

MARROU PUBLICATIONS

C. BOWDEN AND S. GILBERT

Booklet

Review

2A & 2B

HBS

HUMAN BIOLOGICAL SCIENCE SERIES

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Science Dept

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Answers	

- At the end of this unit students should be able to:
1. Define the term science.
 2. Make observations using a range of senses.
 3. Use scientific equipment to make more accurate observations.
 4. Make inferences based on observations.
 5. Explain the purpose of scientific method.
 6. Write a hypothesis based on observations.
 7. Define and identify independent, dependent and control variables.
 8. Define and explain the purpose of experimental and control setups.
 9. Conduct a simple experiment controlling a number of variables.
 10. Identify the sample size in an experiment and explain the need for having a large sample size.
 11. Explain the purpose and method of random selection for experimental groups.
 12. Explain the meaning and influence of experimental bias.
 13. Conduct a blind test.
 14. Explain why it is important to repeat experiments a number of times.
 15. Discuss and identify biological variation and experimental error.
 16. Identify the role of a placebo in the psychosomatic effect.
 17. Record data accurately in an appropriate table.
 18. Distinguish between continuous and discontinuous data.
 19. Construct an appropriate graph for representing data.
 20. Calculate the mean for a group of data.
 21. Calculate percentage changes in data.
 22. Write an appropriate conclusion for an experiment.
 23. Design and conduct an extended investigation with a detailed method.
 24. Identify weaknesses in experimental design and offer improvements.
 25. Use scientific equipment appropriately.
 26. Carry out experiments in a safe manner.
 27. Work cooperatively with others.
 28. Respect the opinions of others and carry out meaningful discussions.

The Practice of Human Biology Objectives

6. Complete the following statement (on scientific method) using the words below.
 (Experiment, observations, inferences, scientific method and hypothesis)
 When investigating a question or problem, the scientist uses the (1) _____

of phenomena thought to be relevant to the problem; collection, classification and comparison of these observations (i.e. interpretations or (3) _____); selecting one aspect of the problem to be tested; designing a controlled experiment (4) _____ to be tested to test the hypothesis.

7. Define the term Hypothesis.

When investigating a question or problem, the scientist uses the (1) _____ of phenomena thought to be relevant to the problem; collection, classification and comparison of these observations (i.e. interpretations or (3) _____); selecting one aspect of the problem to be tested; designing a controlled experiment (4) _____ to be tested to test the hypothesis.

c) After being out in the sun for one hour a student notices that their skin has become darker.

a) Independent variable.

9. Define the following variables.

b) Dependent variable.

c) Controlled variable.

14. What is a placebo and how are they used to control the psychosomatic effect?

Human Biological Sciences
2A&B Revision Booklet

15. Data consists of measurements that are made during an investigation that are used to make determinations on the effect of the independent variable under consideration.

a) What is the difference between first and second hand data?

16. Explain the difference between continuous and discontinuous data.

b) When and how should first hand data be recorded?

17. Why is experimental data normally represented as a graph?

18. List five important characteristics of a line graph.

19. The following table represents second hand continuous data of the mass of a male human from birth to 26 years. Represent this data in a line graph on the following page.

Age(years)	Birth	2	4	6	8	10	12	14	16	18	20	22	24	26	Weight(kg)
	3.5	12	16	22	27	32	38	46	58	63	67	70	72	73	

Weight from birth to 26 years

d) Give two variables that they would have controlled about the subjects (cows).

c) What was the dependent variable?

b) What was the independent variable?

a) Write the hypothesis they were testing.

was 4.2L/cow/day.

month trial the average milk production of group A was 5.1 L/cow/day and for group B the milk production of group B but did not give them LACTPLUS. At the end of the day for a month and measured their milk production. At the same time they measured cattle and split them into two groups. To group A they administered LACTPLUS each make dairy cattle produce over 20% more milk. To test their idea they selected 50 dairy 22. A chemical company discovered a synthetic hormone, LACTPLUS, which appeared to

investigation?

21. What types of information and statements should be included in the conclusion of an

mass was 65kg?

mass (over the three month period) if her starting mass was 69kg and her finishing c) Laura went on a diet over three months, what was her total percentage decrease in

was 170cm and his finishing height was 180cm?

b) What was Craig's percentage increase in height over one year if his starting height

a) What is the formula for percentage change?

20. Often to compare data sets percentage change is used as a measure of comparison.

g) What was the sample size?

f) What was the experimental control?

e) Give two variables other than about the rats that would also need to be controlled.

d) Give two variables that they would have controlled about the rats.

c) What was the dependent variable?

b) What was the independent variable?

a) Write the hypothesis they were testing

Groups	Initial ave mass (g)	Final ave mass (g)	Percentage change
A	350.4	310.1	
B	352.6	345.5	

Average mass of Rats over a ten day period

Their initial and final average masses are recorded in the table below over the ten day period.

As it was not possible to conduct the test on students they chose the next best thing into two groups. Group A where given one treatment of DISSOLVOFAT with their food RATS! The experiment was conducted as follows. Fifty rats were randomly selected every morning. Group B was given a placebo.

The students were a little skeptical so they went to the school principal (Mr. Svennson) who directed them to the science department. Mr. Coults in the science department claimed to be a weight loss guru and suggested students conduct a controlled experiment.

23. The school ball was coming up and some of the students decided they had to lose weight fast. A drug company was advertising a new drug, DISSOLVOFAT, which claimed if used as directed would drop 10% of your body mass in 10 days.

1. A positive statement that explains an observation:
2. First hand data collected using the body senses:
3. The practical application of scientific knowledge:
4. The variable being tested in an experiment:
5. Two ways that biological variation and experimental errors may be allowed for in experiments:
6. The main function of the control group:
7. Random selection is used to control this:
8. A possible explanation of an observation:
9. The variable that is measured in a controlled experiment to determine the effect of the independent variable:
10. The effect due to expectation:
11. A hypothesis may be proven by experimentation (T or F):
12. A major hypothesis that withstands the 'test of time':
13. A controlled experiment is designed to _____ a hypothesis:
14. Differences between individuals:
15. When asked to predict beyond the know data on a graph:
16. An inactive substance given to the control group:
17. Data where there is a relationship between the points:
18. Graph used to represent continuous data:
19. All variables that are kept constant in an experiment:
20. When asked to predict between two known values on a graph:

The Practice of Human Biology Terminology

c) What is the difference between a Chromatid and a Chromosome?

b) What is the purpose of mitosis?

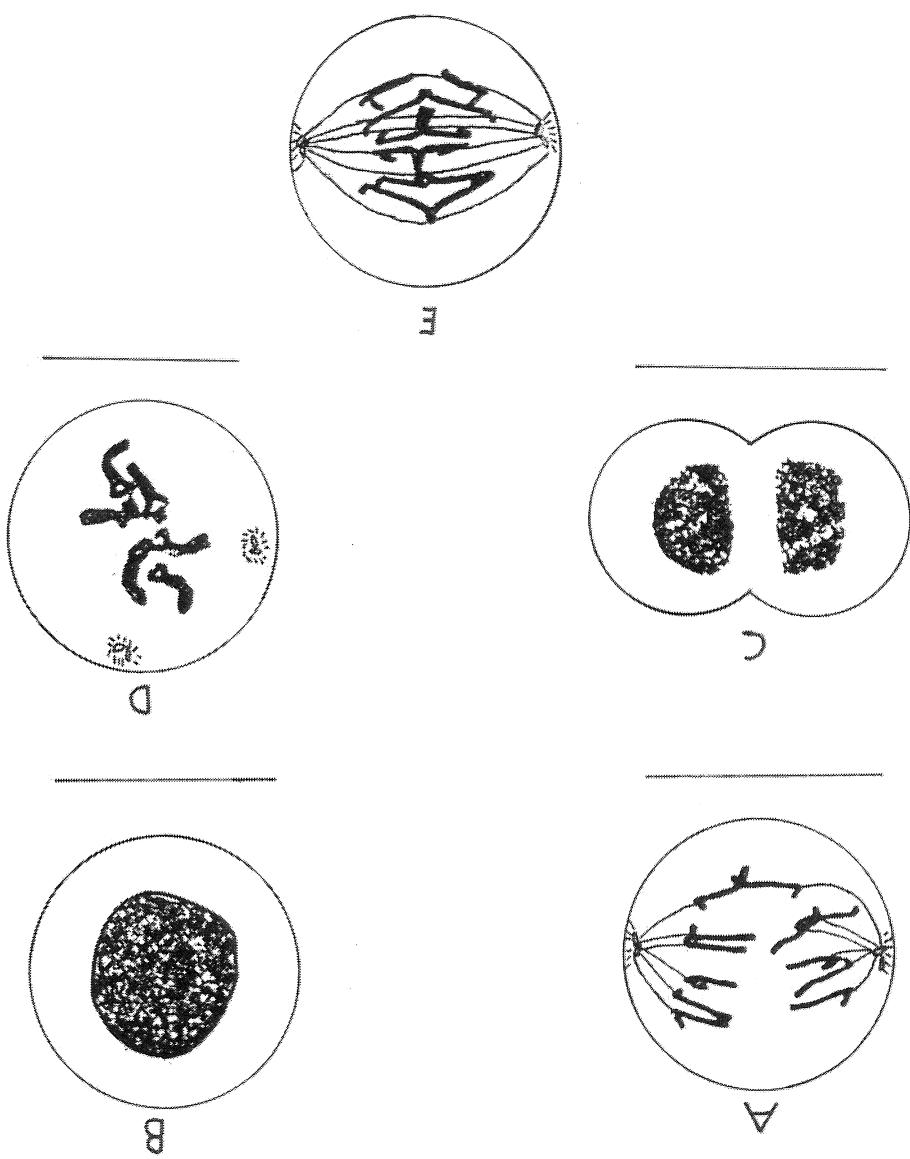
a) Define Mitosis.

5. Mitosis is an essential process in the development of all organisms.

Organelle	Function of Organelle
Nucleus	
Mitochondria	
Cell Membrane	
Organelles	
Nucleus	
Lysosomes	
Ribosomes	
Endoplasmic Reticulum	
Cytoplasm	
Centrioles	
Golgi Body / Apparatus	
Nucleolus	

4. An organelle is a structure within the cell which is specialised for a particular function. Complete the following table for the functions of the following organelles.

6. Explain what would happen to the number of chromosomes in body cells if there was no duplication of chromosomes before the cell underwent telophase.



- h) Label each of the following cells with its appropriate stage of mitosis.

c) Anaerobic respiration —

b) Aerobic respiration —

a) Cellular respiration —

3. Define the following terms:

c) Anabolism —

b) Catabolism —

a) Synthesis —

2. Explain using examples the following terms:

b)

a)

1. What are the two main requirements for the synthesis of cellular components?

Metabolism Questions

16. Describe what is meant by the term 'optimal' conditions.
15. Describe how enzymes become denatured.
14. Describe the factors that can effect enzyme action.
13. Draw diagrams to explain the lock and key model of enzyme action.
12. List four properties of enzymes.
11. Explain the need for enzymes in living organisms.
10. Define the following terms; catalyst and enzymes.
9. Describe the structure of carbohydrates, proteins and lipids.
8. Describe the nutrients required and their uses in metabolism.
7. Describe the ATP cycle.
6. Make comparisons between anaerobic and aerobic respiration.
5. Explain where in the cell the following occur; aerobic respiration and anaerobic respiration.
4. Write word equations for aerobic respiration and anaerobic respiration.
3. Explain the following processes; cellular respiration, aerobic respiration and anaerobic respiration.
2. Explain the following terms; synthesis, catabolism and anabolism.
1. State the two main requirements, for the synthesis of cellular components.

At the end of this section students should be able to:

Metabolism Objectives

(iv)

(iii)

(ii)

(i)

c) List four properties of enzymes:

b) Explain the need for enzymes in living organisms.

(ii) Enzyme -

(i) Catalyst -

a) Define the following terms:

g. Chemical reactions are vital for cells to maintain their function

(c) Lipids -

(b) Proteins -

(a) Carbohydrates -

8. Describe the structure of the following.

Nutrient	Use of nutrient in metabolism
Carbohydrate	
Protein	
Lipid	
Vitamins	
Minerals	
Water	

7. A nutrient is a substance that is required for metabolism. There are six groups of nutrients; carbohydrates, proteins, lipids, vitamins, minerals and water. Complete the following table for the uses of nutrients in metabolism.

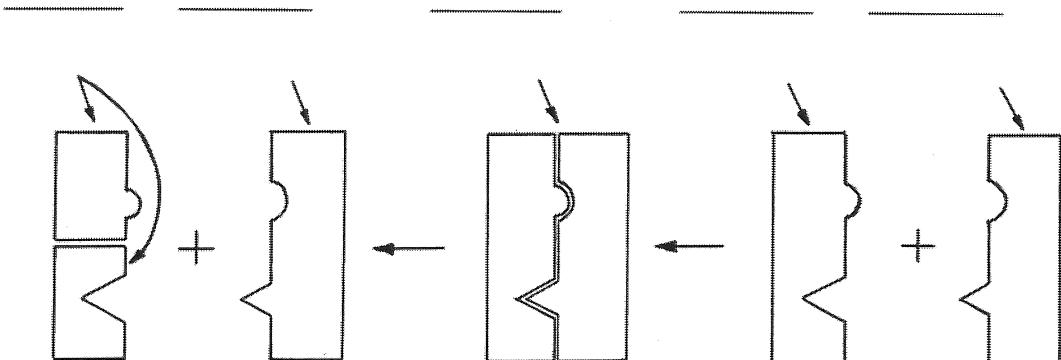
h) What properties of enzymes are accounted for in the diagram in (c)?

g) If another chemical e.g. a poison happened to fit an active site, what would happen to the reaction?

f) What term describes the specific shapes/places where the enzyme molecule and substrate 'fit' together?

e) Could the reaction in (c) above use the same enzyme in the opposite direction (ie synthesis)? Explain.

d) The diagram above shows what type of reaction?



c) Label the diagram below.

b) How are enzymes thought to work?

a) How are enzymes named?

13. The action of enzymes is essential for chemical reactions to proceed within cells.

1. The formation of new products from existing reactants:
2. The breaking down of large reactants into smaller products:
3. The formation of large products from small reactants:
4. Respiration requiring oxygen:
5. Respiration that results in the formation of lactic acid:
6. The location in a cell where the final stages of aerobic respiration takes place:
7. The acronym ATP stands for:
8. The name for the part of an enzyme that attaches to the substrate:
9. A substance required for metabolism:
10. Type of nutrient used for growth and repair:
11. Inorganic nutrient:
12. Type of nutrient that contains relatively small amounts of oxygen:
13. All enzymes are made of:
14. Enzymes are termed as biological or organic:
15. The name for the conditions where an enzyme works at its best rate:
16. This will happen to enzymes if they are placed in conditions outside of their range:
17. Enzymes work by reducing the _____ of _____ the chemical reactions:
18. Vitamins act as _____ in enzyme controlled reactions:

Metabolism Terminology

(vi) Phagocytosis —

(v) Pinocytosis —

(iv) Active transport —

(iii) Osmosis —

(ii) Facilitated diffusion —

(i) Diffusion —

d) Define the following terms:

(iv) Phagocytosis —

(iii) Active transport —

(ii) Pinocytosis —

b) Explain the difference between Endocytosis and Exocytosis.

a) Explain the difference between active and passive transport.

a cell to function.

2. The movement of materials in both directions across the cell membrane is necessary for

(iii) At equilibrium, would diffusion cease? Explain.

(ii) After some time, what would you notice about the concentration of the sugar solutions in sides A and B?

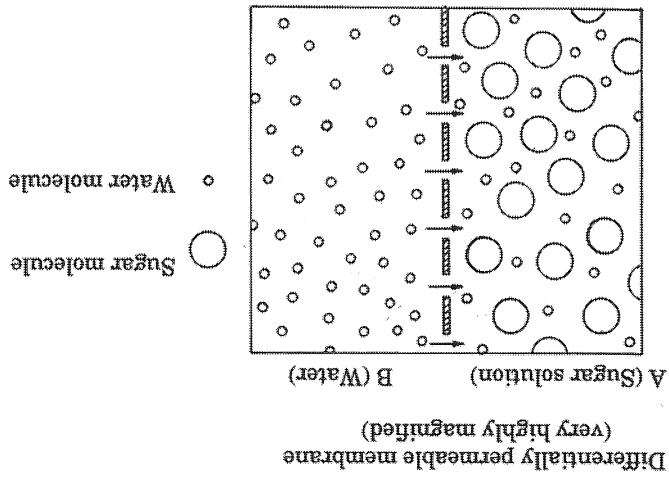
(i) Which molecule would diffuse faster? Explain.
 e) If the membrane was permeable to both sugar and water:

d) What will happen to the osmotic pressure in side A?

c) In which direction will there be a net diffusion of water? Explain.

b) In which direction will water diffuse?

a) In which direction will the sugar diffuse? Explain.



3. The diagram below shows a membrane separating a sugar solution from distilled water.

- At the end of this unit students should be able to:
1. Describe the main functions of the circulatory system.
 2. Describe the three main components of the circulatory system.
 3. Describe why multi-cellular organisms require a circulatory system.
 4. Label a diagram of the heart.
 5. Describe the functions of the various parts of the heart.
 6. Explain the cardiac cycle.
 7. Describe cardiac output.
 8. Explain the difference between systemic and pulmonary circulation.
 9. Describe the structure and function of arteries, veins and capillaries.
 10. Compare the structure and function of arteries and veins.
 11. List the four major components of blood.
 12. Describe a number of important functions of blood.
 13. Describe the process of blood clotting.
 14. Describe the inflammation response.
 15. Complete a table on the origin, function, lifespan and fate of the different blood cells.
 16. Describe the different types of white blood cells.
 17. Describe the role of plasma in the blood.
 18. Explain how oxygen and carbon dioxide are transported in the blood.
 19. Describe how blood flow is regulated.

Circulatory System Objectives

7. Use arrows to show the direction of blood flow through the heart in question 5 and shade the heart red where there is oxygenated blood and blue where there is deoxygenated blood.

(a) _____

(b) _____

(c) _____

(d) _____

(e) _____

(f) _____

(g) _____

(h) _____

(i) _____

(j) _____

(k) _____

(l) _____

(m) _____

(n) _____

(o) _____

(p) _____

(q) _____

(r) _____

(s) _____

(t) _____

(u) _____

(v) _____

(w) _____

(x) _____

(y) _____

(z) _____

6. For each of the parts labelled in questions 5 write its name and briefly describe its function;

c) Capillaries -

b) Veins -

a) Arteries -

17. Describe the function of the following blood vessels;

Capillaries				
Veins				
Arteries				
Blood vessel	Relative thickness of wall	Valves present/absent	Muscle present	Size of lumen

capillaries.

