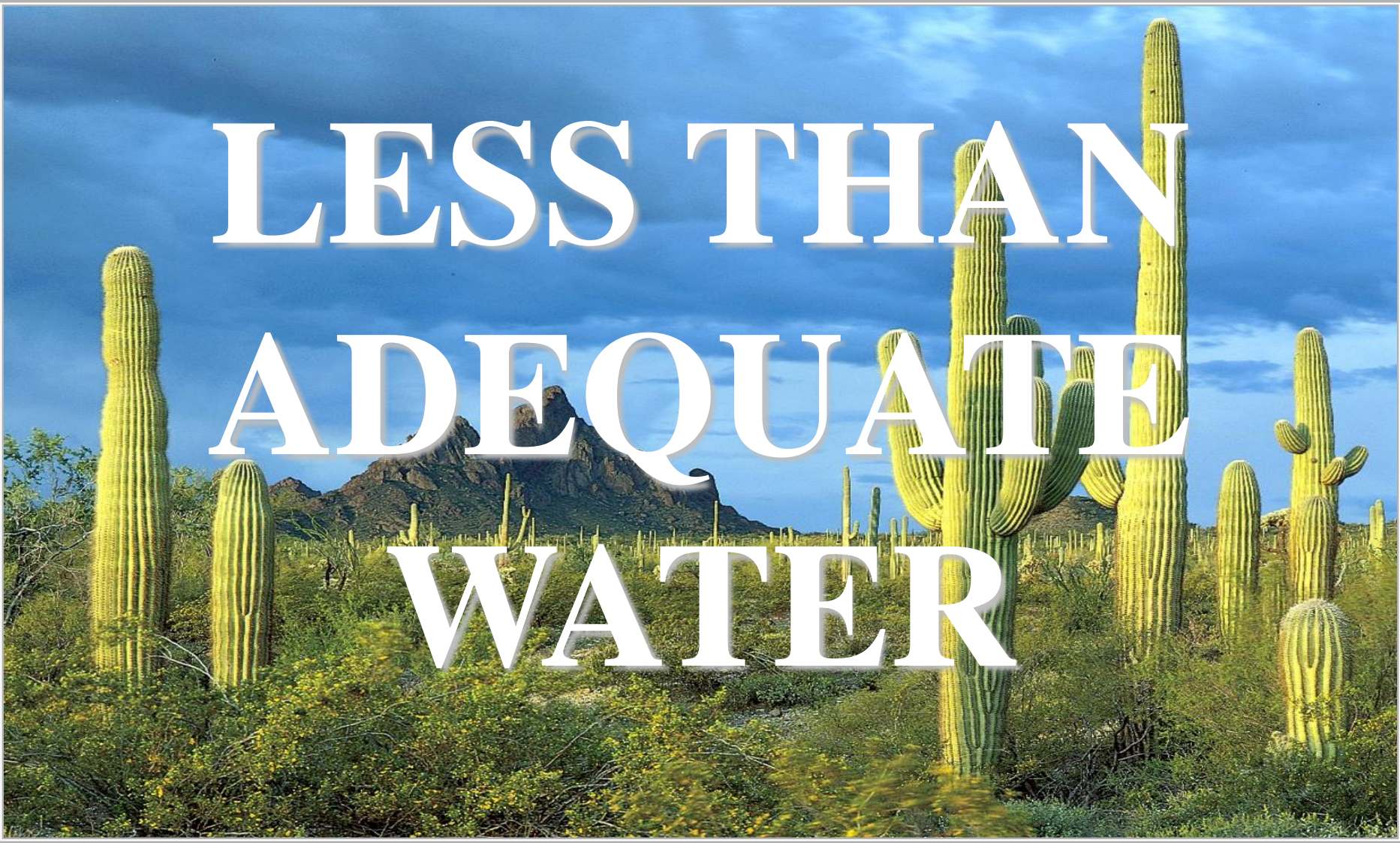


A photograph of a desert landscape featuring several tall saguaro cacti. The cacti are green and ribbed, with some showing small arms. The background shows a range of brown, rocky mountains under a blue sky with light clouds. The foreground is filled with low-lying green and yellow shrubs.

