

Year 10 B2 Human Organ Systems Fact sheet

Tissues, organs and organ systems

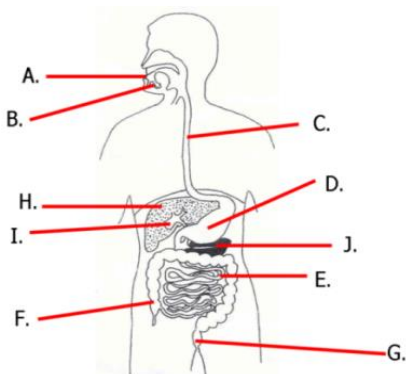
1. What do we call a group of similar cells which do the same function?	Tissue
2. What do we call a group of tissues working together?	Organ
3. Define organ system	A group of organs which work together
4. Put these into size order, starting with the smallest: organism, cell, tissue, organ system, organ	Cell, tissue, organ, organ system, organism

Food tests

5. How do you test for starch?	<ul style="list-style-type: none">• Add iodine solution• Black shows starch
6. How do you test for protein?	<ul style="list-style-type: none">• Add biuret solution• Purple shows protein
7. How do you test for sugar?	<ul style="list-style-type: none">• Add Benedict's solution• Heat it (80°C for 5 min)• Orange shows sugar
8. How do you test for fat?	<ul style="list-style-type: none">• Add ethanol and shake• Mix with water• Cloudy emulsion shows fat

Digestive system

9. Label the digestive system (10)

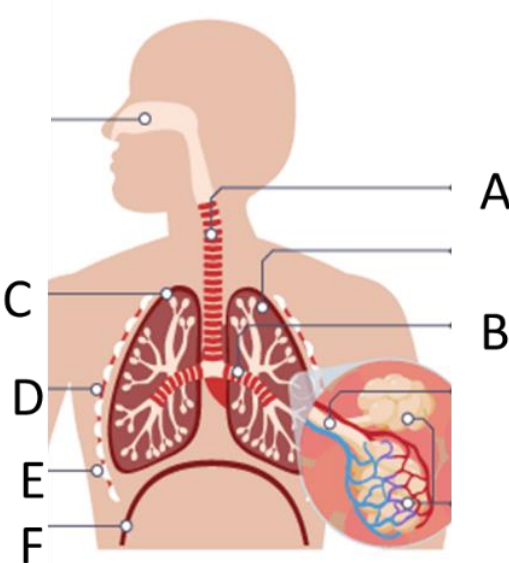


- A. Mouth**
- B. Salivary gland**
- C. Oesophagus**
- D. Stomach**
- E. Small intestine**
- F. Large intestine**
- G. Rectum**
- H. Liver**
- I. Gall bladder**
- J. Pancreas**

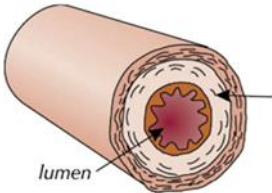
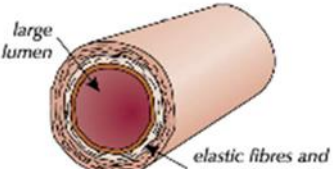
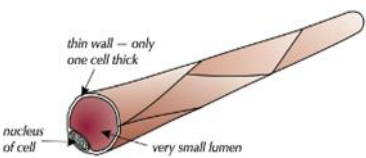
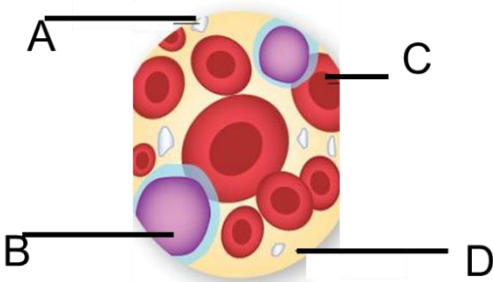
10. Describe the function of the salivary glands

Produces amylase and releases saliva

11. Describe the functions of the stomach	<ul style="list-style-type: none"> • Churns food • Produces acid & protease • Digests protein
12. Describe the function of the small intestine	<ul style="list-style-type: none"> • Produces enzymes (protease, lipase & amylase) • Digests food • Absorbs the soluble food into the bloodstream
13. State the function of the liver	Makes bile
14. State the function of the gall bladder	Stores bile
15. Describe the function of the pancreas	Makes enzymes Protease, lipase & amylase
Enzymes	
16. What are enzymes?	Biological catalysts (speed up reactions without being used up)
17. What are enzymes made of?	Protein
18. Name the place on an enzyme where a substrate molecule can bind	Active site
19. Explain why 1 enzyme will only speed up 1 reaction	<ul style="list-style-type: none"> • The active site is a specific shape • Only 1 molecule will fit into the active site
20. Explain how enzymes work according to the lock and key hypothesis	<ul style="list-style-type: none"> • Substrate is the key and enzyme's active site is the lock • Substrate fits into the active site • Because it is a complementary shape (perfect fit) • Only 1 substrate can fit into the active site
21. Why are enzymes needed in digestion?	<ul style="list-style-type: none"> • To break food down • Into soluble molecules • So it can be absorbed into the blood
22. Name the enzyme that digests carbohydrates/ starch	Carbohydrase/ amylase
23. Name the enzyme that digests protein	Protease
24. Name the enzyme that digests fat/ lipid	Lipase
25. What are carbohydrates digested into?	Sugar/ glucose
26. What are proteins digested into?	Amino acids
27. What are fats digested into	Fatty acids AND glycerol
28. What is it called when an enzyme changes shape so it doesn't work?	Denatured

