

AQA Additional Science B2 Revision Booklet

Name _____

Teacher _____

Biology 2

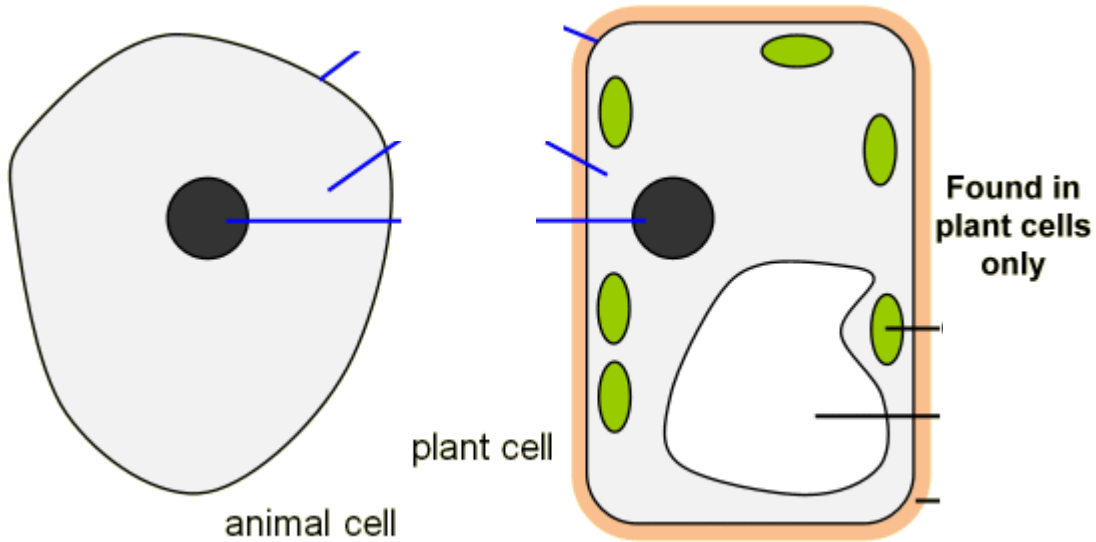
The table below states what the examiners expect you to know. Assess your knowledge and understanding at different times during your revision lessons. Use the following key

Red: no knowledge or understanding
 Yellow: some knowledge or understanding – needs more work
 Green: confident in knowledge or understanding

Outcome: student should be able to	Start	Middle	End
Cells			
To identify and explain parts of animal and plant cells			
To relate the structure of different cells to their function (e.g. sperm, red blood cells)			
To explain the process of diffusion			
To explain the process of osmosis			
Plants			
To explain the process of photosynthesis and factors which limit it			
To explain why certain minerals are needed by plants and deficiency symptoms if plants do not obtain them			
Energy Flows			
To be able to draw and interpret pyramids of numbers and biomass			
To explain why pyramids of biomass are always a pyramid shape			
To explain how we can improve the efficiency of food production by restricting energy loss in animals			
To identify how decay occurs and the conditions needed.			
To explain the main stages of the carbon cycle			
Enzymes			
To explain what enzymes are and how they work.			
Name enzymes involved in the digestion of food and explain how they work			
Give uses of enzymes within industry.			
Homeostasis			
To identify condition which the body must be controlled.			
To explain ways in which the body monitors and controls temperature			
To explain how the body monitors and controls blood sugar levels.			
To give ways in which diabetes may be treated			
Genetics			
To explain how genetic material is arranged inside cells using the terms chromosomes and genes.			
To predict and explain crosses between different combinations of dominant and recessive genes.			
To give the symptoms, and treatments for Cystic Fibrosis and Huntington's Disease.			
To understand the difference between mitosis and meiosis			
To make informed judgements about the social and ethical issues concerning the use of stem cells from embryos in medical research and treatments			