CAM PLANTS
VERY XERIC
HABITATS

VERY XERIC HABITATS



LESS THAN
ADEQUATE
WATER

VERY XERIC HABITATS

DESERTS



VERY XERIC HABITATS

PHOTOSYNTHESIS



DARK REACTION SUMMARY

DARK REACTION



ALABAMA FORESTS

MESIC HABITATS


DARK REACTION



C3 PATHWAY PLANTS

MESIC HABITATS

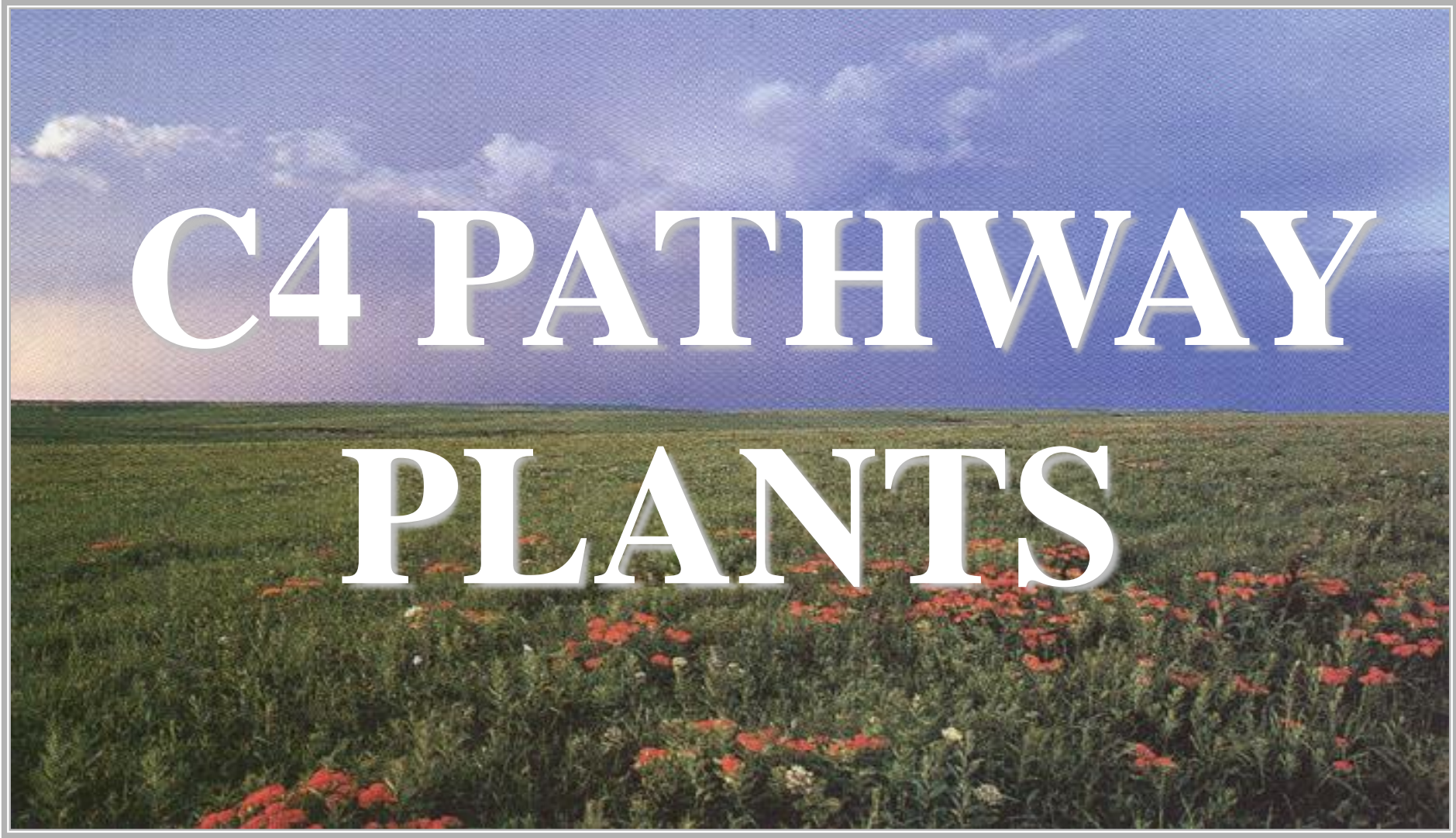
DARK REACTION



MIDWEST GRASSLANDS

XERIC HABITATS

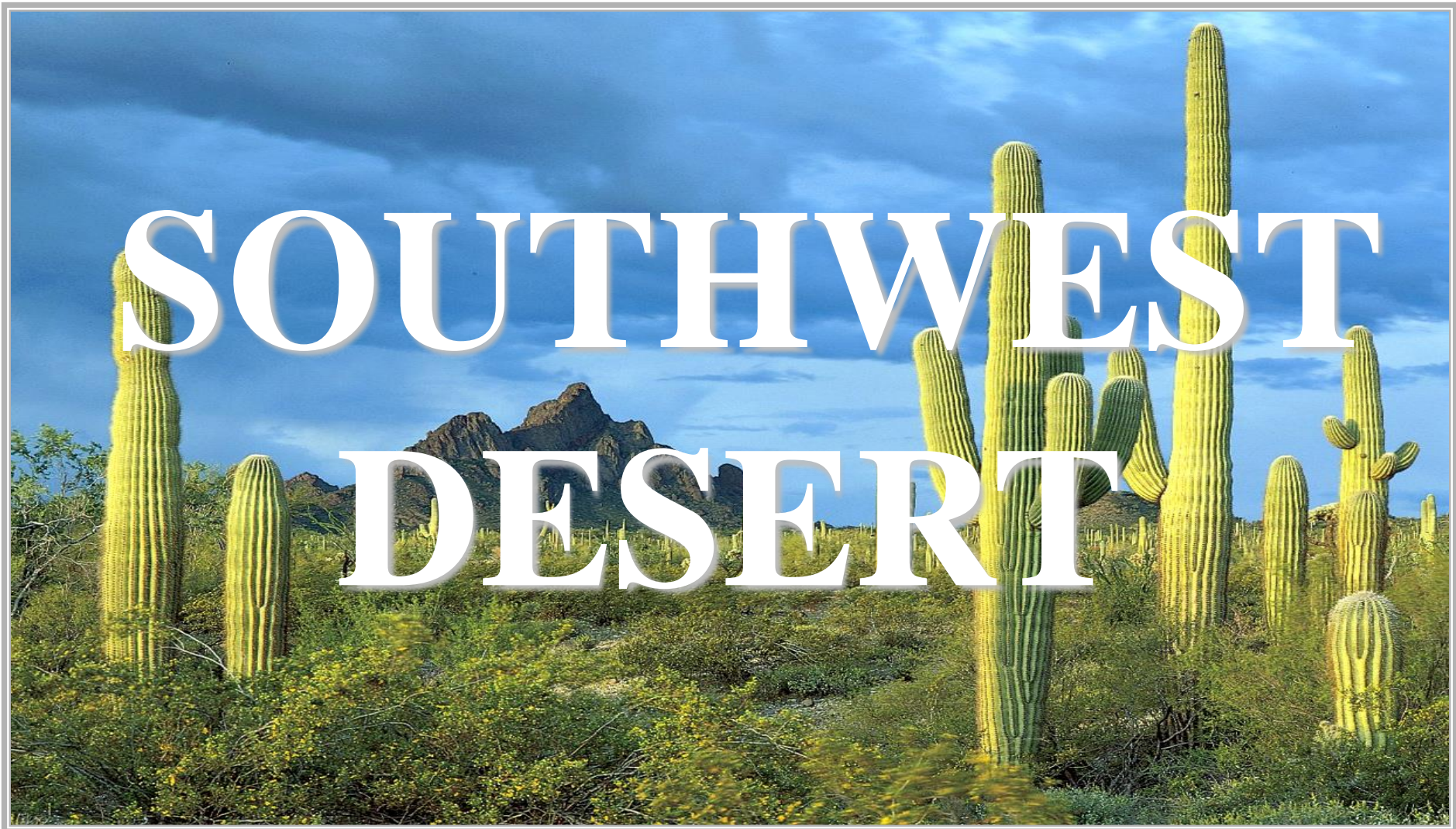
DARK REACTION



C4 PATHWAY PLANTS

XERIC HABITATS

DARK REACTION



VERY XERIC HABITATS

DARK REACTION



CAM PATHWAY PLANTS

VERY XERIC HABITATS

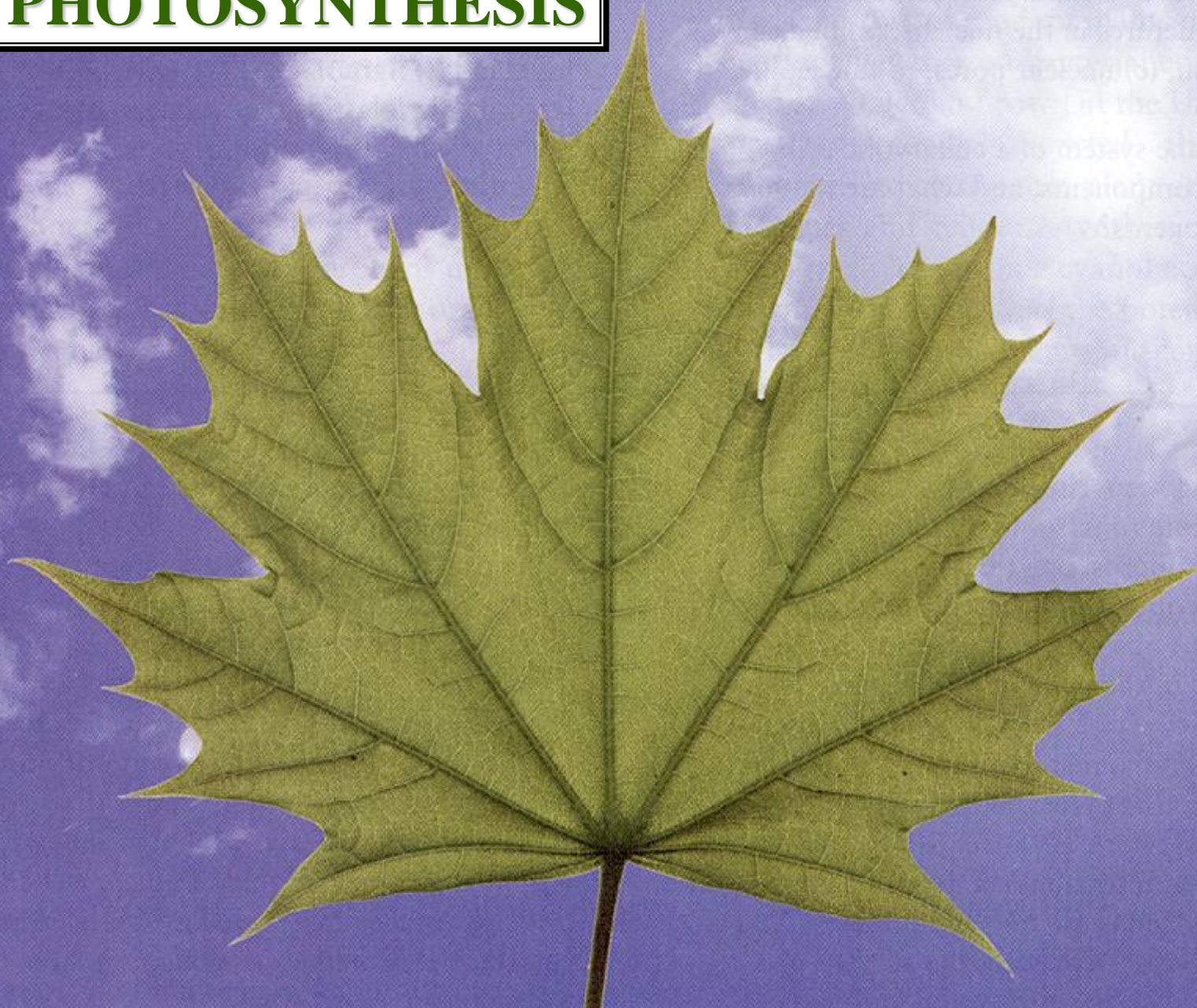


CHAPTER 09

RESPIRATION

PHOTOSYNTHESIS

L



PHOTOSYNTHESIS

C



LIGHT
ENERGY

PHOTOSYNTHESIS

G



CHEMICAL
ENERGY

PHOTOSYNTHESIS

G

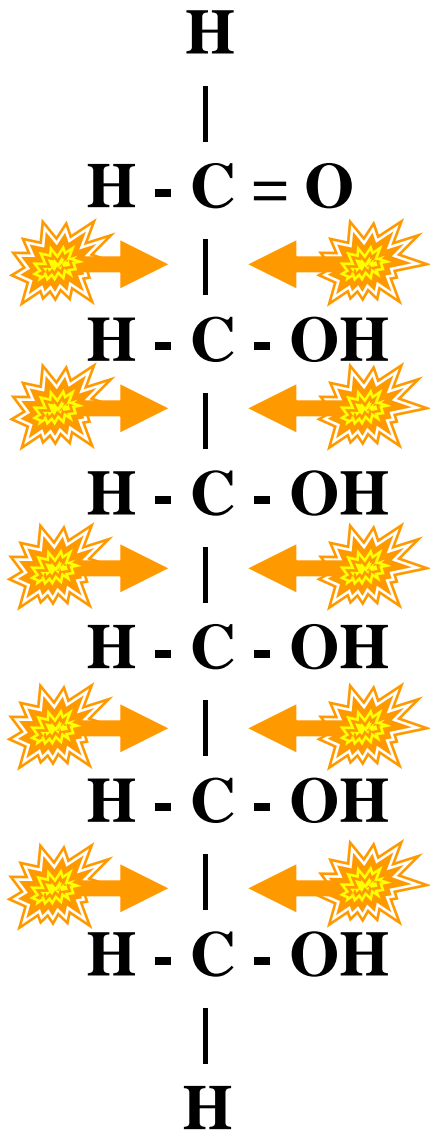
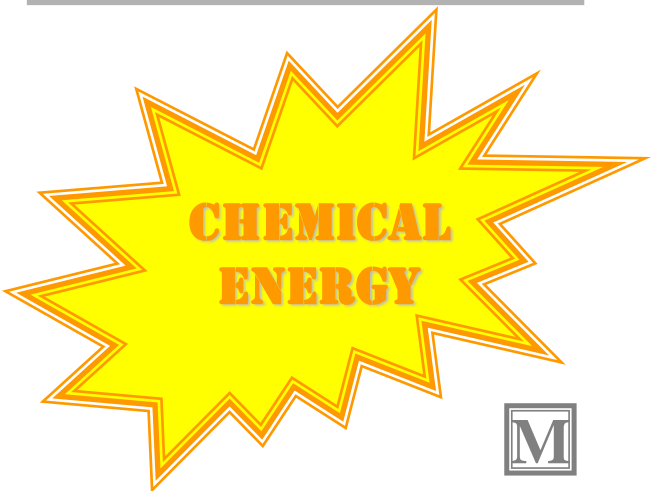
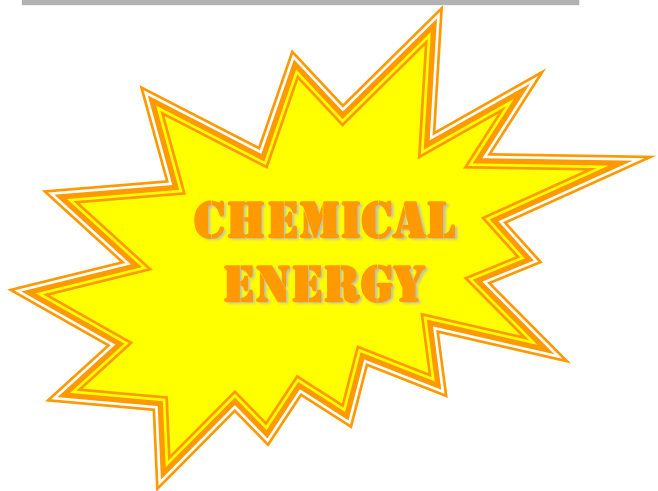