16. Complete the following table comparing the structure of arteries, veins and

15. What are the advantages of the double circulation systems of humans have over a single circulation system?

14. What side of the heart is involved with pulmonary circulation?

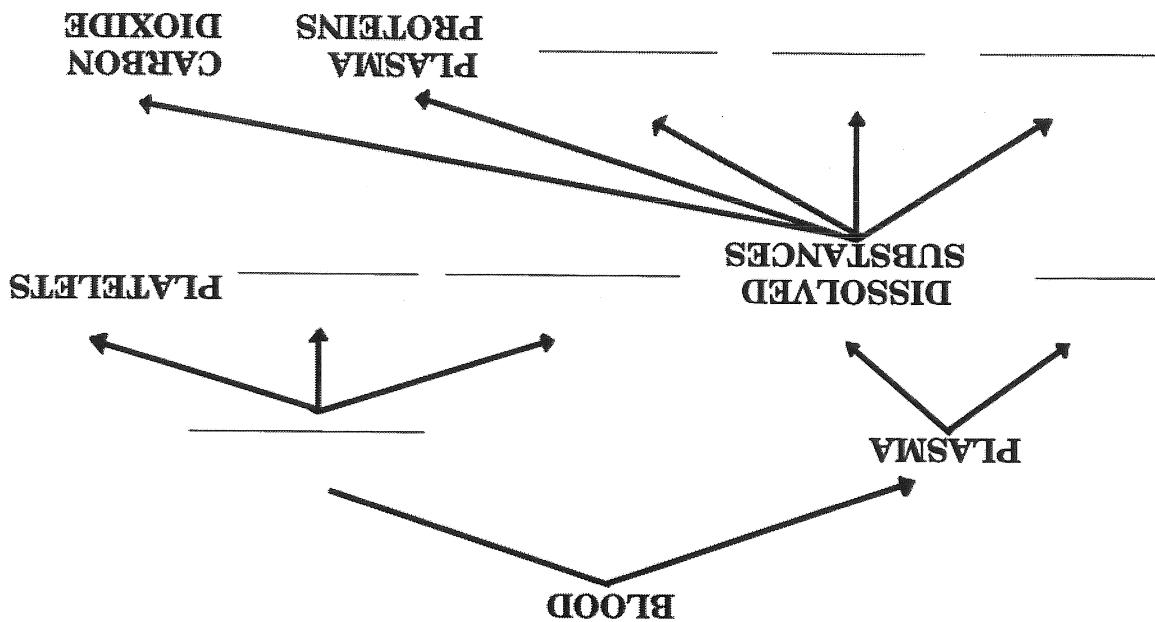
13. What side of the heart is involved with systemic circulation?

c) Portal -

b) Pulmonary -

a) Systemic -

12. Briefly describe the function of each of these circulatory systems;



28. Complete the diagram below on the composition of blood using the following words.
 (Nutrients, erythrocytes, blood cells, water, leucocytes, hormones, wastes)

(a) _____
 (b) _____
 (c) _____
 (d) _____
 (e) _____

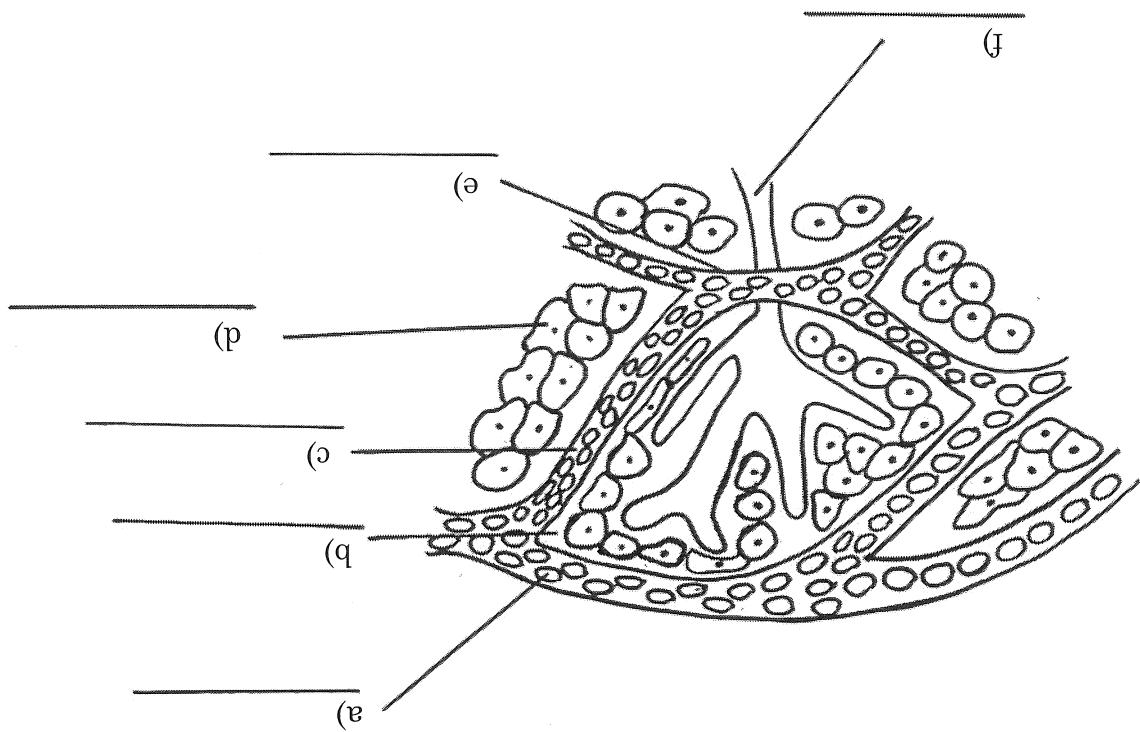
27. List five substances that are transported in the plasma.

(a) _____
 (b) _____
 (c) _____
 (d) _____
 (e) _____
 (f) _____
 (g) _____

26. Briefly describe seven main functions of blood.

(a) (Non-cellular) _____
 (b) (Cellular) _____
 (c) (Cellular) _____
 (d) (Cellular) _____

25. List the four major components of blood.



37. Label the following diagram of the relationships between various body fluids.

- (a) _____
 (b) _____
 (c) _____
 (d) _____
 (e) _____

36. List the five substances that are exchanged between capillaries, tissue fluid and cytoplasm.

- (a) Plasma — _____
 (b) Tissue (intercellular) fluid — _____
 (c) Cytoplasm (intracellular fluid) — _____
 (d) Lymph — _____
 (e) Diffusion — _____

35. Define the following terms.

1. The colour typically used on diagrams to represent oxygenated blood:
2. The upper chambers of the heart:
3. The lower chambers of the heart:
4. The vessels that carry blood from the heart to the lungs:
5. The type of blood in pulmonary veins:
6. The type of valves that prevent backflow of blood from the ventricles to the atria:
7. The type of valves that prevent backflow of blood from the arteries to the ventricles:
8. The type of circulation that transports blood to and from the lungs:
9. The ventricle with the thickest walls:
10. The side of the heart involved in systemic circulation:
11. The arteries that carry blood to the intestines:
12. The arteries that carry blood to the head:
13. The arteries that carry blood to the heart muscle:
14. The type of blood vessel with the thickest walls:
15. The type of blood vessel with the largest lumen:
16. They type of muscle within the walls of arterioles:
17. The name for the small veins that join to capillaries:
18. The liquid component of blood:
19. The scientific name for red blood cells:
20. The scientific name for white blood cells:
21. The scientific name for platelets:
22. The shape of red blood cells is described as:
23. Erythrocytes cells are formed in the:
24. The organ responsible for removing old and dead blood cells from the blood:
25. The term for when the heart is relaxing:
26. The instrument used to measure blood pressure:
27. The term for pressure in the arteries during ventricular systole (contraction):

Circulatory System terminology

- At the end of this section students should be able to:
- Explain the need for a gas exchange system in multi-cellular organisms.
 - Label a diagram of the respiratory system.
 - Describe the structure and function of the parts of the respiratory system.
 - Define the following terms; breathing, inspiration, expiration and cellular respiration.
 - Describe the direction of air flow from the nose/mouth to the alveoli.
 - Describe the mechanics of inspiration and expiration.
 - Describe the following term; diffusion, diffusion gradient and gas exchange.
 - Describe what a respiratory surface is and list four properties of a respiratory surface which aid diffusion.
 - Explain the process and mechanisms involved in the diffusion of gases between air in the alveoli and the blood.
 - Outline the differences in composition between inhaled and exhaled air.
 - Explain how the following mechanisms are involved in keeping the lungs clean; coughing, mucous secretion and cilia.
 - Explain the cause, symptoms and treatment of the following; asthma, emphysema, lung cancer, bronchitis, carbon monoxide poisoning and pneumonia.

Respiratory System Objectives

d) Cellular respiration – _____

c) Expiration – _____

b) Inspiration – _____

a) Breathing – _____

5. Define the following terms;

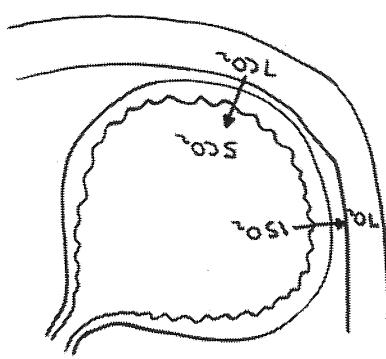
Lung	_____
Larynx	_____
Pharynx	_____
Epiglottis	_____
Nasal cavity	_____
Diaphragm	_____
Pleural membranes	_____
Pleural cavity	_____
Bronchial tube	_____
Bronchiole	_____
Alveoli	_____
Cavity	_____
Left bronchus	_____
Rib	_____
Intercostal muscle	_____
Trachea	_____
Cartilage	_____
Tracheal cartilage	_____
Structures	Structure/function

4. Explain the structure and function of the following.

Component	Inhaled Air	Exhaled Air	Water Vapour (%)
Oxygen (%)			Carbon Dioxide (%)

14. Complete the following table contrasting the composition of inhaled air and exhaled air.

13. Name and describe four mechanisms that maintain the diffusion gradient in the lungs.



12. Using the diagram below showing the concentration of oxygen and carbon dioxide in the alveolar capillaries and air, explain why carbon dioxide moves from the blood in the alveolar capillaries into the alveolar capillaries.

1. System involved in the exchange of gases:
2. The movement of air into and out of the lungs:
3. Filters, warms and moistens the air:
4. Fine hair-like projections that filter the air:
5. Smell receptors:
6. Produced by mucus membrane and help to trap dust particles:
7. Common pathway for air and food:
8. Organ of speech:
9. Two folds of mucus membrane that vibrate to produce sound:
10. Can be increased by increasing the force air over the vocal chords:
11. Changing the tension of the vocal chords changes this:
12. Stops food going down the trachea:
13. Largest tube in system contains rings of cartilage:
14. There are two of these one to each lung:
15. Tubes that have non cartilage but smooth muscle:
16. Breathing in :
17. Breathing out:
18. Double membrane which helps to reduce friction:
19. Muscles used to raise ribs:
20. Dome-shaped muscle that separates thoracic and abdominal cavities:
21. Small 'air sacs' where gas exchange takes place:
22. Made of bone and help to protect the lungs:
23. Gas which controls breathing rate:
24. Oxygen and haemoglobin combine to produce this:
25. Most carbon dioxide is carried in the plasma as this:
26. Combination of carbon dioxide and haemoglobin:
27. Oxyhaemoglobin is this colour:
28. Type of cancer for which smoking is a major cause:
29. Disease where the alveoli loose their elasticity:

Respiratory System Terminology

- At the end of this section students should be able to:
1. Define the following terms ingestion, digestion and defecation (egestion).
 2. Distinguish between mechanical and chemical digestion.
 3. Label a diagram of and describe the uses for the four types of teeth.
 4. Describe how swallowing takes place.
 5. Describe what is peristalsis and where does it take place in the body.
 6. Describe the substrates acted on and the products produced for the following enzymes; amylase, lipase and protease.
 7. Complete a table for the main enzymes involved in chemical digestion in the body.
 8. Describe a number of tests for starches, proteins, glucose and lipids.
 9. Describe the role of bile and HCl in digestion.
 10. Label a diagram of the human digestive system.
 11. State the functions of the following parts of the human digestive system; mouth,
 12. Label a cross section of the alimentary canal.
 13. Describe the features of the small intestine (ileum) that make it suitable for the absorption of digested nutrients.
 14. Describe how the surface area of the ileum is increased.
 15. Explain how absorption of nutrients takes place out of the ileum into the bloodstream.
 16. Explain the concept of a balanced diet.
 17. Explain the problems associated with the following diets; high salt, low fibre, high sugar, high saturated fats and excess kilojoules.
 18. Explain the causes symptoms and treatments of the digestive disorders; ulcers, indigestion, constipation and bowel cancer.

Digestive System Objectives

Enzyme	Source	Site of action	Substrate	Products
Maltase				
Sucrase				
Lactase				
Lipase				
Gastric protease				
Pancreatic protease				
Peptidase				

6. Discuss with your teacher which parts of the following table are required knowledge.

5. Outline the process of chemical digestion including the general parts of the digestive system involved.

Tooth type	Total number	Description	Function
Incisors			
Carnivores			
Primates			
Premolars			
Molars			

4. Complete the following table.

(d) Gastric HCl -

(e) Trypsinogen -

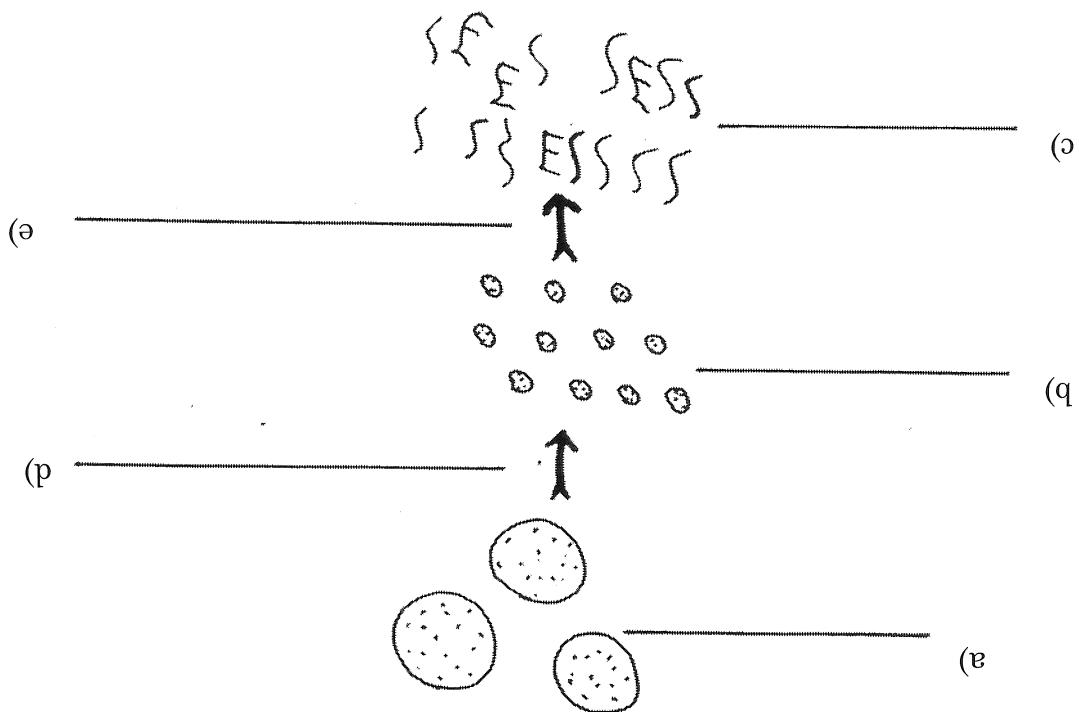
(f) Pepsinogen -

(g) Bile -

11. Describe the role of each of the following in chemical digestion.

Substance	Test	Colour change for positive result	Starch	Benedict's	Protein	Brown paper

10. Complete the following table outlining tests that can be used to test for the presence of specific substances in foods.



9. Label the following diagram of chemical digestion lipids.

(s)

(x)

(b)

(d)

(o)

(u)

(m)

(l)

(k)

(j)

(i)

(h)

(g)

(f)

(e)

(d)

(c)

(b)

(a)

outline its function(s).

14. For each of the following parts labelled on the diagram on the previous page briefly

19. Define the following terms and describe their role in the digestive system.

a) Secretion –

b) Absorption –

c) Peristalsis –

d) Defecation –

20. Explain one problem associated with each of the following diets.

a) High salt –

b) Low fibre –

c) High sugar –

d) High saturated fat –

e) Excess kilojoules –

8. Organ that contains gastric juice:
9. Teeth used for cutting or biting:
10. Used for crushing and grinding food:
11. Produces bile:
12. Stores bile:
13. First part of the small intestine mainly involved in chemical digestion:
14. The taking in of food and water:
15. Back of the mouth cavity:
16. Carries food from the mouth to the stomach:
17. Circular muscle that controls the flow of material from the stomach to the duodenum:
18. Final part of the large intestine where faeces is stored:
19. Enzyme in the stomach helps to break down proteins to polypeptides:
20. Organic catalyst which speeds up chemical reactions without itself being consumed:
21. Lining of the stomach:
22. Helps to break-up fat into smaller particles:
23. Finger-like projections that extend out of the mucosa in the small intestine:
24. Movement of materials against the concentration gradient and requires metabolic energy:
25. Enzyme involved in the breakdown of lipids:
26. Intestine which has the biggest diameter:
27. The removal of faeces out of the rectum:
28. Can be caused by a lack of roughage:
29. Frequent defaecation of watery faeces:
30. Common form of cancer:
31. Has no specific function:
32. Produces pancreatic juice containing enzymes:
33. Opening surrounded by the anal sphincter:
34. Molars tend to break these down:
35. Mainly removed in the large intestine:

"There is a constant exchange of (1) _____ between the plasma, intercellular fluid and intracellular (2) _____. A general rule for small molecules is the (3) _____ of substances in the plasma directly affects concentrations in the intercellular fluid and in turn the (4) _____, e.g. nutrients diffuse from the plasma through the intercellular fluid to the cytoplasm. The opposite occurs for small molecules moving from the cytoplasm to the plasma e.g. (5) _____. Larger molecules like (6) _____ are limited in their movement due to the (7) _____ of the walls of the blood vessels and the cell (8) _____."

3. The concentration of substances in the cytoplasm, intercellular fluid and plasma differs according to the activities taking place. Use the words below to complete the following passage.