Cells

1. The diagrams below show an animal and plant cell, next to the arrows label the cell part and its function.



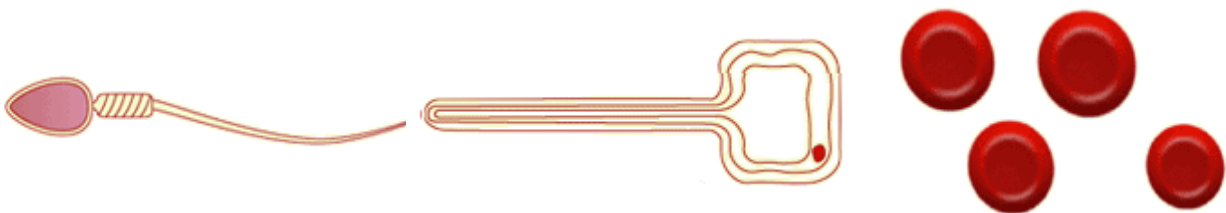
2. What is the function of mitochondria?

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.....

3. What is the function of the ribosomes?

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.....

4. Below are three different cells, name each one and in the space underneath identify and explain its adaptations.

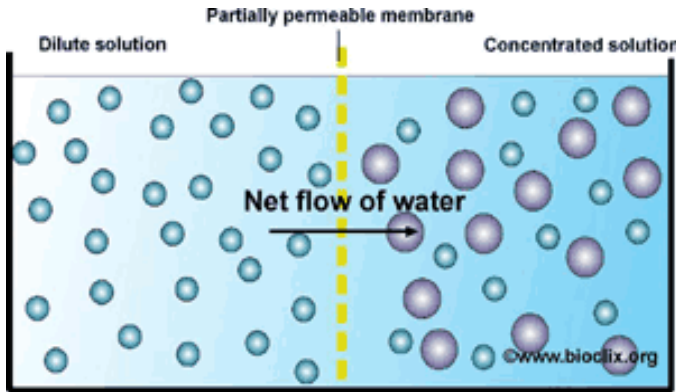


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5) In terms of concentration in which direction do substance move via diffusion?

.....

6)



The diagram shows osmosis write your own definition of osmosis.....

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Plants

1) What is the word equation for photosynthesis?

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2) Name two other things that are also needed for photosynthesis.

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3) Most of the glucose made by photosynthesis is stored as which substance?

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4) Describe how you could test for this substance.

.....

5) In the spaces below sketch three graphs to show how each limiting factor affects photosynthesis and explain the shape of each graph. The first has been done for you

<p>The graph shows a coordinate system with a vertical y-axis labeled 'Rate of p/s' and a horizontal x-axis labeled 'Light Intensity'. A line starts at the origin (0,0), rises at a constant positive slope until it reaches a certain point, and then continues as a horizontal line to the right, indicating that the rate of photosynthesis has reached a maximum and is no longer affected by further increases in light intensity.</p>	<p>1) Light Intensity At first as light intensity increases so does the rate of photosynthesis, this continues up to a certain point. After this increasing the light does not make any difference to the rate, temperature or amount of carbon dioxide are limiting it at this point.</p>
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	2) Carbon Dioxide
	3) Temperature

6) Why are nitrates needed by plants and how would a plant deficient in nitrates appear?

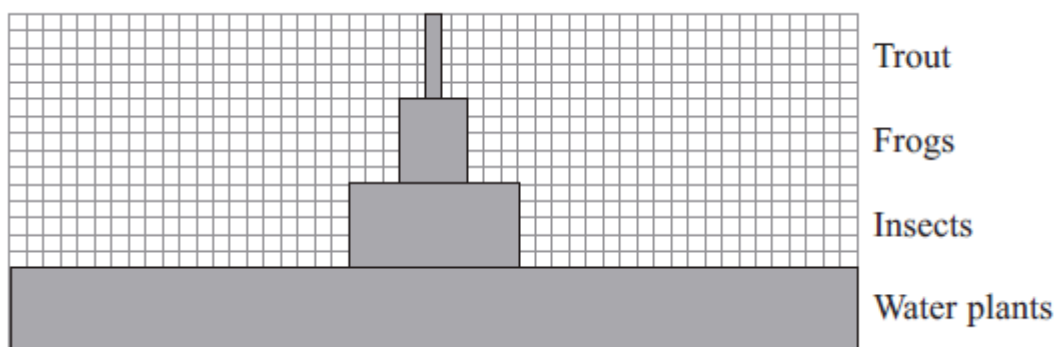
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7) Why is magnesium needed by plants and how would a plant deficient in magnesium appear?