GLUCOSE



= CHEMICAL ENERGY

GLUCOSE



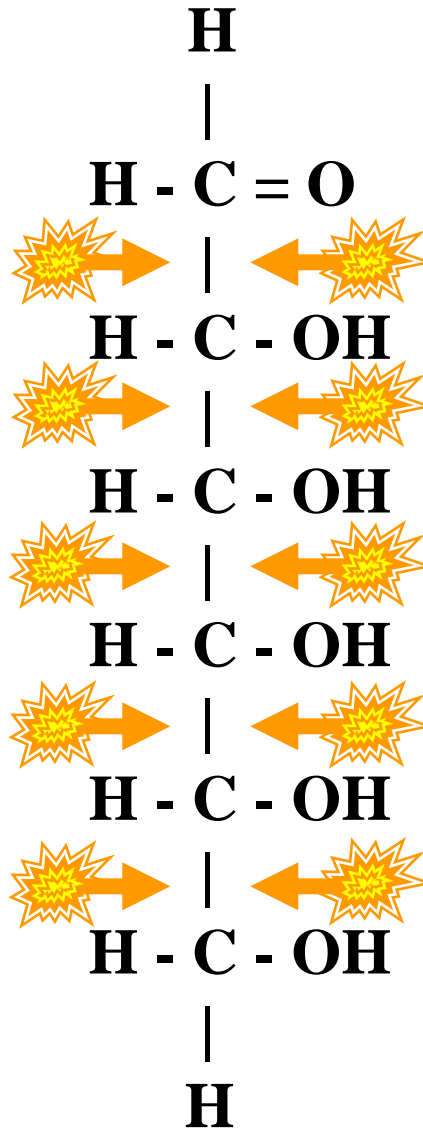


GLUCOSE



ENTERS
METABOLISM

ENTERS
METABOLISM



GLUCOSE METABOLIC ROUTES

**GLUCOSE
METABOLIC ROUTES**

ENERGY STORAGE

**GLUCOSE
METABOLIC ROUTES**

**GLUCOSE
METABOLIC ROUTES**

**ENERGY STORAGE
ANABOLIC METABOLISM**

**GLUCOSE
METABOLIC ROUTES**



GLUCOSE METABOLIC ROUTES

ENERGY STORAGE

ANABOLIC METABOLISM

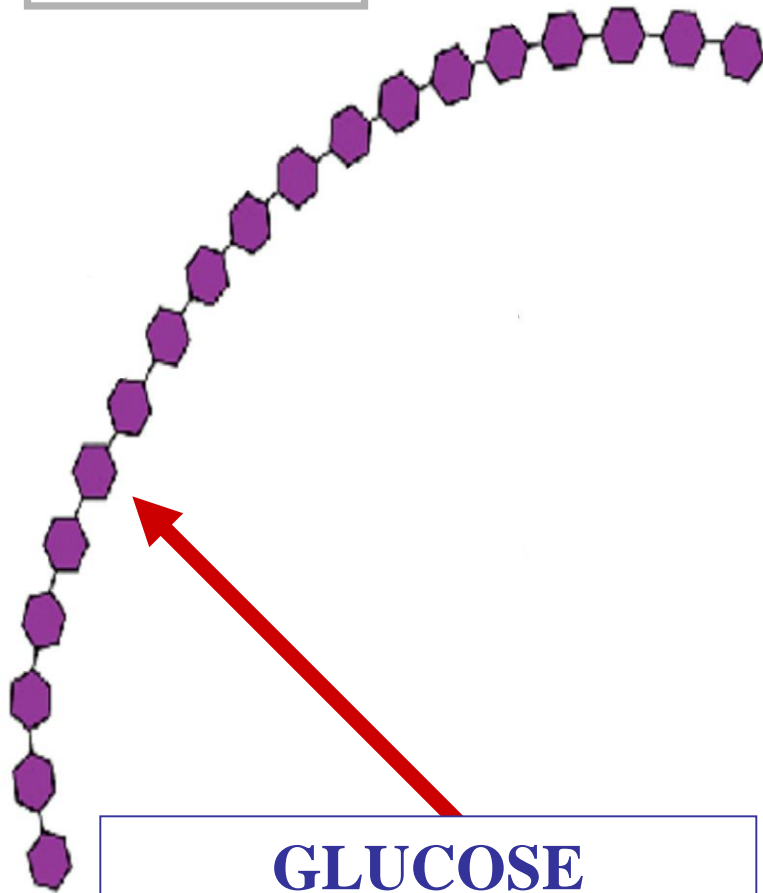
CATABOLIC METABOLISM

GLUCOSE METABOLIC ROUTES

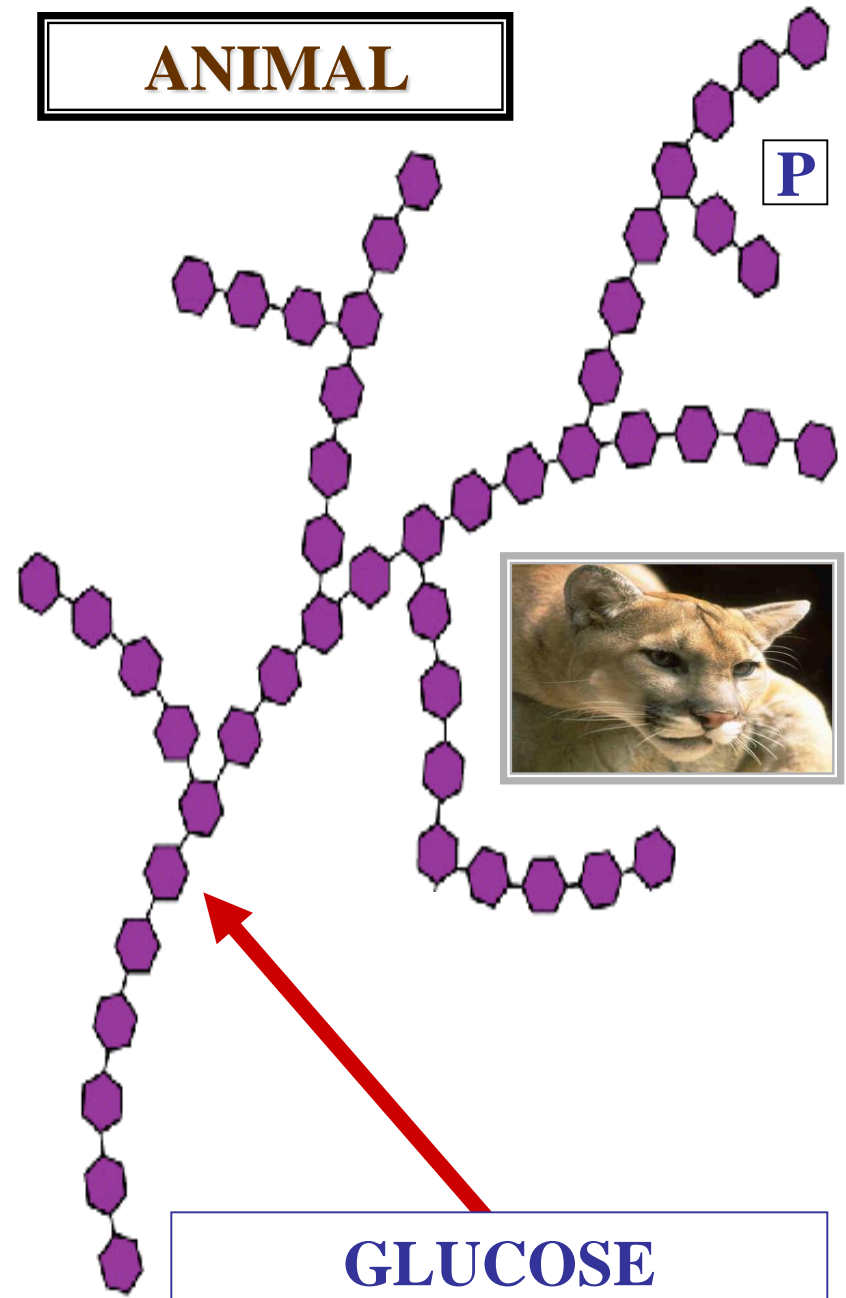


GLUCOSE ENERGY STORAGE

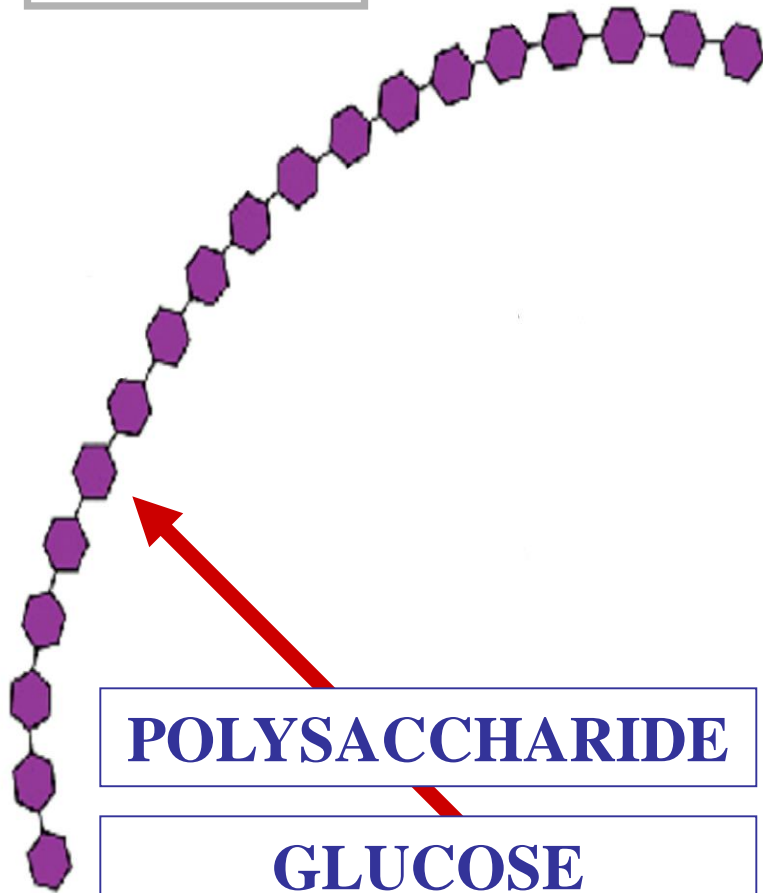
PLANT



ANIMAL



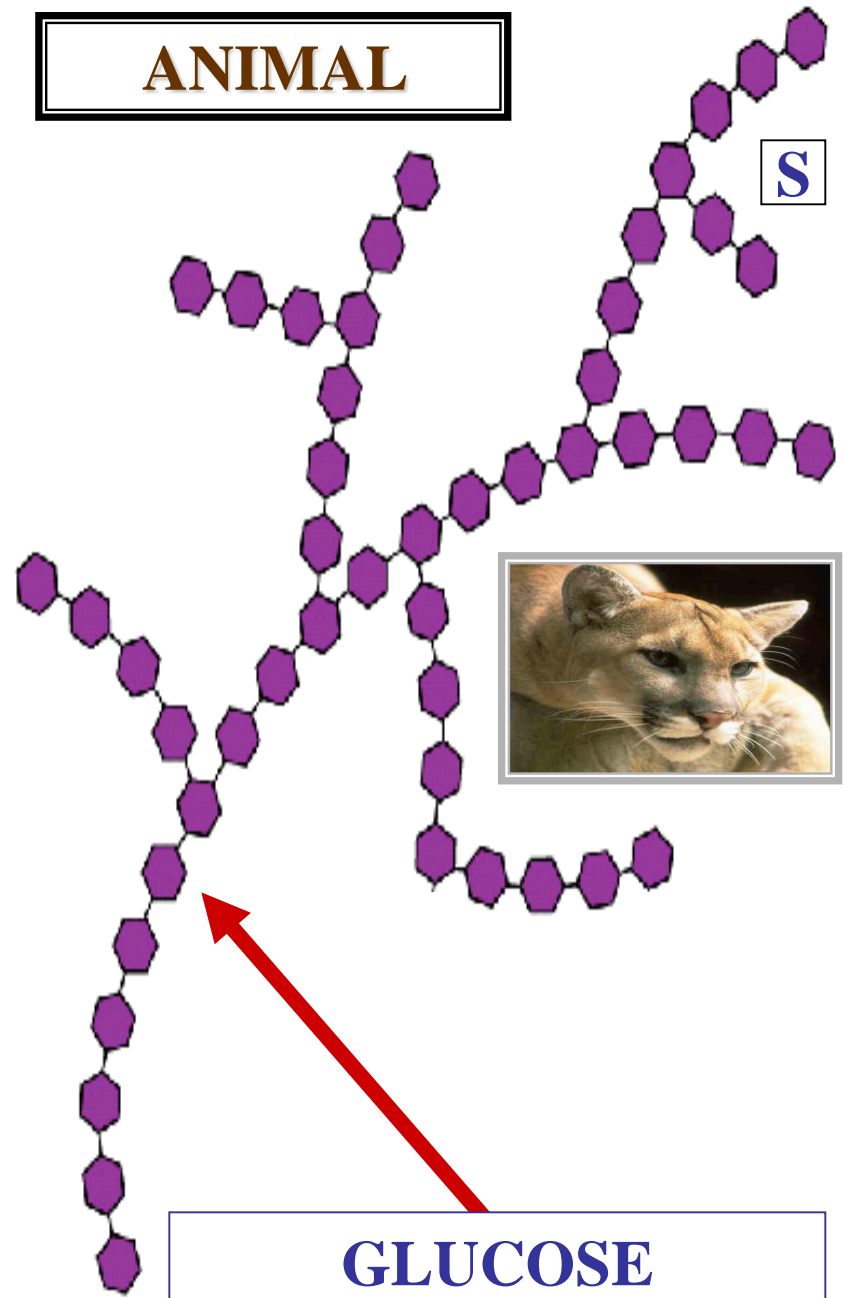
PLANT



POLYSACCHARIDE

GLUCOSE

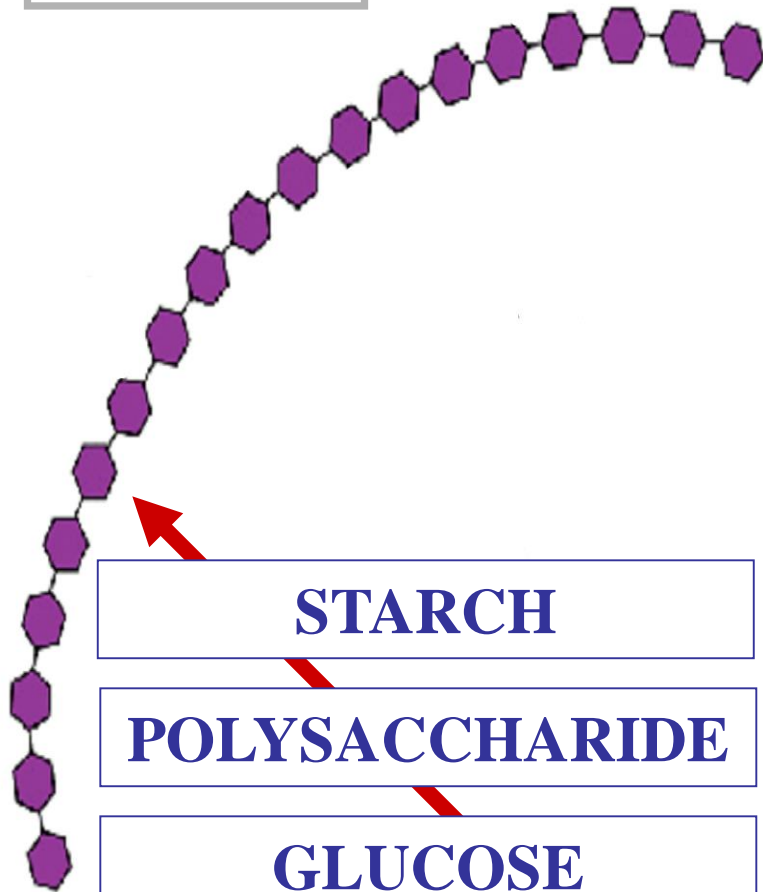
ANIMAL



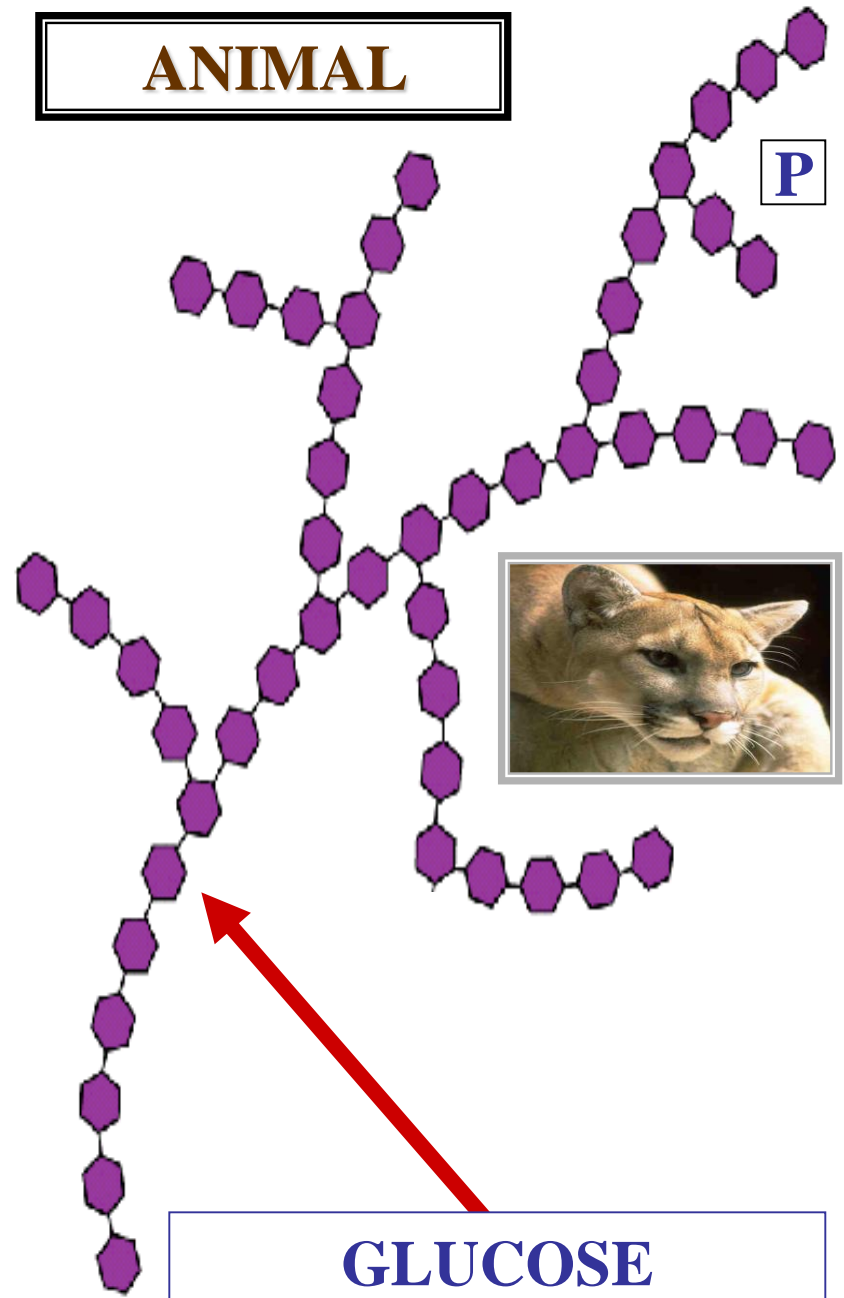
S

GLUCOSE

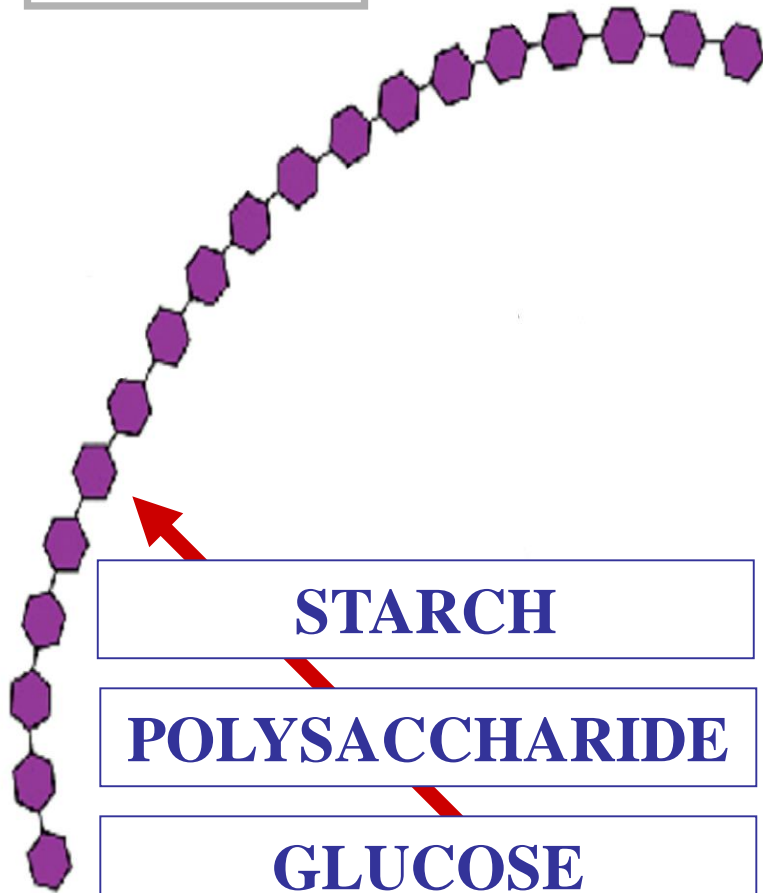
PLANT



ANIMAL



