

Knowledge Organiser: Biology, CB2a

1 **Mitosis** occurs during growth, repair and replacement of cells

2 **Mitosis produces two genetically identical diploid cells**

3 **Interphase** happens before mitosis; increase in the number of sub cellular structures e.g ribosomes, mitochondria. DNA replication makes copies of chromosomes

Stages of mitosis

Prophase: Nucleus breaks down and spindle fibres appear

Metaphase: Chromosomes are lined up on spindle fibres on the equator of the cell

4 **Anaphase:** Chromosome copies are separated and pulled to opposite ends of the cell

Telophase: A new nuclear membrane forms around each set of chromosomes

Cytokinesis: Cell surface membrane forms to separate the cells (and new cell wall in plants)

5 **Human embryonic stem cells** can be cloned and made to differentiate into any cell type

6 **Adult stem cells** Can form into surrounding human cells e.g. blood cells

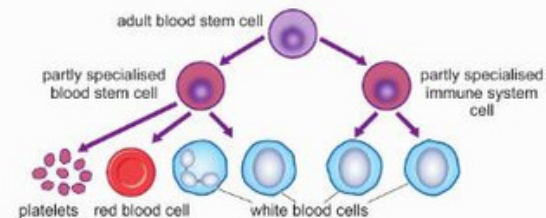
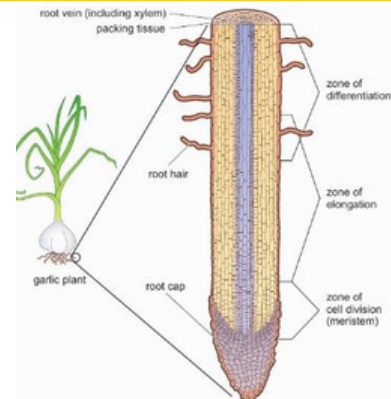
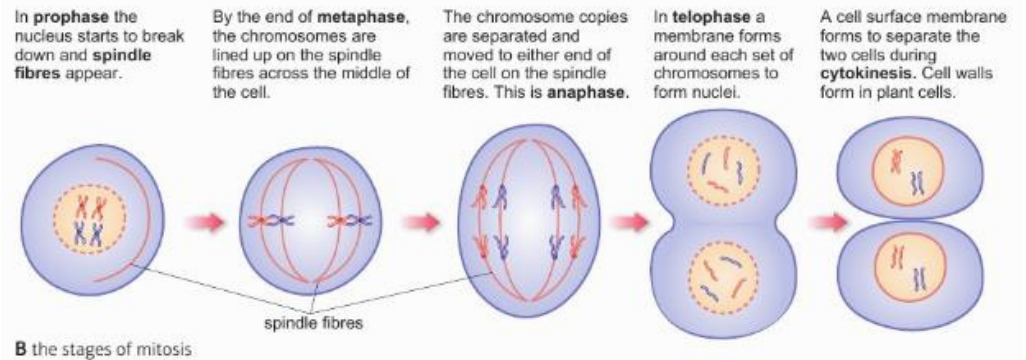
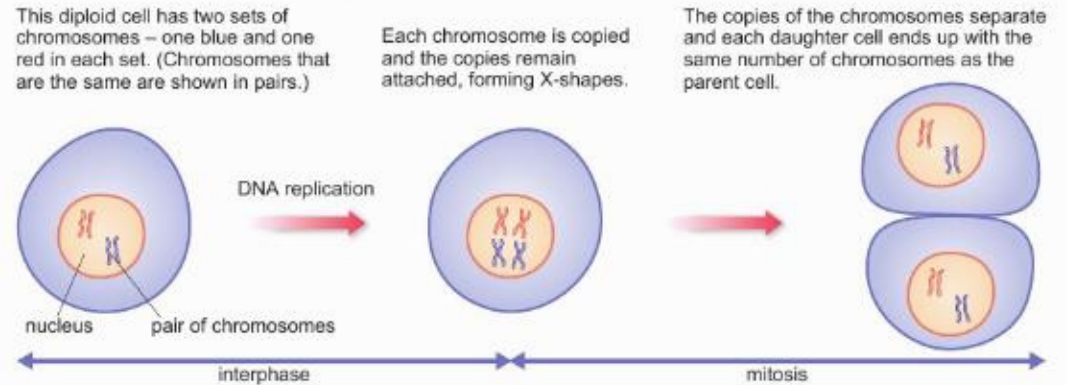
7 **Meristems (plants)** Can differentiate into any plant cell type throughout the life of the plant

