

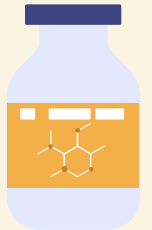
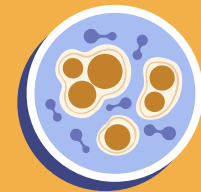
Biochemistry – GLYCOLYSIS

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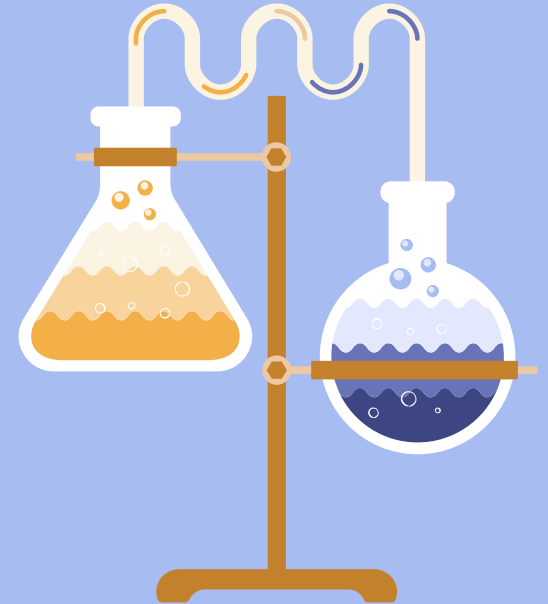
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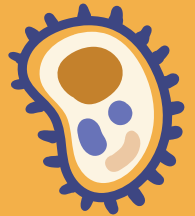
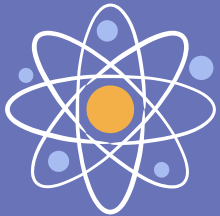
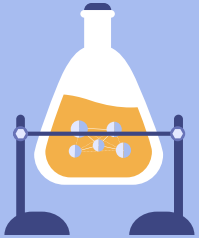
ILOS

- Define glycolysis**
- Describe Major pathways of glucose utilization**
- Describe 10 steps of breakdown of glycolysis**



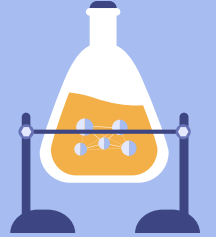
Introduction

- Glycolysis comes from a merger of two Greek words: Glykys = sweet ~ Lysis = breakdown/ splitting
- GLYCOLYSIS is the sequence of 10 enzyme-catalyzed reactions that converts glucose into pyruvate with simultaneous production on of ATP.
- This major pathway of glucose metabolism occurs in the cytosol of all cell.
- This unique pathway occurs aerobically as well as anaerobically & doesn't involve molecular oxygen.





Major pathways of glucose utilization





Major pathways of glucose utilization:



