

Topic:	Types of cells (B.1)
What is the main difference between a prokaryotic and eukaryotic cell?	Eukaryotic have their DNA contained within a nucleus
Give an example of a eukaryotic cell.	Animal and plant cells
Give an example of a prokaryotic cell.	Bacteria
Eukaryotic cells have which sub-cellular structures?	Cell membrane, cytoplasm and genetic material in a nucleus.
What is the function of cell wall?	Supports/ Strengthens the cell
What is the function of mitochondria?	Where respiration takes place
What is the function of the nucleus?	Controls the activities of the cell
What is the function of cell membrane?	Controls what enters/exits the cell
What is the function of the vacuole?	Store sugars and salts
What is the function of chloroplasts?	Absorb light for photosynthesis
What is the function of cytoplasm?	Where chemical reactions of the cell takes place
What is the approximate size of a prokaryotic cell	0.1-5.0 μm
What is the approximate size of a eukaryote cells	10-100 μm
Which is bigger? A prokaryotic or eukaryotic cell?	Eukaryotic
What is meant by "micro"	1/1,000,000th (1 millionth)

Topic:	Specialised cells (B.2)
Define "cell differentiation"	A cell becoming specialised to perform a particular function
Define "cell division"	The splitting of a cell into two genetically identical daughter cells
Name 3 specialised cells found in the animals and 3 in plants	Animals: Muscle cell, nerve cell, sperm cell Plants: Root hair cell, phloem, xylem
State the function of a muscle cell	Produce movement
State one adaptation of a muscle cell	Lots of mitochondria for releasing energy
State the function of a sperm cell	Fertilise the female egg
State three adaptations of a sperm cell	*Tail for movement *Lots of mitochondria to release energy *Enzymes in its head to penetrate egg
State the function of a nerve cell	Carry information from one part of the body to another
State two adaptations of a nerve cell	*Dendrites to connect to other neurones *Long axon to cover large distances
State the function of a root hair cell	Absorb water and minerals from the soil
State two adaptations of a root hair cell	*Large surface area *Thin cell wall
State the function of a xylem cell	Carry water from roots to leaves
State two adaptations of a xylem cell	*Lignin to strengthen cells *End walls broken down to form hollow tubes
State the function of a phloem cell	Transport glucose within a plant
State two adaptations of a phloem cell	*less sub-cellular structures *end walls have sieve plates to allow glucose through

Topic:	Microscopy (B.3)
How do you calculate the magnification?	magnification = size of image/size of object
Which microscope has the highest magnification?	electron microscopes
Which microscope has the lowest resolution?	Light microscope
Which microscope produces 3D images?	Scanning and transmission Electron microscope
Which microscope shows colours?	Light microscope
Which microscope allows to see inside an object?	Transmission Electron Microscope
Which microscope shows black and white images?	Scanning and transmission electron microscope
Which sub-cellular structures can you see with a higher resolution?	Mitochondria and ribosomes
Define "tissue"	A group of similar specialised cells working together to fulfil a function
Define "organ"	A group of different tissues working together to fulfil a function
Define "organ system"	A group of different organs working together to fulfil a function
Put into order of size (smallest to largest): cell, organism, nucleus, tissue, organ system, organ	nucleus, cell, tissue, organ, organ system, organism
What is meant by "centi"?	1/100th (1 hundredth)
What is meant by "milli"	1/1000th (1 thousandth)
What is meant by "nano"	1/1,000,000,000th (1 billionth)

Topic:	Cell division (mitosis) (B.4)
Put in order of size (smallest to largest): genes, chromosomes, DNA, cell, nucleus	DNA, gene, chromosome, nucleus, cell
Name the 3 stages of the cell cycle	Interphase, Mitosis, Cytokinesis
Describe the three things that happen during interphase	1) The cell grows, 2) chromosomes are copied, 3) more mitochondria and ribosomes are made
Describe what happens during mitosis	Chromosomes pulled to opposite ends of the cell
Describe what happens during cytokinesis	Cell membrane and cytoplasm split in two
State why the cell cycle is important	More cells are made for growth and repair
State what is produced in the cell cycle	Two genetically identical daughter cells
Mitosis produces which type of cells?	Diploid cells
Define "stem cell"	An undifferentiated cell
Name 3 places where stem cells can be found in humans	Embryos, adult bone marrow, meristem
State two conditions that stem cells can be used to treat in humans	Paralysis and type 1 diabetes
State two uses of stem cells in plants	1) Clone rare species 2) produce disease resistant crops
Describe what is meant by "therapeutic cloning"	Using clones of a patient's own stem cells to treat them
Which cells are required for therapeutic cloning?	Egg cell and a normal body cell from patient
State two objections to using stem cells in treatment	Potential transfer of viral infections and ethical/religious objections