.....

Energy Flows

The diagram shows a pyramid of biomass drawn to scale.



1) What is the source of energy for the water plants?

2) The ratio of the biomass of water plants to the biomass of insects is 5 : 1.
 Calculate the ratio of the biomass of insects to the biomass of frogs.

Show clearly how you work out your answer.

.....

ratio = : 1

3) Pyramids of biomass are always a pyramid shape. Give **two** reasons why the biomass of the frog population is smaller than the biomass of the insect population.

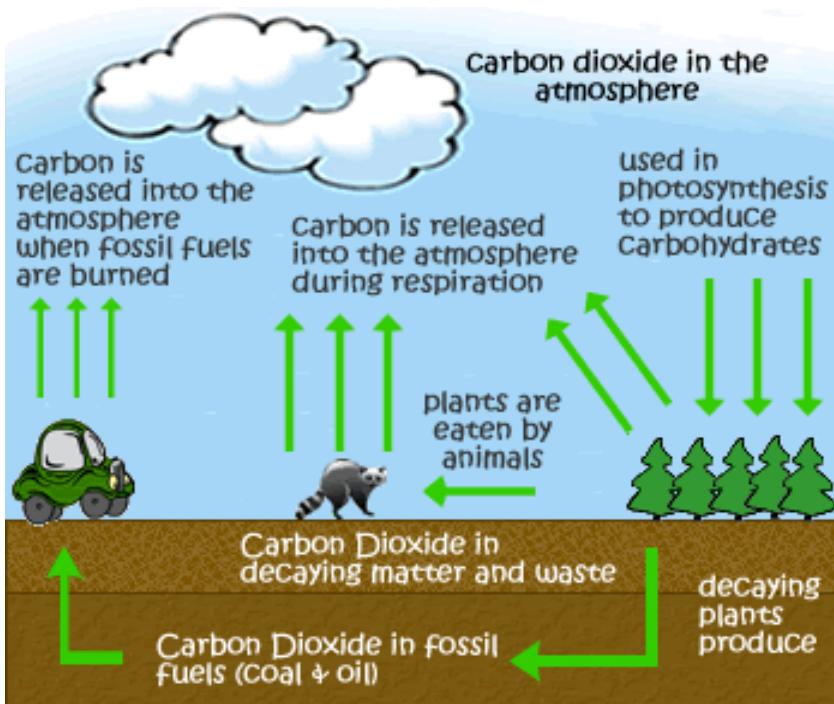
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4) The diagram below shows the carbon cycle use it along with your own knowledge to answer the following exam question. Some insects die. Describe how the carbon in the dead insect bodies may be recycled.



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5) What role do microbes play in the carbon cycle?

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Enzymes

Complete the following sentences

1. Enzymes _____ up the rate of chemical _____.
2. Enzymes are specific because they only work on one _____
3. The substrate fits into the _____ site of the surface of the _____.
4. With an increase in _____ the rate of reaction _____.
5. Enzymes can be re-used, so only _____ amounts are needed.
6. To which group of chemical compounds do enzymes belong? _____
7. Why is an enzyme specific for a particular substrate?

.....

.....

8. A number of factors can alter the rate of an enzyme- controlled reaction. Say what each of the following would do to the rate of reaction and give your reasons.

An increase in enzyme concentration

.....

A decrease in temperature

.....

A lowering of pH

.....

9. Sketch a labelled diagram below to show how enzymes work include the terms active site, substrate and enzyme

Lipase is an enzyme that breaks down fats. We can use an indicator to follow this reaction. The indicator is red to start with but turns yellow when all the fat has been broken down. Look at the results table below.

