ANSWER KEY.

ZornScience
zornscience.org

Monomers and Polymers

Biology | ANSWER KEY

Answer in complete sentences. Show your setup for calculations.

1. Name the class of large molecule that fits each description.

Description	Class of large molecule
Contains only C, H, and O, with H and O in a 2 : 1 ratio	**carbohydrate**
Mostly C and H, does not mix with water, has fatty acid tails	**lipid**
A chain of nucleotides that contains phosphorus	**nucleic acid**

Check the elements and building blocks in each description.

2. A polysaccharide is a polymer of 300 glucose monomers in one chain.

(a) How many molecules of water are released when it is built? Show your setup.

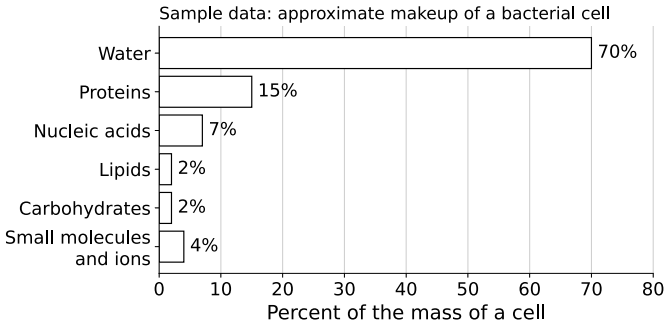
(b) How many molecules of water are used to break it down completely? Explain why your answer to (b) is related to (a).

(a) 300 monomers have 300 − 1 = **299 bonds**, and each bond releases 1 water, so **299 molecules of water** are released.

(b) **299 molecules. Hydrolysis reverses dehydration synthesis, so it uses 1 water molecule for each bond that was formed.**

CC BY-NC-SA 4.0 | zornscience.org

3. The graph shows the makeup of a bacterial cell (sample data).



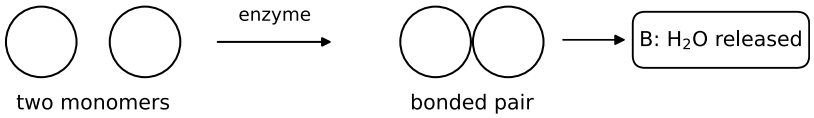
(a) What percent of the cell's non-water mass is protein? Show your setup.

(a) Non-water mass: 100% − 70% = 30%. Protein: 15% ÷ 30% × 100 = **50%**

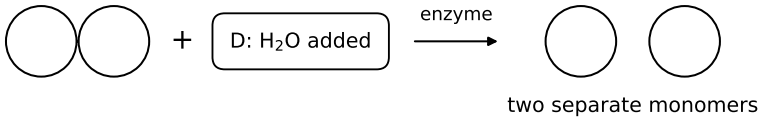
---

4. The model shows two reactions. Fill in the blanks A to D.

Building a polymer: A: dehydration synthesis



Breaking a polymer: C: hydrolysis



(a) Blank A

(b) Blank B

(c) Blank C

(d) Blank D

(a) **Dehydration** (dehydration synthesis)

(b) **H_2O** (water)

(c) **Hydrolysis**

(d) **H_2O** (water)

CC BY-NC-SA 4.0 | zornscience.org