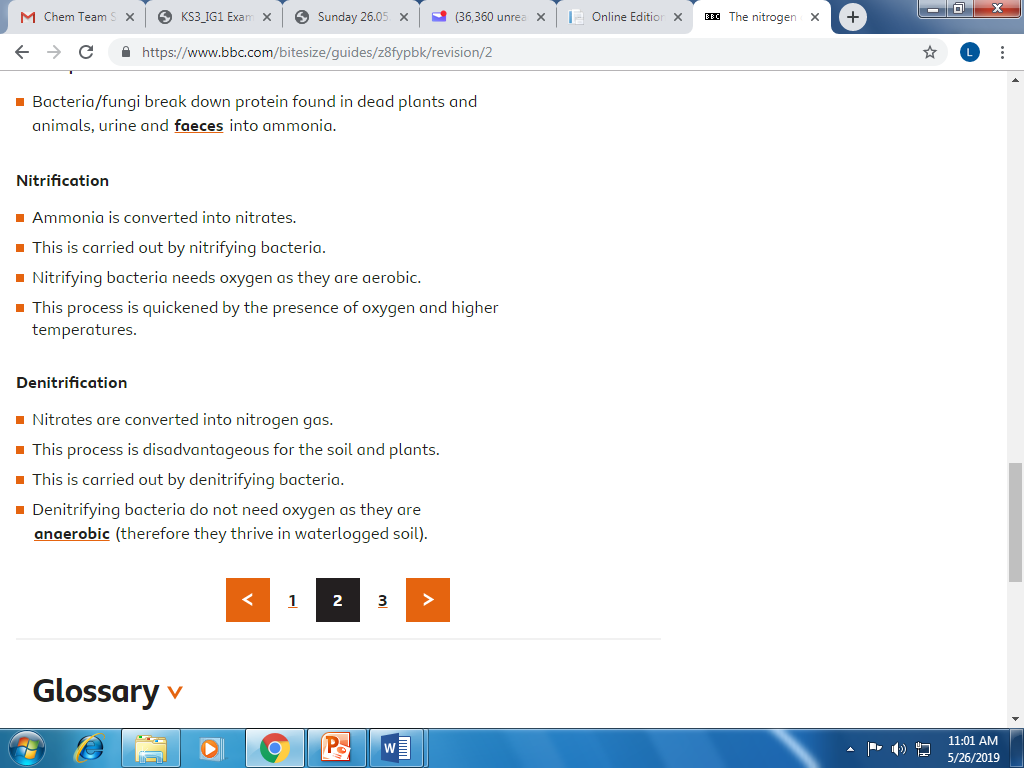


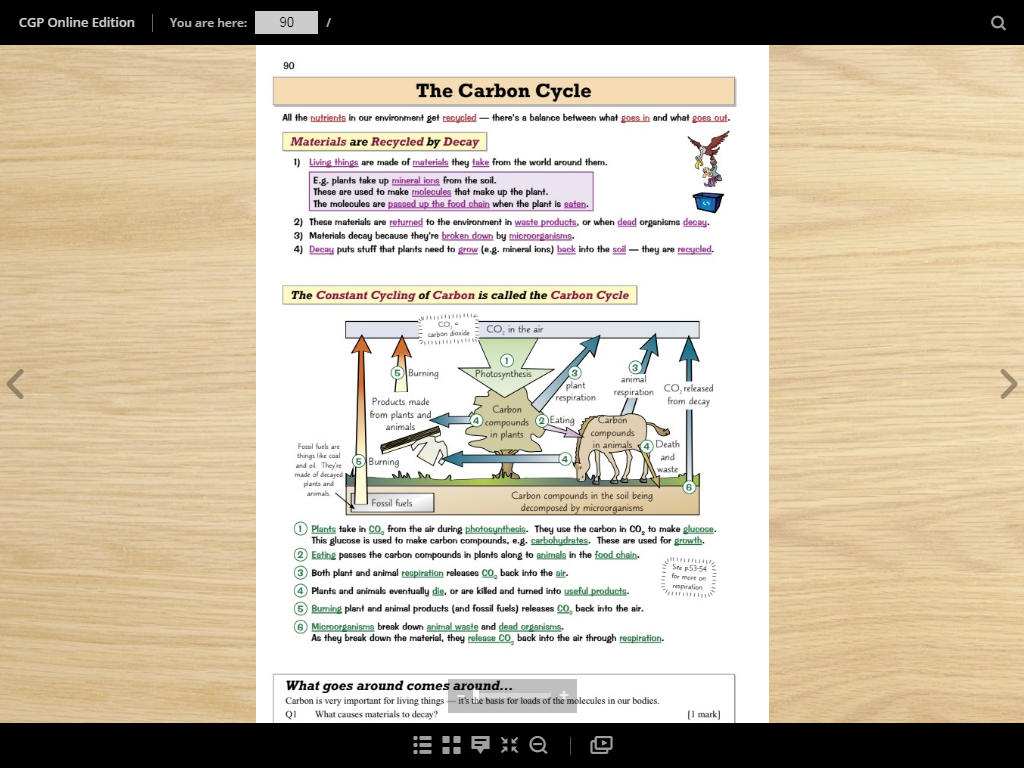


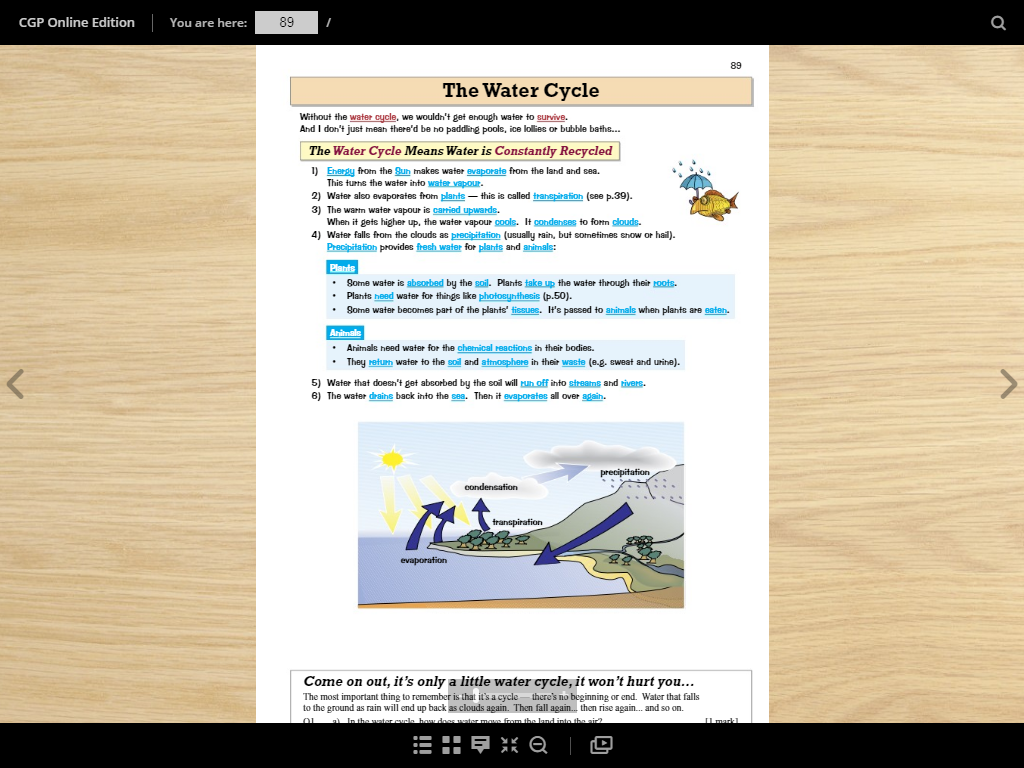
**Nitrogen cycle**









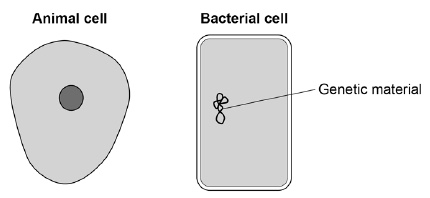


**Cells**

**Q1.**

**Figure 1** shows an animal cell and a bacterial cell.

**Figure 1**

****

(a)     Compare the structure of the cells in **Figure 1**.

Complete the sentences.

Choose the answers from the box.

|  |  |  |
| --- | --- | --- |
| **cell membrane** | **cell wall** | **chloroplast** |
| **cytoplasm** |  | **nucleus** |

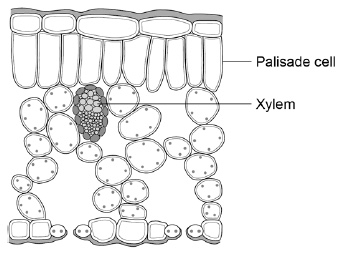
**Only** the animal cell contains a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

**Only** the bacterial cell contains a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

**(2)**

**Figure 2** shows a section through a leaf.

**Figure 2**

****

(b)     The function of palisade cells is to photosynthesise.