PLANT

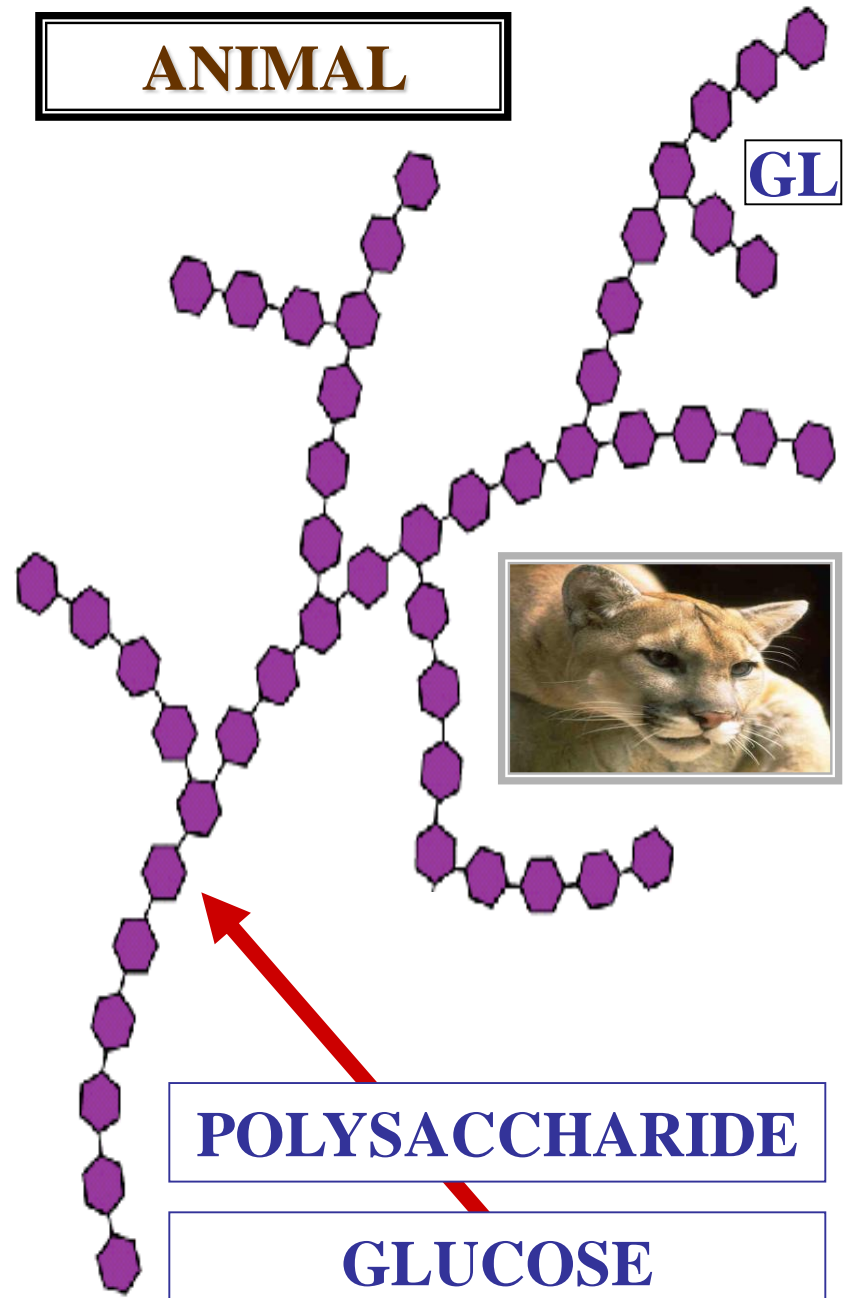


STARCH

POLYSACCHARIDE

GLUCOSE

ANIMAL

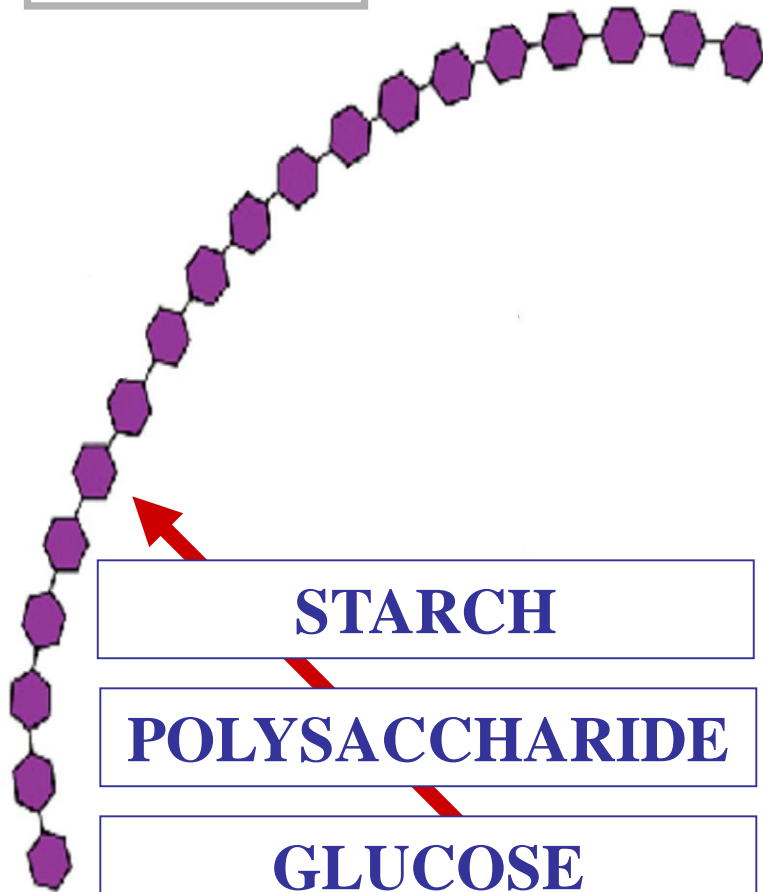


GL

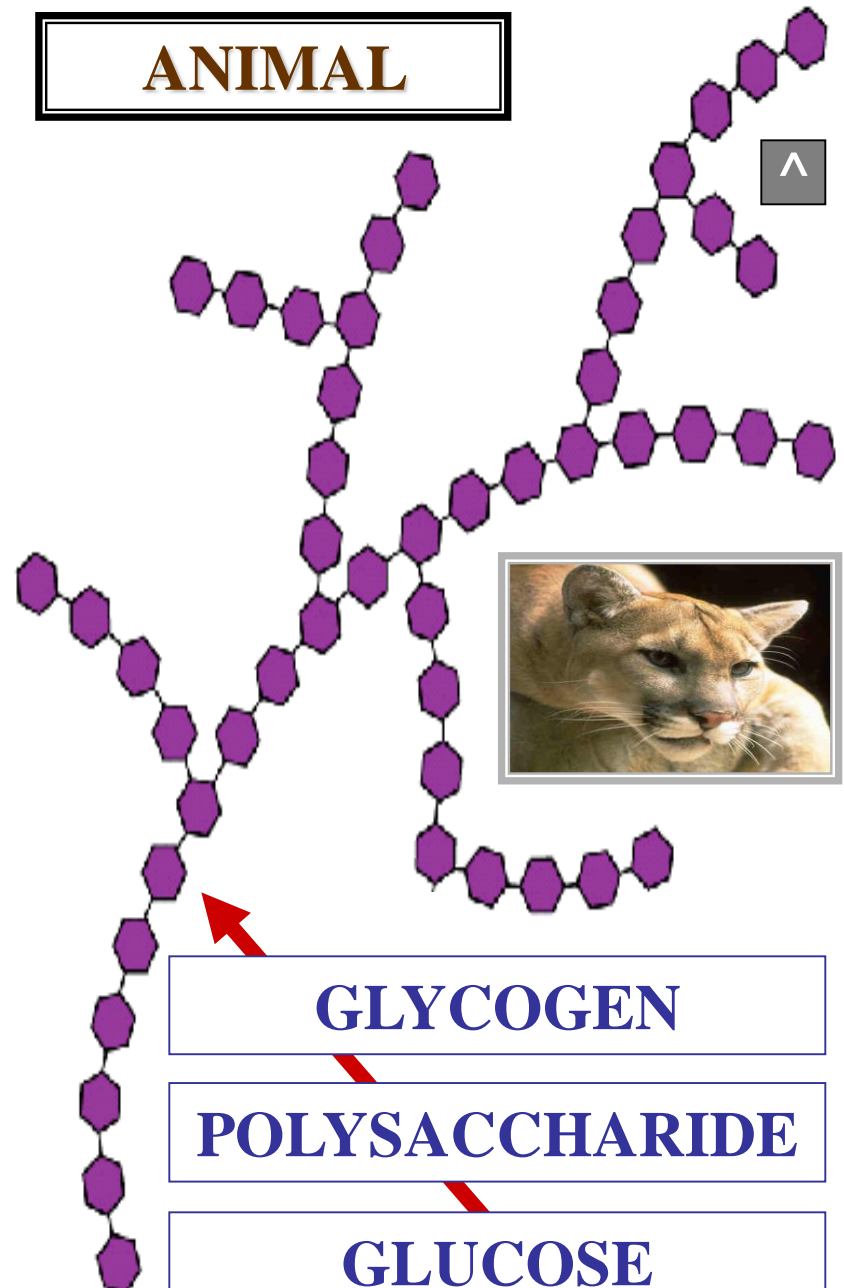
POLYSACCHARIDE

GLUCOSE

PLANT



ANIMAL



**GLUCOSE
ANABOLIC
METABOLISM**

METABOLISM

GLUCOSE



AM

?

METABOLISM

GLUCOSE



**ANABOLIC
METABOLISM**

**?
METABOLISM**

METABOLISM

GLUCOSE



**ANABOLIC
METABOLISM**

**BUILD-UP
METABOLISM**

METABOLISM

GLUCOSE



**ANABOLIC
METABOLISM**

**BIOSYNTHESIS
METABOLISM**

B



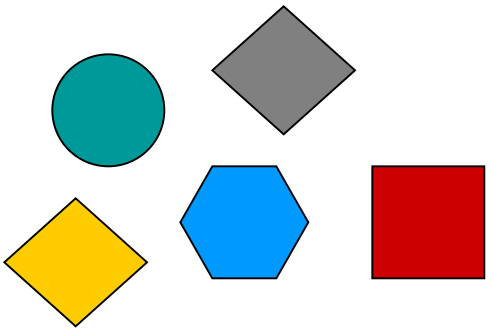
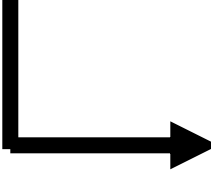
METABOLISM

GLUCOSE



ANABOLIC METABOLISM

BIOSYNTHESIS METABOLISM



BUILDING BLOCKS



METABOLISM

GLUCOSE

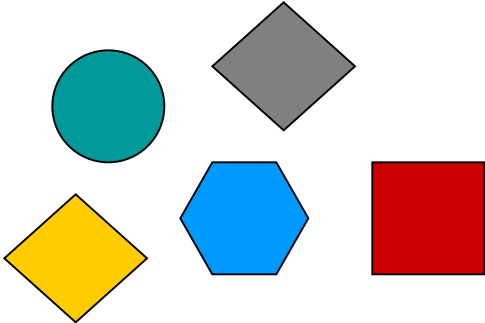


ANABOLIC METABOLISM

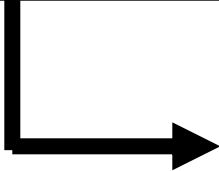
BIOSYNTHESIS METABOLISM

BIOSYNTHESIS METABOLISM