(Carbon Dioxide, Fluids, Permeability, Concentration, Materials, Proteins, Cytoplasm, Membrane)

- a) pH - _____
- b) Nutrients - _____
- c) Wastes - _____

2. Why is it important to maintain constant levels of pH, nutrients and wastes to maintain efficient function of cells?

- a) Internal environment - _____
- b) Intracellular fluid (cytoplasm) - _____
- c) Extracellular fluid - _____
- d) Plasma - _____
- e) Regulation - _____

1. Define the following terms.

Questions

Excretory System & Assisted Protection of the Body

(e) Bladder — _____

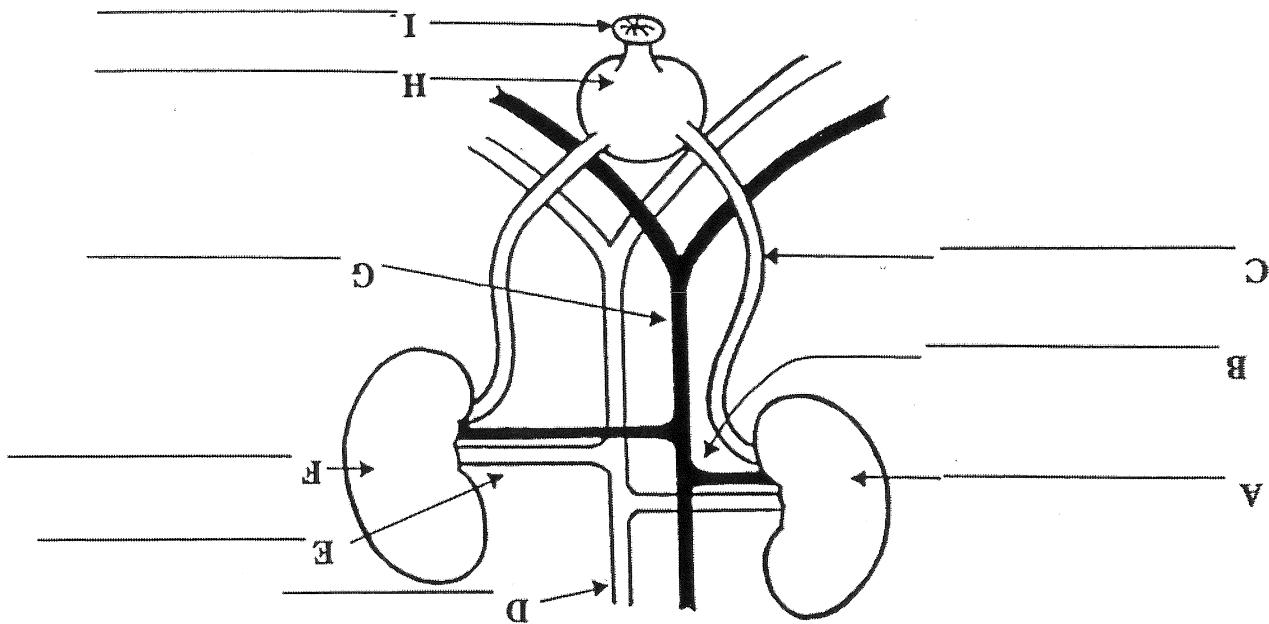
(d) Urethra — _____

(c) Uretter — _____

(b) Renal vein — _____

(a) Renal artery — _____

10. Give the functions of the parts of the Urinary System?



9. Label the following diagram of the Urinary System.

(d) _____

(c) _____

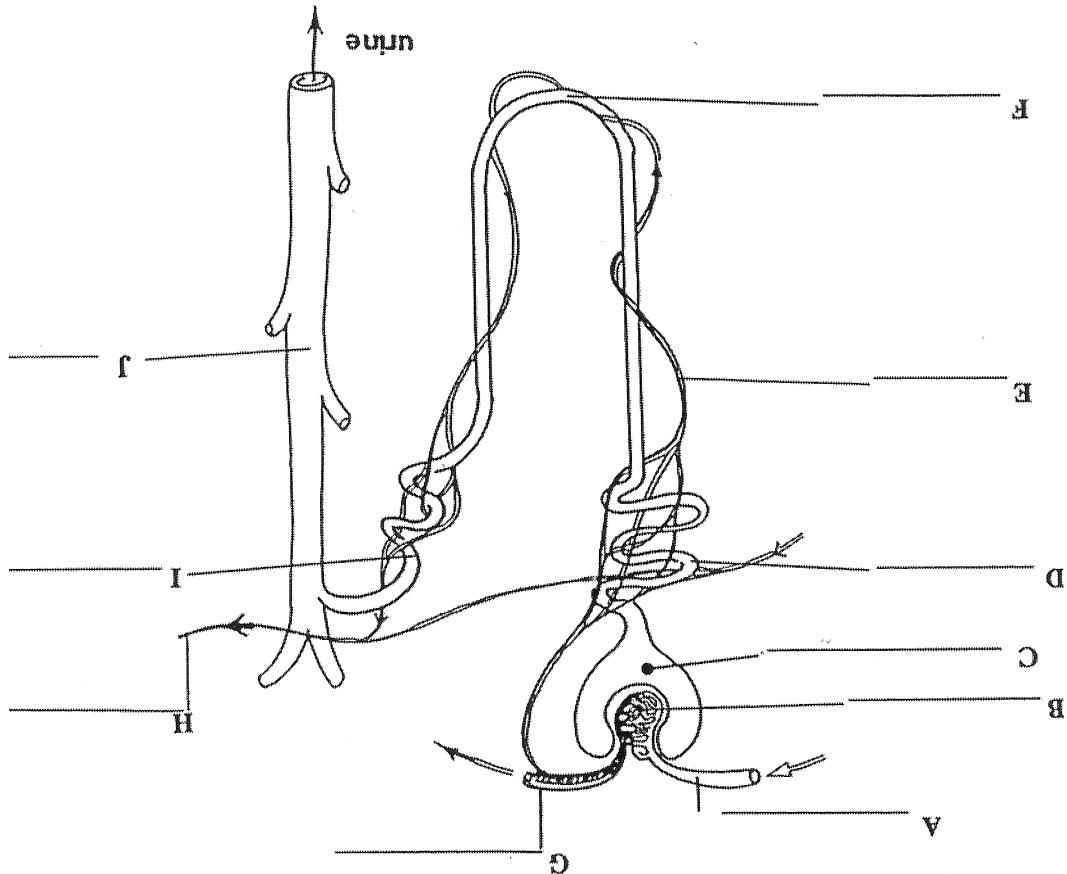
(b) _____

(a) _____

8. List the four functions of the kidney.

- i) Capillary Network — _____
- h) Efferent Arteriole — _____
- g) Afferent Arteriole — _____
- f) Collecting Duct — _____
- e) Distal Convoluted Tubule — _____
- d) Loop of Henle — _____
- c) Proximal Convoluted tubule — _____
- b) Glomerular Capsule — _____
- a) Glomerulus — _____

14. What is the function of each of the following parts of the nephron?



13. Each kidney is made up of around 1 million nephrons, these are functional units of the kidney. Label the following diagram of the Nephron.

EXCRETORY SYSTEM & ASSISTED PROTECTION OF THE BODY

Terminology

1. Fluid between the cells:
2. Fluid inside the cell:
3. Liquid part of the blood:
4. Toxic substances that build up in the blood:
5. Substances required by cells:
6. A membrane that allows some substances to pass through but not others:
7. Breakdown of proteins in the liver:
8. Carries blood to the kidney:
9. Carries blood away from the kidney:
10. Stores urine:
11. Non toxic nitrogenous waste:
12. Carries urine to the bladder:
13. Takes the urine from the bladder to outside the body:
14. Tough, waterproof, protective barrier:
15. Sticky and helps to trap foreign particles:
16. Ball of blood vessels in nephron:
17. Loop of:
18. Duct that helps to control the amount of water absorbed back into the blood:
19. Functional unit of the kidney:
20. Removal of wastes from the body:

5. DNA in a non dividing cell:
-
4. The smallest inheritable unit of DNA:
-
3. The point of attachment of chromatids in a chromosome:
-
2. The identical structures that form a chromosome:
-
1. What does the acronym DNA represent:
-

DNA Terminology

The nucleus is able to control the cell by determining what (15) _____ the cell can make. It controls the (16) _____ of the cell as most cell structures are protein based. It controls the (17) _____ of the cell as all enzymes are proteins and enzymes determine cell (18) _____.

The DNA is able to release information from the nucleus by splitting, copying itself in the form of (12) _____, which then passes out of the nucleus to the (13) _____ where it determines protein (14) _____ in the cell.

The complementary base (10) _____ therefore, producing two (11) _____ strands. When DNA "unzips" (splits in the middle) each side can rebuild itself using the same (12) _____.

The genetic information is stored in the (5) _____ of the nitrogenous (6) _____ on one side of the (8) _____ is the equivalent of the other side. The nitrogenous bases only form (7) _____ pairs, so the code

structure is then twisted to form a double (4) _____.

A molecule of DNA consists of a (1) _____ chain of alternating sugar and (2) _____ bases, ribosome's, double, structure, replicate, strand, helix, metabolism, identical,

(bases, sequence, synthesis, proteins, paired, complementary, pairs, RNA, phosphate, function.) DNA. Note - The numbers refer to the answers.

4. Use the words below to complete the following summary on the structure and function of

_____ ← _____ + _____

d) Complete the following using the terms above:

3. Describe what is meant by the following terms.

c) List five ways in which humans vary.

b) Explain why variation occurs more often in sexually reproducing populations.

a) What is meant by the term variation in humans?

offspring produced by sexual reproduction tend to show variation.

2. The passing of characteristics from parents to offspring is termed heredity. Offspring produced by sexual reproduction are usually very similar to their parents. However

important.

1. What is genetics and describe two reasons why the study of human genetics is

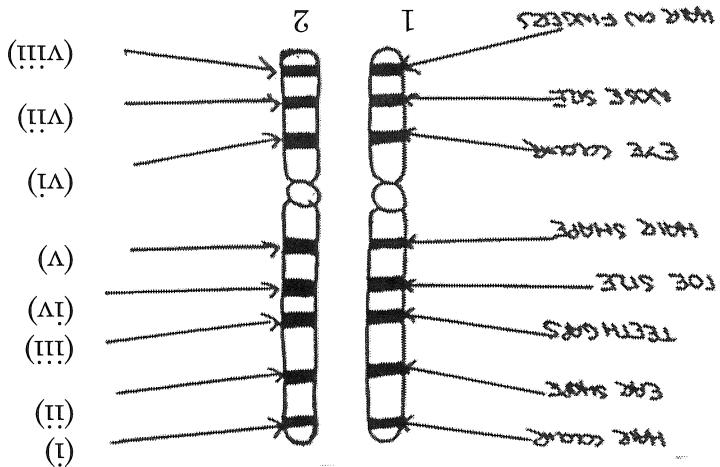
Inheritance, Meiosis & Variation Questions

(ii) Possibly functionally different.

(i) Structurally the same.

(f) In the diagram (d) above explain how the chromatids (1) and (2) are;

(e) Explain why the two chromosomes in (d) above are described as homologous.



gene of the pair would be located.

(d) Label the diagram of a pair of homologous chromosomes to indicate where the other

(c) Describe a homologous chromosome.

Chromosomes consisting of _____ pair

(ii) Sex -

Chromosomes consisting of _____ pairs

(i) Autosomal -

Describe the function of each and state the number of each type in the cell.

(b) The human cell contains two types of chromosomes autosomal and sex chromosomes.

(a) The human cell contains _____ chromosomes or _____ pairs of chromosomes.

cell division.

6. The structure of chromosomes allows the DNA to be moved about the nucleus/cell during

b) Why is it not possible to have a heterozygous blue eyed person?

- i) Homozygous brown —
 — ii) Heterozygous blue —
 — iii) Heterozygous brown —

following Phenotypes ($Brown = B$, $Blue = b$)

a) In Humans, the allele for brown eyes masks (is dominant over) the effect of the allele for blue eyes. Use the letters given below to complete the Genotypes for the examples to help understand the basics of genetic inheritance.

14. Human genetics is very complex; in this course you have studied a number of simplified

letter and the recessive letter.

13. In dominant/recessive inheritance the dominant allele is normally assigned the

12. Explain the difference between homozygous and heterozygous genotypes.

11. Explain the difference between dominant and recessive alleles.

d) List four traits which are controlled by monogenetic inheritance.

b) What is monogenetic inheritance?

a) What is the name given to alternative forms of a gene?

the pair coming from the mother and the other from the father.
 10. Many characteristics of organisms are controlled by a pair of alleles with one allele of

- a) Roman nosed man – _____
 b) Straight nosed woman (mans mother) – _____
 c) Straight nosed woman – _____
 d) Straight nosed children – _____
 e) Roman nosed children – _____

List the genotypes of all the individuals above.

With Roman nose and two with straight nose.

a straight nose has children to a straight nosed woman. They have five children, three with Roman nose (r). A roman nosed man whose mother had

Show your working.

17. Astigmatism is dominant to normal vision in humans. A woman with astigmatism, whose father had normal vision, has children to a man with normal vision. What is the probability that they will have a child with normal vision? Explain your reasoning and show your working.

- Phenotypes – _____
 Genotypes – _____

Show your working.

16. Free ear lobes are dominant to attached ear lobes in humans. A man with a heterozygous genotype has children with a woman who has attached ear lobes. What are the probable genotypic and phenotypic frequencies for the ear lobes of their children?

eyed children. Explain how this discrepancy could take place.

15. A homozygous blue eyed male and a heterozygous brown eyed female have a large family of eight children. Two have blue eyes and six have brown eyes. According to genetic probability (i.e. part c) you would have expected four blue and four brown

Phenotype	Genotype
Colour blind male	
Normal female	
CARRIER female	
Normal male	
Colour blind male	

- c) Red-Green colour blindness is an example of a sex-linked recessive trait. Using the following information complete the table below. X^N = Normal sight, X^a = Colour Blind

- b) Are the majority of the sex-linked abnormal characteristics carried on the sex (X) chromosome, sex-linked dominant or sex-linked recessive?

- a) Describe sex linked inheritance.

23. Characteristics determined by alleles on the sex chromosomes are termed sex-linked.

22. Why are males more likely to have sex-linked abnormalities than females?

(iii) —

Disadvantages (i) —

Advantage (ii) —

advantages and disadvantages. Describe some of these.

- c) The genotype $Hb^s Hb^s$ causes the individual to die but genotype $Hb^a Hb^s$ has some

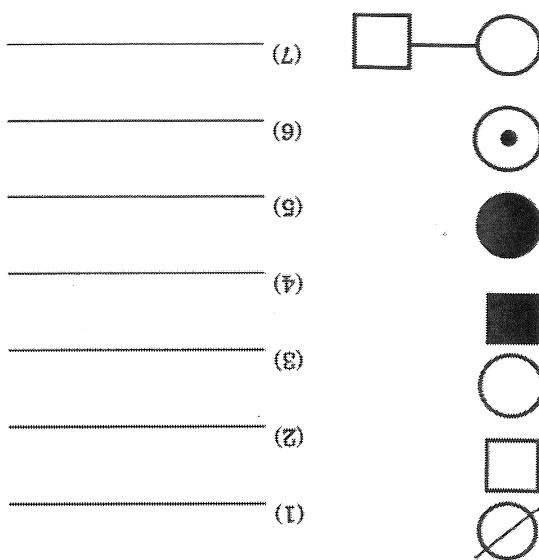
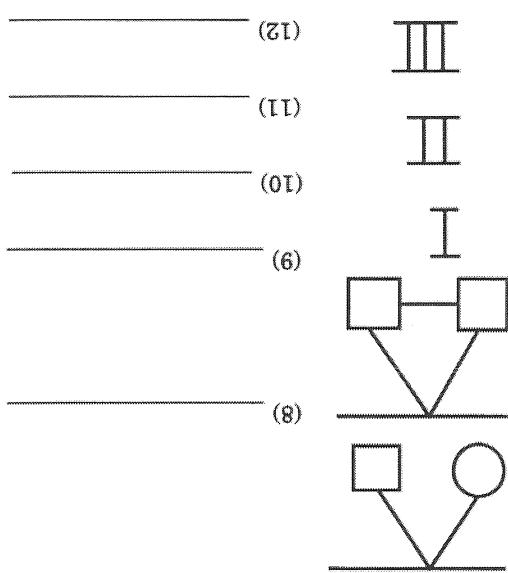
Phenotypes —

Genotypes —

- (ii) Heterozygous X Heterozygous.

Inheritance, Meiosis & Variation Terminology

1. The method of inheritance of red-green colour blindness:
2. The term for the alternative form of a gene:
3. The term for the passing of characteristics from parents to offspring:
4. The term for the actual gene complement of an organism:
5. The term for the way a genotype is expressed:
6. The type of twins produced from a single fertilized ovum:
7. The term for non-sex chromosomes:
8. The term for structurally identical chromosomes:
9. The type of cell division for gamete production:
10. The term for the number of chromosomes in a somatic cell:
11. The term for the fusion of sperm and ovum:
12. The term for a characteristic determined by a single gene:
13. The type of genotype when the two alleles are different:
14. The term describing characteristics located on the X chromosome:
15. The genotype of a female carrier:
16. The genetic condition when blood does not clot:
17. The term for alleles that must be homozygous to be expressed:
18. The term for when chromosomes or chromatids do not correctly separate:
19. The parent that determines the sex of an individual:
20. The standard symbol used for a dominant allele:
21. Rod-like structure made of genes that appears in the nucleus before cell division:
22. Organelle in the cytoplasm that manufactures proteins:
23. Unit from which proteins are manufactured:
24. Differences between individuals:
25. Reproduction that involves the joining of gametes:
26. Term used to describe half the normal number of body chromosomes:
27. Type of cell division for growth and repair:
28. When both alleles are expressed in the heterozygote:



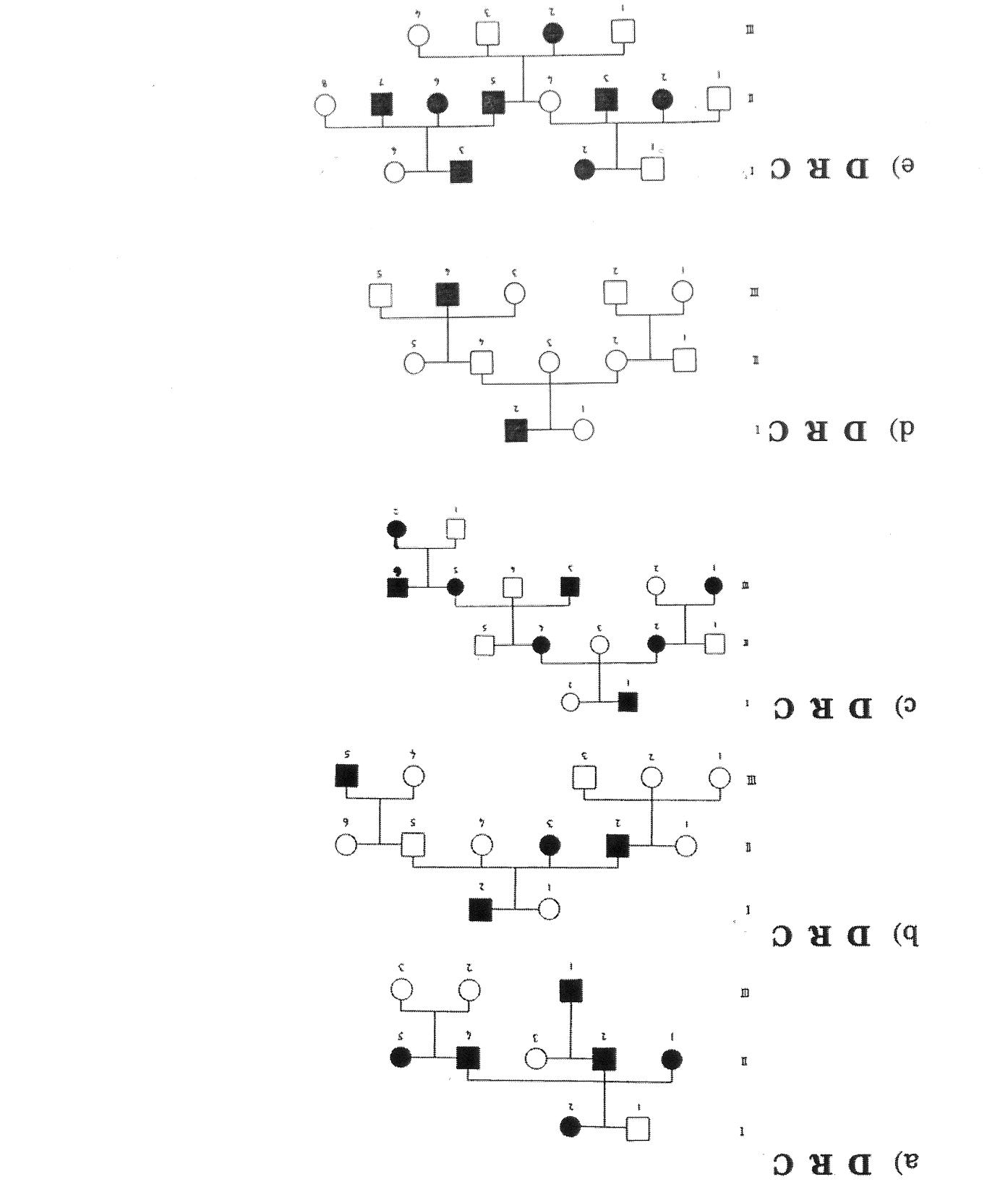
2. Indicate what the following pedigree symbols represent.