Extracellular matrix & cell wall polysachharide

Synthesis of structural polymers

Oxidation via pentose phosphate pathway

Ribose-5-phosphate

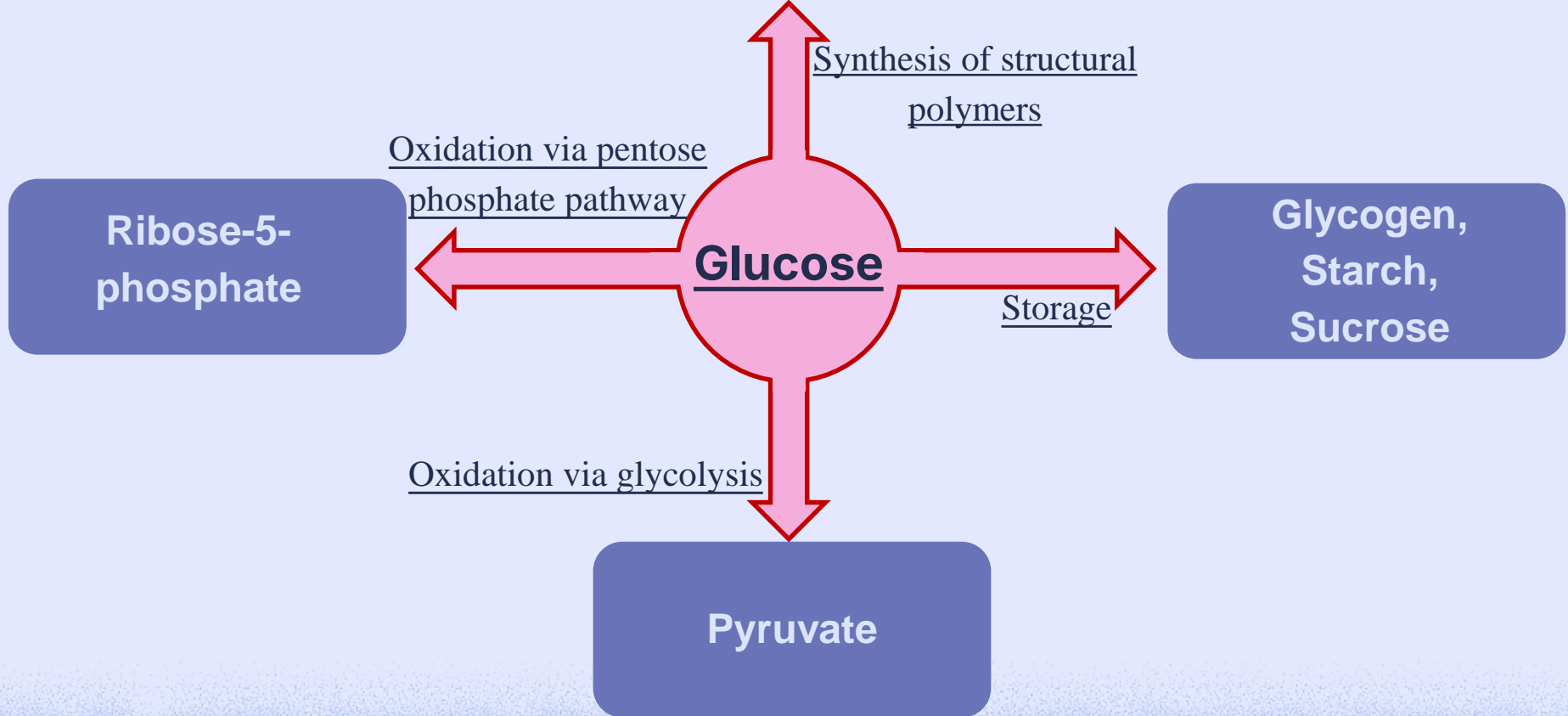
Glucose

Storage

Glycogen, Starch, Sucrose

Oxidation via glycolysis

Pyruvate





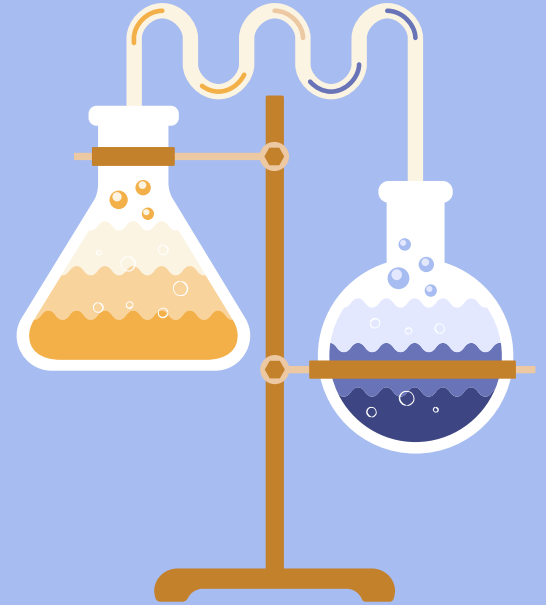
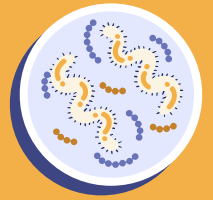
10 Steps of breakdown

