AQA AS/A-level Year 1 Biology exam practice answers

3 Organisms exchange substances with their environment

**1 (a) (i)** 0 to 2 seconds

**(ii)** 2 to 4 seconds

 **(b)** 1 cycle = 4 seconds; 60/4 = 15, so 15 cycles per minute

 **(c)** 0.45 dm3

 **(d)** 0.45 × 15 = 6.75 dm3, or 6.75 litres

**2 (a)** 27 × 0.002 = 0.054 g.

 **(b)** Small cube = 6:1; large cube = 2:1 (calculated as 6 × 32 = 54; 54/33 = 54/27 = 2)

 **(c)** The small cube; because it has the shortest diffusing distance/because it has the largest surface area to volume ratio.

 **(d)** In larger cells diffusion is too slow to provide them with the materials they need/gas exchange is too slow.

 **(e)** For: it shows the surface area to volume problem; it keeps the maths simple.

 Against: cells are not a regular shape; cells are much smaller than this; cells have membranes; cells are made up of many different substances/not just one substance; diffusion

**3 (a)** The degree of saturation/the number of C¦=¦C bonds; the length of the carbon chain

 **(b)** Condensation

 **(c)** Ester bonds

 **(d)** Four — one triglyceride and three water molecules

 **(e)** Triglycerides have three fatty acids but phospholipids have a phosphate–containing group instead of one of the fatty acid molecules.

**4 (a)** The sequence of amino acids in the polypeptide chain.

 **(b)**

 **(c)** The amino acid must occur more than once; the polypeptide/amino acid chain folds/bend back on itself; two –SH groups react and hold the polypeptide in that shape.

**5 (a)** W = flagellum; X = cell wall; Y = membrane; Z = DNA/main chromosome/nucleoid

 **(b)** Ribosomes and plasmids

 **(c)** The resolution was not high enough.

 **(d)** The scale bar is 50 mm long. 50 000 µm represents 3 µm, so the magnification is:

$$\frac{50 000}{3}=16 666 $$

 **(e)** 100 × body length = 300 µm

1 mm = 1000 µm

$$\frac{1000}{300}=3.33 seconds$$

**6 (a)** So we can compare populations of different sizes.

 **(b)** The number of deaths is falling in each age group, from 1970 to 2008. The number of deaths is higher in males than in females. The older you are, the higher the number of deaths. (There are several other trends that are also supported by the data.)

 **(c)** Any one factor and accompanying explanation from:

• fewer smokers — smoking raises blood pressure

• better education — fewer people smoke

• better diet — saturated fat/cholesterol contributes to the development of atheroma/coronary heart disease

• earlier diagnosis — so lifestyle can be changed/medicines such as beta blockers can be given

• more people take regular exercise — lowered stress levels and arteries in better condition, lower blood pressure