Topic:	Sexual and asexual reproduction (meiosis) (B.5)
Another word for sex cells is...	gametes
State the 2 gametes in animals	Sperm & egg cells
State the 2 gametes in flowering plants	Pollen & egg cells
State the number of parents involved in sexual reproduction	2
State the number of parents involved in asexual reproduction	1
Describe the cells produced from mitosis	2 genetically identical daughter cells
Describe the cells produced from meiosis	4 genetically different daughter cells
What is mitosis used for?	Growth and repair
What is meiosis used for?	Making gametes
Define "diploid cell"	A cell with a full set of chromosomes
Define "haploid cell"	A cell with half of the number of chromosomes
How many divisions occur in mitosis?	1
How many divisions occur in meiosis?	2
Are haploid or diploid cells produced during mitosis?	Diploid
Are haploid or diploid cells produced during meiosis?	Haploid

Topic:	The DNA code (B.6)
State the name of the genetic material found in the nucleus of a cell	DNA
Describe the structure of DNA	Double helix
State the name given to one molecule of DNA	Chromosome
State the name of a small section of DNA	A gene
What does a gene code for?	A sequence of amino acids which join to form a specific protein
Define the "human genome"	The sequence of the human DNA
State 3 reasons for mapping the human genome	1) locating disease causing genes 2) treating inherited disorders 3) tracing human migration patterns
Define "homozygous"	two of same alleles e.g. BB
Define "heterozygous"	Two different alleles e.g. Bb
Define "dominant"	always expressed
Define "recessive"	Expressed only with 2 of this allele present
Define 'genotype'	The 2 alleles present e.g. Bb
Define 'phenotype'	The characteristic expressed e.g. brown eyes
Is cystic fibrosis caused by a dominant or recessive allele?	Recessive
Is Huntingdon's caused by a dominant or recessive allele?	Dominant

Topic:	Investigating bacterial cells (triple only) (B.37)
How do bacterial cells multiply?	Binary fission
How do you calculate the number of bacteria in a culture?	2 to the power of the number of divisions
What equipment is required to grow a culture of bacteria?	Agar gel, petri dish, inoculating loop, bacteria sample, disinfectant
Why is the inoculating loop passed through a flame?	To sterilise it (kill any other bacteria)
What is used to dispose of the used agar plate?	Place it into an autoclave
How do we calculate the size of a clear zone?	Area = πr^2
How can you decide by looking at the clear zone which is the best antibiotic/antiseptic	It has the biggest clear zone
Why is it important to only allow the culture to grow for a few days?	0
How frequently do bacteria (on average) multiply?	Every 20 minutes
What is needed for bacteria to be able to multiply?	Enough nutrients and suitable temperature
Why must the petri dish be sterilised before use?	To prevent contamination
Why is the lid of the petri dish sealed <u>with tape</u> ?	To prevent contamination
Why are spaces left in the adhesive tape?	To allow oxygen in to the petri dish
What temperature is the bacteria cultured at?	25°C
Why is the petri dish stored upside down?	To prevent condensation from dripping onto culture

Topic:	Methods of cloning (triple only) (B.38)
Name 4 methods of cloning	Tissue culture, cuttings, embryo transplant, adult cell
Which methods of cloning tend to take place in animals?	Embryo transplant and adult cell
Which methods of cloning tend to take place in plants	Cuttings and tissue culture
Which type of cloning is old and commonly carried out at home by gardeners	Cuttings
Define "clone"	A genetically identify offspring
Describe step one of "tissue culture"	1) Remove a small group of cells from a plant
Describe step two of "tissue culture"	2) place on agar with nutrients & auxin,
Describe step three of "tissue culture"	3) grow into plantlets
Describe step four of "tissue culture"	4) plant in compost
Describe the process of "embryo transplant"	Splitting an embryo and implanting into multiple surrogates
Describe the process of taking "cuttings"	1) remove part of parent plant, 2) place in compost
Step 1 of "adult cell cloning"	1) Remove nucleus from unfertilised egg
Step 2 of "adult cell cloning"	2) insert nucleus of adult body cell into empty egg
Step 3 of "adult cell cloning"	3) give egg cell electric shock (to make it divide into embryo)
Step 4 of "adult cell cloning"	4) place embryo into a womb