01

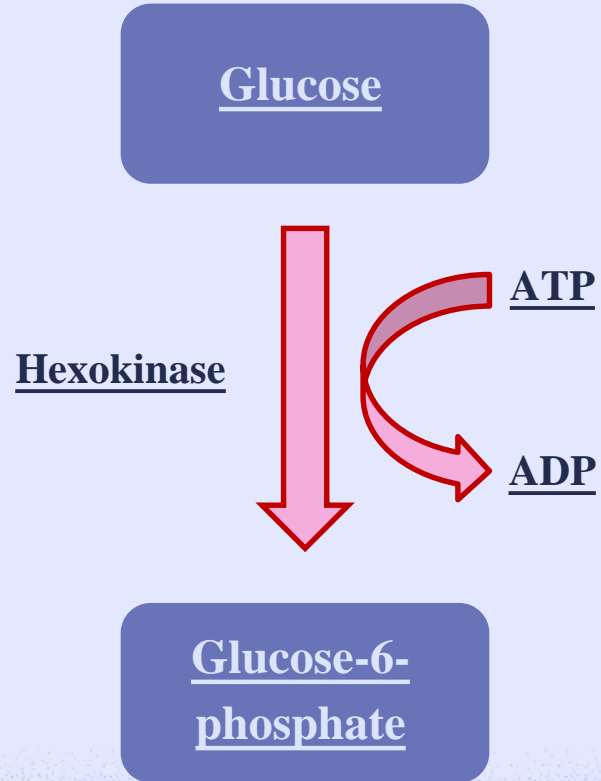
02

03

04



01 Phosphorylation

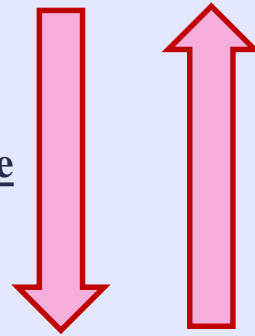


02

Isomerization

Glucose-6-phosphate

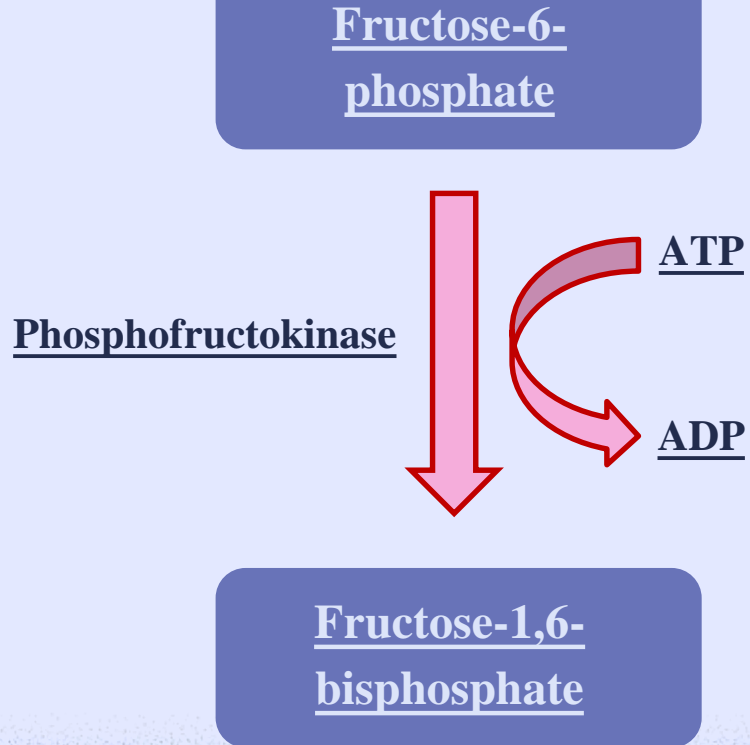
Phosphoglucoisomerase



Fructose-6-phosphate

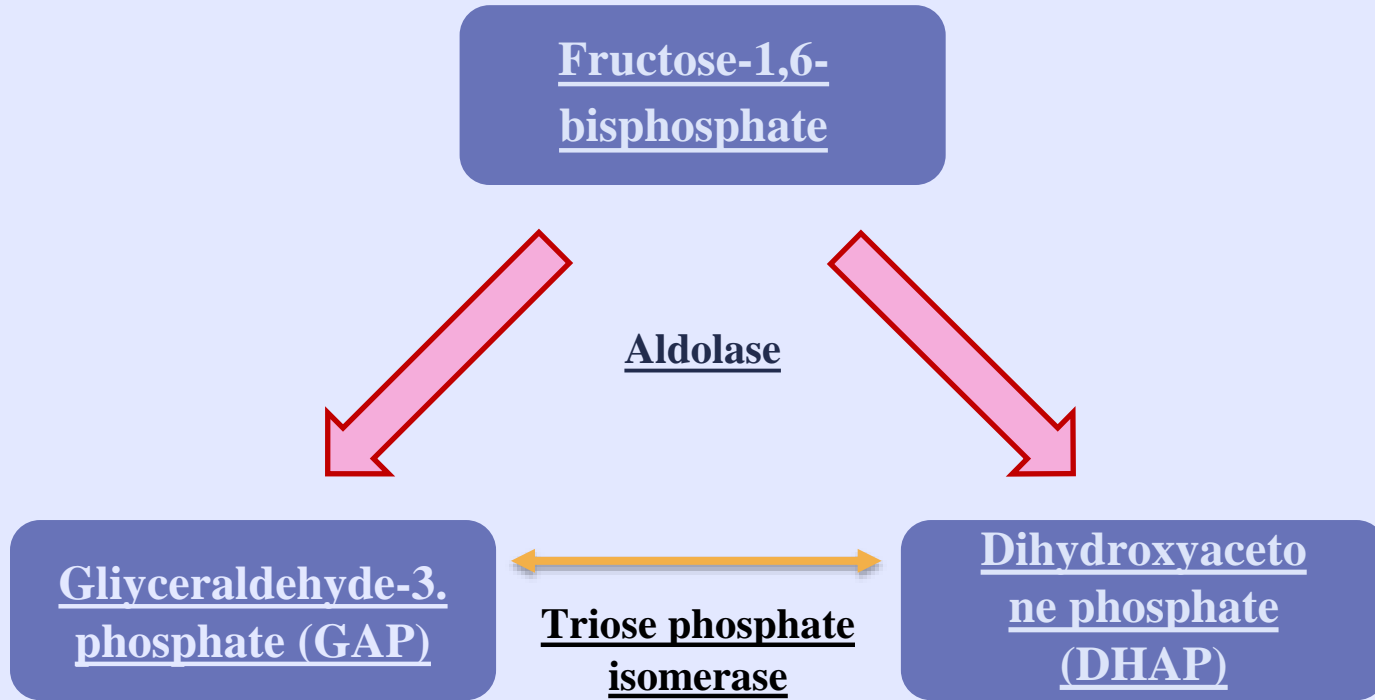


