Y9 Triple

Biology Cells Topic

Science homework booklet

Core questions

How to use:

1 – **Copy** the answers once into your **knowledge organiser** to help you to learn them.

2 – Fold the page in **half** so that you can only see the questions, and write the answers out **again from memory**.

3 – Show your knowledge organiser to your teacher on the specified due date. You should show them **TWO** sets of answers to each question.

That's it!

Teacher's name: _____

Core questions – Biology unit 1 – Cell biology

Due Date:_____

No.	Question	Answer
1	What is the structure eukaryotic cell?	Have a cell membrane, cytoplasm and genetic material enclosed in a nucleus
2	What types of organisms contain eukaryotic cells?	Animal and plant cells
3	What is the structure of a prokaryotic cell?	Contain cytoplasm, cell membrane, cell wall, genetic material **not** enclosed in a nucleus, rings of DNA called plasmids
4	What types of organisms contain eukaryotic cells?	Bacteria
5	What is a sub-cellular structure?	Structures within the cell
6	What sub-cellular structures do animals cells have?	nucleus, cytoplasm, cell membrane, mitochondria, ribosomes
7	What additional sub-cellular structures do plants cells have that animal cells don't?	cell wall, chloroplasts, permanent vacuole
8	What is the function of the nucleus?	Contains genetic material (DNA) which controls the cell's activities
9	What is the function of the cytoplasm?	Jelly-like substance where most chemical reactions happen
10	What is the function of the cell membrane?	Surrounds the cell and controls movement of substances in and out

Due Date_____

11	What is the function of the mitochondria?	Part of the cell where energy is **released** from glucose
12	What is the function of the ribosomes?	Makes proteins
13	What is the cell wall made of?	Cellulose
14	What is the function of the cell wall?	Provides structure and support
15	What is the function of the chloroplasts?	Where photosynthesis occurs
16	What substance is contained in the chloroplasts that absorbs light?	Chlorophyll
17	What is the function of the vacuole?	Contain cell sap, a solution of sugar and salts
18	How do we observe cells?	Using a microscope

Due Date_____

19	What is a light microscope?	A microscope that uses visible light and lenses
20	What are the key features of a light microscope?	Stage, objective lens, eye piece lens, focus adjustment, light source
21	What is an electron microscope?	A microscope that uses electrons and electron lenses
22	What is magnification?	How many times bigger than it actually is
23	What is resolution?	Minimum distance apart that two objects can be in order for them to be seen as separate objects
24	What are the advantages of using an electron microscope compared to a light microscope?	Higher magnification and resolution
25	How is magnification calculated?	magnification = image size / actual size
26	What does the prefix milli mean?	Thousandth of a metre (x 10^{-3}m)
27	What does the prefix micro mean?	Millionth of a metre (x 10^{-6}m)
28	What does the prefix nano mean?	Billionth of a metre (x 10^{-9}m)
29	What is the relationship between the prefixes milli, micro and nano?	1000 times smaller each time

Due Date_____

30	Why do cells differentiate?	The process by which a cell changes to become specialised for a particular job
31	When does most cell differentiation happen in animals?	At an early stage of development (as a foetus)
32	What is cell division mainly used for in mature animals?	Repair and replace cells
33	When does cell differentiation occur in plants?	Most plant cells retain the ability to differentiate throughout the life of the plant
34	What is a specialised cell?	A cell that has a structural adaptation to perform a particular function
35	What are 3 examples of specialised cells in animals?	Sperm cells, nerve cells & muscle cells
36	How is a sperm cell specialised to carry out its function?	Long tail and streamlined head to swim; lots of mitochondria to provide it with energy
37	How is a nerve cell specialised to carry out its function?	They a very long with branched connections to connect to other nerve cells and form a network it the body
38	What are 3 examples of specialised cells in plants?	Root hair cells, xylem and phloem cells
39T	How do bacteria divide?	By binary fission
40T	How often can bacteria divide	Up to once every 20 minutes

Due Date_____

41T	How are bacteria grown in a lab?	On a nutrient broth solution or on an agar gel plate
42T	What is the definition of 'aseptic'?	'Free from contamination'
43T	Why is it important we can grow uncontaminated cultures of microorganisms?	To investigate the action of disinfectants and antibiotics
44T	Why is it important equipment is sterilised before and during aseptic technique?	To prevent contamination of unwanted microorganisms
45T	Why is the lid of the petri dish secured with adhesive tape?	To prevent microorganisms entering or leaving the petri dish
46T	Why are petri dishes stored upside down?	To stop condensation dripping on the agar
47T	At what temperature should bacterial cultures be stored in school laboratories?	25°C
48T	Why do schools use a maximum temperature of 25°C when incubating cultures?	To avoid harmful bacteria growing
49	What is a chromosome?	Coiled up lengths of DNA that contain genes

Due Date_____

50	Why do cells divide by mitosis?	For growth and repair
51	What is a stem cell?	An undifferentiated cell capable of giving rise to more cells of the same type
52	What can stem cells be used to treat?	Diabetes and paralysis
53	What can stem cells from human embryos be turned into?	Any kind of cell because they haven't become specialised yet
54	Where are stem cells found in adults?	Bone marrow
55	Why are bone marrow stem cells not as good as embryo stem cells?	They can't turn into any type of cell
56	What is therapeutic cloning?	an embryo is produced with the same genes as the patient.
57	Why is therapeutic cloning advantageous?	Any cells produced by it, wouldn't be rejected by the patient because it contains their own genes

58	What are the risks associated with stem cells?	If they are contaminated, viral infections may transfer to the patient
59	Why are some people opposed to using stem cells from embryos?	They have ethical or religious objections about destroying a potential human life
60	What can stem cells from meristems be used for?	Protect rare species from extinction. Produce crops with disease resistance.

Due Date_____

61	What is diffusion?	The net movement of particles from an area of high concentration to an area of lower concentration
62	What factors affect the rate of diffusion?	Temperature, concentration gradient, the surface area of the membrane
63	What substances diffuse into/out of cells?	Oxygen & carbon dioxide in gas exchange Glucose, amino acids, fatty acids and glycerol in digestion Water in the large intestine Urea in the kidney
64	How does surface area to volume ratio relate to the size of an organism?	The smaller the organism, the larger its surface area to volume ratio
65	What are the features of a good exchange surface?	Large surface area; Good blood supply a big concentration gradient; Thin
66	What are two specialist exchange surfaces in mammals?	Villi in the small intestine; alveoli in the lungs
67	What specialist exchange surface does a fish have to exchange gases?	Gills

Due Date_____

68	What is osmosis?	diffusion of water through a partially permeable membrane
69	What is active transport?	Movement of substances against concentration gradient, using energy
70	Where does active transport take place in plants?	Root hairs
71	What substances are absorbed by root hairs using active transport?	mineral ions are absorbed into the root hair cells from very dilute solutions in the soil
72	Why do plants require ions?	For healthy growth
73	Where does active transport take place in animals?	in the small intestine
74	State an example of active transport in the small intestines	Sugar molecules are absorbed from lower concentrations in the gut to higher concentrations into the blood
75	What are sugar molecules used for?	Respiration