Test-tube	Temp (°C)	Original colour	Final colour
1	0	Red	Red
2	10	Red	Orange
3	40	Red	Yellow
4	60	Red	Orange
5	100	Red	Red

10) What is the optimum temperature for lipase? _____

11) Why do you think the colour didn't change in test tube 1?

.....

12) Why do you think the colour didn't change in test tube 5?

.....

13) Predict what you think would happen if you warmed test tubes 1 and 5 up to 40 °C. Try to explain your prediction.

.....
.....

14) Name the enzymes that work on carbohydrates, which products are formed?

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15) Which enzymes work on proteins and which products are formed?

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16) Which enzymes work on fats and which products are formed?

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17) Explain the main functions of bile

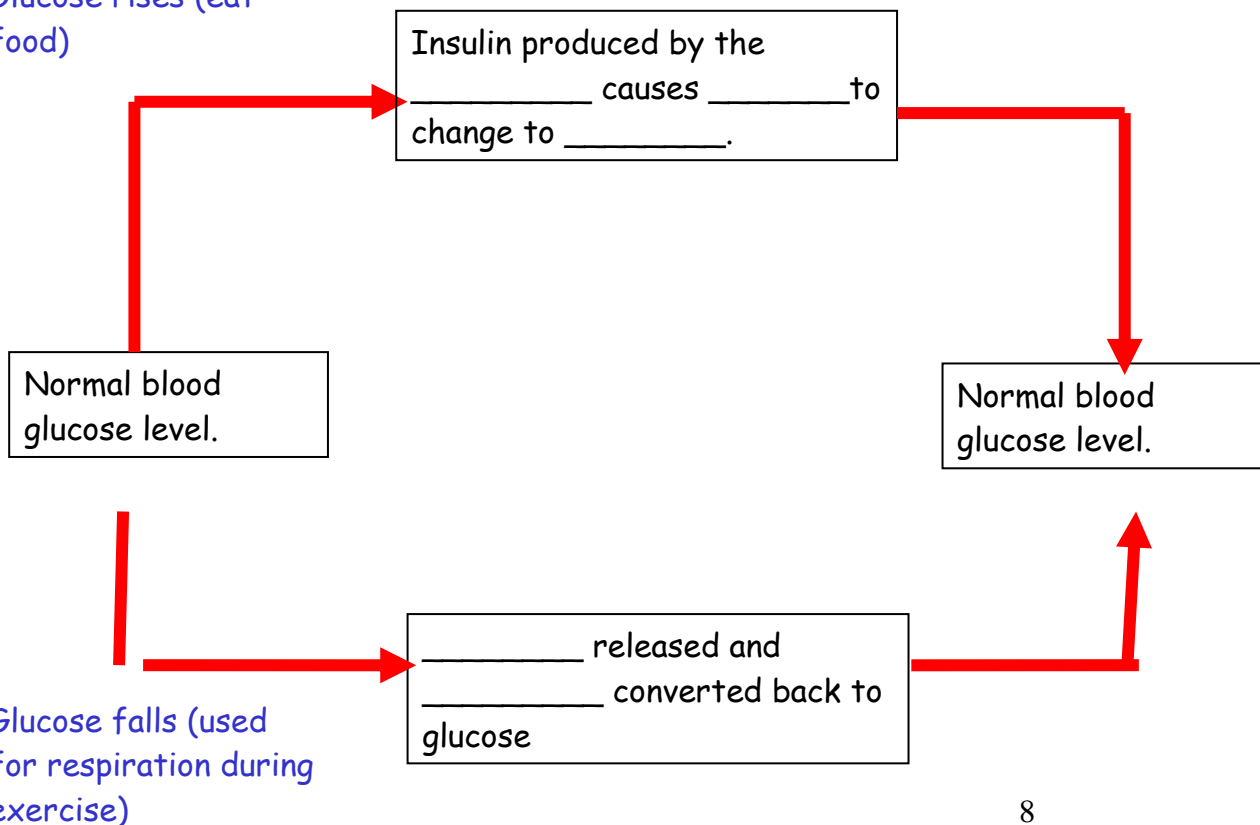
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Homeostasis