03 Phosphorylation



04

Breakdown





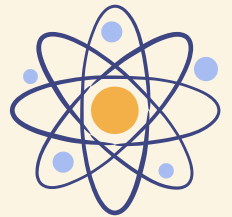
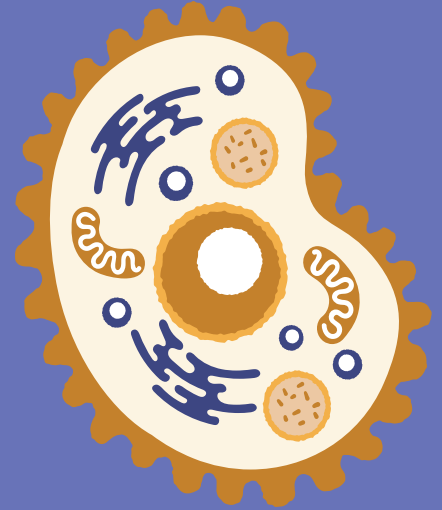
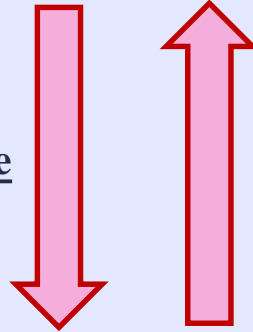
05

Isomerization

2

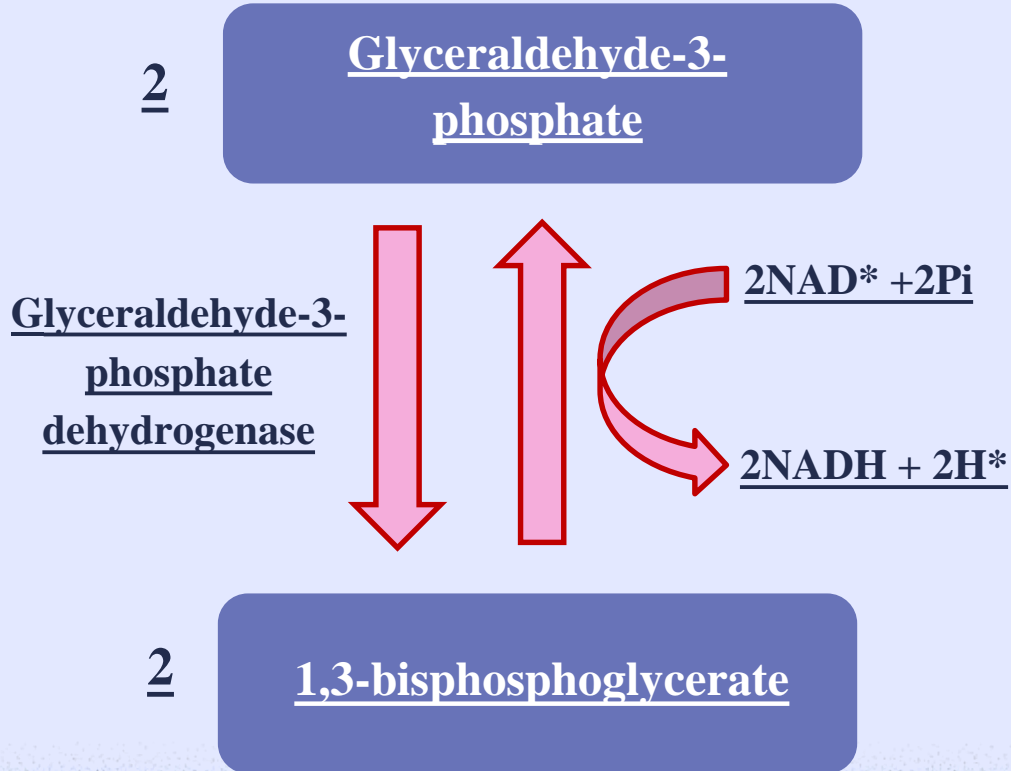
Glyceraldehyde-3-phosphate

Triose phosphate isomerase





06 Resultant reaction





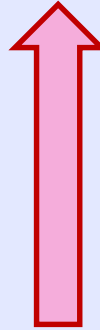
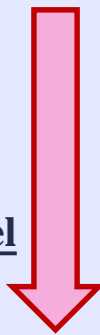
07 High-energy phosphate

2

1,3-bisphosphoglycerate

Phosphoglycerate
kinase

First substrate level
phosphorylation

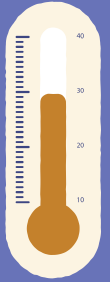
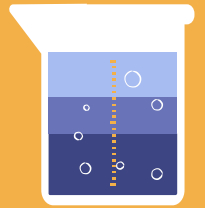


