

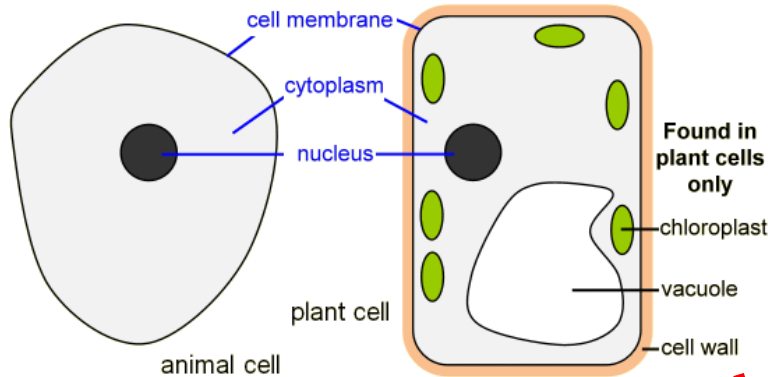
A group of tissue carrying out a particular function for example lungs and heart.

e) Organ system:

Several organs working together for example respiratory system and digestive system.

Chapter 4: Cell Structure

1) Draw and label a plant and an animal cell:



2) What are the functions of the following parts of the cell? (6)

a) Nucleus (2):

It regulates all cell activity. It is where DNA is located.

b) Cytoplasm:

Jelly-like substance where chemical reactions occur.

c) Cell membrane:

Controls what substances can get in and out of the cell.

d) Cell wall:

Made of a tough substance called cellulose, which supports the cell.

e) Chloroplast (2):

Where photosynthesis happens. They contain a green substance called chlorophyll.

f) Vacuole:

Contains a liquid called cell sap, which keeps the cell firm.

3) What are the differences between plant and animal cells? (3)

The plant cell has a vacuole, chloroplasts and a cell wall and the animal cell doesn't.

Chapter 5: Biological Molecules

1) What chemical elements are present in the following? (3)

a) Carbohydrates (3):

Carbon, hydrogen and oxygen.

b) Proteins (4):

B cells (produce antibodies) and t cells.

21) What do lymphocytes help do?

They help destroy bacteria, viruses and other pathogens

22) What are 3 ways that antibodies help?

- They help phagocytes to recognize pathogens.
- They split open pathogens.
- They cause pathogens to stick together.

23) What is the function of blood platelets:

To clot blood.

24) What are the 14 parts of the heart?

Pulmonary artery, pulmonary vein, aorta, vena cava, left atrium, right atrium, left ventricle, right ventricle, bicuspid valve, tricuspid valve, semi-lunar valve, atrio-ventricular valves, sapium, muscle.

25) Where does the blood go in the:

a) Pulmonary Artery:

From the heart to the lungs.

b) Vena cava:

From the head and body to the heart.

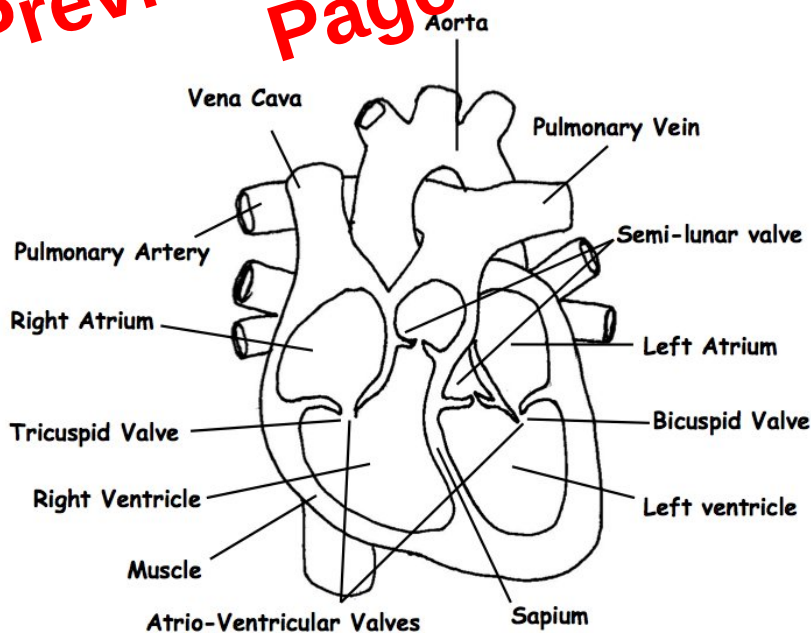
c) Aorta:

From the heart to the head and body.

d) Pulmonary vein:

From the lungs to the heart.

26) Draw and label the heart



27) Describe the 7 steps of blood flow through the heart

- Blood enters the atria (left and right) passively.
- Atrial muscles contract:

The brain and spinal cord and is linked to sense organs by nerves.

26) Why are the reactions so quickly in the nervous system?

Stimulation of receptors in the sense organs sends electrical impulses along the nerves into and out of the central nervous system, resulting in rapid responses.

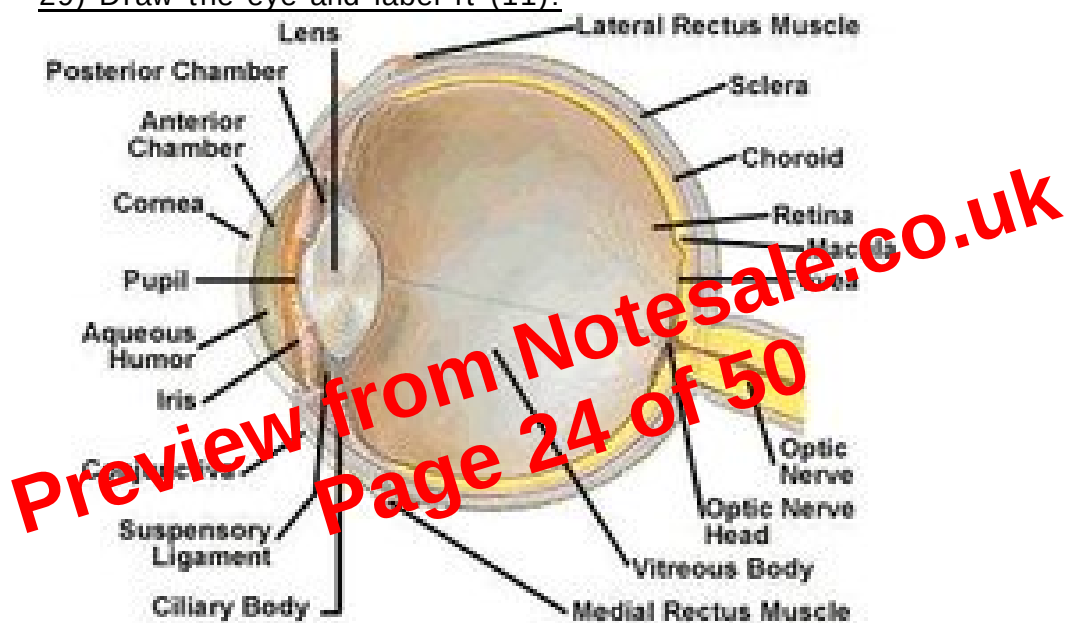
27) What is the stimulus response pathway for a reflex? (7)

Stimulus → Receptor → Sensory nerve → Spinal cord → Motor nerve → Effector → Response

28) Name the 11 parts of the eye:

Ciliary muscles, retina, fovea, optic nerve, blind spot, sclera, choroid, suspensory ligaments, pupil, lens and iris.

29) Draw the eye and label it (11):



30) What are the functions of each of the parts of the eye? (11)

a) Blind spot:

- Area of no receptors.

b) Choroid (2):

- It provides the blood supply to the eye.