Describe **one** way palisade cells are adapted to carry out their function.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(1)**

(c)     Complete **Table 1** to show whether each structure is a tissue, an organ or an organ system.

Tick **one** box for each structure.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table 1** | | | |
| **Structure** | **Tissue** | **Organ** | **Organ system** |
| Leaf |  |  |  |
| Xylem |  |  |  |
| Roots, stem and leaves |  |  |  |

**(2)**

A student observed palisade cells using a microscope.

The microscope had four objective lenses, each with a different magnification.

(d)     Which objective lens should the student use first?

Tick **one** box.

Give a reason for your answer.

|  |  |
| --- | --- |
| ×4 magnification |  |
| ×10 magnification |  |
| ×40 magnification |  |
| ×100 magnification |  |

Reason \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(2)**

The student measured the width of 5 different palisade cells at a total magnification of ×400

(e)     Eyepiece lenses are usually ×5 or ×10 magnification.

What combination of eyepiece and objective lenses would give a total magnification of ×400?

Eyepiece lens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Objective lens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(1)**

(f)      **Table 2** shows the student’s results.

|  |  |
| --- | --- |
| **Table 2** | |
| **Cell** | **Width of cell image in mm** |
| 1 | 12 |
| 2 | 13 |
| 3 | 16 |
| 4 | 10 |
| 5 | 11 |

(f)      Calculate the mean width of the palisade cell images.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Mean width = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm

**(1)**

(g)     Calculate the real width of a palisade cell.

Use the mean width you calculated in part (f).

Use the equation:



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Real width = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm

**(2)**

**(Total 11 marks)**

**Classification**

**Q1.**

All living organisms are classified into groups.

**Table 1** shows the classification of one species of wheat.

**Table 1**

|  |  |
| --- | --- |
| Kingdom | Plant |
| Phylum | Angiosperms |
| Class | Monocotyledons |
| Order | Commelinids |
| Family | Poaceae |
| Genus | Triticum |
| Species | spelta |

(a)  What is the binomial name for the wheat in **Table 1**?

Tick **one** box.

|  |  |
| --- | --- |
| *Angiosperm monocotyledons* |  |
| *Poaceae triticum* |  |
| *Species spelta* |  |
| *Triticum spelta* |  |

**(1)**

Modern classification systems compare the similarity between the DNA of organisms.

The more similar the DNA code, the more closely the organisms are related.

**Table 2** shows DNA codes in five different organisms.

**Table 2**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **DNA Codes** | | | | | | | | | **Number of differences in DNA code compared with the human sequence** |
| **Human** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** |  |
| Pig | J | F | C | D | E | F | G | H | I |  |
| Wheat | C | I | K | D | M | F | G | H | I |  |
| Yeast | C | I | K | D | L | M | G | H | I | 5 |
| Chicken | J | F | C | D | M | F | G | H | I | 3 |

(b)  Complete the final column of **Table 2** for Pig and for Wheat.

**(1)**

(c)  Which organism in **Table 2** appears to be most closely related to humans?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(1)**

(d)  Give **one** reason why conclusions about the similarities between organisms should not be made using **only** the DNA codes in **Table 2**.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(1)**

**Ecology**

**Q1.**

Every year scientists have recorded the date when migrating birds arrived at summer breeding grounds in the UK.

The records show that for every 1 °C increase in mean global temperature, the birds arrived one day earlier.

(a)  What will the birds be competing for when they arrive at their UK breeding grounds?

Tick **two** boxes.

|  |  |
| --- | --- |
| Eggs |  |
| Food |  |
| Light |  |
| Mates |  |
| Oxygen |  |

**(2)**

(b)  Birds that arrive early might survive better than birds that arrive later.

Suggest **one** reason why.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(1)**

(c)  Global temperatures are increasing every year.

This is because of an increase of greenhouse gases in the atmosphere.

Name **one** greenhouse gas.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(1)**

(d)  Global warming affects the migration of animals.

Give **one** other effect of global warming.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(1)**

(e)  Which **two** human activities cause global warming?