ANABOLIC METABOLISM



BUILDING BLOCKS





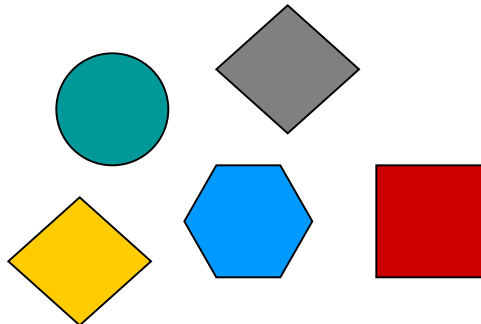
METABOLISM

GLUCOSE



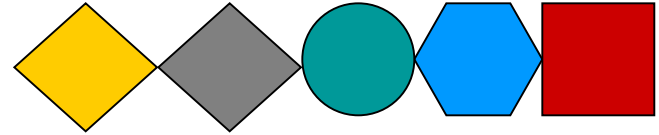
**ANABOLIC
METABOLISM**

**BIOSYNTHESIS
METABOLISM**



BUILDING BLOCKS

COMPLEX BIO-CHEM-CMPS



**BIOSYNTHESIS
METABOLISM**

**ANABOLIC
METABOLISM**

***CELL
GROWTH
&
MAINTENANCE***



HOMEOSTASIS



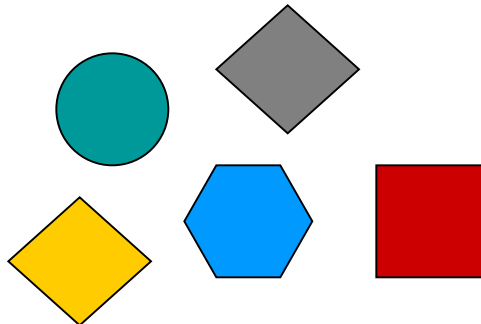
METABOLISM

GLUCOSE



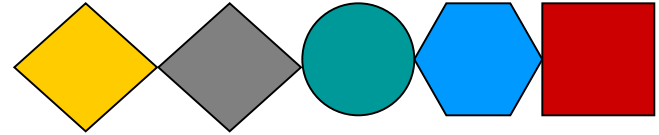
**ANABOLIC
METABOLISM**

**BIOSYNTHESIS
METABOLISM**



BUILDING BLOCKS

COMPLEX BIO-CHEM-CMPS



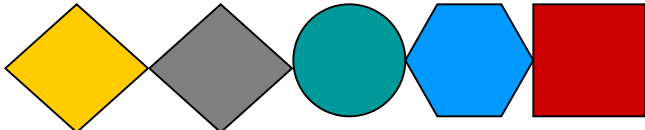
**BIOSYNTHESIS
METABOLISM**

**ANABOLIC
METABOLISM**

METABOLISM

GLUCOSE

COMPLEX BIO-CHEM-CMPS



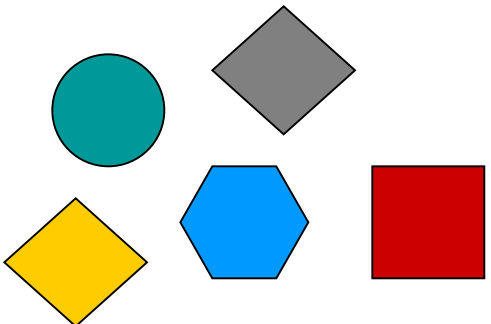
ANABOLIC METABOLISM



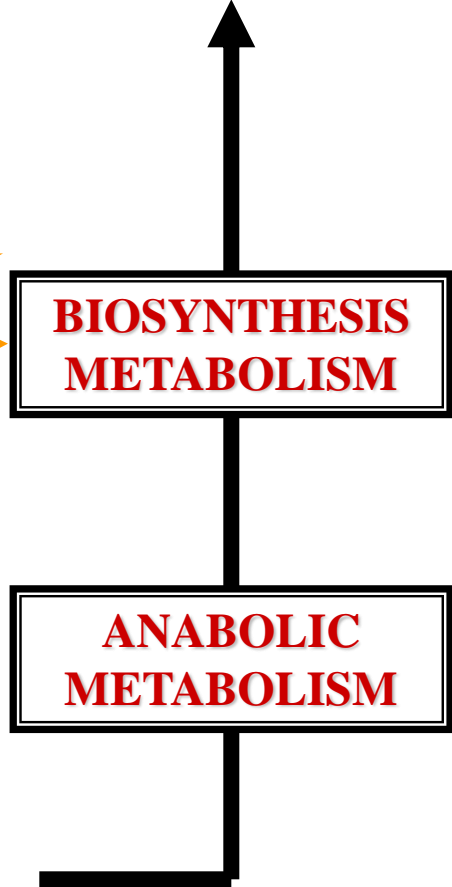
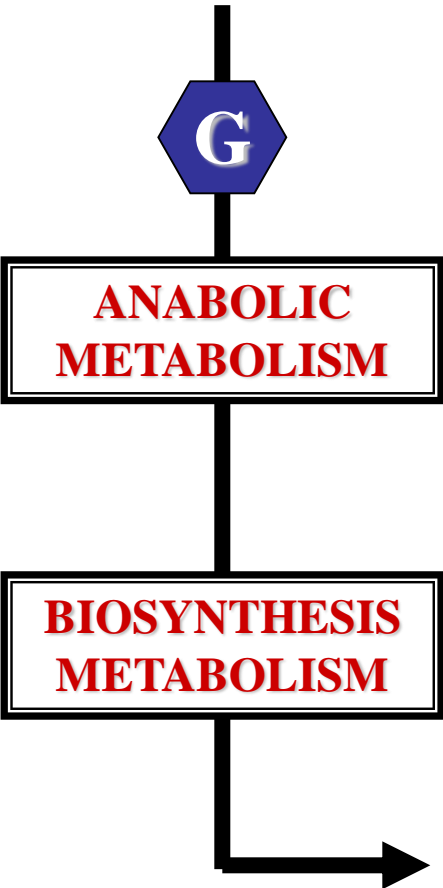
BIOSYNTHESIS METABOLISM

