



Copyrighted Material Digestion in humans

2 Quick quiz ?

Draw **one** line from each enzyme to its substrate, then **one** line from each substrate to the products formed.

lipase
carbohydrase (e.g. amylase)
protease

protein
fat
carbohydrates (e.g. starch)

amino acids
glucose
fatty acids and glycerol

10 Digestive system Grade 5

1. (a) Give **two** different uses of the products of digestion. [2 marks]

.....
.....

Look at the products in the quiz list above, and think of two ways in which glucose is used in the body.

(b) Explain the role of enzymes in digestion. [3 marks]



Food molecules are too large to be

Digestive enzymes

.....
.....

10 Enzyme action Grade 7

2. **Figure 1** shows a model of enzyme action.

(a) Label **Figure 1** to show the enzyme, substrate and products. [2 marks]

(b) Use the lock and key hypothesis to explain why an enzyme is specific to its substrate. [3 marks]

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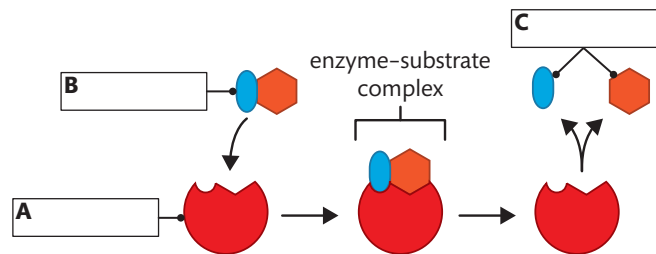


Figure 1

3. Bile is an alkaline substance that is involved in the digestion process.

(a) Name the parts of the digestive system where bile is produced and stored. [2 marks]

Produced **Stored**

(b) Explain the importance of bile being alkaline. [2 marks]

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.....

(c) Explain the other function of bile in the digestive process. [2 marks]

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Copyrighted Material Food tests



Quick quiz



- Some food tests need the use of a water bath.
- Number the steps in the correct order to describe how to set up a water bath safely using a Bunsen burner.
- Adjust the collar on the Bunsen burner to produce a flame that maintains the required temperature.
- Set up the heating apparatus.
- Check that the temperature is constant for a couple of minutes.
- Collect together a tripod, gauze, heat-resistant mat, Bunsen burner, a large beaker, thermometer.
- Half-fill a beaker with water and place it on the heating apparatus.



Food tests and observations

Grade 6



1. (a) **Table 1** shows three food groups.

Complete the table to show the food test used for each food group, and what a positive result looks like. [3 marks]

Table 1

Food group	Test	Positive result
Glucose	Benedict's test	
Protein		
Starch		blue-black



Only one of the food groups shown in the table is found in meat.

(b) A sample of meat is tested using the three tests in **Table 1**. Predict the results for each test. [3 marks]

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Tests for food molecules

Grade 7



2. (a) Ethanol can be used to identify the presence of lipids in a food sample. Describe what would be observed if lipids were present. [1 mark]

.....

(b) Give a reason why the lipid test is described as a qualitative test. [1 mark]

.....

Exam focus

Learn all the tests for carbohydrates (starch and simple sugars), lipids and proteins – this is a required practical.



3. **Figure 1** shows test tubes in which two different food samples have been tested using the Benedict's test.

(a) Describe how the Benedict's test is carried out. [2 marks]

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(b) One food sample was ground rice, the other was ground rice digested with amylase. Identify which tube contained the digested rice, giving a reason for your answer. [2 marks]

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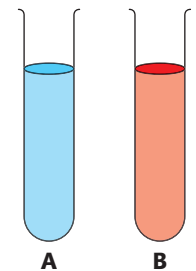


Figure 1





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Investigating enzymes

2 Quick quiz ?

True or false?

Changing the pH has no effect on a lipase enzyme.

True / False

Increasing the temperature from 10°C to 20°C increases the rate of a reaction controlled by a human enzyme.