1. What is a Pedigree?

Pedigrees, Genetic Testing and the Human Genome Project Questions

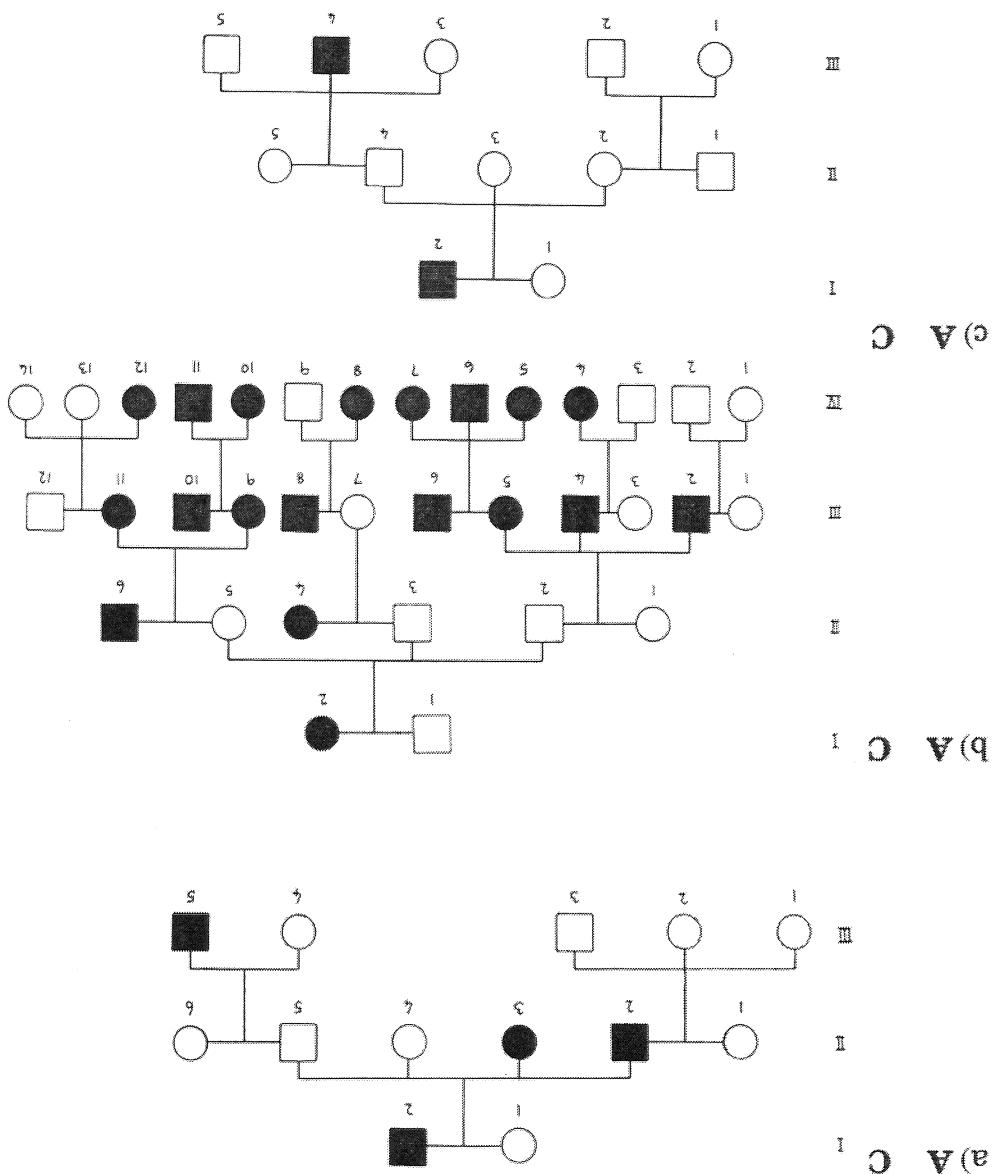
9. Explain what was involved in the human genome project.
 8. Describe the processes of amniocentesis and chorionic villus sampling.
 7. Describe how Mitochondrial DNA is inherited and how it can be used to help study human ancestry.
 6. Describe the mode of inheritance, characteristics and possible treatments, for (a) Huntington's disease, (b) PKU, (c) Duchene muscular dystrophy, (d) Sickle-cell anaemia, (e) Red-green colour blindness.
 5. Given a pedigree determine if a trait is autosomal or sex-linked.
 4. Given a pedigree determine if a trait is dominant or recessive.
 3. Construct a pedigree showing the family history of a particular trait.
 2. Describe what the various symbols in a pedigree represent.
 1. Describe the meaning of the term Pedigree.
- At the end of this unit students should be able to:

Pedigrees, Genetic Testing and the Human Genome Project Objectives



6. Below are a variety of pedigrees for inherited characteristics. In each case, decide whether the trait is dominant (D), recessive (R) or cannot say (C) (i.e. cannot be determined from the information given in the pedigree). Circle the part of the pedigree which allows you to determine dominant or recessive traits.

Human Biological Sciences
2A&2B Revision Booklet



If a trait is sex-linked then it a mother has the trait then all her sons must have it and if a father does not have the trait then none of his daughters can have it. So when looking at a pedigree to determine if it is not sex linked i.e. autosomal, look for a mother who has the trait and her sons do not and a father without the trait and who has daughters who has the trait and her sons do not and a father with the trait and who has daughters who will never prove it is sex-linked.

A pedigree can only ever show if a trait is not sex-linked recessive (i.e. autosomal). It will never prove it is sex-linked.

If a trait is sex-linked then it a mother has the trait then all her sons must have it and if a father does not have the trait then none of his daughters can have it. So when looking at a pedigree to determine if it is not sex linked i.e. autosomal, look for a mother who has the trait and her sons do not and a father with the trait and who has daughters who has the trait and her sons do not and a father without the trait and who has daughters who has the trait and her sons do not and a father with the trait and who has daughters who will never prove it is sex-linked.

7. Many recessive traits can be sex-linked or autosomal.

13. What was involved in the human genome project?
-
-
-
-
1. The more correct term for a "family tree":
2. Affected individuals in a pedigree are indicated by:
3. Decreased individuals in a pedigree are indicated by:
4. A trait determined by genes on non-sex chromosomes:
5. A trait that can be masked or hidden:
6. In a pedigree homozygous recessive individuals will
always be:
7. In a pedigree for a sex-linked recessive trait if the mother
exhibits the trait then all of her _____ will also exhibit the trait:
8. DNA can be found in the nucleus and in:
9. Genetic testing involving examination of the amniotic fluid:
10. Genetic testing involving examination of the chorion:
11. The international effort to map human DNA:

Pedigrees, Genetic Testing and the Human Genome Project Terminology

13. What was involved in the human genome project?

8. Explain monosomy and give an example.

Disorder	Cause	Effect	Tay-Sachs Disease	Cystic Fibrosis	Duchenne Muscular Dystrophy	Albinism	Klinefelters Syndrome

7. Explain the cause and effect of the following disorders.

6. What is a karyotype and how can karyotypes be used to determine sex and possible genetic disorders.

5. Describe some of the effects of mutations.

4. Distinguish between somatic and germ-line mutations.

1. Term for a spontaneous inheritable change in DNA:
2. Agents that increase the rate of mutations:
3. Term for the process by which better adapted organisms have a greater chance of survival and therefore leave more offspring with their inherited characteristics:
4. Term for the change in a species over time as a result of natural selection:
5. Any characteristic of an organism that gives it a greater chance of survival in its new environment:
6. Term describing all the genes of a population:
7. Term describing organisms that can interbreed, under natural conditions and produce fertile offspring:
8. An organism with a characteristic resulting from a mutation:
9. Changes in a single gene:
10. Mutation where all or part of a chromosome is effected:
11. Mutations that occur in the body cells:
12. Mutations that occur in the gametes:
13. PKU:
14. Change in only one base pair:
15. Absence of pigment from the hair, skin and eyes:
16. Wasting of first leg muscles then arms and chest:
17. Persistent coughing and wheezing:
18. Recurrent mutations that cause death:
19. Occurs more frequently in children of older mothers:
20. A photograph of chromosomes in order:
21. Syndrome where males have small testes and breasts (XXX or XYY):
22. Where individual is missing a chromosome of the homologous pair:
23. Differences between individuals:
24. Loss of part of a chromosome:
25. Where section of chromosome occurs twice:

Mutations, Variation and the Environment Terminology

5. Describe sexual dimorphism and the reason for it.

d) Secondary sex organs —

c) Primary sex organs —

a) Gonads —

4. Define the following terms;

3. How is the genetic information transferred from parent to their offspring?

2. Reproduction is not necessary for the survival of an individual. Why then do individuals reproduce?

e) Internal fertilisation —

d) Fertilisation —

c) Sexual reproduction —

1. Define the following terms;

Reproductive Systems Questions

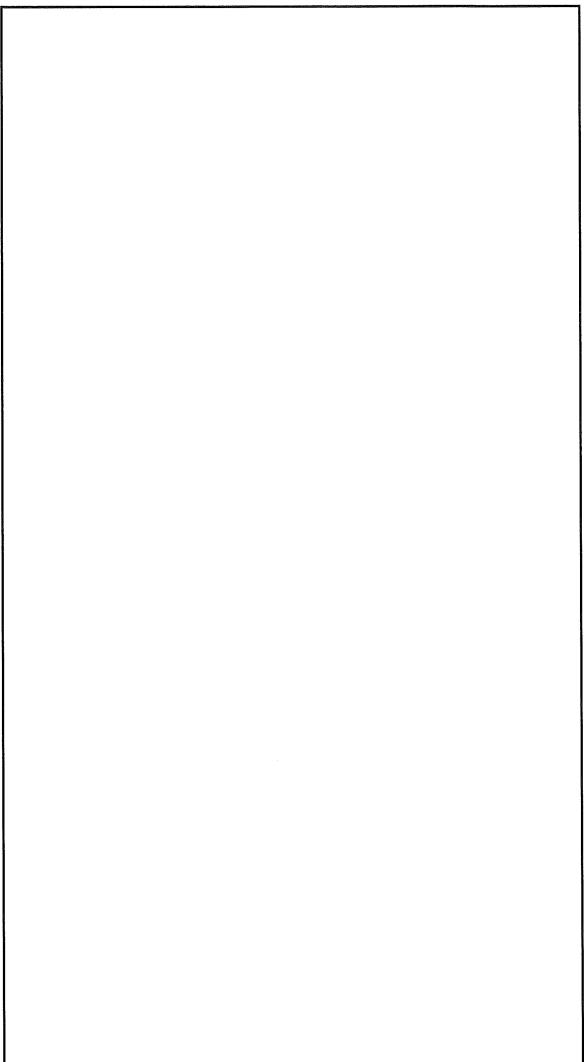
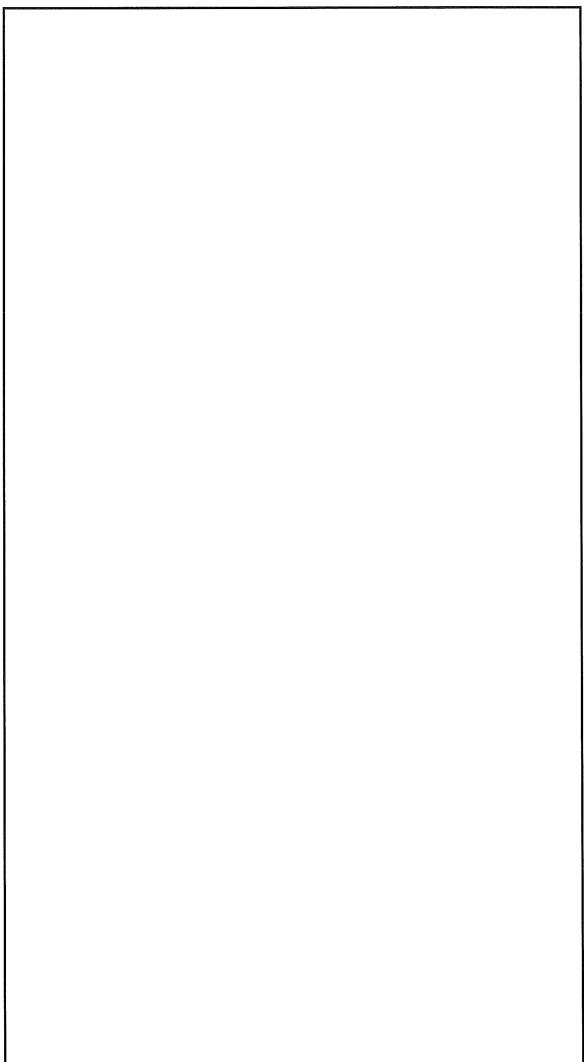
Semiferoous Tubules	
Penis	
Scrotum	
Epididymis	
Vas Deferens	
Bulbo-urethral Gland	
Prostate	
Seminal Vesicle	
Testes	
Foreskin	
Erectile Tissue	
Urethra	
Pelvis	
Bladder	
Uretter	
Structure	Function

7. Describe the general function of each of the parts of the male reproductive system in the table below.

	Function
	Fimbriae
	Uterus
	Cervix
	Rectum
	Vagina
	Labia
	Citoris
	Urethra
	Bladder
	Uterine tube
	Ovary
	Pelvis
	Endometrium
	Anus
	Bladder

9. Describe the general function of each of the parts of the female reproductive system below.

12. Draw diagrams to illustrate the processes of spermatogenesis and oogenesis.



13. How do the processes of spermatogenesis and oogenesis differ?

28. Explain the role of endocrine glands and hormones in communication within the body.

b) Identical -

a) Non-identical -

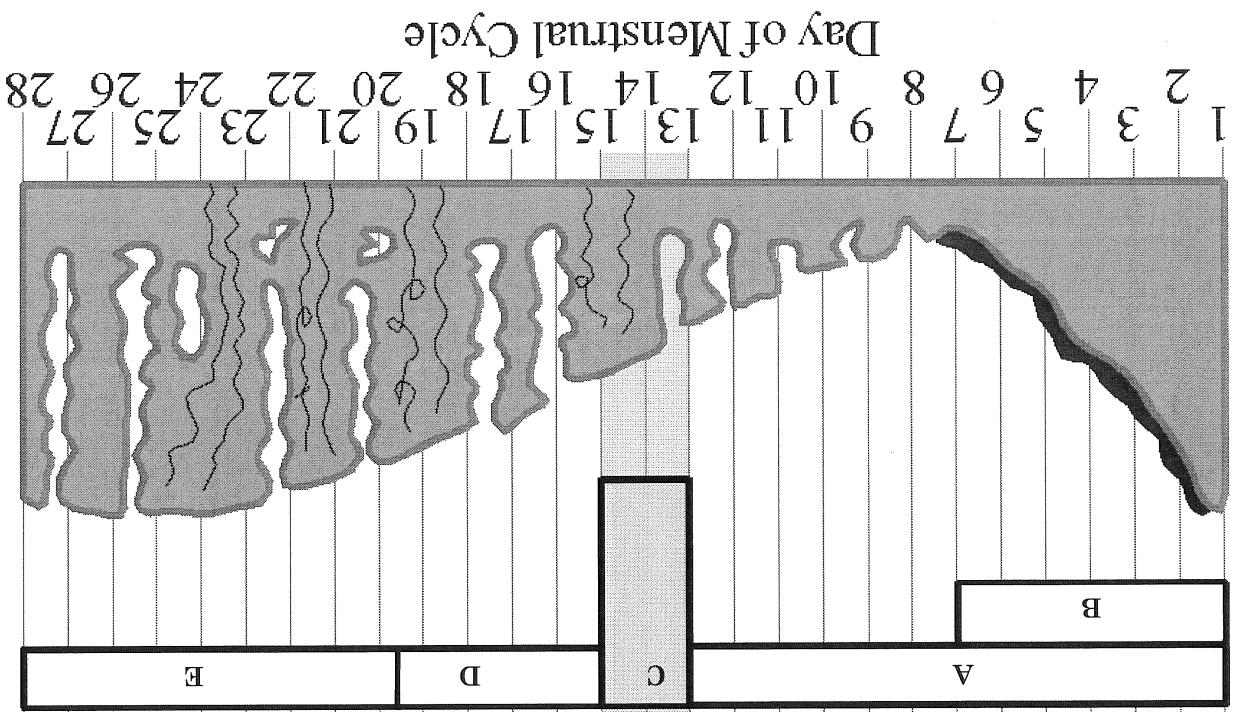
27. Explain how each of the following sets of twins occur;

26. List five signs and symptoms of pregnancy.

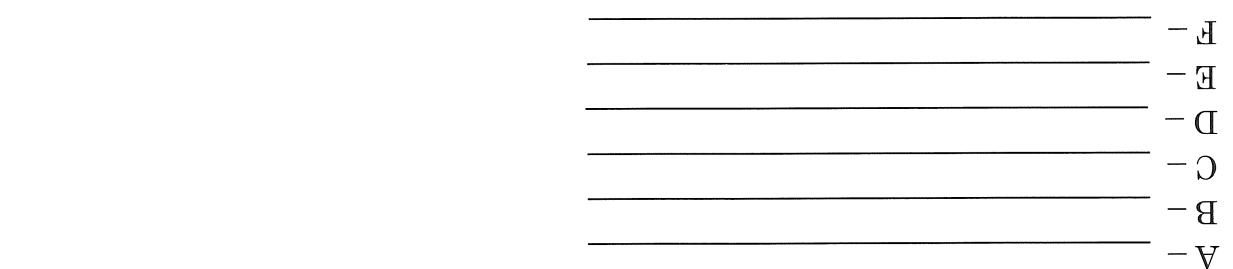
25. Explain how the zygote implants into the endometrium.

blastocyst.