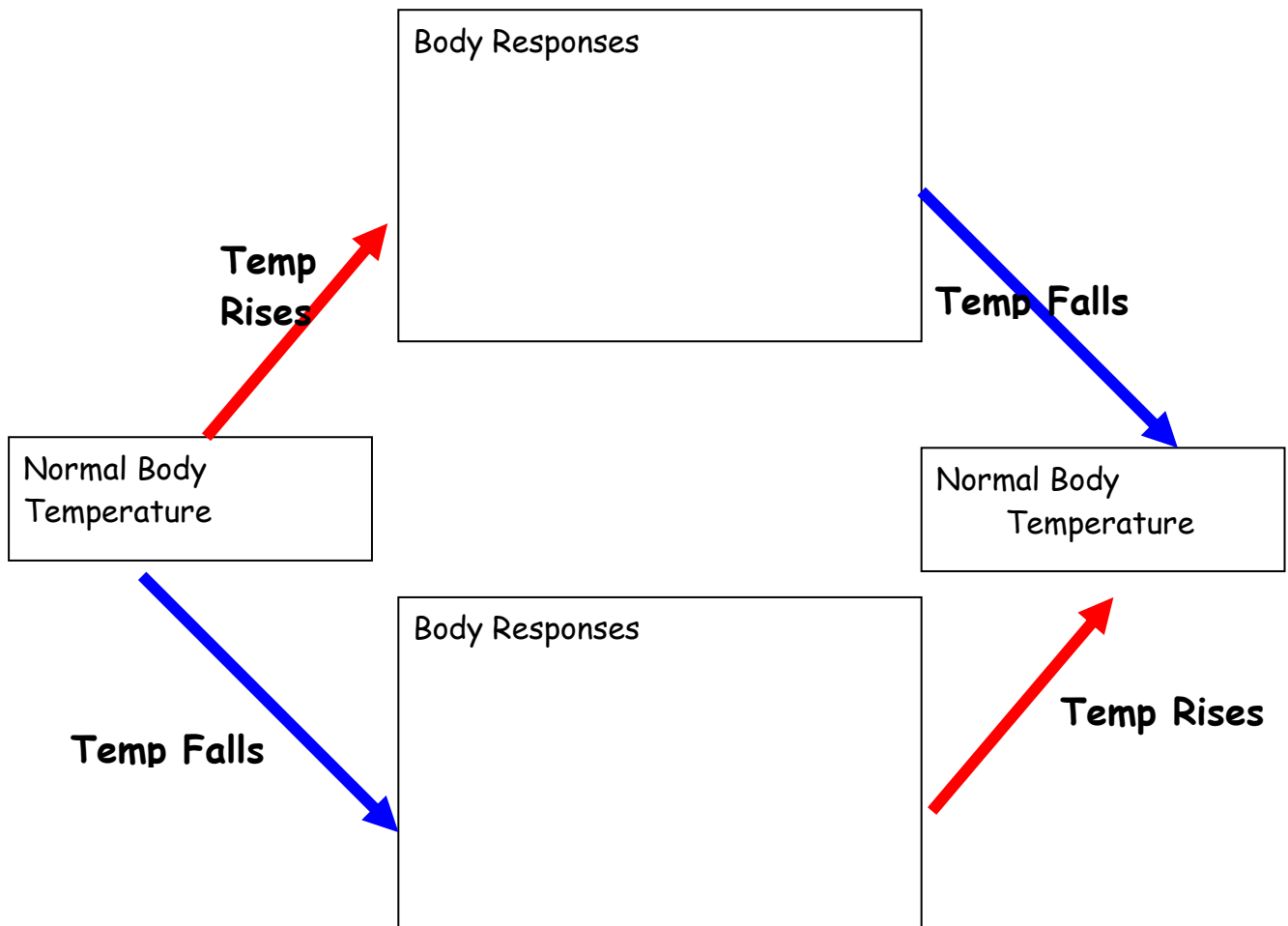
1) Complete the following

Controlling Blood Glucose Levels

Glucose rises (eat food)



2) Complete the following diagram to show how the body maintains a constant internal temperature



2) What does the term vasodilation mean and when does it occur?