True / False

Above the optimum temperature, rising temperature increases the rate of an enzyme-controlled reaction.

True / False

Above or below the optimum pH, an enzyme does not work as quickly because its active site changes shape.

True / False

10 Investigating enzyme action Grade 5

1. Students carried out a continuous sampling technique to investigate the effect of pH on amylase digestion of starch. **Figure 1** shows the results from a test at pH6. A drop of starch/ amylase mixture was added to the top left spot on the tile at time 0.

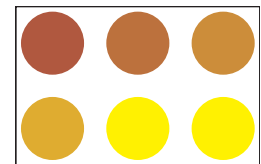


Figure 1

(a) Suggest a suitable time delay before adding a drop of starch/amylase mixture to the next spot on the tile. **[1 mark]**

.....

(b) Use your answer to (a) to calculate the time taken for the starch to be digested. Give your answer in seconds. **[2 marks]**

.....

Remember that the first spot was done at time 0.

(c) Use your answer to (b) to calculate the rate of reaction at pH6 in rate per s. **[2 marks]**

The rate of the reaction can be calculated by dividing 1 by the time taken. The rate of the reaction will be $\frac{1}{t}$.

(d) Explain why the starch/enzyme mixture was kept in a 30°C water bath during the tests. **[2 marks]**

To keep temperature constant because

.....
.....

5 Amylase digestion Grade 6

2. **Figure 2** was produced by combining the results of tests on the rate of amylase digestion of starch carried out at different pHs.

(a) Describe the relationship shown in the graph. **[2 marks]**

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.....

(b) Explain the shape of the graph. **[3 marks]**

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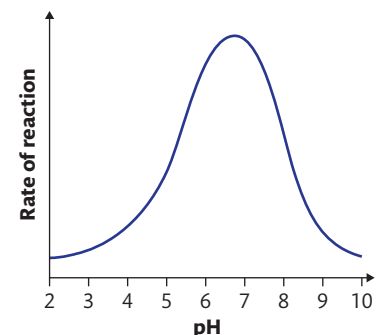


Figure 2



Made a start



Feeling confident



Exam ready



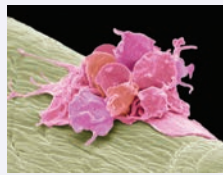
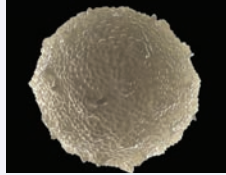
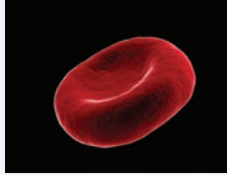
Copyrighted Material The blood



2 Quick quiz ?

Identify the parts of the blood shown in the images below. Use words from the box.

plasma red blood cell white blood cell platelets



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.....

.....

.....

10 Function of blood components Grade 6

1. Explain **one** way in which each of these blood components is adapted for its function.

(a) Red blood cells *Red blood cells contain haemoglobin that* [2 marks]

(b) White blood cells *These cells can protect us from disease because* [2 marks]

(c) Platelets [2 marks]

5 Risks related to blood products Grade 7

2. A blood transfusion is when blood is given to a patient who has lost a lot of blood, such as in an accident. Suggest why blood must be fully checked and tested before use in transfusions. [3 marks]

Blood carries many things around the body including
.....
.....

Exam focus
Some exam questions require you to apply your knowledge to a new situation.

10 Blood vessels and blood flow Grade 7

3. Give a reason for each of the following adaptations of blood vessels.

(a) Capillaries have very thin walls. [1 mark]

(b) Veins have valves on their inner walls. [1 mark]

4. The rate of blood flow through a blood vessel can be calculated using the formula:

$$\text{rate of blood flow} = \text{volume of blood (cm}^3\text{)} / \text{number of minutes}$$

Remember to check you are using the correct units.

In 180 seconds, the volume of blood which passed a specific point in an artery was measured as 1.2 dm³.