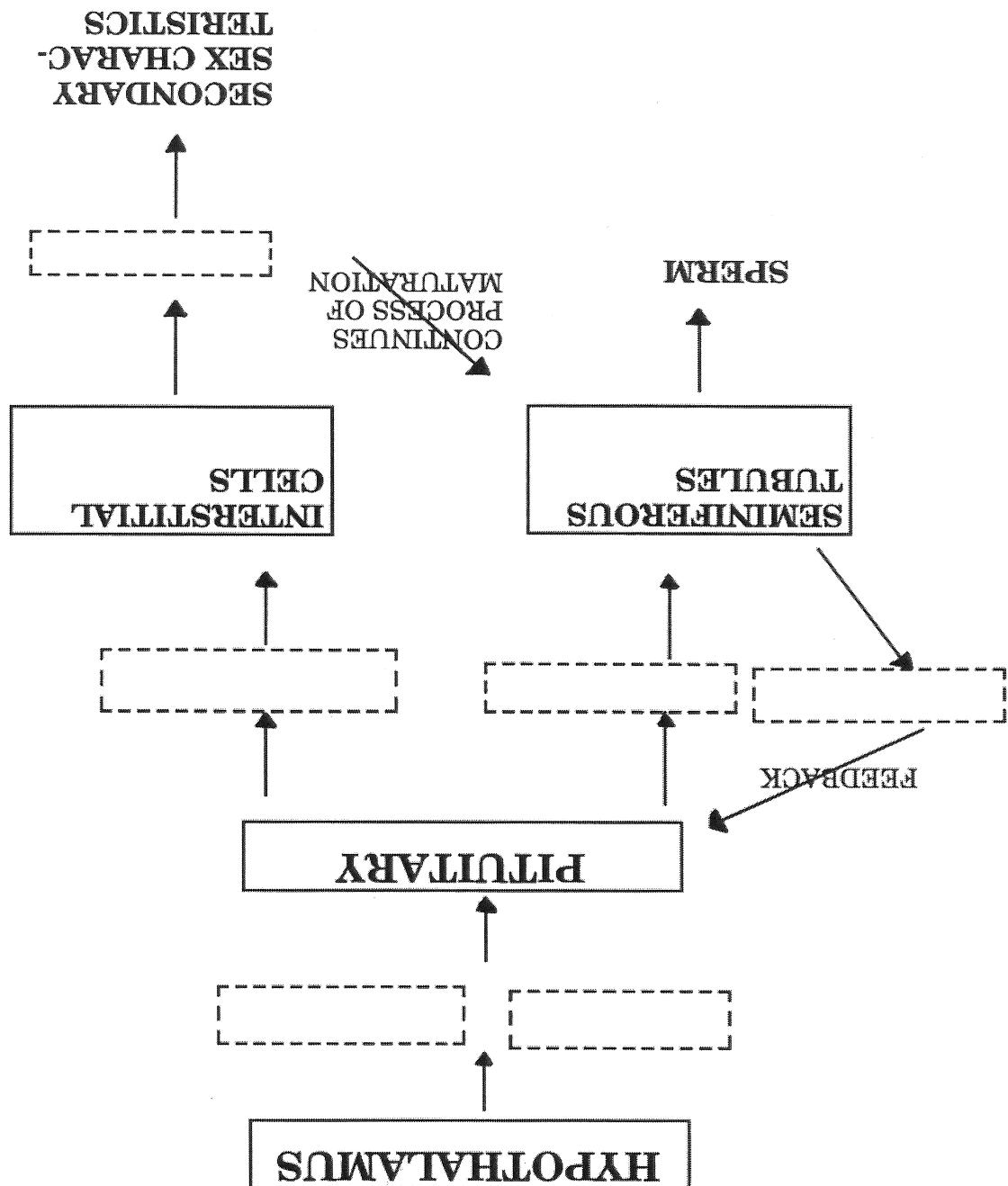
24. Describe the timing and changes in structure as a zygote develops into a morula then a



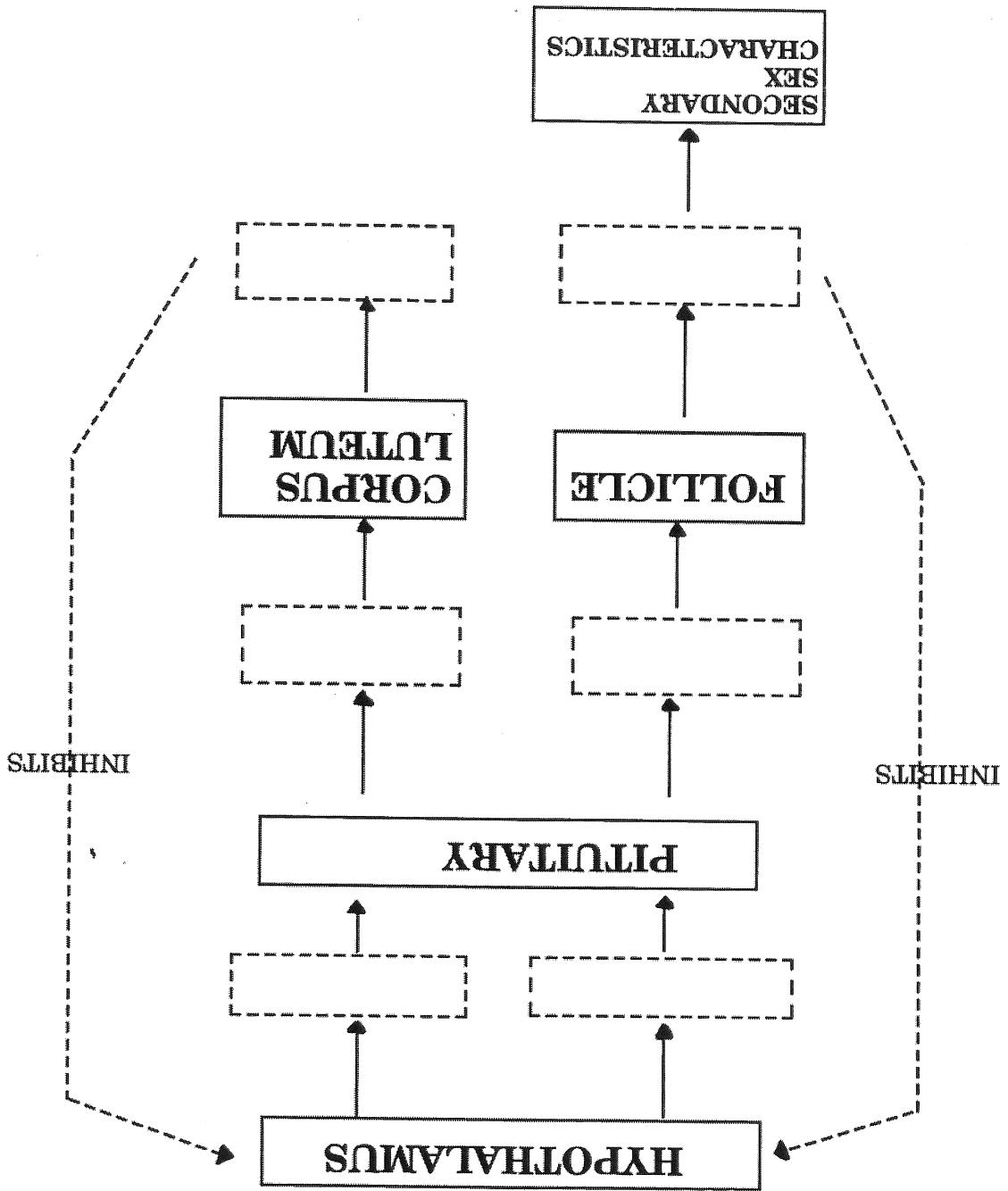
33. Label the following diagram of the menstrual cycle with the terms below.
 (Ovulation, Menstruation, Pre-ovulation, Secretion, pre-menstruation.)



32. Label the following diagram of the ovarian cycle with the terms below.
 (Mature follicle, Ova, Secondary follicle, Primary follicle, Corpus luteum, Ovulation)



35. Use the following list of hormones to complete the diagram below on the hormonal regulation of spermatogenesis in males.
- (FSH-rl, LH-rl, LH, FSH, Inhibin, Testosterone)



37. Use the following list of hormones to complete the diagram below on the hormonal regulation of oogenesis in females.
- (FSH-rf, LH-rf, LH, FSH, OESTROGEN, PROGESTERONE)
37. Use the following list of hormones to complete the diagram below on the hormonal regulation of oogenesis in females.

30. Folds of skin and tissue that have majora and minor parts:
31. The name that describes the number of chromosomes in somatic cells:
32. Cycle of events that takes place in the ovaries:
33. When the female matures sexually:
34. The first menstruation for females:
35. Ceasing of the menstrual cycle:
36. Release of ovum from the ovary:
37. Shredding of the endometrium through the vagina:
38. Hormone that stimulates follicle development:
39. Hormone that causes ovulation:
40. Produces both FSH-rf and LH-rf:
41. Feedback where a rise in one hormone causes a drop in another:
42. Form of cell division that produces gametes:

Type of stem cell	Potential to develop (potency)
	Totipotent
	Pluripotent
	Multipotent

4. Complete the following table on the potential for development of the various types of stem cells.

b) Distinguish between the terms proliferation and differentiation.

3. a) Describe what is meant by the term stem cell.

b) Implantation —

a) Cleavage —

2. Define the following terms;

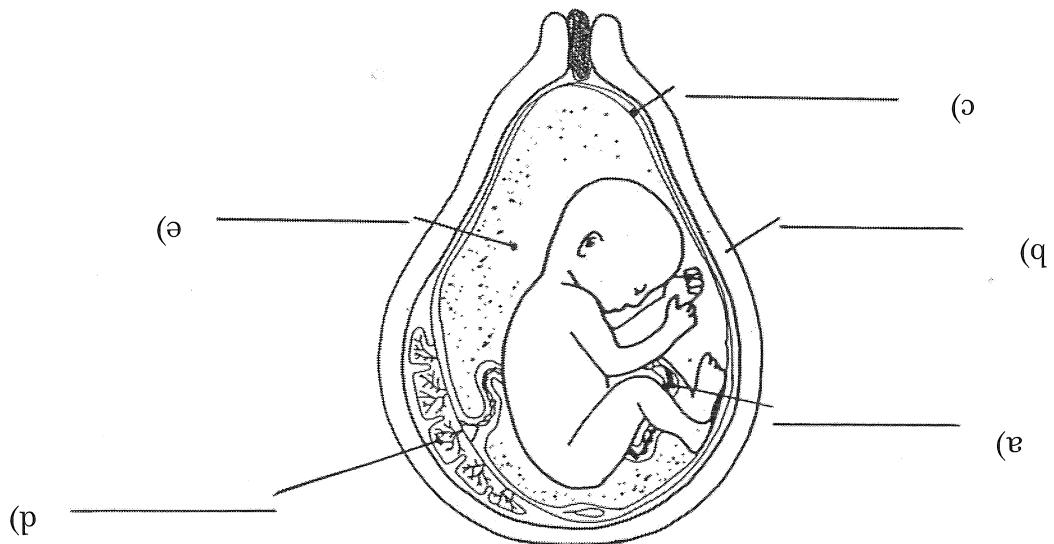
c) Blastocyst —

b) Morula —

a) Zygote —

1. Describe the following structures;

Differentiation & Development Questions



14. Label the following diagram of the embryonic membranes.

13. In what week of development is the developing embryo termed a foetus?

c) Limb buds – _____

b) Ossification – _____

a) Heart beat – _____

12. When does each of the following milestones of development occur?

11. Describe the major changes in structure during the period of the foetus - week 9-39.

10. Describe the major changes in structure during the period of the embryo - week 0-8.

- Drugs -

e) Weight gain -

d) Diet -

c) Digestive system -

b) Respiratory system -

a) Circulatory system -

must take during pregnancy, under the following headings.

19. Outline the physiological changes in the mother to be, and the considerations that she

18. Describe the general role and structure of the umbilical chord.

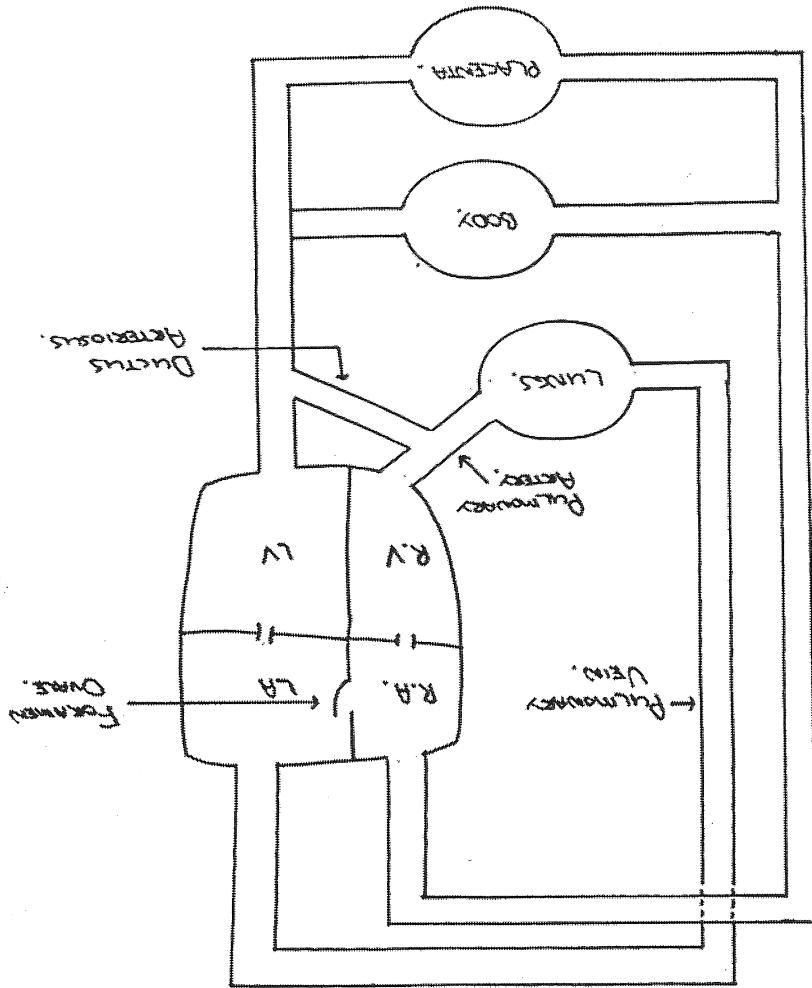
d) Diet/nutrition —

c) Infection —

b) Water balance —

a) Body temperature —

26. Explain the following in terms of postnatal care:



25. On the following diagram of the circulation of a foetus/baby, use a red pen to show the direction of blood flow before the birth and the blue pen to show the direction of blood flow after birth.

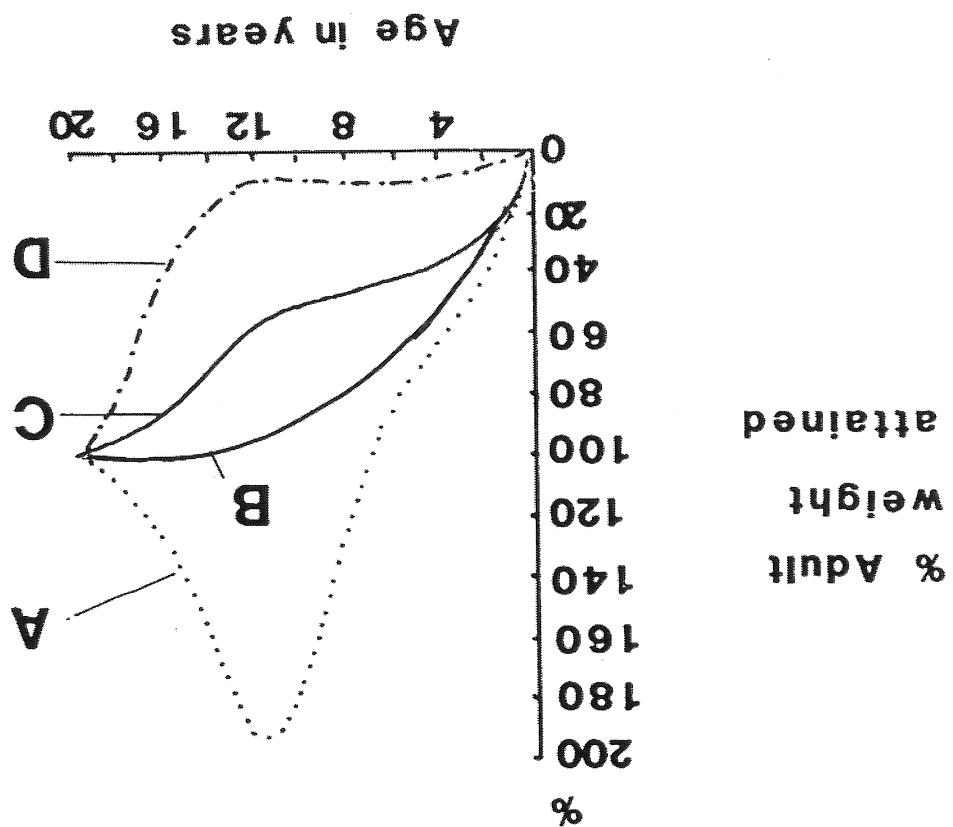
d) General - _____

c) Reproductive - _____

b) Nervous - _____

a) Lymphoid - _____

30. Explain the reasons for the variable growth in each of the tissues labelled above.



29. Use the words below to label the following graph showing the growth of the various tissues (nervous, general, lymphoid, and reproductive).

38. The development of speech in children that do not have contact with their parents or other family members is often detrimentally affected. Explain why this is so.

37. Describe the changes in type and complexity of speech/Language as a new born baby develops into a toddler and then a child.

(p)

(c)

(b)

(a)

36. List and describe four factors that influence social development.

35. Define socialisation.

2. Define the term teratogen and describe the effects of two teratogens on the unborn child.

1. Describe why care must be taken with the unborn child with relation to smoking and alcohol.

Environmental Factors and Reproductive Technologies

mainenance of pregnancy.

7. Describe how ultrasound, foetal monitoring and hormonal intervention are used in the

6. Give the causative agent, the effects on the body, control and treatment for the following STIs; Syphilis, Gonorrhoea, Chlamydia, Herpes and AIDS.

5. Describe the mechanism of action and give the relative and advantages and disadvantages of a range of contraceptive techniques.

4. Define the term contraception.

(IVF), gamete intrafallopian transfer (GIFT), intracytoplasmic sperm injection (ICSI), donor ovum or embryo and surrogacy.

3. Explaining the following assisted reproductive technologies (ART); in-vitro fertilisation (IVF) and embryo transfer.

2. Define the term teratogen and describe the effects of a number of teratogens on the embryo/fetus.

1. Describe the care which must be taken with the unborn child with relation to; smoking and alcohol.

At the end of this unit students should be able to:

Environmental Factors and Reproductive Objectives

STI	Causative agent	Effects on body	Control	Treatment
AIDS				
Herpes				
Chlamydia				
Gonorrhoea				
Syphilis				

6. Complete the following table on sexually transmitted diseases infections.

1. A substance than cause physical defects in an embryo/fetus:
2. The acronym ART stands for:
3. The acronym IVF stands for:
4. The acronym GIFT stands for:
5. The acronym ICSI stands for:
6. The term for a woman who bears a child for an infertile couple:
7. A measure to prevent a pregnancy occurring or continuing:
8. Contraceptive method involving the determination of ovulation and avoidance of intercourse:
9. The condom and diaphragm are examples of contraceptive methods that work by forming a:
10. The combined hormonal pill contains the hormones:
11. The acronym IUD stands for:
12. The type of micro-organism responsible for syphilis and gonorrhoea:
13. The sore or ulcer caused by syphilis:
14. The most effective method of preventing STI's:
15. Type of STI that has few symptoms in females and can lead to sterility:
16. Causative agent of AIDS:
17. Virus that can cause blisters on genital organs:

Environmental Factors and Reproductive Terminology

Organelles	Function of Organelles	
Cell membrane	Differently permeable, controls the movement of materials into and out of the cell.	
Mitochondria	Where aerobic respiration takes place. Makes energy available for the cells	
Nucleus	Controls the activities of the cell through protein synthesis.	
lysosomes	Contains digestive enzymes that are able to break down proteins, lipids and carbohydrates.	
Ribosomes	Assembles amino acids to make proteins.	
Endoplasmic reticulum	Increases surface area for chemical reactions. Channels used as a transport system.	
Cytoplasm	Liquid medium for cell metabolism. Where organelles are suspended.	
Centrioles	Produce spindle fibres. Involved in the process of cell division.	
Golgi Apparatus	Concentrates, stores and packages materials for secretion from the cell.	
Nucleolus	RNA synthesis for ribosomes.	