.....
.....

3) What does the term vasoconstriction mean and when does it occur?

.....
.....

Inheritance

This is a difficult topic so make sure you revise it. The following are basic facts you need to learn for a C grade!

1) Where in a cell is genetic material found?

.....

2) How many chromosomes are found in a normal cell?

.....

3) How many chromosomes are found in the sex cells?

4) A short section of a chromosome is called a ?

5) What is the difference between a dominant and recessive allele?

6) Which pair of chromosomes are known as the sex chromosomes? What combinations are found in females and males?

7) What type of cell division is used for normal growth?

8) What type of cell division produces the sex cells?

9) What is a stem cell?

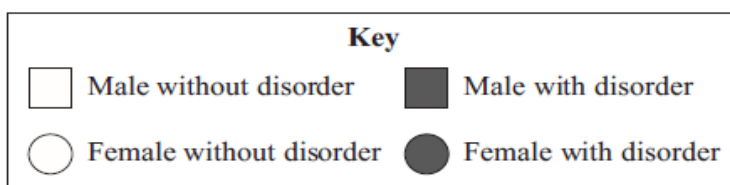
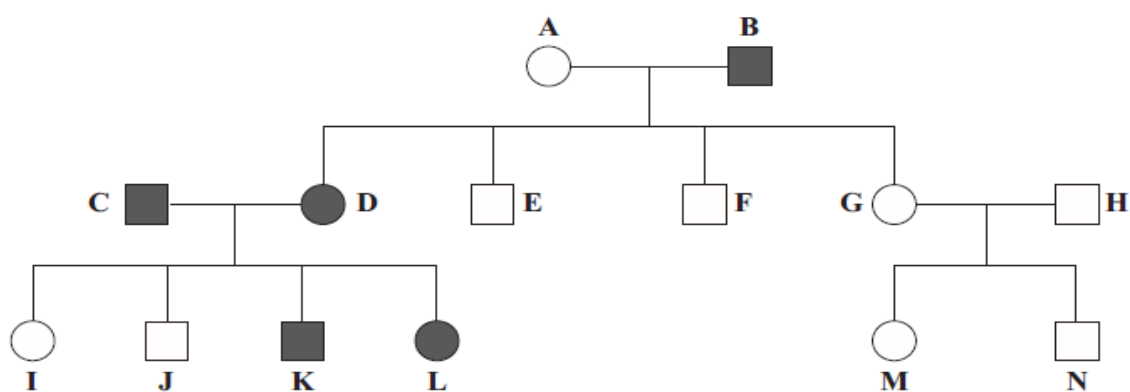
10) What type of allele causes cystic fibrosis?

11) What are the symptoms of cystic fibrosis?

12) What type of allele causes Huntington's Disease?

13) What are the symptoms of Huntingtons Disease?

The diagram shows a family tree in which some individuals have an inherited disorder, which may cause serious long-term health problems.



18) Inheritance Practice

For each of the following work out the chance of the offspring having the disease, for each one draw fully labelled genetic diagrams.

A carrier and a sufferer of cystic fibrosis.

A parent with Huntington's (heterozygous) and a non sufferer.

Two parents who are both carriers of cystic fibrosis.

TOP FIVE

List the TOP 5 things to remember about...

Enzymes

- 1.
- 2.
- 3.
- 4.
- 5.

List the TOP 5 things to remember about...

-
- 1.
 - 2.
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List the TOP 5 things to remember about...

