**a**

**Draw and label a typical plant cell.**

**Which organelle is:**

- the site of anaerobic respiration?

_____

- the site of protein synthesis?

_____

- the site of photosynthesis?

_____

**b**

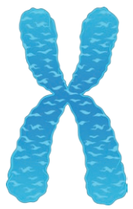
**How many chromosomes does:**

- a human skin cell contain?

_____

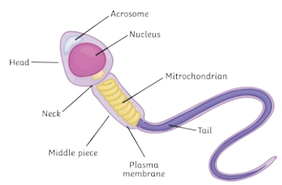
- a human gamete contain?

_____



**c**

**Sperm cells are specialised cells. Explain how the acrosome helps the sperm cell to carry out its function.**




_____

_____

_____

_____

**d**

**Draw and label the parts of a typical bacterial cell.**

**e**

**Why do cells undergo mitosis?**

_____

**What happens to the cell during:**

- interphase?

_____

_____

- mitosis?

_____

_____

_____

_____

_____

_____

**f**

**What are 'embryonic' stem cells?**

_____

_____

**Name 2 medical conditions that could be treated with embryonic stem cells in the future.**

1. _____
2. _____

**g**

**Describe how to prepare an uncontaminated culture of bacteria using the aseptic technique.**

_____

_____

_____

**h**

**Diffusion is:**

The movement of water particles from a high water concentration to a lower water concentration across a partially permeable membrane. ☐

The spreading out of the particles of any gas, or liquid from an area of high concentration to an area of lower concentration. ☐

The movement of particles from a low concentration to a higher concentration. ☐

**i**

**Name 3 substances that are transported into or out of animal cells by diffusion:**

1. _____
2. _____
3. _____

**j**

**List 5 important keywords from this unit.**

1. _____
2. _____
3. _____
4. _____
5. _____

**k**

**Describe an advantage of using therapeutic cloning to treat disease.**

_____

_____

_____

**l**

Light microscopes have objective lenses.
**What is the purpose of the objective lens?**

_____

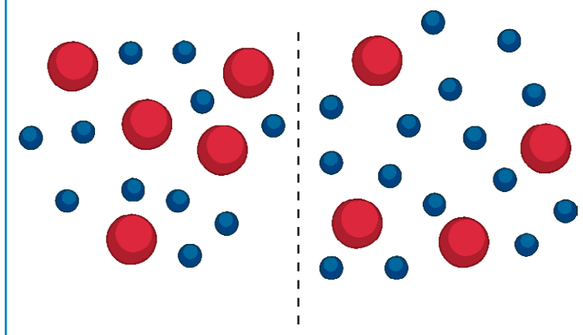
**m**

**Name the tubes that transport water up the stem of a plant.**

_____

**n**

**On the diagram below, draw an arrow to show the direction of the net movement of water molecules.**



**water molecules** **sugar molecules**

**o**

**What is osmosis?**

_____

_____

_____

**o**

**My main areas for improvement in this unit are:**

_____

_____

_____

**a**

**Draw and label a typical animal cell.**

**Which organelle is:**

- the site of aerobic respiration?

_____

- controls the movement of substances in and out of the cell?

_____

- contains the genetic information?

_____

**b**

**An elephant sperm cell contains 28 chromosomes. How many chromosomes would be in an elephant:**

- liver cell?

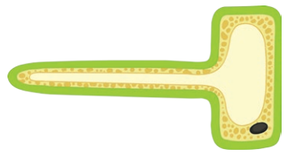
_____

- ovum?

_____

**c**

**Root hair cells are specialised cells. Describe how the root hair cell is adapted to carry out its function.**



_____

_____

_____

_____

**d**

**A bacterium can divide once every 20 minutes. A piece of chicken was contaminated with 5 bacteria; how many bacteria will there be on the chicken after 3 hours?**

