



# Check

- Release energy in respiration (NOT produce)
- Plant cells have a vacuole, chloroplasts and a cell wall and animal cells do not
- They have no nucleus – their DNA is free floating in the cytoplasm
- The meristem
- Light and electron
- Ribosomes, mitochondria, chloroplasts etc
- $M = I/A$
- Cellulose
- A stem cell is an unspecialised/undifferentiated cell that is capable of becoming any type of cell
- Focus and magnification (the objective lens can be changed)

# Apply

1. Eukaryotic cells tend to be bigger and more complex than prokaryotic cells. Eukaryotic cells have a nucleus, prokaryotes don't
2. Growth & DNA replication – The cell grows and copies all of its DNA and structures like mitochondria and ribosomes. Mitosis – the chromosomes line up in the centre and are pulled apart by spindles. Membranes form around both sets of chromosomes and the cell membrane divides
3. A stem cell is an unspecialised/undifferentiated cell that is capable of becoming any type of cell
4.  $A = l/M$  so  $A = 78/2600$   
 $A = 0.03 \text{ mm}$   
change to micrometers – x 1000  
 $A = 30\mu\text{m}$

5a) 100x

5b) 2 orders of magnitude ( $10^2$ )

5c)  $2/500 = 0.004\mu\text{m}$

6. Growing rare species to stop them going extinct and producing lots of a plant with a particular characteristic

7.

Advantages	Disadvantages
Less chance of rejection	The cells could carry a virus and infect the patient
It could cure the paralysis	Embryos produced in this way are still capable of becoming a human life and would be destroyed

Don't just say 'they are genetically identical' – explain the advantage of this

# Specialised cells

- a) Muscle cells have lots of mitochondria to release (NOT produce) lots of energy so that they can contract
  
- b) Nerve cells are long and have branched ends so that they cover a large distance and can connect to other cells
  
- c) Root hair cells have long 'hairs' so that they have a large surface area to get as much water as possible