2 ADP

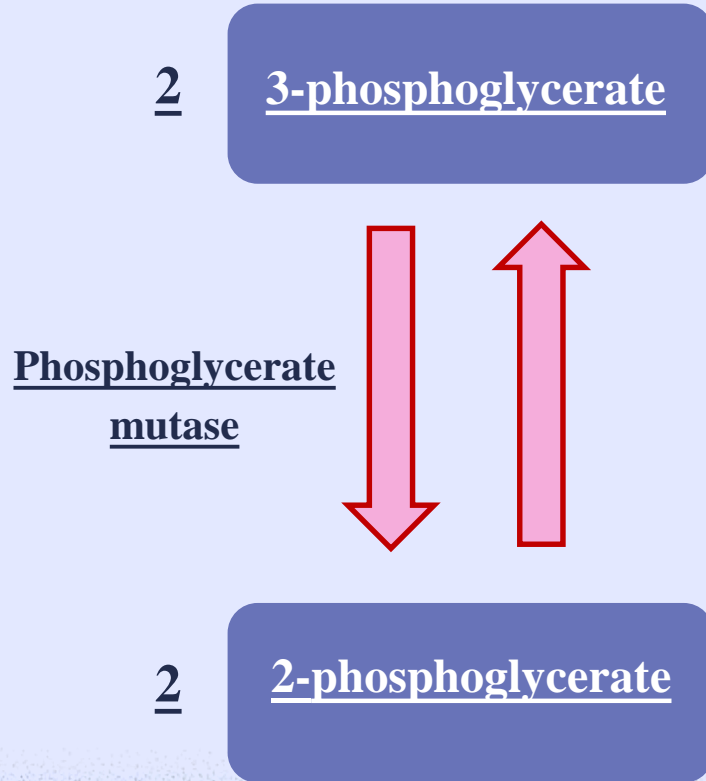
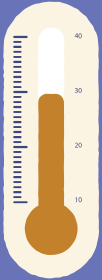
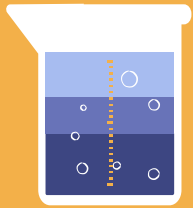
2 ATP

2

3-phosphoglycerate

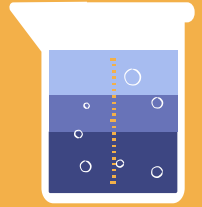


08 Phosphate-ester linkage





09 Dehydration of 2-PG



2

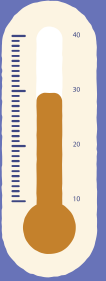
2-phosphoglycerate

Enolase

H₂O

2

Phosphoenol pyruvate
(PEP)



10

TRANSFER OF PHOSPHATE FROM PEP to ADP

2

Phosphoenolpyruvate

Pyruvate
kinase

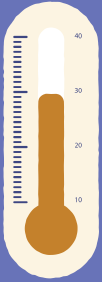
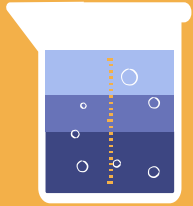
2 ADP

SECOND SUBSTRATE LEVEL
PHOSPHORYLATION

2 ATP

2

pyruvate



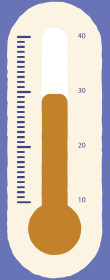
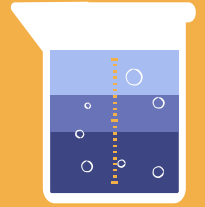


Summary



-Glycolysis is the process in which glucose is broken down to produce energy.

-GLYCOLYSIS is the sequence of 10 enzyme-catalyzed reactions that converts glucose into pyruvate with simultaneous production of ATP.





References



*-(Champe C. pamela, Richard A. Harvey,
Third edition)*





**Thank
You for
Your
Attention**