_____

**e**

**Describe how active transport is used by:**

- plants

_____

_____

_____

_____

_____

- animals

_____

_____

_____

_____

_____

**f**

**Describe 3 ways that exchange surfaces are adapted to their function.**

1. _____
2. _____
3. _____

**g**

**Describe 2 ways in which active transport is different to diffusion.**

1. _____
2. _____

**h**

**Where in the body are adult stem cells found and how do they differ from embryonic stem cells?**

_____

_____

**i**

**The unit 'centimetres' is written as 'cm'. What do each of the following units represent?**

mm: _____

µm: _____

nm: _____

pm: _____

**j**

**Plants can be cloned from meristem cells. Give two advantages of cloning plants.**

_____

_____

_____

**k**

**List 5 important keywords from this topic.**

1. _____
2. _____
3. _____
4. _____
5. _____

**l**

**Electron microscopes have better resolution than light microscopes. What does 'resolution' mean?**

_____

_____

_____

_____

**m**

**State 2 factors that affect the rate of diffusion.**

1. _____
2. _____

**n**

**Write each of the following numbers in standard form.**

2500; _____

0.003; _____

4 200 000; _____

0.00000006; _____

**o**

**Which has a bigger 'surface area to volume' ratio, an elephant or a mouse?**

_____

**p**

**What is the equation for calculating the magnification of an image?**

_____

**q**

**Why do some people object to embryonic stem cell research?**

_____

_____

_____

**r**

**How do prokaryotic cells differ from eukaryotic cells?**

_____

_____

_____

_____

**s**

**My main areas for improvement in this unit are:**

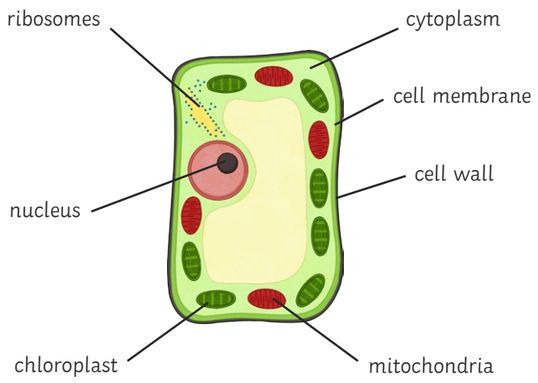
_____

_____

_____

**a**

**Draw and label a typical plant cell.**




**Which organelle is:**

- the site of anaerobic respiration?

Cytoplasm

- the site of protein synthesis?

Ribosomes

- the site of photosynthesis?

Chloroplasts

**b**

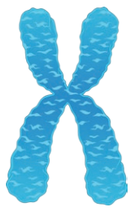
**How many chromosomes does:**

- a human skin cell contain?

46 / 23 pairs (diploid)

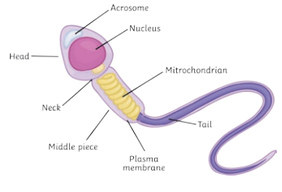
- a human gamete contain?

23 single (haploid)



**c**

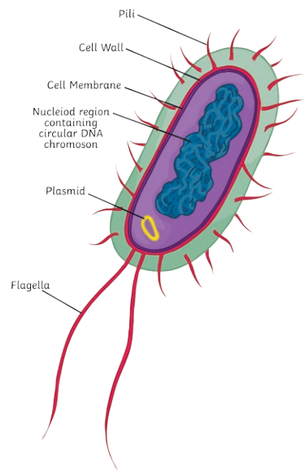
**Sperm cells are specialised cells. Explain how the acrosome helps the sperm cell to carry out its function.**




The acrosome contains enzymes to digest through the egg cell membrane.

**d**

**Draw and label the parts of a typical bacterial cell.**




**e**

**Why do cells undergo mitosis?**

To produce new cells for growth and repair.

**What happens to the cell during:**

- interphase?

The cell grows, increases the amount of organelles and replicates its DNA.

- mitosis?

1. Chromosomes line up at the centre of the cell and the copies are pulled apart by spindle fibres to opposite ends of the cell.

2. Nuclear membranes form around the chromosomes to make 2 nuclei.

3. Finally, the cell splits into two identical 'daughter' cells.

**f**

**What are 'embryonic' stem cells?**

Undifferentiated cells found in the early embryo.

**Name 2 medical conditions that could be treated with embryonic stem cells in the future.**

1. Diabetes

2. Spinal injuries/paralysis

**g**

**Describe how to prepare an uncontaminated culture of bacteria using the aseptic technique.**

1. Sterilise the Petri dish, inoculating loop, culture medium and working area to kill any unwanted microorganisms.

2. Lift the lid slightly to inoculate the plate and replace quickly to prevent microorganisms from the air getting in.

3. Secure the Petri dish lid with a small piece of tape.

**h**

**Diffusion is:**

The movement of water particles from a high water concentration to a lower water concentration across a partially permeable membrane. ☐

The spreading out of the particles of any gas, or liquid from an area of high concentration to an area of lower concentration. ☒

The movement of particles from a low concentration to a higher concentration. ☐

**i**

**Name 3 substances that are transported into or out of animal cells by diffusion:**

1. Oxygen

2. Carbon dioxide

3. Amino acids

**j**

**List 5 important keywords from this unit.**

1. Eukaryotic/Prokaryotic

2. Differentiation

3. Mitosis

4. Aseptic technique

5. Osmosis

**k**

**Describe an advantage of using therapeutic cloning to treat disease.**

The stem cells would have the same DNA as the patient, so would not be rejected by the body.

**l**

Light microscopes have objective lenses.
**What is the purpose of the objective lens?**

To form and magnify an image of the specimen.