BIOSYNTHESIS METABOLISM

ANABOLIC METABOLISM



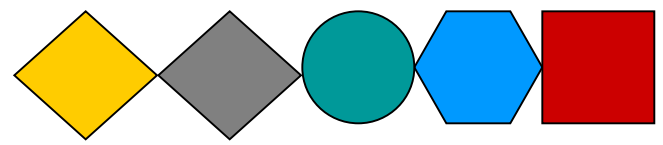
BUILDING BLOCKS



METABOLISM

GLUCOSE

COMPLEX BIO-CHEM-CMPS



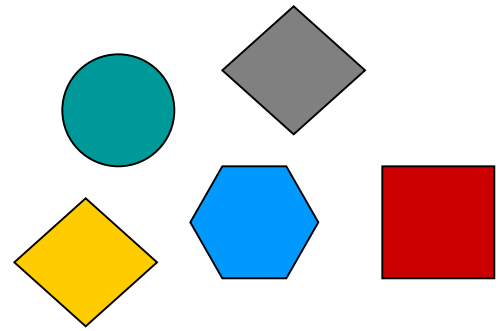
ANABOLIC METABOLISM



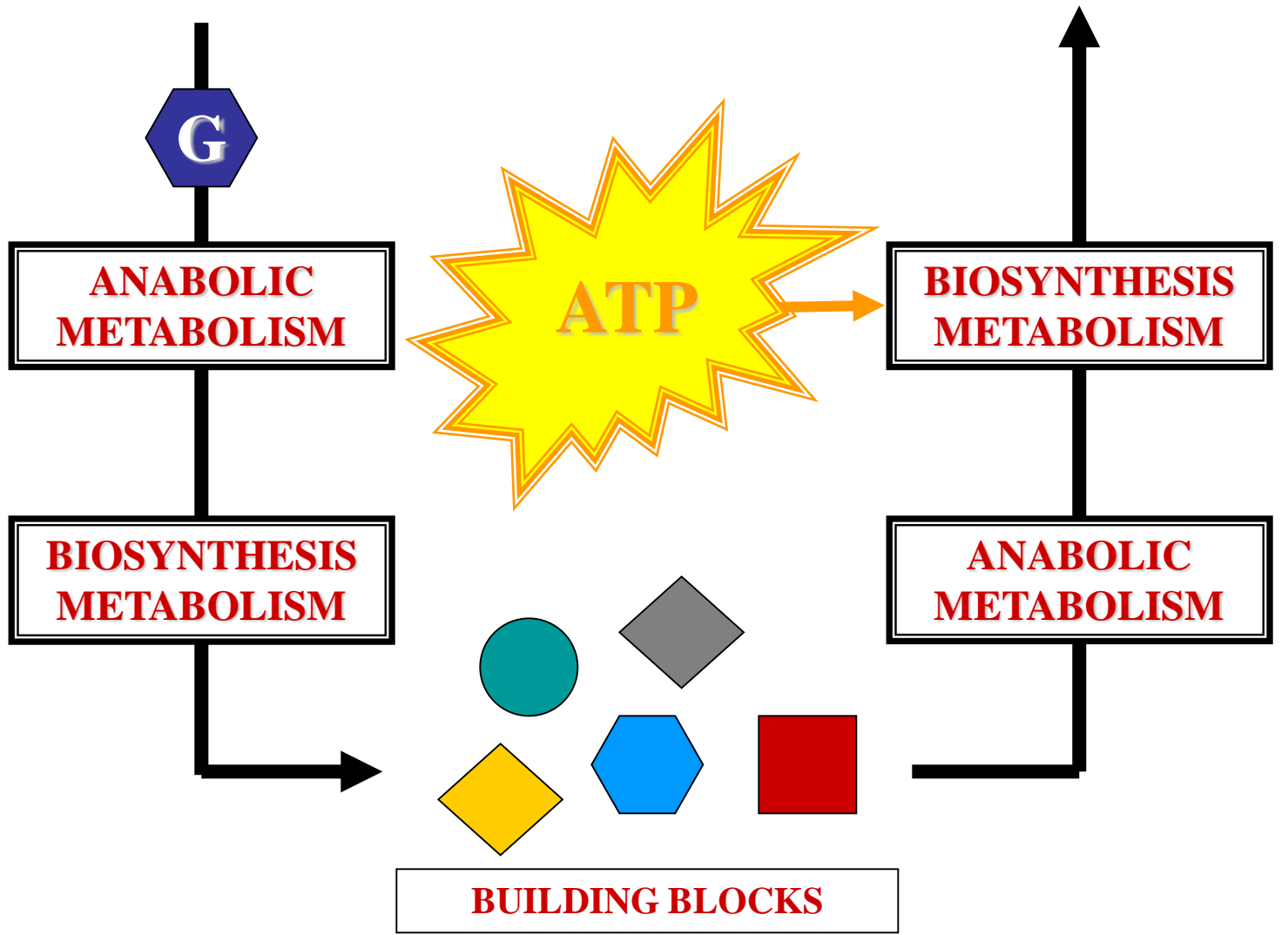
BIOSYNTHESIS METABOLISM

BIOSYNTHESIS METABOLISM

ANABOLIC METABOLISM



BUILDING BLOCKS



QUESTION

WHAT IS GOING TO PROVIDE
ANABOLIC METABOLISM
WITH ATP CHEMICAL
ENERGY INPUT?

QUESTION



ANSWER

**CATABOLIC
METABOLISM**

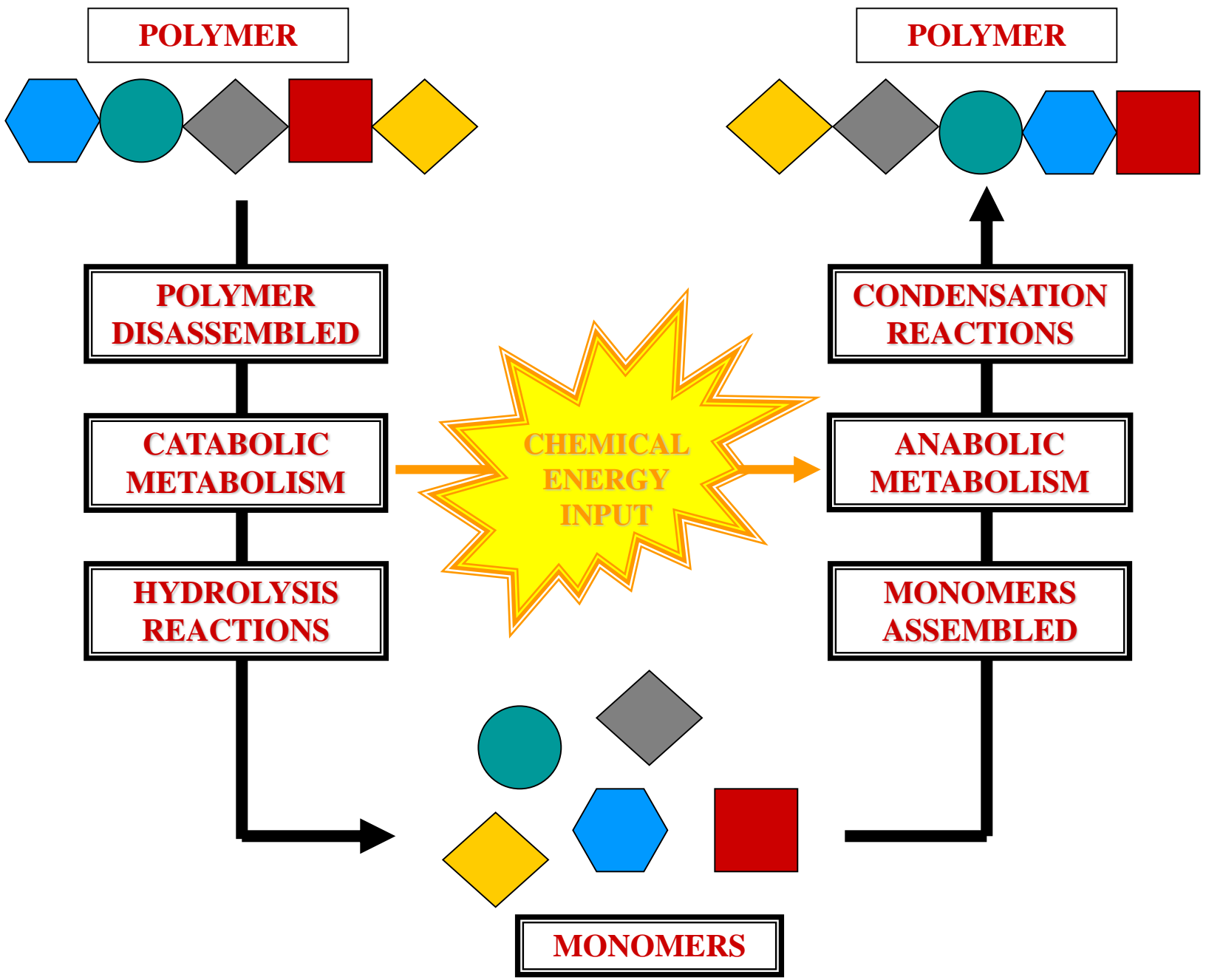
ANSWER

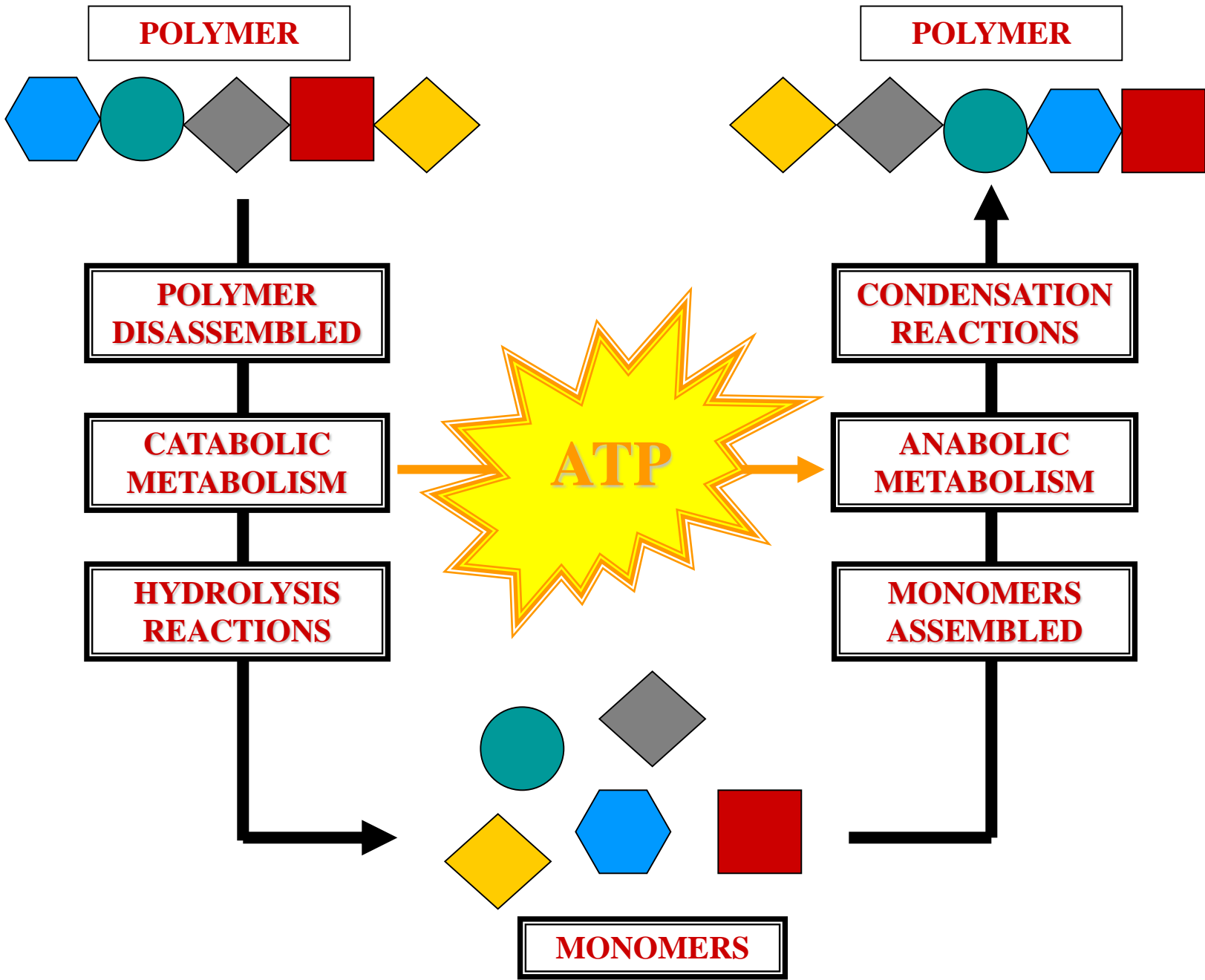
**ANABOLIC
METABOLISM
&
CATABOLIC
METABOLISM
?**

