LEES BROOK COMMUNITY SCHOOL

Section A: Key Vocabulary

Keyword	Definition
adaptation	The features that something has to enable it to do a certain function (job).
catalyst	A substance that speeds up the rate of a reaction, without itself being used up.
chloroplasts	A green disc containing chlorophyll, found in plant cells. Where the plant makes glucose, using photosynthesis.
chromosome	A structure found in the nuclei of cells. Each chromosome contains one enormously long DNA molecule.
concentration	The amount of a solute dissolved in a certain volume of solvent. Measured in units such as g/cm^3.
cytoplasm	The watery jelly inside a cell where the cell's activities take place.
denatured	A denatured enzyme is one where the shape of the active site has changed so much that its substrate no longer fits and the reaction can no longer happen.
digestion	A process that breaks molecules into smaller, more soluble substances.
diploid	A cell that has two sets of chromosomes.
DNA	A substance that contains genetic information. Short for deoxyribonucleic acid.
enzyme	A substance that can speed up some processes in living things (e.g. breaking down molecules).
eukaryotic	A cell with a nucleus is eukaryotic.
fertilisation	Fusing of a male gamete with a female gamete.
gamete	A cell used for sexual reproduction.

Section B: Core Practical

Osmosis

Prepare sucrose solutions of different concentrations ranging from pure water to a very concentrated sucrose solution.

Use a cork borer to cut a potato into the same sized pieces (the pieces need to be about 1 cm in diameter and preferably from the same potato).

Divide the cylinders into groups of three and use a mass balance to measure the mass of each group.

Place one group in each solution.

Leave the cylinders in the solution, as shown in Figure 1, for at least 40 minutes (making sure that they all get the same amount of time).
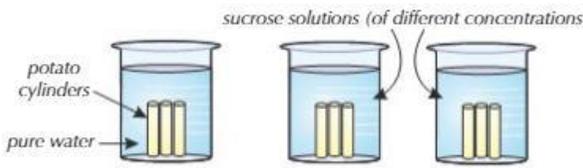
Enzymes and nutrition

Different enzymes are found in different places and catalysed different reactions.

Enzyme name	Where found	Reaction catalysed
amylase	saliva and small intestine	breaking down starch to small sugars, such as maltose
catalase	most cells, but especially liver cells	breaking down hydrogen peroxide made in many cell reactions to water and oxygen
starch synthase	plant	synthesis of starch from glucose
DNA polymerase	nucleus	synthesis of DNA from its monomers
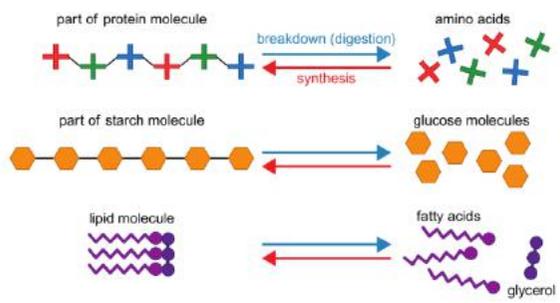
Section C: Diagrams

Animal cell
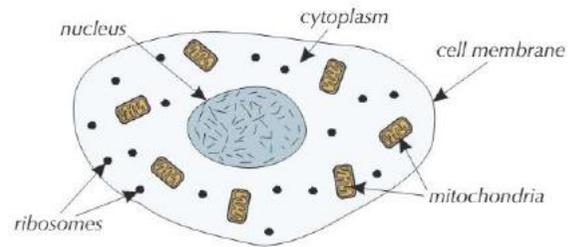
Plant cell
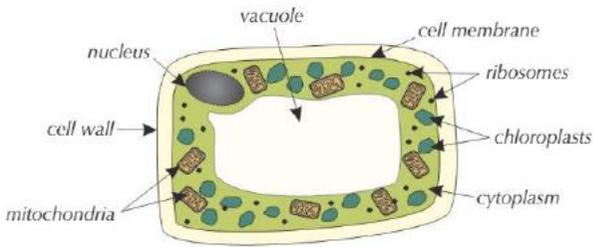
Bacteria Cell
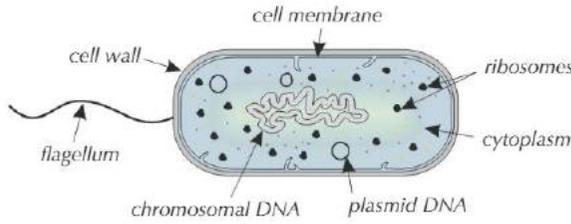
Active transport
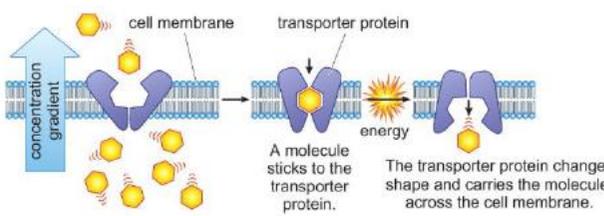
haploid	Describes a cell that has one set of chromosomes
magnification	How much bigger something appears compared with its actual size.
mitochondrion	An organelle in the cytoplasm of eukaryotic cells, where aerobic respiration occurs.
nucleus	The 'control centre' of a eukaryotic cell.
plasmid	A small loop of DNA found in the cytoplasm of bacteria
precipitate	Insoluble substance formed when two soluble substances react together.
Product	A substance formed in a reaction
prokaryotic	A cell with no nucleus is prokaryotic. Organisms such as bacteria, which have cells like this, are also said to be prokaryotic.
resolution	Smallest change that can be measured by an instrument.
semi-permeable	Describes something that will allow certain particles to pass through it but not others. Another term for 'partially permeable'.
solute	The solid that has dissolved in a liquid to make a solution
solvent	The liquid in which a substance dissolves to make a solution.
stain	A dye used to colour parts of a cell to make them easier to see.
synthesis	To build a large molecule from smaller subunits

Section B: Diagrams and Maths skills

Enzyme action

Maths skills : Standard form **(Higher tier)**

For numbers greater than 0, count how many times you need to move the unit to the right until you form a number between 1 and 10.

Write this number as the power of 10, insert the decimal point and remove the zeros.

$$1150000 = 1.15 \times 10^6$$

For numbers less than 0, count how many times you need to move the unit to the left until you form a number between 1 and 10.

This becomes a negative power.

$$0.00000007 = 7 \times 10^{-8}$$

Maths skills : Conversion

To convert	Unit	In standard form	To convert
× 1000	Millimetre (mm)	$\times 10^{-3}$ m	÷ 1000
× 1000	Micrometre (μm)	$\times 10^{-6}$ m	÷ 1000
× 1000	Nanometre (nm)	$\times 10^{-9}$ m	÷ 1000
× 1000	Picometre (pm)	$\times 10^{-12}$ m	

Maths skills : Magnification

$$\text{total magnification} = \text{eyepiece lens magnification} \times \text{objective lens magnification}$$

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

Section C: Microscope core practical

Light Microscope

Preparation of a microscope slide

Scientific drawing of a cell

Onion cells, × 400

0.1 mm