Before then, microscope magnification was not as powerful, and so scientists were unable to see and identify single cells or cell components. - CORRECT ANSWER -Why was cell theory not fully developed before the mid-19th century?

1. Place the stage micrometer on the stage and align it with the eyepiece graticule.

2. Remember that each division on the stage micrometer is 10 micrometres.

3. Each eyepiece division is calculated by dividing the number of eyepiece divisions by the number of micrometres.

4. Replace the stage micrometer with a specimen to measure. - CORRECT ANSWER -Describe the process of calibrating a microscope.

How many times larger the image is than the actual size of the object. - CORRECT ANSWER -Define magnification.

It has two lenses - the objective lens near the specimen, and the eyepiece lens, through which the specimen is viewed. - CORRECT ANSWER -How does a compound light microscope work?

A mount used to observe solid specimens, where the specimen is sectioned and a cover slip is placed over the top. - CORRECT ANSWER -What is a dry mount?

A mount used to observe specimens suspended in water or immersion oil. - CORRECT ANSWER -What is a wet mount?

Transmission Electron Microscopy - electrons are transmitted THROUGH a specimen and focused to produce an image. - CORRECT ANSWER -What is TEM?

Scanning Electron Microscopy - electrons are sent across the SURFACE of a specimen, and the reflecting electrons are collected, giving 3D images. - CORRECT ANSWER -What is SEM?

Light = inexpensive to buy and operate

Electron = expensive - CORRECT ANSWER -Relative costs of light and electron microscopes?

Light = small and portable

Electron = large and must be installed - CORRECT ANSWER -Relative portability of light and electron microscopes?

Light = simple sample preparation that doesn't usually lead to distortion.

Electron = complex sample preparation that often leads to distortion. - CORRECT ANSWER -Relative difficulties of sample preparation of light and electron microscopes?

Light = natural colour of the sample, or colour of a stain, is seen.

Electron = black and white images are produced but can be coloured digitally. - CORRECT ANSWER -Relative colours of the samples produced from light and electron microscopes?

Light = up to x2000

CORRECT ANSWER -Describe the process of protein production (NOT protein synthesis)

To keep plant cells turgid. - CORRECT ANSWER -What is the function of the vacuole?

Tonoplast - CORRECT ANSWER -What is the name given to the membrane surrounding the vacuole?

They have a double membrane, enclosing fluid inside called stroma. They have an internal network of membranes which form flattened sacs called thylakoid discs. Stacks of these are referred to as grana, and these contain chlorophyll. - CORRECT ANSWER -Describe the structure of a chloroplast.

They only have one molecule of DNA, a chromosome, and this is super-coiled to make it more compact. The genes on this are often grouped into operons, meaning a number of genes can be switched on or off at the same time. - CORRECT ANSWER -How is the DNA in a prokaryotic cell packaged?

Smaller in prokaryotes. - CORRECT ANSWER -Relative size of ribosomes in prokaryotic and eukaryotic cells?

Peptidoglycan - CORRECT ANSWER -What are prokaryotic cell walls made from?

Binary fission - CORRECT ANSWER -How do prokaryotic cells reproduce?

Electrolytes - CORRECT ANSWER -What is the term given to ions in solution?

- CORRECT ANSWER -Structure of a fatty acid?

A fatty acid with one double bond between the carbon atoms. - CORRECT ANSWER -What is a monounsaturated fatty acid?

A fatty acid with more than one double bond between the carbon atoms. - CORRECT ANSWER -What is a polyunsaturated fatty acid?

Bend, which means that they cannot pack as closely together, making them liquid at room temperature instead of solid. - CORRECT ANSWER -The presence of double bonds in fatty acids causes them to do what?

- CORRECT ANSWER -Phospholipid?

Hydrophilic - hydrophobic - CORRECT ANSWER -Phospholipids have a _____ head and two _____ tails.

Hydrophilic heads go into the water whilst the hydrophobic tails remain sticking out, forming a layer on the surface of the water. They can also form a bilayer arrangement, where the heads face out and the tails are inside, shielded from the water. This enables them to form a membrane which can separate the aqueous environment of cells from the aqueous cytosol within cells. - CORRECT ANSWER -What happens when phospholipids interact with water, and why is this important in the formation of cell membranes?

- CORRECT ANSWER -Sterol?

The hydroxyl group. - *CORRECT ANSWER* -Which part of a sterol is hydrophilic?

It helps to form cell membranes, and positions itself between the phospholipids to provide stability and regulate their fluidity. - *CORRECT ANSWER* -Describe a role of cholesterol.

Membranes - hydrophobic barriers - *CORRECT ANSWER* -Lipids can form _____ and _____ _____

Hormones. - *CORRECT ANSWER* -Lipids can be used to produce _____.

Electrical insulation - nerve impulse transmission. - *CORRECT ANSWER* - Lipids can provide _____ _____ necessary for _____.

Thermal insulation - heat loss. - *CORRECT ANSWER* -Lipids can be used to provide _____ _____ to reduce _____ _____.

Cushion vital organs. - *CORRECT ANSWER* -Lipids can be used to _____ _____ _____ (such as the heart and the kidneys).

Buoyancy. - *CORRECT ANSWER* -Lipids can provide _____ for aquatic animals, like whales.

1. Mix sample with ethanol.

Universal energy currency. - CORRECT ANSWER -ATP is the ....

- CORRECT ANSWER -ATP?

A small amount of energy is needed to break the bond holding the last phosphate group in ATP, but once this phosphate is released, it can release a lot of energy in other reactions. - CORRECT ANSWER -How does ATP release energy?

Small molecule - CORRECT ANSWER -Property of ATP that enables it to move easily in/out of cells?

Water soluble - CORRECT ANSWER -Property of ATP that enables it to provide energy in aqueous environments?

It's large enough to be useful, but not so large so that energy is wasted as heat. - CORRECT ANSWER -Property that enables ATP to be a good immediate energy source?

It releases energy in small quantities. - CORRECT ANSWER -Property of ATP that prevents energy being wasted as heat?

Each enzyme is specific to a particular substrate, and so there is an area within the tertiary structure of the enzyme that has a shape complementary to the substrate, known as the active site. This hypothesis states that the substrate fits into the active site, forming an enzyme-substrate complex, and then once they reaction, an enzyme-product complex is formed. This leaves the enzyme unchanged and able to take part in subsequent reactions. - CORRECT ANSWER -Describe the lock-and-key hypothesis.