4.

1. Cell, Tissue, Organ, System, Organism.
 2. The structural and function unit of the Human Body.
 3. A-Cytoplasm, B-Endoplasmic Reticulum, C-Ribosomes, E-Nucleoplasm, F-Mitochondria, G-Cell Membrane, J-Nucleolus, K-Nuclear Membrane, L-Golgi Body, O-Centrioles.

Cell Structure & Mitosis Answers

1. Hypothesis. 2. Observations. 3. Technology. 4. Independent. 5. Sample size and replication. 6. Comparison. 7. Bias. 8. Inference. 9. Dependent. 10. Phycosomatic. 11. False. 12. Theory. 13. Test. 14. Biological variation. 15. Extrapolate. 16. Placebo. 17. Continuous. 18. Line. 19. Controlled. 20. Interpolation.
23. (a) "That DISSOLVEAT will reduce 10% of your body mass in 10 days". (b) DISSOLVEAT represents a 21.4% increase. Therefore the hypothesis (and the company's claim) has been supported.
- (c) Body mass. (d) Age, health, breed. (e) Diet, water intake, temperature of room, exercise. (f) Group B. (g) Negatively correlated. (h) Reduce the influence of biological variation and experimental error. (i) Reduce the influence of bias by introducing another variable. (j) To reduce the influence of the psychosomatic effect. (k) Group A experiments lost 11.5% on average over the ten day period. (l) The results support the hypothesis because Group A lost 11.5%, Group B Negative 2%. (m) Experiment was carried out on rats not humans, experiment was not repeated. Do a trial on human volunteers and repeat the experiment a number of times. (n) Yes to reduce the influence of biological variation and experimental error.

22. (a) "That LACTPLUS will increase milk production in dairy cows by over 20%". (b) LACTPLUS. (c) Milk production. (d) Same age, same breed. (e) Food, water. (f) Group B. (g) 25. (h) To reduce the influence of biological variation and experimental error. (i) To reduce the effect of bias, to not introduce another variable. (j) Biological variation. (k) Group A averaged 0.9 L / cow/day more than group B. This is variable. (l) To reduce the influence of bias, to not introduce another variable. (m) Positive 5.9%. (n) Negatives should be quoted where appropriate.
21. Should include if the results "support" or "do not support" the hypothesis. Averages and percentage should be included where appropriate.
20. (a) Percentage Change = $(\text{Final value} - \text{Initial value}) / \text{Initial value} \times 100$. (b) Positive 5.9%. (c) Negative 5.8%.

2. a) Passive processes do not require metabolic energy from the cell to occur. Active processes do require metabolic energy from the cell to occur. b) Endocytosis is the process of taking materials into the cell while exocytosis is the removal of materials from the cell to occur. c) Lipoproteins are small semi-permeable membranes that permits the passage of certain substances (usually smaller ones) but restricts the passage of others (usually larger ones). d) Dissolves lipid from membrane (iii) Disrupts structure of membrane; separates lipid/protein.
3. Synthesis. 2. Catalabolism. 3. Anabolism. 4. Aerobic. 5. Anaerobic. 6. Mitochondria.
4. a) Changes the shape/structure of the protein of the enzyme (denatures/coagulates the protein). Therefore no longer have the correct active sites. b) The condition of temperature and pH that produce the greatest rates of reaction, about 37 degrees Celsius and pH 7 for most human enzymes.
5. Many enzymes require the presence of certain ions before they will catalyze a reaction. These are called co-factors. Some co-factors are non-protein organic molecules, these are called co-enzymes.
6. Catalysts. 15. Optimal. 16. Denature. 17. Activation energy. 18. Co-enzyme.
7. Adenosine Tri Phosphate. 8. Active site. 9. Nutrient. 10. Protein. 11. Minerals. 12. Lipids. 13. Protein.
8. a) A differentially permeable membrane that controls the movement of materials into and out of the cell. b) Endocytosis is a membrane that permits the passage of certain substances (usually smaller ones) but restricts the passage of others (usually larger ones). c) Lipoprotein (ii) Denature protein of
9. Semipermeable membrane is a membrane that permits the passage of certain substances (usually smaller ones) but restricts the passage of others (usually larger ones). d) Diffusion, active transport, endocytosis and exocytosis.
10. a) Enzymes have an optimum temperature usually in humans (37 degrees Celsius). Extremes of temperature denature enzymes. b) pH sensitivity - Enzymes have an optimum pH, extremes of pH will substrate concentration has no effect on the rate of the reaction, for a given quantity of enzyme.
11. No answer provided.
12. No answer provided.
13. a) The name ends in -ase i.e. Protease acts on proteins, Lipase on lipids, etc. b) Lock and Key hypothesis. The shape/structure of the enzyme allows it to combine with the substrate, reducing the activation energy required for the reaction, allowing the reaction to proceed at a faster rate. c) From left to right; Enzyme, Substrate, Enzyme/Substrate Complex, Enzyme and Products. d) Breakdown/Catabolic. e) Yes, however the synthesis reaction would require a greater input of energy. f) Active sites, g) With the active site blocked, the enzyme-substrate complex would not form and the reaction would effectively cease. h) Used in anaerobism and catabolism, reusable and specific.
14. a) Changes the shape/structure of the protein of the enzyme (denatures/coagulates the protein). Therefore no longer have the correct active sites. b) The condition of temperature and pH that produce the greatest rates of reaction, about 37 degrees Celsius and pH 7 for most human enzymes.
15. Many enzymes require the presence of certain ions before they will catalyze a reaction. These are called co-enzymes. Some co-factors are non-protein organic molecules, these are called co-enzymes.
16. Catalysts. 17. Activation energy. 18. Co-enzyme.
17. Adenosine Tri Phosphate. 8. Active site. 9. Nutrient. 10. Protein. 11. Minerals. 12. Lipids. 13. Protein.
18. a) Osmosis is the movement of water from an area of lower concentration (dilute solution) to an area of higher concentration to areas of higher concentration. (iii) Osmosis - Osmosis is the diffusion of molecules across the cell membrane and AGAINST the concentration gradient, from regions of low concentration to regions of high concentration (concentrated solution). (iv) Active Transport - The movement of molecules across the cell membrane by carrier proteins. Is a passive process that moves molecules from areas of high concentration to areas of low concentration. (ii) Facilitated diffusion - Diffusion of larger molecules through the membrane by vacuole formation by the cell membrane. (v) Pinocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
19. a) NETT movement of water from an area of high water concentration (dilute solution) to an area of low concentration to areas of lower concentration. (iii) Osmosis - Osmosis is the diffusion of molecules across the cell membrane and AGAINST the concentration gradient, from regions of high concentration to regions of low concentration (concentrated solution). (iv) Active Transport - The movement of molecules across the cell membrane by carrier proteins. Is a passive process that moves molecules from areas of high concentration to areas of low concentration. (ii) Facilitated diffusion - Diffusion of larger molecules through the membrane by vacuole formation by the cell membrane. (v) Pinocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
20. a) Observation - Red blood cell bursts, Explanation - Water diffuses out of potato cube. (ii) Observation - Red blood cell shrinks, Explanation - Net movement of water out of the red blood cell.
- b) Observation - Red blood cell shrinks, Explanation - Net movement of water across the membrane. Diffusion is zero, but the molecules would still be moving equally in both directions across the membrane. Energy of molecules. (ii) Increase the concentration gradient and increase the temperature. (iii) No, kinetic solid particles by vacuole formation by the cell membrane. (iv) Phagocytosis - The engulfing of larger, taking in of liquids by vacuole formation by the cell membrane. (v) Phagocytosis - The engulfing of larger, taking in of liquids by vacuole formation by the cell membrane. (vi) Pinocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
- c) Observation - Red blood cell shrinks, Explanation - Net movement of water from water into the honey. (ii) Observation - Potato cube swells, Explanation - Water diffuses into potato cube. (iii)
- d) Observation - Red blood cell shrinks, Explanation - Net movement of water out of the red blood cell.
- e) Observation - Red blood cell shrinks, Explanation - Net movement of water across the membrane. Diffusion is zero, but the molecules would still be moving equally in both directions across the membrane. Energy of molecules. (ii) Increase the concentration gradient and increase the temperature. (iii) No, kinetic solid particles by vacuole formation by the cell membrane. (iv) Phagocytosis - The engulfing of larger, taking in of liquids by vacuole formation by the cell membrane. (v) Phagocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
- f) Observation - Red blood cell shrinks, Explanation - Net movement of water out of the red blood cell.
- g) Observation - Red blood cell shrinks, Explanation - Net movement of water across the membrane. Diffusion is zero, but the molecules would still be moving equally in both directions across the membrane. Energy of molecules. (ii) Increase the concentration gradient and increase the temperature. (iii) No, kinetic solid particles by vacuole formation by the cell membrane. (iv) Phagocytosis - The engulfing of larger, taking in of liquids by vacuole formation by the cell membrane. (v) Phagocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
- h) Observation - Red blood cell shrinks, Explanation - Net movement of water from water into the honey. (ii) Observation - Potato cube swells, Explanation - Water diffuses into potato cube. (iii)

Cell Transport Answers

1. Synthesis. 2. Catalabolism. 3. Anabolism. 4. Aerobic. 5. Anaerobic. 6. Mitochondria.
2. a) A differentially permeable membrane that controls the movement of materials into and out of the cell. b) Endocytosis is a membrane that permits the passage of certain substances (usually smaller ones) but restricts the passage of others (usually larger ones). c) Lipoprotein (ii) Denature protein of
3. Semipermeable membrane is a membrane that permits the passage of certain substances (usually smaller ones) but restricts the passage of others (usually larger ones). d) Diffusion, active transport, endocytosis and exocytosis.
4. a) Osmosis is the movement of water from an area of lower concentration (dilute solution) to an area of higher concentration to areas of lower concentration. (iii) Osmosis - Osmosis is the diffusion of molecules across the cell membrane and AGAINST the concentration gradient, from regions of high concentration to regions of low concentration (concentrated solution). (iv) Active Transport - The movement of molecules across the cell membrane by carrier proteins. Is a passive process that moves molecules from areas of high concentration to areas of low concentration. (ii) Facilitated diffusion - Diffusion of larger molecules through the membrane by vacuole formation by the cell membrane. (v) Pinocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
5. a) Observation - Red blood cell shrinks, Explanation - Net movement of water out of the red blood cell.
- b) Observation - Red blood cell shrinks, Explanation - Net movement of water across the membrane. Diffusion is zero, but the molecules would still be moving equally in both directions across the membrane. Energy of molecules. (ii) Increase the concentration gradient and increase the temperature. (iii) No, kinetic solid particles by vacuole formation by the cell membrane. (iv) Phagocytosis - The engulfing of larger, taking in of liquids by vacuole formation by the cell membrane. (v) Phagocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
- c) Observation - Red blood cell shrinks, Explanation - Net movement of water from water into the honey. (ii) Observation - Potato cube swells, Explanation - Water diffuses into potato cube. (iii)
- d) Observation - Red blood cell shrinks, Explanation - Net movement of water out of the red blood cell.
- e) Observation - Red blood cell shrinks, Explanation - Net movement of water across the membrane. Diffusion is zero, but the molecules would still be moving equally in both directions across the membrane. Energy of molecules. (ii) Increase the concentration gradient and increase the temperature. (iii) No, kinetic solid particles by vacuole formation by the cell membrane. (iv) Phagocytosis - The engulfing of larger, taking in of liquids by vacuole formation by the cell membrane. (v) Phagocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
- f) Observation - Red blood cell shrinks, Explanation - Net movement of water out of the red blood cell.
- g) Observation - Red blood cell shrinks, Explanation - Net movement of water across the membrane. Diffusion is zero, but the molecules would still be moving equally in both directions across the membrane. Energy of molecules. (ii) Increase the concentration gradient and increase the temperature. (iii) No, kinetic solid particles by vacuole formation by the cell membrane. (iv) Phagocytosis - The engulfing of larger, taking in of liquids by vacuole formation by the cell membrane. (v) Phagocytosis - The high concentration. This involves the expenditure of metabolic energy by the cell.
- h) Observation - Red blood cell shrinks, Explanation - Net movement of water from water into the honey. (ii) Observation - Potato cube swells, Explanation - Water diffuses into potato cube. (iii)

Metabolism Terminology Answers

1. Many enzymes require the presence of certain ions before they will catalyze a reaction. These are called co-enzymes. Some co-factors are non-protein organic molecules, these are called co-enzymes.
2. a) Changes the shape/structure of the protein of the enzyme (denatures/coagulates the protein). Therefore no longer have the correct active sites. b) The condition of temperature and pH that produce the greatest rates of reaction, about 37 degrees Celsius and pH 7 for most human enzymes.
3. Synthesis. 2. Catalabolism. 3. Anabolism. 4. Aerobic. 5. Anaerobic. 6. Mitochondria.
4. a) Changes the shape/structure of the protein of the enzyme (denatures/coagulates the protein). Therefore no longer have the correct active sites. b) The condition of temperature and pH that produce the greatest rates of reaction, about 37 degrees Celsius and pH 7 for most human enzymes.
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6. Catalysts. 15. Optimal. 16. Denature. 17. Activation energy. 18. Co-enzyme.
7. Adenosine Tri Phosphate. 8. Active site. 9. Nutrient. 10. Protein. 11. Minerals. 12. Lipids. 13. Protein.
8. a) A differentially permeable membrane that controls the movement of materials into and out of the cell. b) Endocytosis is a membrane that permits the passage of certain substances (usually smaller ones) but restricts the passage of others (usually larger ones). c) Lipoprotein (ii) Denature protein of
9. Semipermeable membrane is a membrane that permits the passage of certain substances (usually smaller ones) but restricts the passage of others (usually larger ones). d) Diffusion, active transport, endocytosis and exocytosis.
10. a) Enzymes have an optimum temperature usually in humans (37 degrees Celsius). Extremes of pH will denature an enzyme. b) pH sensitivity - Enzymes have an optimum pH, extremes of pH will substrate concentration has no effect on the rate of the reaction, for a given quantity of enzyme.
11. No answer provided.
12. No answer provided.
13. a) The name ends in -ase i.e. Protease acts on proteins, Lipase on lipids, etc. b) Lock and Key hypothesis. The shape/structure of the enzyme allows it to combine with the substrate, reducing the activation energy required for the reaction, allowing the reaction to proceed at a faster rate. c) From left to right; Enzyme, Substrate, Enzyme/Substrate Complex, Enzyme and Products. d) Breakdown/Catabolic. e) Yes, however the synthesis reaction would require a greater input of energy. f) Active sites, g) With the active site blocked, the enzyme-substrate complex would not form and the reaction would effectively cease. h) Used in anaerobism and catabolism, reusable and specific.
14. a) Changes the shape/structure of the protein of the enzyme (denatures/coagulates the protein). Therefore no longer have the correct active sites. b) The condition of temperature and pH that produce the greatest rates of reaction, about 37 degrees Celsius and pH 7 for most human enzymes.
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17. Adenosine Tri Phosphate. 8. Active site. 9. Nutrient. 10. Protein. 11. Minerals. 12. Lipids. 13. Protein.
18. a) Enzymes have an optimum temperature usually in humans (37 degrees Celsius). Extremes of pH will denature an enzyme. b) pH sensitivity - Enzymes have an optimum pH, extremes of pH will substrate concentration has no effect on the rate of the reaction, for a given quantity of enzyme.
19. a) Enzymes have an optimum temperature usually in humans (37 degrees Celsius). Extremes of pH will denature an enzyme. b) pH sensitivity - Enzymes have an optimum pH, extremes of pH will substrate concentration has no effect on the rate of the reaction, for a given quantity of enzyme.
20. a) Enzymes have an optimum temperature usually in humans (37 degrees Celsius). Extremes of pH will denature an enzyme. b) pH sensitivity - Enzymes have an optimum pH, extremes of pH will substrate concentration has no effect on the rate of the reaction, for a given quantity of enzyme.

25. a) Plasma. b) Erythrocytes (red blood cells). c) Leucocytes (White blood cells). d) Thrombocytes (Platelets)
24. a) Arterioles. b) Veins
23. Allows easy and fast transport of substances by diffusion, between the cell intercellular fluid and plasma.
- means that the contraction of these muscles helps push blood along the veins.
- reduces frictional resistance of the vein walls on the blood. The veins close proximity to skeletal muscles
22. The blood in the veins is under low pressure. The valves prevent back flow of blood, the large lumen
- pressure. By maintaining the blood pressure a constant flow of blood is maintained to the capillaries.
- heart relaxes the elastic recoil of the artery walls keeps the blood moving by maintaining the blood
21. When the ventricles contract the walls of the arteries expand (stretch) due to the blood pressure. When the
- through the artery.
20. The muscle can contract or dilate thus increasing or decreasing the amount of blood flowing
19. Pulmonary Arteries, carry deoxygenated blood to lungs.
18. a) Capillary. b) Artery. c) Vein.
- cells and blood.
- c) Capillaries. Very close to all cells, where transfer of nutrients, gases and wastes takes place between
- b) Veins. Carry blood to the heart (All veins carry deoxygenated blood except for pulmonary).
- a) Arteries. Carry blood away from the heart (all arteries carry oxygenated blood except the pulmonary).
- | Blood vessel | Relative thickness | Size of wall | Muscle present/absent | Valves present | Capillaries |
|--------------|--------------------|--------------------|-----------------------|----------------|-------------|
| Arteries | Thin | Large | Absent | Absent | Very small |
| Veins | Thick | Small (changeable) | Present | Present | |
| | | | | | |
16. Right.
15. Prevents mixing of oxygenated and deoxygenated blood thus allowing a more efficient oxygen transfer in the circulatory system.
14. Left.
13. Left.
- c) Portal. Transports blood containing nutrients absorbed from the gut to the liver for storage.
- b) Pulmonary. transports deoxygenated blood to lungs where oxygenation takes place, and returns oxygenated blood to the lungs.
- a) Systemic. Transports nutrients and oxygen to body cells and wastes and carbon dioxide away.
11. No answer supplied.
- be reduced when breathing.
10. Pericardium. Encloses and holds heart in place, prevents heart from over-stretching allows for friction to blood a shorter distance to lungs.
9. Left ventricle has to pump blood a large distance throughout the whole body, right ventricle has to pump to lungs and body.
8. Atrial only have to pump blood short distance to ventricles, ventricles have to pump blood larger distances
7. No answer supplied.

