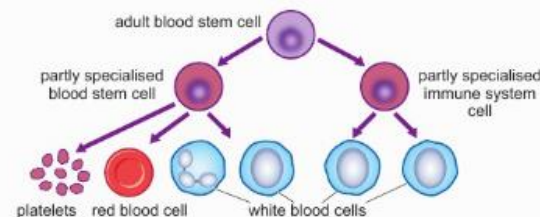
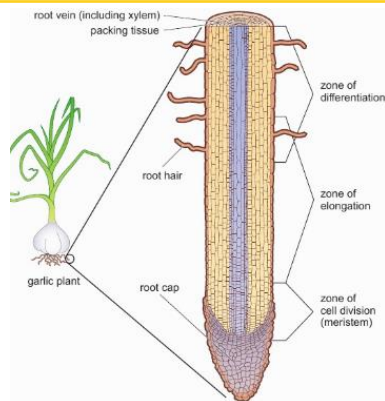
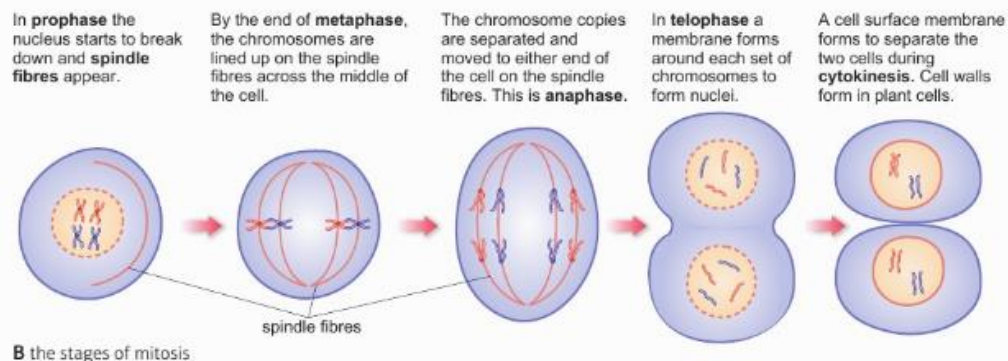
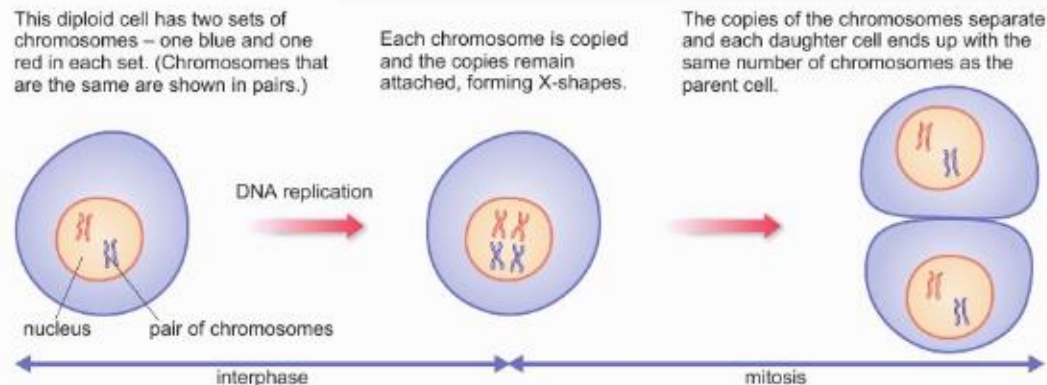




- 1 **Mitosis** occurs during growth, repair and replacement of cells
- 2 **Mitosis produces two genetically identical diploid cells**
- 3 **Interphase** happens before mitosis; increase in the number of sub cellular structures e.g ribosomes, mitochondria. DNA replication makes copies of chromosomes
- 4 **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
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
- 10 **Meristems can be used** to produce clones quickly and economically, e.g rare species, crop plants with pest/disease resistance





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

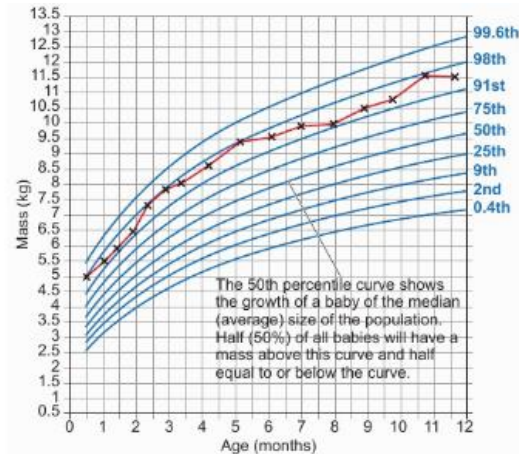
Motor neurone- Long axon carries impulse from receptor to effector

11

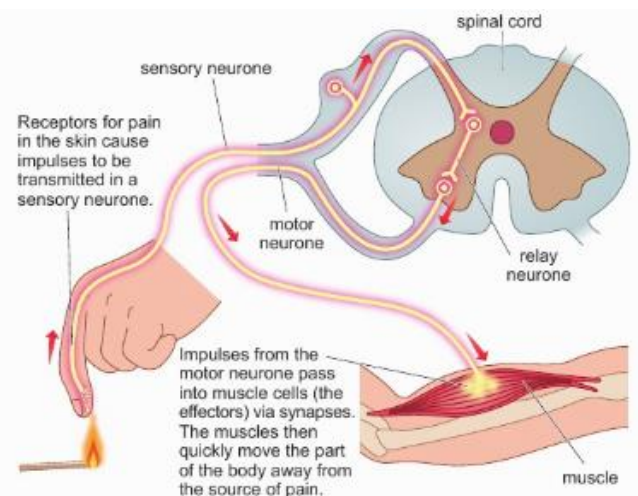
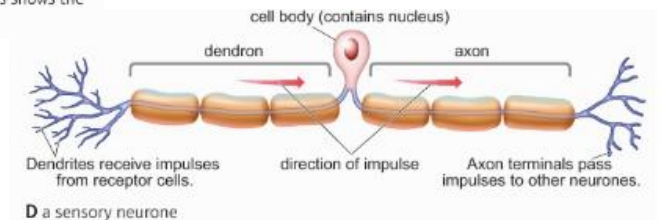
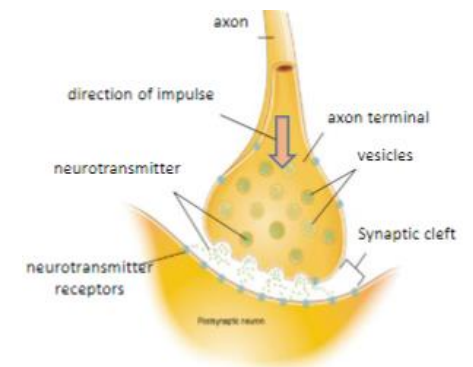
Effector- Muscle or gland that carries out a response.

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