

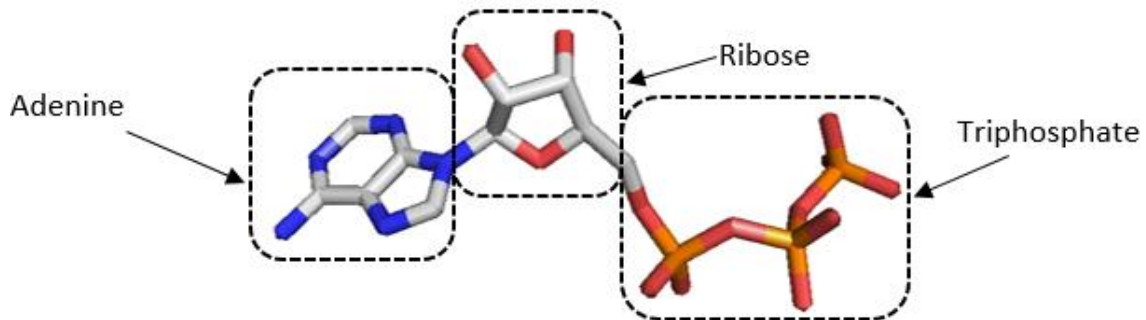
QB4 - ATP

Name:

Date:

1. Adenosine triphosphate is a small molecule found in all organisms. What is the role of ATP?
It is an **energy carrier**, transferring energy around cells, and temporarily **storing** it.

2. Label the three parts of ATP.



3. The enzyme ATP hydrolase hydrolyses ATP. What are the two breakdown products of this?
ADP and **P_i**.
4. State which bond is cleaved in the process, and explain the naming of the two products.
The final **phosphate-phosphate bond** is cleaved.
ADP stands for **adenosine diphosphate**, as it only has **two phosphate groups** left. The other product is **P_i**, which is an **inorganic phosphate** group.
5. How does hydrolysing ATP transfer energy in a cell?
When ATP is hydrolysed, a **phosphate-phosphate bond is broken**. Breaking this bond **triggers a series of reactions which release chemical energy**, which is used within the cell.
6. Explain how hydrolysing ATP can lead to other molecules being phosphorylated.
One of the products of the breakdown of ATP is **P_i, inorganic phosphate**. This can then **phosphorylate other compounds**, making them more reactive.
7. Describe how ATP is resynthesised within cells, and explain where the energy for this process comes from.
ATP is resynthesised using the **ATP synthase enzyme**, which **combines ADP and P_i** in a **condensation** reaction. It is the opposite to the hydrolysis reaction which breaks down ATP and releases energy. This means that it **requires energy to resynthesise**, and this energy comes from either **respiration** or **photosynthesis**.