7. a) Relax. b) Fall down. c) Relaxes, up. d) Back. e) Decreasing, increasing, out.
6. a) Contract b) rise, out c) Contracts, down d) forward e) increasing, decreasing, into
- It occurs in cells.
- muscles. d) The process of releasing useful energy from organic compounds usually with the use of oxygen. the process of forcing air out of the lungs it is a passive process and is due to the relaxation of the muscles. c) or exhalation; is drawing air into the lungs it is an active process involving the contraction of muscles. b) or inhalation; is the process of moving air into and out of the lungs. b) or inhalation; is the process of ventilation; is the process of moving air into and out of the lungs. b) or inhalation; is the process of breathing.
- tubes and air sacs used for gas exchange.
- Larynx. Production of sound that leads to speech. Lung: Pair of organs in the chest cavity compressed by swallowing to prevent food/liquid passing into the trachea. Pharynx: Air from nasal cavity passes through the larynx cavity: Arms, moistens (humidifies) and filters the air. Epiglottis: Covers trachea during swallowing: Fluid membranes together with the pleural fluid hold the outside of the lungs against the inside of the chest wall. Diaphragm: Flat tenus during contraction to increase the volume of thoracic cavity. members: Pleural membranes together with the pleural fluid to control the amount of air entering the alveoli by a layer of smooth muscle. Pleural
- to alveoli they control the amount of air entering the alveoli by a layer of smooth muscle. Pleural
- for gas exchange between blood in capillaries and alveolar air. Bronchial: Conduct air from bronchial tree to alveoli that allows the pleural membranes to slide over each other reducing friction. Alveoli: Contains organs (Heart/Lungs). Left bronchus: Conducts air from trachea to bronchial tree. Pleural cavity: Contains bronchi. Intercostal Muscle: Raise ribs to increase volume of thoracic cavity. Rib: Protection of thoracic
4. Tracheal Cartilage: Prevents collapsing of the trachea. Trachea: Conducts air from pharynx/larynx to
- Alveoli
3. a) No answer supplied b) Nasal cavity → Larynx → Trachea → Bronchus → Bronchial tree → Bronchial cavity →
- l.) Nasal cavity. M.) Epiglottis. N.) Larynx. O.) Pharynx.
- G.) Alveoli. H.) Bronchial. I.) Inner pleural membrane. J.) Outer pleural membrane. K.) Diaphragm.
2. A) Tracheal Cartilage. B) Trachea. C) Intercostal Muscle. D) Rib. E) Left bronchus. F) Pleural cavity.
- occur (efficiently enough) by diffusion.
1. Individual cells of the organism are too far removed from the external environment for gas exchange to

Respiratory System Answers

1. Red. 2. Atira. 3. Venricles. 4. Pulmonary arteries. 5. Oxygenated. 6. Atrioventricular valves. 7. Semilunar valves. 8. Pulmonary. 9. Left. 10. Left. 11. Mesoenteric. 12. Carotid. 13. Coronary. 14. Artery. 15. Veins. 16. Smooth. 17. Venules. 18. Plasma. 19. Erythrocytes. 20. Leucocytes. 21. Thrombocytes. 22. Biconcave discs. 23. Red bone marrow. 24. Spleen. 25. Diastole. 26. Sphygmomanometer. 27. Systolic. 28. 120/80 mmHg. 29. Lymph. 30. Shock. 31. Haemorrhage. 32. Histamine. 33. Pus

43. Histamine increases the flow of blood to the infected area. This causes the redness and heat. Histamine also increases the permeability of the capillaries. This results in more plasma entering the tissues which results in swelling of the infected area.
42. Redness, swelling, pain & heat.
43. Histamine increases the flow of blood to the infected area. This causes the redness and heat. Histamine medical aid.
3. Elevate wounded body part. 4. Immobilise body part that is bleeding. 5. Treat for shock. 6. Seek

40. a) The term given to the condition where there is an insufficient blood supply to the body's vital tissues. b) External or internal loss of blood (bleeding).

Tooth type	Total number	Description	Function
Incisors	8 (4 in each jaw)	Chisel shaped crown	Cutting and biting
Canines	4 (2 in each jaw)	Conical shaped crown	Ripping and tearing
Premolars	8 (4 in each jaw)	Square shaped crown with 4+ cusps	Chewing, crushing and grinding
Molars	12 (6 in each jaw)	Square shaped crown with 4+ cusps and 2+ roots	Chewing, crushing and grinding

4.

3. a) Incisors. b) Canines. c) Premolars. d) Molars.

the stomach by the churning of the food (chyme) due to muscular contraction.

2. Mechanical digestion takes place in the mouth the teeth act in combination with the lips and tongue. The various teeth cut, bite, tear, rip, crush and grind food into smaller particles. Mechanical digestion also occurs in the digestive tract.

e) The breakdown of food by digestive juices and enzymes into soluble components.

d) The break down of food by the action of the mouth (teeth, tongue lips) and the chewing action of the alimentary canal into smaller particles. Decrease in particle size and increase surface area.

c) The expulsion from the alimentary canal of the undigested remains of food.

b) The process by which insoluble food (large particles) is broken down into soluble components (small molecules).

1. a) The act of taking food into the alimentary canal through the mouth.

Digestive System answers

1. Respiratory. 2. Ventilation. 3. Nasal cavity. 4. Gills. 5. Olfactory. 6. Mucus. 7. Pharynx. 8. Larynx. 9. Vocal cords. 10. Loudness. 11. Pitch. 12. Epiglottis. 13. Trachea. 14. Bronchi. 15. Bronchioles. 16. Inspiration. 17. Expiration. 18. Plueral. 19. Intercostal. 20. Diaphragm. 21. Alveoli. 22. Ribs. 23. Carbon Dioxide. 24. Oxygen. 25. Bicarbonate ion. 26. Carboxyhaemoglobin. 27. Bright red. 28. Lung. 29. Emphysema. 30. Phenomata. 31. Asthma. 32. Diffusion. 33. Concentration gradient. 34. Oxygen. 35. Deoxygenated. 36. True. 37. Decrease. 38. Down. 39. Danger. 40. Oxygen.

Respiratory System Terminology Answers

Lung cancer	Uncontrolled division of cells within the respiratory system causes mutations and irritants and result in formation of tumor.	Changes in mucus production in lungs cause irritation and result in formation of tumor.	An increase in mucus secretion in bronchus/ infection increases mucus accumulation leading to built up.	Bronchitis	An increase in mucus secretion in bronchus/ infection increases mucus accumulation leading to built up.	Decrease in mucus production due to carbon monoxide exposure to irritants.	Reduction of oxygen carrying capacity of blood due to carbon monoxide poisoning.	Carbon monoxide	Removal from source.	Decrease in oxygen carrying capacity of blood due to carbon monoxide poisoning.	Death due to burning of fuel.	Increase in monoxide concentration with haemoglobin resulting in oxygen.	more readily.	The expulsion from the alimentary canal of the undigested remains of food.	c) The break down of food by the action of the mouth (teeth, tongue lips) and the chewing action of the alimentary canal into smaller particles. Decrease in particle size and increase surface area.	b) The process by which insoluble food (large particles) is broken down into soluble components (small molecules).	a) The act of taking food into the alimentary canal through the mouth.
Malaria	12 (6 in each jaw)	Square shaped crown with 4+ cusps and 2+ roots	Square shaped crown with 4+ cusps and 2+ roots	Tooth type	3. a) Incisors. b) Canines. c) Premolars. d) Molars.												
Parasites	8 (4 in each jaw)	Square shaped crown with 4+ cusps and 2+ roots	Square shaped crown with 4+ cusps and 2+ roots														
Ameloblasts	4 (2 in each jaw)	Conical shaped crown	Conical shaped crown														
Incisors	8 (4 in each jaw)	Chisel shaped crown	Chisel shaped crown														
Canines	4 (2 in each jaw)	Root	Root														
Premolars	8 (4 in each jaw)	1 root	1 root														
Molars	12 (6 in each jaw)	2+ roots	2+ roots														

14. a) Mouth: Mechanical digestion (teeth) and chemical digestion (salivary glands).
 b) Salivary Glands: Production of saliva, lubrication and amylase.
 c) Pharynx: Joins mouth and oesophagus.
 d) Oesophagus: Connects pharynx and stomach.
 e) Epiglottis: Covers trachea during swallowing.
 f) Teeth: Mechanical digestion cut, rip, bite, tear, crush, grind and chew food into smaller pieces.
 g) Tongue: Moves food around mouth during mastication.
 h) Stomach: Site for mechanical digestion, chemical digestion of proteins, absorption of some substances.
 i) Duodenum: Site for mechanical digestion, secretion of bile and pancreatic juice.
 j) Jejunum: Site of chemical digestion, absorption of bile and pancreatic juice.
 k) Ileum: Site of absorption of soluble food molecules.
 l) Large intestine (Colon): Absorption of water.
 m) Appendix: No specific function, vestigial organ.
 n) Rectum: Stores faeces, muscular movements during defecation, reabsorption of water.
 o) Anus: Final opening of the alimentary canal, site of defecation.
 p) Gall Bladder: Stores bile and secretes the bile into the duodenum.
 q) Pancreas: Stores digestive enzymes and hormones insulin and glucagon.
 r) Liver: Stores glucose as glycogen, produces bile.
 s) Cecum: Joins small intestine to large intestine- no specific function.
 d) Capillary network: Efficient capillary network continually removes absorbed nutrients, Lacteal for fats/
 fatty acids/Glycerol.
 15. a) Mucosa, b) Submucosa, c) Peritoneum, d) Muscle, e) Villi, f) Epithelial cell, g) Capillary network, h)
 Central lacteal, i) Blood vessel.
 16. a) Long length: Increased time of contact between chyme and intestinal wall.
 b) Large surface area due to villi, microvilli and circular folds and long lengths.
 c) Thin, moist walls to facilitate diffusion.
 d) Capillary network: Facilitate diffusion.
 e) Large area as it can take place against a concentration gradient and is faster and more complete diffusion.
 f) A small amount of water is absorbed by osmosis into the villi and passes into the capillaries of the capillary. Active transport is used as it can take place against a concentration gradient and is faster and more complete diffusion.
 g) Villi is a passive process.
 h) Fatty acids along with glycerol are absorbed by diffusion into the villi. They then combine to form a triglyceride (fat). This is then coated in a layer of protein to form a chylomicron. This then enters the villi. This is a passive process.
 i) Fatty acids are absorbed by diffusion into the villi and passes into the capillaries of the villi of the villi.
 j) The release of a substance (juice/enzyme) from a cell or gland into the alimentary canal.
 17. a) Great length (6-7 metres).
 b) Circular folds of mucosa.
 c) Villi (small finger like projections of the mucosa).
 d) Microvilli (microscopic hair like projections on villi).
 e) Villi are absorbed by osmosis into the villi and passes into the capillaries of the capillary.
 f) Active transport is used as it can take place against a concentration gradient and is faster and more complete diffusion.
 g) Villi is a passive process.
 h) The emptying of the faeces contained in the rectum through the anal sphincter.
20. a) A diet high in salt is a contributor towards hypertension (high blood pressure). Hypertension itself is a contributing factor towards cardiovascular diseases.
- b) A diet low in soluble or insoluble fibre can contribute to a number of diseases/disorders ranging from diverticulitis to haemorrhoids and bowel cancer.
- c) A diet high in refined sugars can lead to conditions varying from tooth decay and obesity to the aggregation of diabetes.
- d) A diet high in saturated fat can lead to a number of conditions including cardiovascular disease to obesity and bowel cancer.
- e) A diet that results in a excess of kilojoules to that needed to maintain body function, can result in the person becoming over weight or obese.

8. a) Removal of wastes like urea from blood plasma. b) Control of water levels in blood plasma. c) Control of electrolyte levels (Na^+ , Ca^{2+} , Cl^- etc.). d) Helps control pH levels.
9. a) Right kidney. b) Renal vein. c) Ureter. d) Aorta. e) Renal artery. f) Left kidney. g) Inferior vena cava. h) Bladder. i) Ureters.
10. a) Supplies blood to kidney. b) Takes blood away from kidney c) Carries urine to bladder. d) Takes urine from bladder to the outside of the body. e) Stores urine.
11. a) Capsule. b) Pelvis c) Calyx. d) Cortex e) Cortex f) Renal artery (g) Ureter. h) Medulla (pyramids).
12. 1) Capsule. 2) Cortex. 3) Medulla. 4) Calyx. 5) Pelvis. 6) Ureter. 7) Renal vein. 8) Renal artery.
13. a) Different arteriole. b) Glomerulus. c) Filtration capsule (Bowmans). d) Proximal convoluted tubule. e) Capillary. f) Loop of Henley. g) Different arteriole. h) Venule (leads to renal vein). i) Distal convoluted tubule. j) Collecting duct.
14. a) Glomerulus - Works in conjunction with the filtration (Bowmans) capsule to filter the blood. Large substances like red and white blood cells and proteins (which are too large to pass through the membrane of the glomerulus and capsule) remain in the bloodstream and small molecules like water, glucose, salts, amino acids, urea, hormones, etc. pass through the membrane into the capsule.
15. Washing hand before preparing food, eating and providing first aid. Washing hand after sneezing, coughing, using the toilet. Avoiding sneezing or coughing over other people, surfaces or food. Avoiding contact with body fluids such as blood. Avoiding contact with objects such as used needles. Not sharing items with others that may contain traces of body fluids or tissue.
16. The skin is a flexible but tough barrier. The layer of dead epidermal cells prevents microbes from entering. The constant shedding of cells dislodges microbes that do attempt to enter. Sweat and oils contain lysozyme that provides a chemical barrier to microbes.
17. A topical preparation is a liquid or cream such as an ointment or gel that is applied to the skin. Topical preparations can be used to protect the skin e.g sun cream, prevent infections e.g antibiotic cream; or improve the appearance of the skin e.g cosmetics.
18. a) 1) Trachea/bronchi - narrow and curved passages. 2) Nasal cavity - Hairs and mucus. 3) Skin - Impervious barrier. 4) Urethra - Flow of urine. 5) Ear - sticky wax. 6) Tears - Flushing effect. 7) Mouth - Saliva washes away microbes. 8) Mucous membranes - trap microbes. b) 1) Ear - wax inhibits growth of microbes. 2) Stomach - HCl kills microbes. 3) Vagina - Acidic environment inhibits microbes. 4) Eyes - Saliva washes away microbes. 5) Mouth of urine. 6) Tear - sticky wax. 7) Mouth - lysozyme in tears inhibits microbes. 8) Saliva - lysozyme inhibits microbes.

7. Meiosis occurs in the testes and ovaries and is involved in the formation of gametes. Four cells are produced which are haploid and contain 23 chromosomes. Mitosis occurs anywhere in the body where growth and repair takes place. It produces two daughter cells which are diploid and contain 46 chromosomes.
8. a) During metaphase I the 'legs' of chromosomes become tangled or cross over each other. These points are termed chiasmata, sometimes the DNA at these chiasmata breaks and chromatids from different chromosomes rejoin. This results in unusual combinations of genes being formed. b) During metaphase I when homologous pairs of chromosomes line up there are multiple ways of combinations that can occur. These different combinations result in different combinations of alleles in the gamete. c) Sometimes in anaphase I and anaphase 2 the spindle fibres break. This results in more than one chromosome ending up in the final cell produced. This results in some cells having excess genes and other lacking particular genes combinations. d) Due to crossing over, random assortment and other lacking particular genes combinations itself and the recessive allele will be masked.
9. a) $23 + 23 \rightarrow 46$ (b) $Y + X \rightarrow XY$, $X + X \rightarrow XX$.
10. a) alleles. b) When a characteristic is controlled by alleles of only one gene pair. c) Phenotypes are in distinct groups (little variation). d) ABO blood groups, tongue rolling, PTC, albinism, ear lobes, plus others.
11. Dominant alleles 'over-ride/mask' the effect of recessive alleles. In a heterozygous genotype the dominant allele will express itself and the recessive allele will be masked.
12. Heterozygous - Genotype has a pair of different alleles for a characteristic. Homozygous - Genotype has a pair of similar alleles for a characteristic.
13. Capital, Lower case.
14. a) i) BB, ii) bb, iii) Bb. (b) If the person is heterozygous then the genotype will be (Bb) and as the brown gene is dominant the brown eye colour will be expressed. c) i) Bb. 50% B, 50% b. ii) BB. 100% B. iii) bb. 100% b.
15. a) F1 Genotypes 100% BB, F1 Phenotype 100% brown. b) F1 Genotype 50% BB, 50% Bb, F1 Phenotype 100% brown. c) F1 Genotypes 50% Bb, 50% bb F1 Phenotypes 75% brown, 25% blue. d) F1 Genotypes 25% BB, 50% Bb, 25% bb F1 Phenotypes 50% brown, 25% blue. e) This is only an expected outcome, variations may occur due to chance random fertilisation.
16. F = free, f = attached. man = Ff, woman = ff. Genotypes - 50% Ff, 50% ff. Phenotypes - 50% free, 50% attached.
17. A = astigmatism, a = normal. man = aa, woman = AA. Genotypes - 50% AA, 50% aa. Phenotypes - 50% astigmatism, 50% normal.
18. a) Br(b) rr(c) rr(d) rr(e) Rr.
19. a) A woman homozygous for straight hair. Most chance of producing straight hair if man is heterozygous, this is an example of a test cross.
20. The alleles are equally dominant. Both alleles are expressed in heterozygous genotypes.
21. a) 1. Homozygous. 2. Haemoglobin type A. 3. Heterozygous. 4. Haemoglobin type A and S. 5. Homozygous. Disadvantages: (i) blood can't carry as much oxygen. (ii) Hba Hbs x Hba Hbs produces some HbHbs type A, 50% type A and S, 25% type S. (c) Advantages: (i) makes individuals more resistant to malaria. 50% type A and S, 25% (ii) F1 Genotype 50% HbAHbA, 50% HbAHb, F1 Phenotypes 25% HbSHbS, 25% HbAHb, F1 Phenotypes 50% type A. 6. Haemoglobin type S. (b) (i) F1 Genotypes 50% HbAHb and 50% HbAHbA, F1 Phenotypes 50% type A and S. (ii) F1 Genotypes 50% HbAHbA, 50% HbAHb, F1 Phenotypes 50% type A and S. (iii) HbSHbS produces some HbHbs offsprings that die at an early age.

6. A karyotype is a photo/drawing of the full complement of a cell's chromosomes arranged in homologous pairs. Karyotypes are used to determine sex by observing the appearance of the sex chromosomes e.g. XX, female, XY, male. Karyotypes can also indicate the presence of disorders due to extra or missing chromosomes.
5. Mutations can be (i) silent e.g. there is no observable effect in the phenotype; (ii) beneficial e.g. a mutant is produced that has an altered structural, functional or behavioural characteristic that is advantageous to its survival; (iii) negative e.g. the mutant has characteristics that are disadvantageous; (iv) lethal, the changes are so negative that the organism does not survive.
4. Somatic mutations are mutations that occur in body cells. Only the cell where the mutation occurred and cells that arise from it are affected. Germ-line mutations occur in the gonads and as a result can be passed onto offspring.
3. Mutagenic agents or mutagens increase the normally slow rate of mutations. Common mutagens include chemicals e.g. formaldehyde and ionising radiation e.g. x-rays.
2. In a gene mutation only the bases of a particular gene are affected. In a chromosome mutation all or part of a chromosome is involved meaning many genes are affected.
1. A mutation is a sudden permanent change in the bases that make up DNA. An organism that has observable characteristics caused by the mutation is termed a mutant.

Mutations, Variation and the Environment Answers

1. Pedigree. 2. Shading. 3. A line through the symbol. 4. Autosomal. 5. Reccessive. 6. Shared. 7. Sons.
8. Mitochondria. 9. Amniocentesis. 10. Chorionic villus sampling. 11. Human Genome Project.