- The blood supply gives nutrition to the various parts of the eye.

c) Ciliary muscle:

- It changes the shape of the lens so you can focus on things up close or far away.

d) Fovea:

- It gives the sharpest vision.

e) Iris:

- It controls the amount of light that enters the eye by changing the pupil's diameter.

f) Optic nerve:

- It connects the retina to the brain.

g) Retina:

They contain rods, which are used for peripheral vision and night vision and cones which require bright light and provide fine detail and colour vision.

h) Sclera (2):

- It maintains the shape.

- It also provides a firm anchorage for the extra ocular muscles.

i) Lens (3):

- It is transparent to provide a clear medium through.

- It focuses a sharp image of an object on the retina.

- It provides clear images of objects over a wider range of distances.

j) Suspensory ligaments (2): it holds the lens in its position and changes its focus.

k) Pupil:

- The size of it regulates the amount of light entering the eye.

31) What happens to the lens when there is near vision? (3)

- Ciliary muscles contract, so they move closer to the centre.

- Suspensory ligaments loosen, so there is no tension on the lens.

- This allows the lens to become thicker and more rounded.

32) What happens to the lens where there is distance vision? (3)

- Ciliary muscles relax, so they move away from the centre.

- Suspensory ligaments stretch/tighten, to they place tension on lens.

- Stretches the lens to become thinner and longer.

33) What are the sources, targets and effects of the following hormones? (6)

a) ADH:

-Source:

Pituitary.

-Target:

Collecting duct (nephron).

-Effects:

Makes collecting ducts more permeable.

b) Adrenaline:

-Source:

Adrenal glands.

-Target (2):

-Heart.

-Breathing centre.

-Effects (2):

-Increases heartbeat.

- Fertilization takes place.
- Gametes are involved.
- Mixing of hereditary material.
- Asexual (5):
- Single parent.
- Offspring are genetically identical to each other and to their parent.
- No internal or external fertilization.
- No gametes.
- No mixing of hereditary material.

2) What is fertilisation? (4)

It is the fusion of a male and female gamete, to produce a zygote that undergoes cell division and develops into an embryo.

Reproduction in flowering plants:

3) For each feature give the right information on an insect-pollinated flower and a wind-pollinated flower (7):

a) Position of stamens (2):

- Insect-pollinated:

Inside petals so insect come into contact with them.

- Wind-pollinated:

Outside petals, so wind can blow pollen away.

b) Position of stigma (2):

- Insect-pollinated:

Inside petals so insect come into contact with them.

- Wind-pollinated:

Outside petals, to catch pollen blowing in the wind.

c) Type of stigma (2):

- Insect-pollinated:

Sticky, so pollen grains attach

- Wind-pollinated:

Feathery and sticky to catch pollen blowing in the wind.

d) Size of petals (2):

- Insect-pollinated:

Large to attract insects.

- Wind-pollinated:

Small.

e) Colour of petals (2):

- Insect-pollinated:

Bright to attract insects.

- Wind-pollinated:

In the nucleus and small amounts are found in mitochondria and chloroplasts.

3) What is DNA made of? (2)

Nucleotides (monomers).

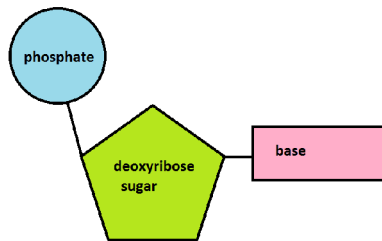
4) What is the name given to lots of nucleotides joined together? (2)

Polynucleotide (polymer).

5) What is a nucleotide made up of?

A phosphate, a sugar and a base.

6) Draw a nucleotide:



7) How do the sister strands of the DNA molecule run? (2)

In opposite direction (anti-parallel).

8) Where are they joined?

By the base.

9) What are the 4 types of bases in DNA?

Adenine (A), Thymine (T), Guanine (G) and Cytosine (C).

10) What are the pairing rules of the bases? (2)

A binds to T and G binds to C.