<p>29. List 3 conditions which denature most enzymes</p>	<ul style="list-style-type: none"> • Too hot (too cold does NOT denature them, just slows them down) • Acid • Alkali
<p>30. What is unusual about the protease in the stomach?</p>	<p>It works in acid conditions</p>
<p>31. Where does bile go into?</p>	<p>Small intestine</p>
<p>32. Is bile acidic, alkali or neutral?</p>	<p>Alkali</p>
<p>33. Describe and explain 2 uses of bile</p>	<ul style="list-style-type: none"> • Neutralise acid from stomach • So enzymes can work • Emulsifies fat into small droplets • Which increases the surface area of the fat • Which increases rate of fat digestion by lipase
<p>Breathing system</p>	
<p>34. State 2 reasons why we breathe</p>	<ul style="list-style-type: none"> • Get oxygen • Remove carbon dioxide
<p>35. Label a diagram of the breathing system</p> 	<p>A: trachea</p> <p>B: bronchus</p> <p>C: alveoli</p> <p>D: intercostal muscle</p> <p>E: rib</p> <p>F: diaphragm</p>
<p>36. State the function of the trachea</p>	<p>Take air into and out of lungs</p>
<p>37. State the function of the bronchi</p>	<p>Take air into and out of bronchioles</p>
<p>38. Describe the function of the alveoli</p>	<ul style="list-style-type: none"> • Where gas exchange takes place • Oxygen goes into the blood and carbon dioxide comes out of the blood

<p>39. Explain how the lungs are adapted for efficient gas exchange (4)</p>	<ul style="list-style-type: none"> • Lots of alveoli give a large surface area • Blood is close to alveoli walls for a short diffusion distance • Breathing keeps a large difference in concentration • Moist
<p>Heart structure</p>	
<p>40. What makes up the circulatory system? (3)</p>	<ul style="list-style-type: none"> • Heart • Blood vessels • Blood
<p>41. What does the circulatory system do?</p>	<p>Transport molecules/ ions around body Defend against bacteria/ viruses</p>
<p>42. What does the heart do?</p>	<p>Pump blood</p>
<p>43. What is the heart wall mostly made of up?</p>	<p>Muscle tissue</p>
<p>44. Label the heart</p>	<p>1: right atrium</p> <p>2: right ventricle</p> <p>3: left ventricle</p> <p>4: left atrium</p> <p>5: vena cava 6: pulmonary artery 7: aorta 8: pulmonary vein</p>
<p>45. Which chamber pumps deoxygenated blood to the lungs?</p>	<p>The right ventricle</p>
<p>46. Which chamber pumps oxygenated blood to the rest of the body?</p>	<p>The left ventricle</p>
<p>47. Which blood vessel takes blood to the lungs?</p>	<p>Pulmonary artery</p>
<p>48. Which blood vessel takes blood to the rest of the body?</p>	<p>Aorta</p>
<p>49. Which blood vessel brings blood from the lungs to the heart?</p>	<p>Pulmonary vein</p>
<p>50. Which blood vessel brings blood from the rest of the body to the heart?</p>	<p>Vena cava</p>
<p>51. Which blood vessel supplies blood to the heart muscle?</p>	<p>Coronary artery</p>
<p>52. What do the pacemaker cells in the heart do?</p>	<p>Control the natural resting heart rate</p>

53. Where are the heart's pacemaker cells located?	Wall of the right atrium
54. What does an artificial pacemaker do?	Corrects irregularities in heart rate
Blood vessels	
55. Name this blood vessel 	Artery
56. Name this blood vessel 	Vein
57. Name this blood vessel 	Capillary
58. What do arteries do?	Carry blood away from the heart
59. How are arteries adapted to carry blood under high pressure? (3)	<ul style="list-style-type: none"> • Thick walls • containing muscle • and elastic fibres
60. What do veins do?	Carry blood back to the heart
61. How are veins adapted to carry blood under low pressure? (2)	<ul style="list-style-type: none"> • Thin walls • Wide lumen • valves
62. What do capillaries do?	Allow exchange of substances between the blood and cells.
63. How are capillaries adapted to allow exchange of substances?	<ul style="list-style-type: none"> • Narrow • <u>Very</u> thin walls • Permeable walls (very small holes in the walls)
Blood	
64. Label the diagram 	<p>A. Platelet B. White blood cell C. Red blood cell D. Plasma</p>