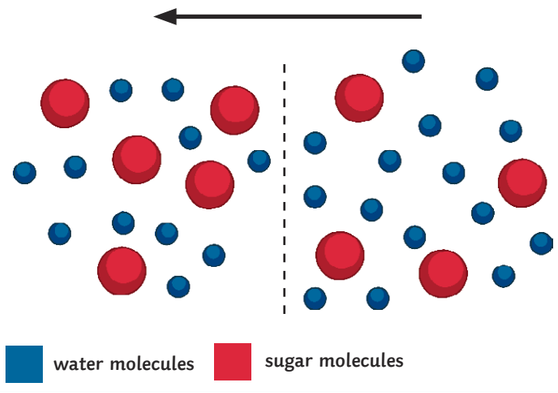
**m**

**Name the tubes that transport water up the stem of a plant.**

Xylem

**n**

**On the diagram below, draw an arrow to show the direction of the net movement of water molecules.**




**o**

**What is osmosis?**

The movement of water molecules from an area of high water concentration to an area of lower water concentration, across a partially permeable membrane.

**o**

**My main areas for improvement in this unit are:**

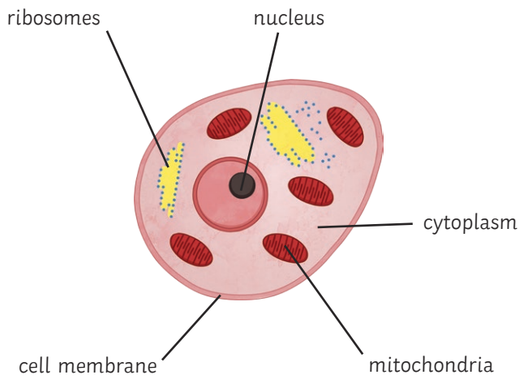
_____

_____

_____

**a**

**Draw and label a typical animal cell.**




**Which organelle is:**

- the site of aerobic respiration?

Mitochondria

- controls the movement of substances in and out of the cell?

Cell membrane

- contains the genetic information?

Nucleus

**b**

**An elephant sperm cell contains 28 chromosomes. How many chromosomes would be in an elephant:**

- liver cell?

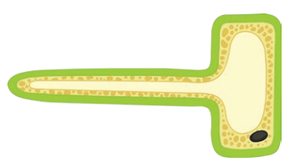
56

- ovum?

28

**c**

**Root hair cells are specialised cells. Describe how the root hair cell is adapted to carry out its function.**



Has a large surface area for the rapid absorption of water and mineral ions from the soil.

**d**

**A bacterium can divide once every 20 minutes. A piece of chicken was contaminated with 5 bacteria; how many bacteria will there be on the chicken after 3 hours?**

| Time | Number |
|---|---|
| 0 | 5 |
| 20 | 10 |
| 40 | 20 |
| 60 | 40.....etc |
| 180 | 2560 |

**e**

**Describe how active transport is used by:**

- plants

To obtain mineral ions from the soil

- animals

To absorb nutrients (e.g.glucose), when they are at low concentrations, from the small intestine.

**f**

**Describe 3 ways that exchange surfaces are adapted to their function.**

1. Large surface area
2. Thin walls
3. Moist/good blood supply (animals)

**g**

**Describe 2 ways in which active transport is different to diffusion.**

1. Moves against a concentration gradient (low to high)
2. Requires energy

**h**

**Where in the body are adult stem cells found and how do they differ from embryonic stem cells?**

Found in the bone marrow. Can only turn into certain cell types, such as blood cells.

**i**

**The unit 'centimetres' is written as 'cm'. What do each of the following units represent?**

mm: millimetres

µm: micrometres

nm: nanometres

pm: picometres

**j**

**Plants can be cloned from meristem cells. Give two advantages of cloning plants.**

Farmers can produce clones of a desired plant quickly and cheaply. Save rare species from extinction.

**k**

**List 5 important keywords from this topic.**

1. Diffusion
2. Active transport
3. Meristem
4. Magnification
5. Resolution

**l**

**Electron microscopes have better resolution than light microscopes. What does 'resolution' mean?**

The ability to distinguish between 2 points, so higher resolution produces a clearer image.

**m**

**State 2 factors that affect the rate of diffusion.**

1. Temperature
2. Concentration gradient

**n**

**Write each of the following numbers in standard form.**

2500; $2.5 \times 10^{3}$

0.003; $3 \times 10^{-3}$

4 200 000; $4.2 \times 10^{6}$

0.00000006; $6 \times 10^{-8}$

**o**

**Which has a bigger 'surface area to volume' ratio, an elephant or a mouse?**

Mouse

**p**

**What is the equation for calculating the magnification of an image?**

$$\text{Magnification} = \frac{\text{image size}}{\text{real size}}$$

**q**

**Why do some people object to embryonic stem cell research?**

They believe that all embryos have the potential to become a human being, so should not be used for experimentation.

**r**

**How do prokaryotic cells differ from eukaryotic cells?**

Bacterial cells are much smaller, they don't have a nucleus, they don't have mitochondria or chloroplasts.

**s**

**My main areas for improvement in this unit are:**

_____

_____

_____