8 **Therapeutic cloning of stem cells** to produce new tissue uses same genes so the body does not reject the tissue

9 **Tissue made from adult stem cells** is matched to avoid rejection but only a few types of cell can be formed

Meristems can be used to produce clones quickly and

10 economically, e.g rare species, crop plants with pest/disease resistance



Knowledge Organiser: Biology, CB2b

1 Growth in plants-Cell division, differentiation and elongation (cells increase in length)

2 Growth in animals-cell division and differentiation

3 **Percentile charts can be used to monitor growth**

4 Information from receptors passes along neurones as electrical impulses to the central nervous system (CNS)

5 The CNS is the brain and spinal cord

6 Sensory receptors detect stimuli e.g pressure

7 **Sensory neurones long axon carries impulse from receptor to spinal cord**

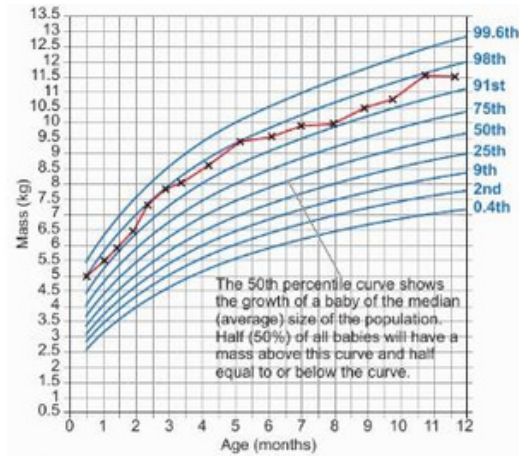
8 Synapse-Gap where neurones meet. Chemical message using neurotransmitter

9 Relay neurone in CNS-Allows impulses to travel between sensory and motor neurone in the spinal cord

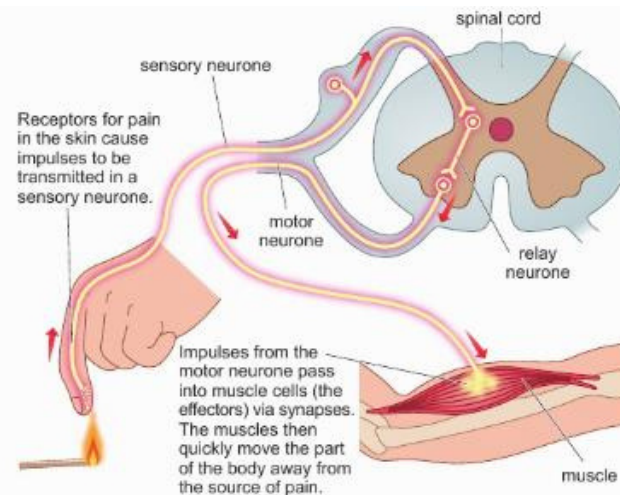
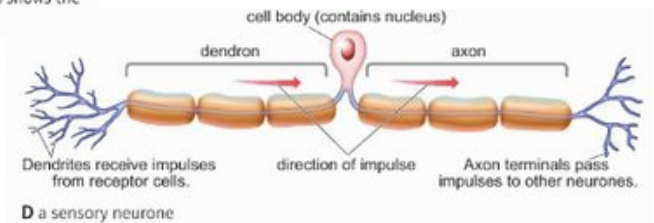
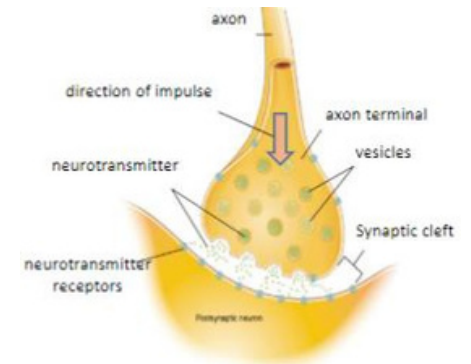
10 Motor neurone-Long axon carries impulse from receptor to effector

11 Effector-Muscle or gland that carries out a response.

12 Reflex actions are automatic and rapid; they do not involve the conscious part of the brain and protect humans from harm



B Percentile growth curves for UK baby boys from 2 weeks to 1 year, for mass. The red line that has been plotted on the curves shows the growth of one baby.



E a reflex arc