Pedigrees, Genetic Testing and the Human Genome Project Terminology Answers

13. Scientists from all over the world cooperated to map all of the genes on the 46 human chromosomes. It took 13 years and mapped the sequence of the bases that make up the human genome easier and faster to complete.
12. Chorionic villus sampling involves the removal of a small part of the chorion foetal membrane and an examination of the cells. Its advantage over amniocentesis is that it can be carried out from 9 weeks and it identifies disorders such as PKU, muscular dystrophy, Down syndrome and cystic fibrosis.
11. Amniocentesis involves the insertion of a needle into the amniotic cavity to remove a sample of amniotic fluid. Cells from the fetus floating in the fluid can be examined for abnormalities in chromosome number and structure. The cells can also be screened for biochemical problems. Amniocentesis can be used to identify disorders such as PKU, muscular dystrophy, Down syndrome and cystic fibrosis.
10. A person's mitochondrial DNA is inherited solely from their mother. The nucleus of the fertilised egg or zygote contains DNA from the father via the sperm and the mother. The mitochondria within the ovum are only from the mother. This allows geneticists to trace people's ancestry.
9. Mitochondrial DNA is formed into 5-10 small circular molecules that together carry 37 genes.
8. a) rr, Red. b) Rr or RR, Normal. c) rr, Red. d) Rr, normal.

4. a) Primary sex organ (testis or ovary). b) First cell produced by the combination of sperm and ovum. c) Sex organs that produce gametes. d) Organs required for reproduction under natural conditions but do not produce gametes.
3. The passing of genes on chromosomes in gametes from parents to offspring.
2. All organisms have a limited lifespan therefore reproduction is important for the survival of the species.
5. a) Physical differences in structure between sexes. So sexes can be easily distinguished.
6. A) Uterer. B) Bladder. C) Pelvis. D) Urethra. E) Erectile tissue. F) Foreskin. G) Testis. H) Seminal Vesicles. I) Prostate. J) Bulbo-urethral Gland. K) Vas deferens. L) Epididymis. M) Scrotum.
7. a) Ureter — transports urine from the kidney to the bladder. b) Bladder — stores urine c) Pelvis — protects acids from urine and vaginal secretions. j) Bulbourethral Gland — secretes a fluid that acts to lubricate the urethra. k) Vas deferens — conveys sperm from the epididymis to the urethra. l) Epididymis — Storage of sperm until they mature. m) Scrotum — holds and protects testes also raises and lowers the testes to keep them at the correct temperature. n) Penis — when erect is placed inside the vagina and helps to transport semen from the male to the female. o) Seminal vesicles — Make up testes and are the site of sperm production.
8. A) Fimbriae. B) Endometrium. C) Cervix. D) Rectum. E) Vagina. F) Labia. G) Clitoris. H) Urethra. I) Bladder. J) Uterine Tube. (Fallopian tube) K) Ovary. L) Pelvis. M) Uterus. N) Anus.
9. a) Fimbriae — contract to help to guide ovum into the uterine tube. b) Uterus — place for growth and development of the embryo. Contracts during labour to push out the baby. c) Cervix — joins uterus and vagina, sperm passes through here to get to the fallopian tube. Holds developing foetus in the uterus.
10. a) Form of cell division that is responsible for the production of gametes — four haploid cells produced. b) Production of gametes which contain half the normal chromosome number. c) Production of sperm in seminiferous tubules. d) Production of ova in ovary. e) Cell containing half the normal number of chromosomes in a chromosome (n). f) Cell where chromosomes exist in pairs, the normal number of chromosomes in a somatic cell (2n).
11. No answer supplied.
12. No answer supplied.
13. Spermatogenesis. i) Takes place in testis. ii) Takes place continually after puberty. iii) Four sperm produced per oogonia. iv) Takes place in ovaries. v) Takes place every 25 days after puberty. vi) One ovum produced spermatogonia. vii) Constitant production of spermatocytes.
14. Sexual stimulation (mental, physical) → increased blood supply to erectile tissue → increased blood pressure in penis → penis becomes rigid.
15. Semen consists of sperm produced in the seminiferous tubule and seminal fluids produced by the seminal vesicles, prostate gland and bulbourethral gland.

1. a) The fertilised ovum (combination of ovum and sperm) from which a new individual develops. b) A solid mass of cells produced as a result of multiple divisions of a fertilized ovum. c) Hollow ball of cells formed during early embryonic period.

Differentiation & Development Answers

1. Fertilisation. 2. Reproduction. 3. Gametes. 4. Haploid. 5. Zygote. 6. Sexual. 7. Dimorphism.
 8. Spermatogenesis. 9. Menstrual. 10. Ova. 11. Scrotum. 12. Seminiferous. 13. Firmbrace. 14. Bladder.
 15. Ovary. 16. Oogenesis. 17. Uterus. 18. Interstitial. 19. Epididymis. 20. Vas Deferens. 21. Seminal.
 22. Prostate. 23. Bulbo-urethral. 24. Semen. 25. Foreskin. 26. Vagina. 27. Cervix. 28. Endometrium.
 29. Clitoris. 30. Labia. 31. Diploid. 32. Ovarian. 33. Puberty. 34. Menarche. 35. Menopause. 36. Ovulation.
 37. Menstruation. 38. FSH. 39. LH. 40. Hypothalamus. 41. Negative. 42. Meiosis.

Reproductive Systems Terminology Answers

37. No answer supplied

- (a) Follicle, Corpus Luteum and Oestrogen
 (b) Endometrium, LH-rf and LH
 (c) Follicular fluid and Oestrogen
 (d) Progestrone
 (e) Hypothalamus
 (f) Ovum
 (g) Fertilised
 (h) Negative feedback
36. a) Hypothalamus, FSH-rf and Oestrogen
 b) Endometrium, LH-rf and LH
 c) Follicular fluid and Oestrogen
 d) Progestrone
 e) Hypothalamus
 f) Ovum
 g) Fertilised
 h) Negative feedback

35. No answer supplied.

Stage	DURATION	MAJOR OCCURRENCES	PRE-MENSTRUATION	MENSTRUATION	OVULATION	SECRETION	PRE-OVULATION	ENDOMETRIUM
			Decrease oestrogen and progesterone.	Menstruation (8 days)	Release of ovum from mature follicle.	Release of corpus luteum.	Increase in FSH and oestrogen.	Decay 21-28
			Increase progesterone.	Day 15-20 (6 days)	Development of corpus luteum.	Development of mucous.	Uterus lining increases.	Day 21-28
			Decrease progesterone.		Release of ovum from mature follicle.	Secretion of mucous.	Release in FSH.	
			Decrease oestrogen and progesterone.		Uterus lining bleeds.	Uterus bleeds.	Uterus lining increases.	
			Increase in FSH, oestrogen and progesterone.	Day 1-5 (5 days)	Endometrium repairs.	Shedding of endometrium.	Uterus bleeds.	
			Increase in FSH, oestrogen and progesterone.		Endometrium repairs.	Uterus lining increases.	Development of follicle.	
			Increase in FSH and oestrogen.	Day 5-12 (8 days)	Uterus lining bleeds.	Secretion of mucous.	Increase in FSH.	
			Increase in FSH and oestrogen.		Release of ovum from mature follicle.	Development of corpus luteum.	Release of ovum.	
			Release of ovum from mature follicle.	Day 14 (1 day)	Release of ovum from mature follicle.	Secretion of mucous.	Release of ovum.	
			Release of ovum from mature follicle.		Release of ovum from mature follicle.	Development of corpus luteum.	Release of ovum.	
			Release of ovum from mature follicle.		Release of ovum from mature follicle.	Development of corpus luteum.	Release of ovum.	
			Release of ovum from mature follicle.		Release of ovum from mature follicle.	Development of corpus luteum.	Release of ovum.	
			Release of ovum from mature follicle.		Release of ovum from mature follicle.	Development of corpus luteum.	Release of ovum.	

34.

33. a) Menstruation. b) Pre-ovulation. c) Ovulation. d) Secretion. e) Pre-menstruation.

32. a) Primary follicle. b) Developing follicle. c) Mature follicle. d) Ovulation. E) Ova. F) Corpus luteum.

in women when they cease to menstruate.

31. Menarche happens at some stage during puberty and is the start of menstruation. Menopause is the time

over approximately 28 days.

30. The menstrual cycle occurs in the uterus and is the breakdown and build-up of the endometrium over 28 days. The ovarian cycle occurs in the ovary and is the development of follicles, ova and a corpus luteum over approximately 28 days.

29. A - Lymphoid, B - Nervous, C - General, D - Reproductive.
28. a) Rooting reflex - If either cheek is touched the baby turns its head in the direction of the touch. This enables it to find the nipple of its mother's breast and together with the sucking reflex enables it to obtain food. b) Grasp reflex - A baby will automatically grasp an object placed in their hand. c) Walking reflex - A baby is held with its feet touching the ground and moved forward it will perform walking movements. d) Startle reflex - When startled, a baby throws out its arms and legs, then pulls them back with the fingers covered as it to catch hold of something. e) Resting position - When resting on its back, a newborn baby lies with its head to one side, with the arm and leg of that side extended and the opposite arm and leg bent. f) Steppage reflex - If a baby is held with the front of one leg in contact with an object, it will raise its other leg and as it to step onto the object.
27. Genetic composition will set the limits of growth and development but the environment can grow and develop differently due to variation in environmental factors e.g. diet and exercise. What the final characteristics will be. For example identical twins with identical genetic composition can ensure her diet is balanced, so her milk contains all of the nutrients for normal development. Development depends on the child's postnatal diet. Breast milk is recommended and the mother has to ensure her diet is balanced, so her milk contains all of the nutrients for normal development. d) Normal growth and in a clean, dry and warm environment to reduce the chance of infection. c) Newborns are prone to infections and must be kept hot conditions. b) Newborns are prone to losing water particularly in hot conditions parents must make sure fluid intake is sufficient to compensate for this. c) Newborns are prone to infections from the lungs to the left atrium this increases the pressure in the left atrium closing the foramen ovale. The ventricles continue to pump blood into the aorta and pulmonary artery.
26. a) Newborns have a large body surface area to mass, this means that they can lose or gain heat much more rapidly than larger people. Care must be taken to keep babies warm in cold conditions and cool in hot conditions. b) Newborns are prone to losing water particularly in hot conditions parents must make sure fluid intake is sufficient to compensate for this. c) Newborns are prone to infections from the lungs to the left atrium this increases the pressure in the left atrium closing the foramen ovale. The ventricles continue to pump blood into the aorta and pulmonary artery.
25. No answer supplied
24. At birth the umbilical arteries and veins are clamped stopping blood flow through them. Blood flow to the lungs decreases the pressure in the left atrium to the left atrium. The foramen ovale diverts blood from the aorta and pulmonary artery to the left atrium. The ductus arteriosus closes up. As more blood returns from the lungs to the left atrium this increases the pressure in the left atrium to the left atrium. The ventricles continue to pump blood into the aorta and pulmonary artery.
23. Before birth the lungs are not functioning to supply the fetus with oxygen and remove carbon dioxide, this role is carried out by the placenta. The ductus arteriosus and foramen ovale act to reduce blood flow to the lungs. The ductus arteriosus diverts blood from the pulmonary artery to the aorta. The foramen ovale diverts blood from the aorta and pulmonary artery to the left atrium.
22. a) Reproductive organs slowly return to their original state (uterus returns to normal size). b) Abdomen flattens. c) Discharge from slowly shrinking uterus. d) Return of menstruation. e) Onset of lactation.
- | Stage | DURATION | MAJOR EVENTS |
|-----------|---------------|---|
| Expulsion | Av. 20 mins | Contractions force the head into the cervix. Contractions are strong and close together the baby is pushed through the birth canal. |
| Dilation | Av. 8-9 hours | Contractions force the head into the cervix. |
| Placental | 5 mins | Contractions of the uterus push the placenta and umbilical cord through the birth canal. |
21. 20. a) "Show" dislodgement of mucus plug from the cervical canal. b) Onset of labour pains.
19. a) 40% increase in blood volume plus an increase in the circulation rate by an increase in heart rate and stroke volume. b) Increase in blood flow to the lungs and breathing rate to supply extra oxygen to the fetus. c) Digestive system slows down and stomach empties slower causing constipation. d) Mother must maintain a balanced diet. The average pregnant woman needs an increase in her energy intake of about 600kcal per day especially in the second half of pregnancy. Increased intake of protein iron and calcium is also necessary. e) An increase in weight is due to fetus, placenta, amniotic fluid, breast tissue, blood volume increase etc. Optimal weight gain is no more than 500g per week in second half of pregnancy, excess weight can be difficult to lose after birth. f) Intake of drugs should be avoided during pregnancy.

5. a) Ultrasound scans use high frequency soundwaves that 'bounce' off the foetus and body tissues forming an image. The image is in 2D and requires an experienced medical practitioner to be able to detect physical abnormalities in a developing foetus e.g. spina bifida, this process can also be used to determine the sex of the child. b) Footises monitoring involves the use of devices such as ultrasound and electrocardiography to monitor a foetus heart rate. Analysis of the recording may detect oxygen deficiencies in a foetus allowing urgent procedures to be taken to avoid brain damage or death. Typically this is done before and during labour/birth to keep track of the foetus condition during this period. c) In some cases due to high blood pressure or break down of the placenta it is necessary to bring forward a birth. In these cases the expectant mother is given the hormone oxytocin either intravenously or by inhalation. Oxytocin is the hormone that causes the uterus to contract, starting the birth process.

4. A chemical agent or physical device/intervention used to prevent conception.

Assisted reproduction technology	Description	Advantages	Disadvantages
Intrauterine insemination (IUI)	Ova and sperm mixed in a glass dish in the laboratory, in hope that they fertilise, then injected into the womb's uterine tube.	Couples own sperm and egg create embryo. Only 20-30% success rate.	Used for couples with low sperm quality. Increases risk of birth defects.
Gamete intrafallopian transfer (GIFT)	Ova and sperm mixed in a glass dish in the laboratory. After injection into the womb's uterine tube.	Couples own sperm and egg create embryo. Risk of multiple births.	Used for couples with low sperm quality.
Donor ovum	When a woman is implanted with another woman's ovum that has been mixed with her partner's sperm.	Used when ovum of male partner only.	Has genes of male parents.
Donor embryo	A donated embryo is implanted using neither partner's gametes.	Used when both the sperm and ovum are of poor quality.	Has genes of neither parent.
Surrogacy	A woman bears a child for another couple, either using their sperm and ova or her own, or the couple's sperm and her ovum.	Couples sperm or man's sperm and ova can be used.	Some surrogate mothers decide they do not want to give up the child after giving birth. Causing emotional and legal problems.

3.

2. Teratogen causes physical defects in a developing embryo e.g. medicinal drugs, antibiotics, marijuana, thalidomide, some hormones, LSD, anti-tumour drugs, anticoagulants, anti convulsives.

- 1.) Smoking - causes decreases birth weight, increases risk of abortion, link between smoking and SIDS alcohol - can increase risk of foetal alcohol syndrome - symptoms can include lower birth weight, slow growth rate before + after birth, small head, mental retardations, facial deformities, effects of organs e.g heart and limbs. A child may also suffer from behavioural problems e.g. poor attention, hyperactivity.

Environmental Factors and Reproductive Technologies Answers

1. Teratogen. 2. Assisted reproductive technology. 3. In-vitro fertilisation. 4. Gamete intrafallopian transfer. 5. Intracytoplasmic sperm injection. 6. Surrogate. 7. Contractation. 8. Rhythm method. 9. Mechanical barrier. 10. Oestrogen and Progesterone. 11. Interuterine Device. 12. Bacteria. 13. Chancroid. 14. Absence/Condom 15. Chlamydia. 16. Human Immunodeficiency Virus. 17. Herpes.

Environmental Factors and Reproductive Technology Answers

Combined Pill	Contains oestrogen and progesterone only. Reduces incidents of ovarian and uterine cancer. Reliable. No protection against STIs side effects possible.	Reliable, does not contain oestrogen. Contains vaginal mucus thicker, thus preventing sperm entry.	Contraception needed, must be taken daily. Prescription only.	Making vaginal mucus against STIs side effects possible.	Slow release progestrone capsules implanted under skin. Effective and long lasting.	Prescription needed. Relatively cheap, against STIs side effects possible.	Two progestrone tablets that must be taken within 120 hours of intercourse, it other methods have been contraception.	Implanation after pill	Should not be used as a regular form of contraception, it other methods have been contraception or fertilisation or prevention either ovulation, prevent either ovulation, fertilisation or implantation.	Irregular bleeding. Ineffective.	Removal of small section of the uterine tubes, and the remaining general tube ends are sealed off the ends.	Usually irreversible, anaesthetic.	Excellent
Tubal Ligation	Removal of small section of the uterine tubes, and the remaining general tube ends are sealed off the ends.	Permanently irreversible, anaesthetic.	Usually irreversible, general anaesthetic.	Removal of small section of vas deferens open ends are then sealed to prevent passage of sperm.	Removal of a small section of vas deferens general ends are then sealed to prevent passage of sperm.	Usually irreversible, anaesthetic.	Removal of a small section of vas deferens general ends are then sealed to prevent passage of sperm.	Vasectomy	Removal of a small section of vas deferens general ends are then sealed to prevent passage of sperm.	Local anaesthetic.	Usually irreversible, general anaesthetic.	Excellent	
Morning After Pill (Implanon)	Relatively cheap, against STIs side effects possible.	Prescription needed. Relatively cheap, against STIs side effects possible.	Prescription needed. Relatively cheap, against STIs side effects possible.	Two progestrone tablets that must be taken within 120 hours of intercourse, it other methods have been contraception.	Slow release progestrone capsules implanted under skin.	Prescription needed. Relatively cheap, against STIs side effects possible.	Two progestrone tablets that must be taken within 120 hours of intercourse, it other methods have been contraception.	Morning After Pill	Should not be used as a regular form of contraception, it other methods have been contraception or fertilisation or prevention either ovulation, prevent either ovulation, fertilisation or implantation.	Ineffective.	Removal of small section of the uterine tubes, and the remaining general tube ends are sealed off the ends.	Excellent	
Implants	Prescription needed. Relatively cheap, against STIs side effects possible.	Prescription needed. Relatively cheap, against STIs side effects possible.	Prescription needed. Relatively cheap, against STIs side effects possible.	Should not be used as a regular form of contraception, it other methods have been contraception or fertilisation or prevention either ovulation, prevent either ovulation, fertilisation or implantation.	Slow release progestrone capsules implanted under skin.	Prescription needed. Relatively cheap, against STIs side effects possible.	Should not be used as a regular form of contraception, it other methods have been contraception or fertilisation or prevention either ovulation, prevent either ovulation, fertilisation or implantation.	Morning After Pill	Removal of small section of vas deferens general ends are then sealed to prevent passage of sperm.	Local anaesthetic.	Usually irreversible, general anaesthetic.	Excellent	
Contraceptive Implants	Prescription needed. Relatively cheap, against STIs side effects possible.	Prescription needed. Relatively cheap, against STIs side effects possible.	Prescription needed. Relatively cheap, against STIs side effects possible.	Should not be used as a regular form of contraception, it other methods have been contraception or fertilisation or prevention either ovulation, prevent either ovulation, fertilisation or implantation.	Slow release progestrone capsules implanted under skin.	Prescription needed. Relatively cheap, against STIs side effects possible.	Should not be used as a regular form of contraception, it other methods have been contraception or fertilisation or prevention either ovulation, prevent either ovulation, fertilisation or implantation.	Contraceptive Implants	Removal of small section of vas deferens general ends are then sealed to prevent passage of sperm.	Local anaesthetic.	Usually irreversible, general anaesthetic.	Excellent	