ANABOLIC
METABOLISM
&
CATABOLIC
METABOLISM

!!!COUPLED!!!







GLUCOSE CATABOLIC METABOLISM

METABOLISM

GLUCOSE



 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**



**?
METABOLISM**

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**



**BREAK-DOWN
METABOLISM**

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

**DEGRADATIVE
METABOLISM**

 = CHEMICAL ENERGY



METABOLISM

GLUCOSE



CATABOLIC
METABOLISM

BREAK-DOWN
METABOLISM



CO₂

 = CHEMICAL ENERGY

?

EX

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**



**BREAK-DOWN
METABOLISM**



CO₂

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

**?
REACTIONS**

CO₂



 = **CHEMICAL ENERGY**



METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

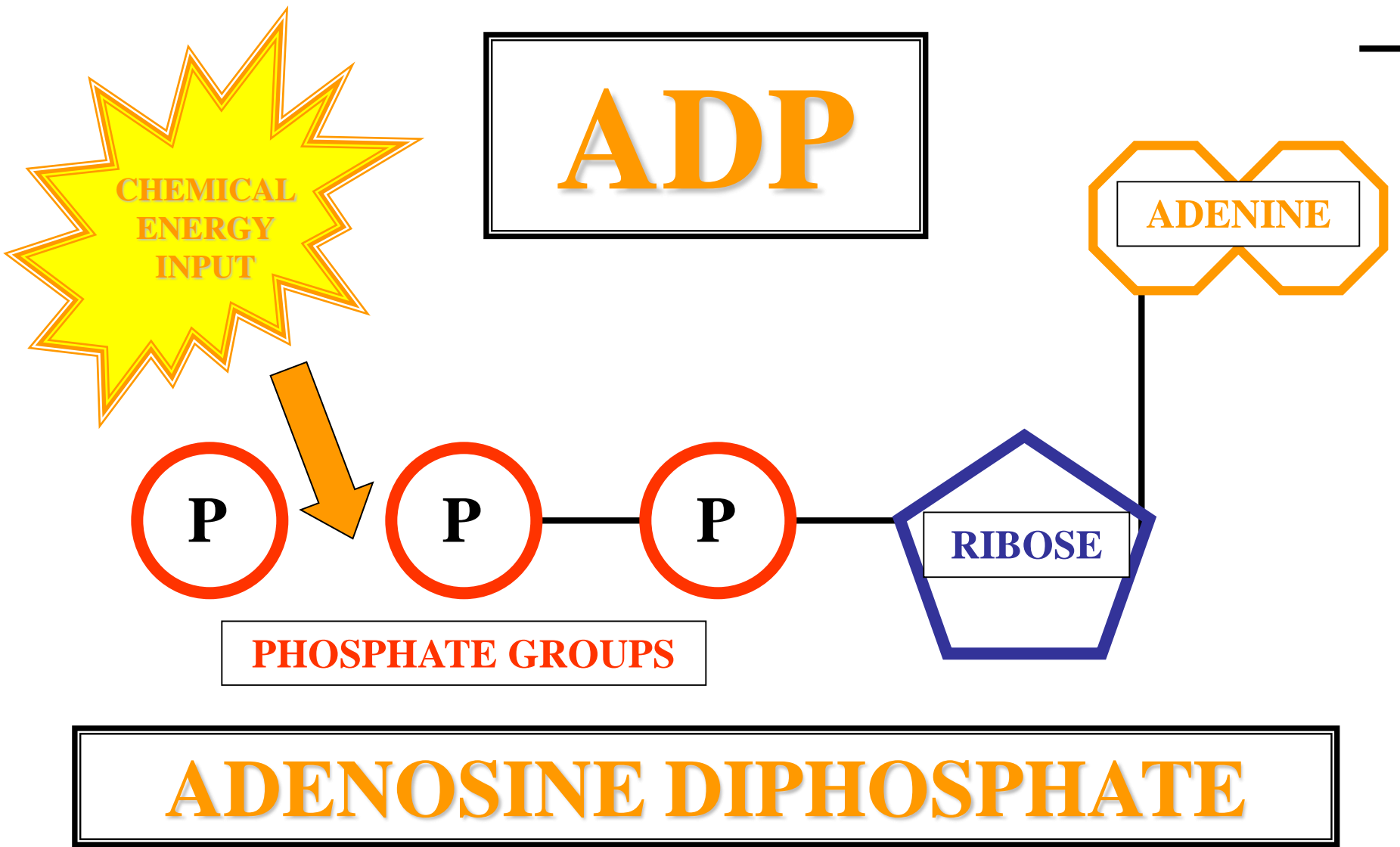
**EXERGONIC
REACTIONS**

CO₂

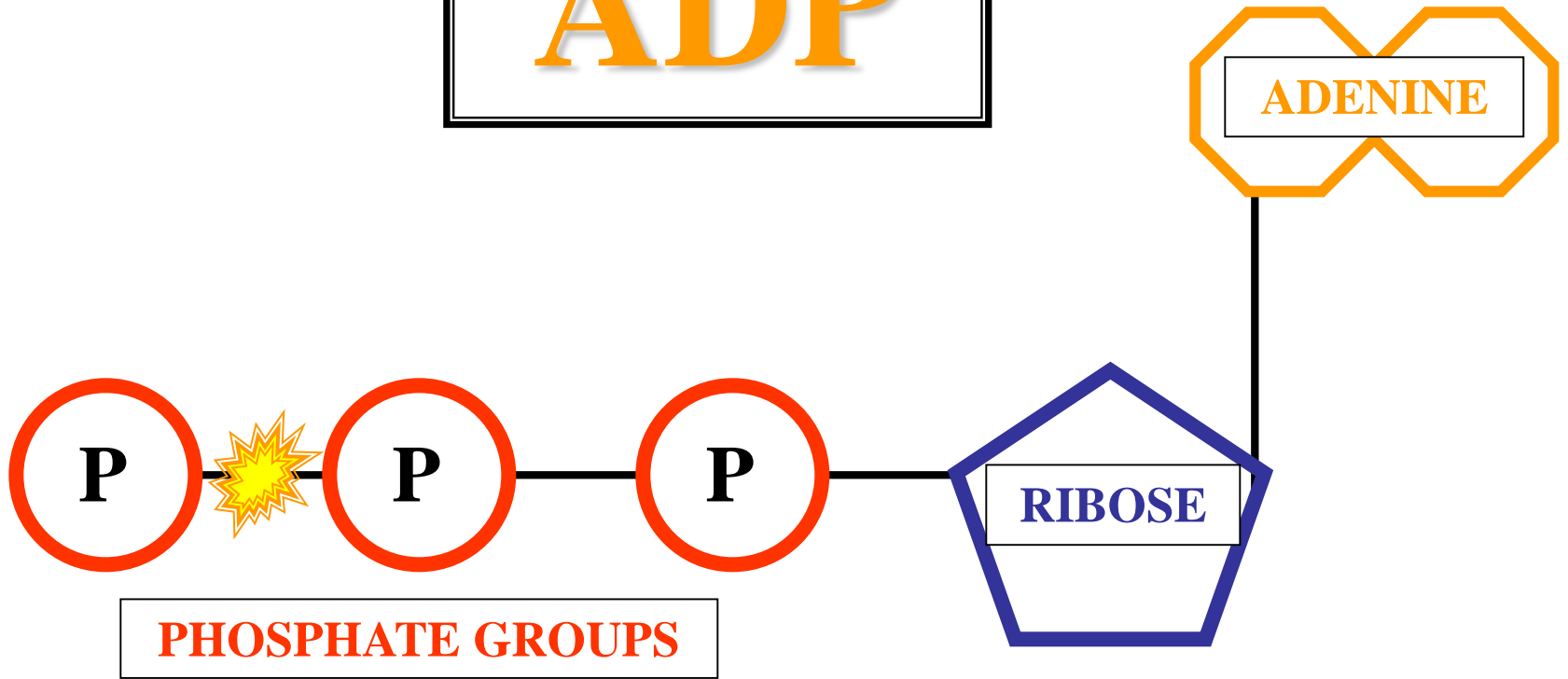
**CHEMICAL
ENERGY
RELEASE**



= CHEMICAL ENERGY




ADP



PHOSPHATE GROUPS

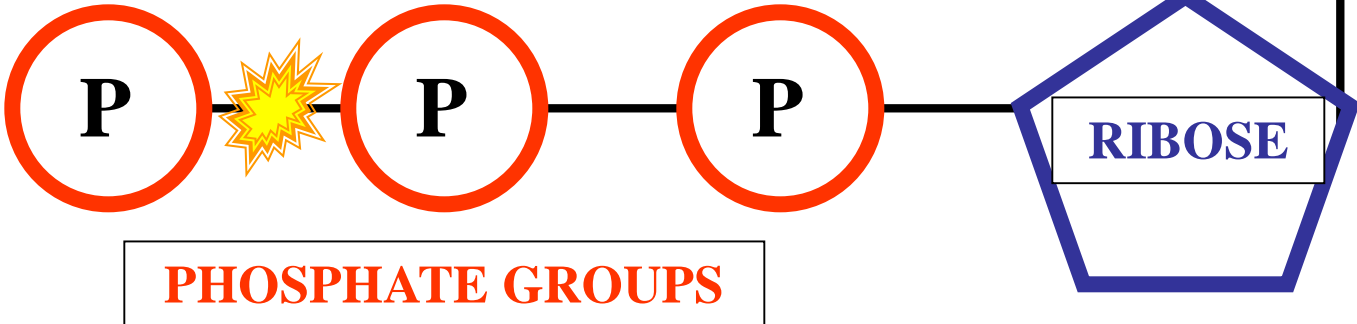
ADENOSINE DIPHOSPHATE