65.Name the liquid part of blood	Plasma
66.What do red blood cells do?	Transport oxygen
67. How are red blood cells adapted to their function?	<ul style="list-style-type: none"> • No nucleus • Packed with haemoglobin
68.What do white blood cells do?	Help to defend the body against pathogens <i>(see topic B3 for more detail)</i>
69.What do platelets do?	Clot blood/ make scabs
70.What does the plasma do? (2)	<ul style="list-style-type: none"> • Transports substances • e.g. carbon dioxide/ soluble food
71.What are platelets?	Fragments/ bits of cells
72.Name two risks of using blood products to treat patients	<ul style="list-style-type: none"> • Possibility of infection • Possibility of rejection
Heart disease	
73.Where does fatty material build up?	Inside walls of coronary arteries
74.What does the fatty material do to the coronary arteries?	Narrows the lumen
75.Explain why fatty material in the coronary arteries can cause a heart attack (2)	<ul style="list-style-type: none"> • Reduced blood flow through the capillaries • So less oxygen gets to the heart muscle
76.What can be used to keep the coronary arteries open?	Stents
77.Name a drug which is used to reduce blood cholesterol levels	Statins
78.How does a reduction in cholesterol levels reduce the risk of a heart attack?	Slows down the rate of fatter material deposit
79.When might a heart transplant be done?	If the heart fails
80.When might an artificial heart be used? (2)	<ul style="list-style-type: none"> • Keep a person alive while they wait for a heart transplant • To let the heart rest to help it recover
81.Describe 2 problems that can occur if a heart valve becomes faulty	<ul style="list-style-type: none"> • Valve doesn't open properly • Blood leaks through the valve
82.Name 2 types of replacement heart valve	<ul style="list-style-type: none"> • Biological • Mechanical
Respiration	
83.Why is respiration important?	Releases energy
84.Write the word equation for aerobic respiration.	Glucose + Oxygen → Carbon dioxide + Water

85. Why is respiration an exothermic reaction?	Releases heat
86. List 3 reasons organisms need energy (3)	<ul style="list-style-type: none"> • Make larger molecules • Animals - Muscle contractions • Birds and mammals – keep warm
87. Write the word equation for anaerobic respiration in animals (2)	Glucose → Lactic acid
88. When does anaerobic respiration happen?	When not enough oxygen
89. List 3 ways anaerobic respiration in animals is different to aerobic respiration	<ul style="list-style-type: none"> • Anaerobic doesn't use oxygen • Anaerobic makes lactic acid and aerobic makes carbon dioxide and water • Anaerobic releases less energy
90. Why does anaerobic respiration release less energy?	Glucose isn't completely broken down in anaerobic respiration
91. Write the word equation for anaerobic respiration in plants and yeast (3)	Glucose → ethanol + carbon dioxide
92. What is another name for anaerobic respiration in yeast??	Fermentation
93. State a commercial use of fermentation	Making alcoholic drinks
Exercise	
94. What happens to heart rate when you exercise? Why?	<ul style="list-style-type: none"> • Increases • Blood flows faster • Oxygen and glucose to muscles faster • Faster aerobic respiration in muscles
95. What happens to breathing rate when you exercise? Why?	<ul style="list-style-type: none"> • Increases • More oxygen into body and to muscles • Faster aerobic respiration in muscles
96. What happens to breathing depth when you exercise? Why?	<ul style="list-style-type: none"> • Increases • More oxygen into body and to muscles • Faster aerobic respiration in muscles
97. What is the problem with lactic acid	Mild poison, causes fatigue
98. When is an oxygen debt created?	When lactic acid is produced

Metabolism	
99. Define metabolism	All the reactions that happen in a cell/ body
100. List 6 examples of metabolic reactions	<ul style="list-style-type: none"> • Respiration • Making proteins from amino acids • breaking down protein to make urea • Making starch, glycogen and cellulose from glucose • the use of glucose and nitrate ions to form amino acids • Making lipid molecules from 1 glycerol molecule and three fatty acid molecules
101. <i>HT: What happens to the lactic acid from anaerobic respiration? (3)</i>	<ul style="list-style-type: none"> • <i>Removed from the muscles by the blood</i> • <i>It is broken down by the liver with oxygen (oxidised)</i> • <i>Into carbon dioxide and water</i>
102. <i>HT: Define oxygen debt</i>	<i>The amount of oxygen the liver needs in order to break down the lactic acid after exercise.</i>