a

Draw and label a typical plant cell.

Which organelle is...

- the site of aerobic respiration?

_____

- the site of protein synthesis?

_____

- the site of photosynthesis?

_____

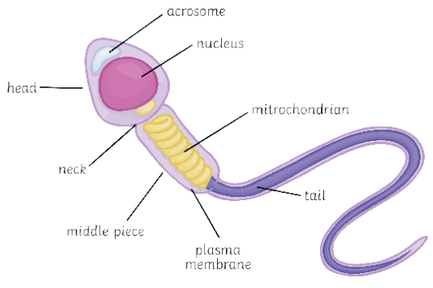
b

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

_____

_____

_____




c

Draw and label the parts of a typical bacterial cell.

d

Why do cells undergo mitosis?

_____

What has to happen before the cell divides?

_____

_____

What happens to the cell during mitosis?

1. _____

_____

2. _____

_____

3. _____

e

What are 'embryonic' stem cells?

_____

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

1. _____

2. _____

f

Diffusion is: (Tick the correct box.)

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

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

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

g

Light microscopes have objective lenses.

What is the purpose of the objective lens?

_____

h

What is osmosis?

_____

_____

_____

i

Name three substances that are transported into, or out of, animal cells by diffusion.

1. _____

2. _____

3. _____

j

Name the tubes that transport the food around the plant.

_____

k

How many chromosomes does...

- a human skin cell contain?

_____

- a human gamete contain?

_____

l

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

_____

m

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?

_____



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n

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

o

How do prokaryotic cells differ from eukaryotic cells?

p

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

1. 
2. 

q

Describe two ways in which active transport is different to diffusion.

1. 
2. 

r

Describe how active transport is used by the following:

1. plants
2. animals

s

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

t

Write each of the following numbers in standard form.

2500 

0.003 

4 200 000 

0.00000006 

u

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

mm: 

µm: 

nm: 

pm: 

v

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

w

Describe three ways that exchange surfaces are adapted to their function.

1. 
2. 
3. 

x

Why do some people object to embryonic stem cell research?

y

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

z

The width of a cell is 0.025mm; under the microscope it is 10mm.

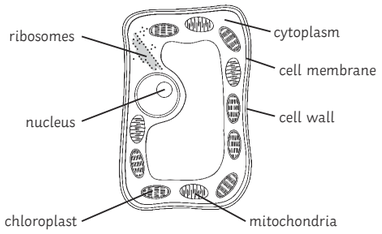
What was the magnification?



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a

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




**Which organelle is...**

- **the site of aerobic respiration?**

  mitochondria

- **the site of protein synthesis?**

  ribosomes

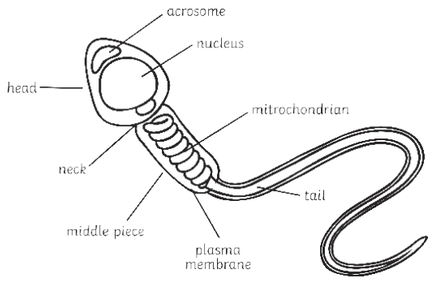
- **the site of photosynthesis?**

  chloroplasts

b

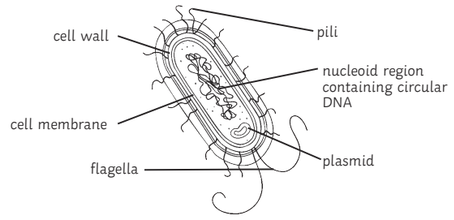
**Sperm cells are specialised cells. Explain how the acrosome helps the sperm cell to carry out its function.**

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




c

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




d

**Why do cells undergo mitosis?**

To produce new cells for growth and repair.

**What has to happen before the cell divides?**

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

**What happens to the cell during mitosis?**

1. Chromosomes line up in the centre of the cell and copies are pulled apart by spindle fibres to opposite ends of the cell.
2. Nuclear membranes form around the chromosomes to make two nuclei.
3. Finally, the cell splits into two identical 'daughter' cells.

e

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

Undifferentiated cells found in the early embryo.

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

1. diabetes
2. spinal injuries/paralysis

f

**Diffusion is: (Tick the correct box.)**

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

b. **The spreading out of the particles of any gas or liquid from an area of high concentration to an area of lower concentration.** ☑

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

g

**Light microscopes have objective lenses.**

**What is the purpose of the objective lens?**

To form and magnify an image of the specimen.

h

**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.

i

**Name three substances that are transported into, or out of, animal cells by diffusion.**

1. oxygen
2. carbon dioxide
3. amino acids

j

**Name the tubes that transport the food around the plant.**

phloem

k

**How many chromosomes does...**

- **a human skin cell contain?**

  46/23 pairs (diploid)

- **a human gamete contain?**

  23 single (haploid)

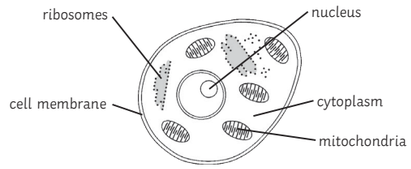
l

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

xylem

m

**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

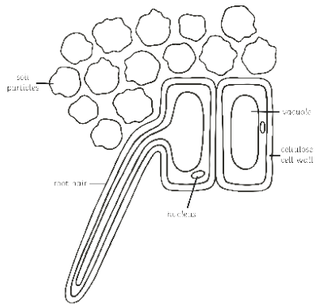


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n

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

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




o

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

Bacterial cells are much smaller. They don't have a nucleus, mitochondria or chloroplasts. They do have plasmids with extra DNA.

p

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

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

q

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

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

r

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

1. **plants**
   To obtain mineral ions from the soil.
2. **animals**
   To absorb nutrients (e.g. glucose) from the small intestine when they are at low concentrations.

s

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

Found in the bone marrow.

They can only turn into certain cell types, such as blood cells.

t

**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** $6 \times 10^{-8}$

u

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

**mm:** millimetres

**µm:** micrometres

**nm:** nanometres

**pm:** picometres

v

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

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

w

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

1. large surface area
2. thin walls
3. moist/good blood supply (animals)

x

**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.

y

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

mouse

z

**The width of a cell is 0.025mm; under the microscope it is 10mm**

**What was the magnification?**

magnification = 10 ÷ 0.025 = 400



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