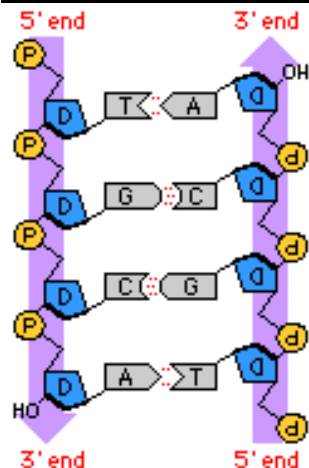
11) What are the bases joined by?

By hydrogen bonds.

12) What does the DNA molecule form?

A double helix structure.

13) Draw two chains of polynucleotides together:



14) What two things cause variation?

Genetic or environmental causes.

- To produce biodegradable plastics.

Chapter 22: Cloning

1) What is micro-propagation?

Tissue culture.

2) Describe the process of micro-propagation:

- Micro-propagation involves taking tiny amounts of tissue from a plant (called explants).
- This is grown in a special nutrient media.
- The plant tissue is supplied with hormones and all the minerals it needs to produce huge amounts of tiny new shoots.
- These are transferred to compost in a greenhouse until they become establish plants.

3) What are the advantages of micro-propagation?

- Large numbers of genetically identical plants can be reproduced rapidly.
- Species that are hard to grow in other ways can be propagated.
- Genetic modification can be made in a small number of plants, which then give thousands of plants carrying the desired change.
- Tiny plants can be stored until needed.
- Plants can be produced at any time of the year.

4) How was Dolly the sheep created?

- Cell taken from the udder of an adult sheep, and the diploid nucleus taken.
- Unfertilised egg cell taken and the nucleus removed.
- Nucleus from the udder cell inserted into unfertilised egg cell.
- This was given a tiny electric shock, which started its dividing.
- The cell developed into an early embryo.
- Combined cell placed into the womb of another sheep to develop.
- There it grew and developed into Dolly.

5) Which sheep was the cloned lamb born genetically identical to?

The adult sheep, from which the cell was taken from the udder.

Extra Questions:

1) In the experiment to investigate Carbon Dioxide production by yeast via anaerobic respiration, what is the oil layer for?

So the oxygen does not come in, and so that the fungi only respire anaerobically not aerobically.

2) What are the following variables? Name an example of each. (3)

a) Dependent variable:

What you measure in the experiment, for example the amount of

15) Give an example of a desired characteristic developed by selective breeding in a named crop plant.

Short stem in wheat.

16) What are the uses of fat in human body?

For energy and it keeps the body insulated.

17) Fill in this table for starch and glucose:

	Soluble in water	Found in animal cells	Broken down by amylase	Small molecule	Absorbed in stomach
Starch	No	No	Yes	No	No
Glucose	Yes	Yes	No	Yes	No

18) What is insect-pollination?

The transfer of pollen by insects from an anther to a stigma.

19) What is the stimulus response pathway? Write it for when you see your friend and wave at him.

Stimulus → Receptor → Sensory neurone → Brain (relay neurone) → Motor neurone → Effector → Response.

Light → Retina → Optic nerve → Brain (relay neurone) → Motor neurone → Muscles in arm → Wave of hand.

20) What is the stimulus response pathway for a reflex? Write it for when you blink when an object is approaching your eye.

Stimulus → Receptor → Sensory neurone → Spinal Cord (relay neurone) → Motor neurone → Effector → Response.

Light → Retina → Optic nerve → Spinal cord (relay neurone) → Motor neurone → Ciliary muscles → Blink of eye.

21) Explain how synapses work. (5)

- An electrical impulse travels along an axon.
- This triggers the nerve ending of a neuron to release chemical messengers called neurotransmitters.
- These chemicals diffuse across the synapse (the gap) and bind with receptor molecules on the membrane of the next neuron.
- The receptor molecules on the second neuron bind only to the specific chemicals released from the first neuron.
- This stimulates the second neuron to transmit the electrical impulse.

22) What do the following vitamins do and name three sources of each:

a) Vitamin A:

- Needed for good vision and healthy skin.
- Green and yellow vegetables.

b) Vitamin C:

- Protects cells for healthy skin and prevents scurvy.
- Citrus fruits