How is the magnification of a light microscope calculated?

A DNA molecule forms the shape of a double helix.

What term is used to describe the shape of a DNA molecule?

What is the word equation for aerobic respiration?

What is the process by which water molecules move across a partially permeable membrane from a dilute solution to a more concentrated one?

Total magnification is calculated by multiplying the magnification of the eyepiece lens by the magnification of the objective lens.

glucose + oxygen → carbon dioxide + water (+ energy released)

The products of photosynthesis are glucose and oxygen.

Osmosis is the movement of water molecules from a dilute to a more concentrated solution across a partially permeable membrane.

What are the products of photosynthesis?
An efficient exchange system should have: (1) a large surface-area-to-volume ratio; (2) thin membranes so the diffusion distance is short; (3) a good supply of transport medium (e.g. blood, air, etc.).

The three types of blood vessel are arteries, capillaries and veins.

Translocation is the movement of glucose from the leaf (where it is produced) to other parts of the plant (where it is needed) via the phloem.

The nervous system is composed of the central nervous system (the brain and the spinal cord) and the peripheral nervous system (all the other nerve cells that connect to the central nervous system).

The ciliary body and suspensory ligaments control the shape of the lens.
Hormones are chemical messengers produced by glands. How do they reach their target organ?

Most contraceptive pills contain oestrogen and progesterone.

What hormone causes phototropism in a plant shoot?

Auxin causes phototropism in a plant shoot.

What triggers the pancreas to produce insulin?

High blood sugar levels cause the pancreas to produce insulin.

The kidney is made up of many filtering units called nephrons. Where in the nephron does selective reabsorption take place?

Selective reabsorption takes place in the tubules of the nephron.
Photosynthesis removes carbon dioxide from the atmosphere. What two processes release carbon dioxide to the atmosphere?

What is the name of the relationship between two organisms where both depend on each other and both benefit?

A pyramid of biomass shows that energy is lost at each trophic level of a food chain. Why is this?

The allele for brown eyes is dominant to the allele for blue eyes. What will be the phenotype of a person who is heterozygous for eye colour?

What type of cell division produces gametes?

Respiration (animal, plant and microbial) and combustion release carbon dioxide to the atmosphere.

Mutualism. In a mutualistic relationship, both organisms depend on each other and both benefit.

Energy is lost from the food chain as organisms move and respire, produce heat and excrete waste. Some energy may be used to produce inedible body parts, such as shells or feathers.

The person will have brown eyes.

Meiosis produces gametes.
For evolution to occur, there must be genetic variation in a population. How might genetic variation arise?

Variation can arise through mutations in genes.

What piece of equipment is used to sample the number of plant species in a field?

A quadrat is used to sample the number of plant species in a field.

In an investigation, how would you make sure your measurements are reliable and identify any that might be anomalous?

All measurements should be repeated. If a single reading is very different to the others (anomalous), this might indicate that an error has been made in measuring.

What is food security?

Food security is ensuring that all people have access to sufficient, safe and nutritious food.

What are the four main human defences to stop microorganisms entering the body?

Microorganisms are prevented from entering the body by the skin (a physical barrier), platelets that help the blood to clot and seal wounds, mucous in the lungs that traps microorganisms and acid in the stomach that destroys microorganisms.
Why wouldn’t you use antibiotics to treat a cold caused by a virus?

Antibiotics are used for bacterial infections. They have no effect on viruses, which are found inside the cell.

What three options can be used to treat cardiovascular disease?

Cardiovascular disease can be treated with lifestyle changes (healthy eating and exercise, stopping smoking), surgery (heart transplants or stents) and medications (statins or aspirin).