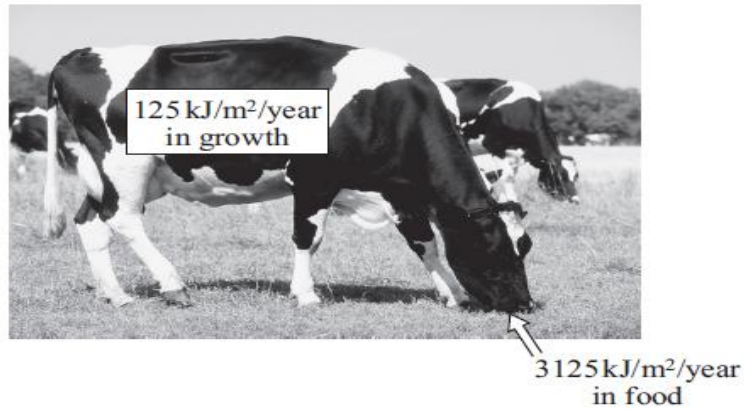
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- 1.
 - 2.
 - 3.
 - 4.
 - 5.

List the TOP 5 things to remember about...

-
- 1.
 - 2.
 - 3.
 - 4.
 - 5.

Biology 2 Revision

3 The photograph shows what happens to some of the energy in the food that a cow eats.



3 (a) Calculate the percentage of the energy in the cow's food that is transferred into new growth.

Show clearly how you work out your answer.

.....
.....

Answer =%
(2 marks)

3 (b) The energy from the cow's food which is not transferred into new growth is lost.

Give **three** ways in which this energy is lost.

1.....
.....
2.....
.....
3.....
.....

(3 marks)

3 (c) The animals that we raise for food are usually herbivores (plant eaters) rather than carnivores (flesh eaters).

Explain why.

.....
.....
.....
.....
.....

(2 marks)

Biology 2 Revision

1 (a) (i) Complete the word equation for photosynthesis.

carbon dioxide + (+ light energy) → glucose +
 (2 marks)

1 (a) (ii) Most of the carbon dioxide that a plant uses during photosynthesis is absorbed from the air.

Give **one** other source of carbon dioxide for a plant.

Draw a ring around your answer.

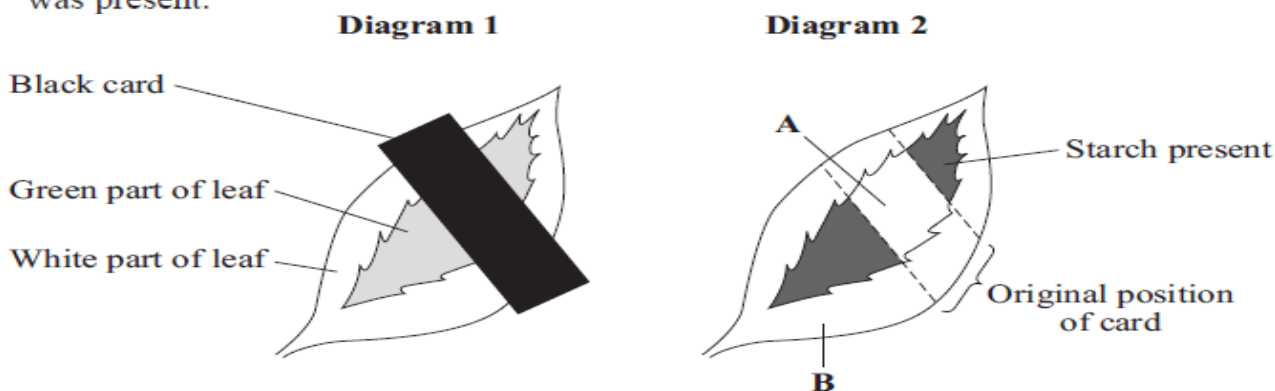
the soil respiration in the plant osmosis in the plant water

(1 mark)

A student investigated the conditions that plants need for photosynthesis. The leaves of the plant he used had green and white parts.

Diagram 1 shows how part of one leaf was covered in black (opaque) card. The plant was placed in a warm, sunny area and was watered well. Eight hours later the leaf was removed from the plant and was tested for starch.

The results of the test are shown in **Diagram 2**, the shaded parts show where starch was present.



1 (b) Name the **two** independent variables in this investigation.

- 1
-
- 2

1 (c) Why was no starch found in:

1 (c) (i) the part of the leaf labelled **A**

.....

(1 mark)

1 (c) (ii) the part of the leaf labelled **B**?

.....