Calculate the rate of blood flow in cm³/min. [2 marks]

rate of blood flow =cm³/min



Copyrighted Material The heart and lungs

2 Quick quiz ? ✓

- True or false?
- The alveoli have a capillary network surrounding them. **True / False**
 - The right ventricle pumps blood to the lungs. **True / False**
 - The pulmonary vein carries oxygenated blood to the lungs. **True / False**
 - The heart pumps blood around the body in a single circulatory system. **True / False**

10 Structure of the heart Grade 5 ✓

1. (a) Label the parts of the heart marked on **Figure 1**. **[2 marks]**

Labelling of the heart is as viewed, so the left side of the heart is shown on the right of the diagram and vice versa.

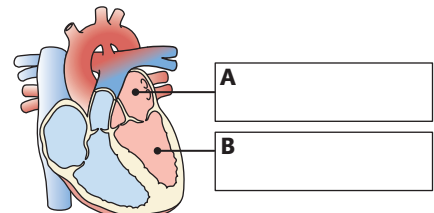


Figure 1

(b) Describe the passage of blood through the heart and body, starting at the right ventricle. **[4 marks]**

▶ The right ventricle pumps blood out of the heart into the

.....

Oxygenated blood is then carried in the to the

.....

'Pulmonary' means 'lungs', but remember that the 'pulmonary artery' carries deoxygenated blood from the heart to the lungs and the 'pulmonary vein' carries oxygenated blood from the lungs to the heart.

10 Lung adaptations Grade 5 ✓

2. (a) Explain **two** ways in which the lungs are adapted to absorb oxygen into the blood. **[4 marks]**

- 1
-
- 2
-

Think about factors that increase the rate of diffusion, as these will increase the rate of gas exchange.

(b) Describe the pathway of air as it enters and leaves our lungs during breathing. **[3 marks]**

.....

.....

5 Function of the pacemaker Grade 5 ✓

3. (a) Give the function of the natural pacemaker in the heart. **[1 mark]**
- (b) Explain the use of an artificial heart pacemaker. **[2 marks]**

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.....



The human nervous system



2 Quick quiz ? ? ✓

Number the steps into the correct order to describe the response of the nervous system to a change in our surroundings. One has been completed for you.

coordinator effector response receptor stimulus 1

5 The CNS Grade 4 ✓

- 1. (a) Name the **two** main parts of the CNS. 1 Brain 2 [1 mark]
- (b) Describe the role of the nervous system. [2 marks]

The nervous system detects
.....
.....

5 Reflex actions Grade 6 ✓

- 2. Blinking when something comes close to our eyes is an example of a reflex action. Explain the importance of reflex actions. [2 marks]

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.....

15 Features of the nervous system Grades 5–8 ✓

- 3. **Figure 1** shows a sensory neurone.
(a) Explain how the structure of a sensory neurone is related to its function. [3 marks]

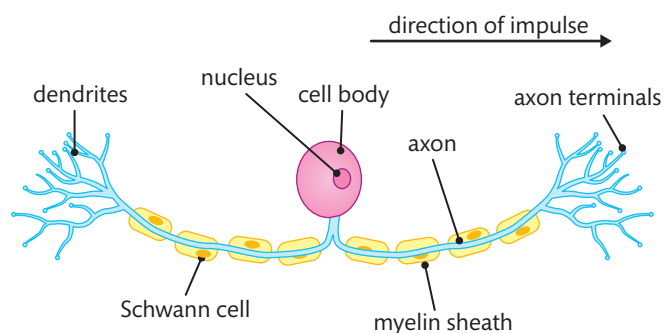


Figure 1

- (b) Give the function of relay neurones. [1 mark]
- (c) Motor neurone disease is a disease of motor neurones. Suggest, with a reason, **one** effect of this disease. [2 marks]

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.....

- 4. Describe how information is carried across a synapse. [2 marks]

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