Tick **two** boxes.

|  |  |
| --- | --- |
| Burning fossil fuels |  |
| Eating vegetables |  |
| Farming cows |  |
| Turning off lights |  |
| Using too much water |  |

**(2)**

(f)  Which gas in the atmosphere causes acid rain?

Tick **one** box.

|  |  |
| --- | --- |
| Carbon monoxide |  |
| Oxygen |  |
| Ozone |  |
| Sulfur dioxide |  |

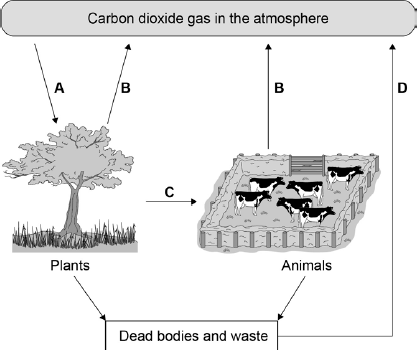
**(1)**

**(Total 8 marks)**

**Nutrient cycles**

**Q1.**

The figure below shows the carbon cycle.



Use the information from the figure above to answer the questions.

(a)     In process **A**, carbon dioxide in the atmosphere is taken into plants.

What is process **A**?

Tick **one** box.

|  |  |
| --- | --- |
| Evaporation |  |
| Fossilisation |  |
| Photosynthesis |  |
| Respiration |  |

**(1)**

(b)     In process **B**, carbon dioxide is released from plants and animals into the atmosphere.

What is process **B**?

Tick **one** box.

|  |  |
| --- | --- |
| Burning |  |
| Feeding |  |
| Photosynthesis |  |
| Respiration |  |

**(1)**

(c)     In which process is carbon passed from one organism to another?

Tick **one** box.

|  |  |
| --- | --- |
| **A** |  |
| **B** |  |
| **C** |  |
| **D** |  |

**(1)**

(d)     What will happen to the concentration of carbon dioxide in the atmosphere if lots of trees are cut down?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(1)**

(e)     Greenhouse gases cause global warming.

Carbon dioxide is a greenhouse gas.

Name **two** other greenhouse gases.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(2)**

(f)     When living organisms die the dead material decays and is broken down.

The process of decay returns carbon dioxide to the atmosphere.

What type of organism causes decay?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(1)**

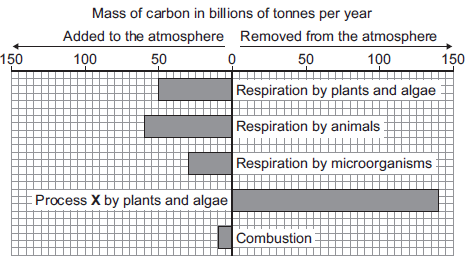
**(Total 7 marks)**

**More C- cycles**

**Q1.**

This question is about carbon.

The graph shows the mass of carbon added to and removed from the atmosphere each year.



(a)     Name process **X**.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(1)**

(b)     (i)      Calculate the mass of carbon added to the atmosphere by respiration per year.

Answer = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ billion tonnes

**(1)**

(ii)     Some scientists are concerned that the mass of carbon in the atmosphere is changing.

How does the data in the graph support this idea?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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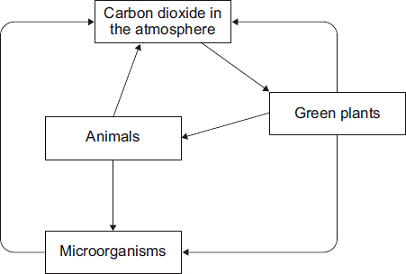
**(1)**

**(Total 3 marks)**

**Q2.**

*In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

The diagram shows part of the carbon cycle.



Describe how living things are involved in the constant cycling of carbon.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(Total 6 marks)**

**Nitrogen cycle**

Online learning:

Access these web pages or any other relevant websites e.g. YouTube etc.

<https://study.com/academy/practice/quiz-worksheet-steps-of-the-nitrogen-cycle.html>

[www.marion.kyschools.us/userfiles/89/nitrogen%20cycle%20w%20questions.docx](http://www.marion.kyschools.us/userfiles/89/nitrogen%20cycle%20w%20questions.docx)

<https://study.com/academy/practice/quiz-worksheet-steps-of-the-nitrogen-cycle.html>

<https://studylib.net/doc/7323032/nitrogen-cycle-questions>