 = HOLDS BIO-CHEM ENERGY

ADP



ENDERGONIC REACTION

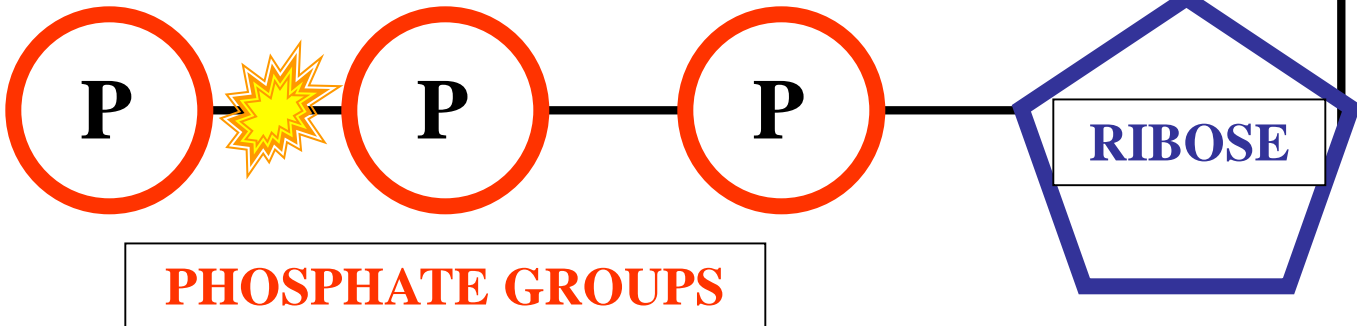


ADENOSINE DIPHOSPHATE

 = HOLDS BIO-CHEM ENERGY

ADP

PHOSPHORYLATION



ADENOSINE DIPHOSPHATE

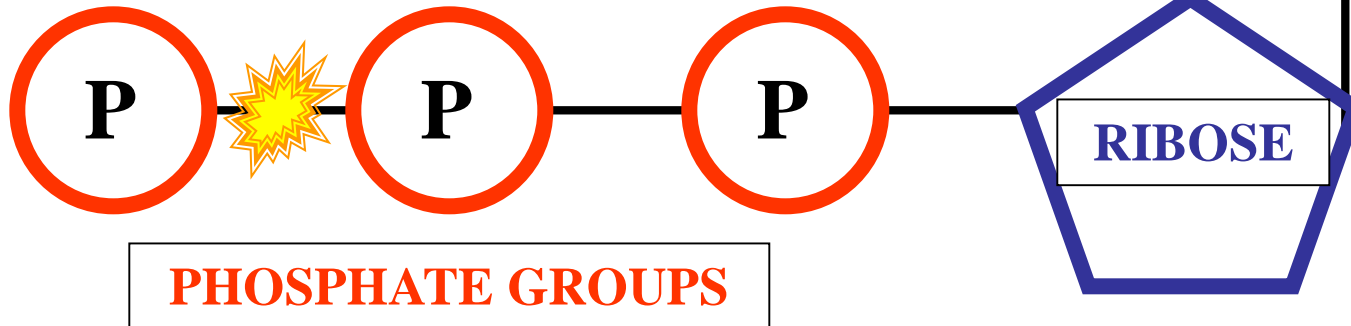
 = HOLDS BIO-CHEM ENERGY

ATP



ADENINE

PHOSPHORYLATION



ADENOSINE TRIPHOSPHATE



= HOLDS BIO-CHEM ENERGY

METABOLISM

GLUCOSE



CATABOLIC METABOLISM

EXERGONIC REACTIONS

CO₂



? METABOLISM

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

**EXERGONIC
REACTIONS**

CO₂



**ANABOLIC
METABOLISM**

 = CHEMICAL ENERGY

?

EN

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

**EXERGONIC
REACTIONS**

CO₂

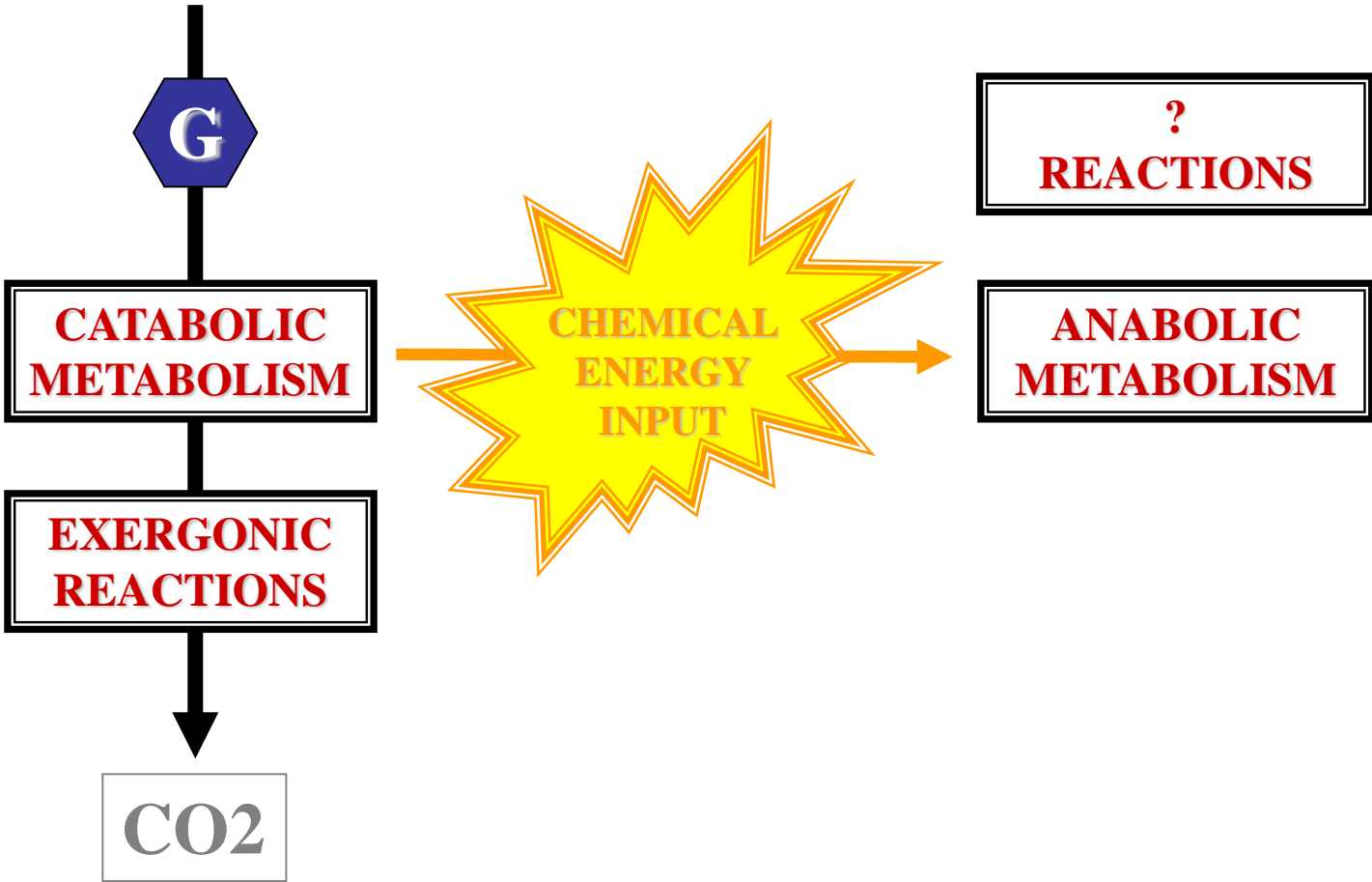


**ANABOLIC
METABOLISM**

 = CHEMICAL ENERGY

METABOLISM

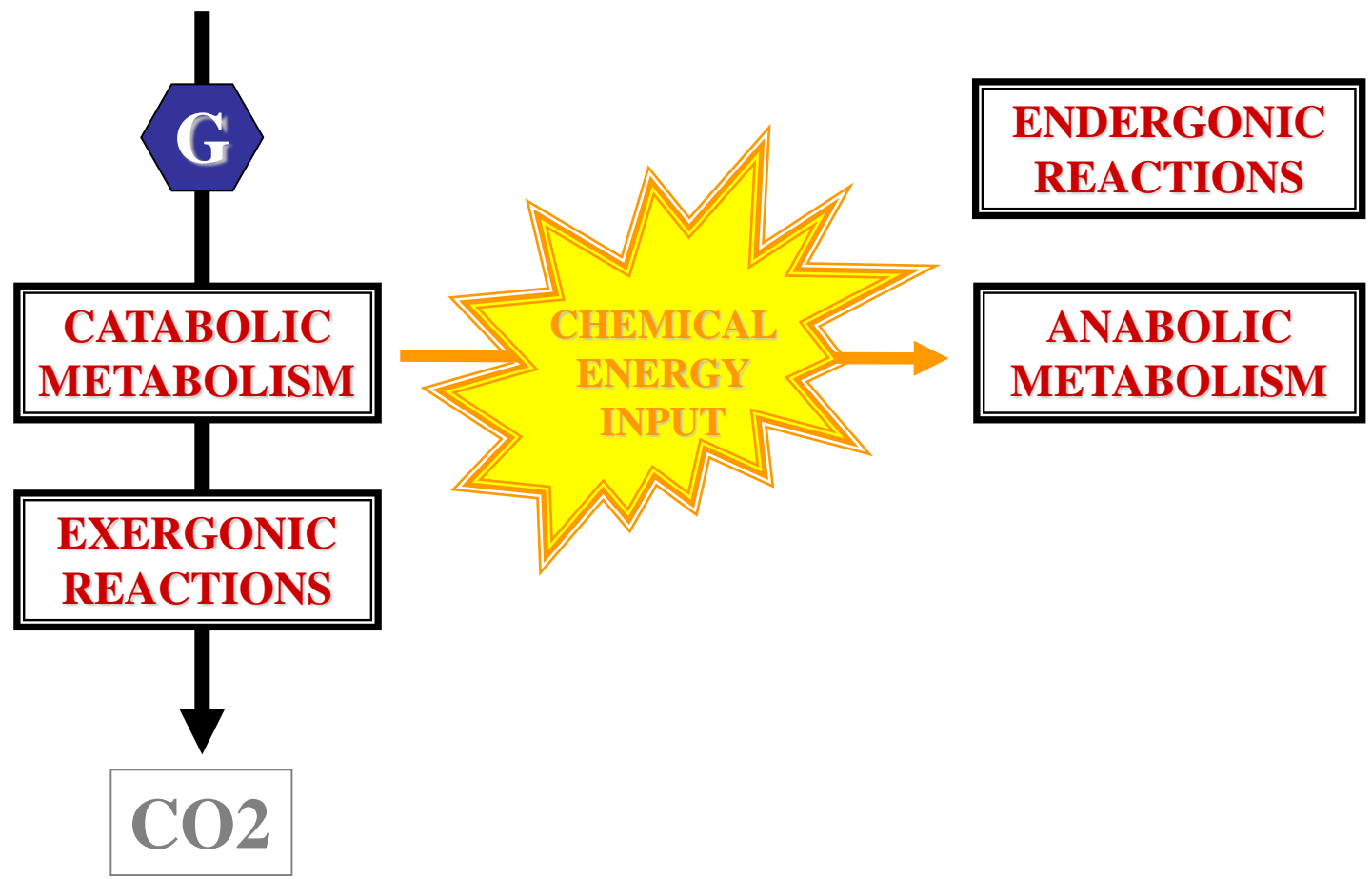
GLUCOSE



 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



 = CHEMICAL ENERGY



METABOLISM

GLUCOSE



CATABOLIC METABOLISM

EXERGONIC REACTIONS

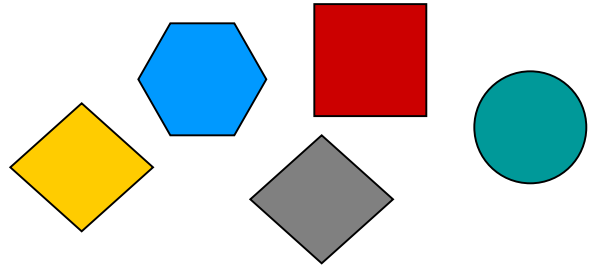


CO₂



ENDERGONIC REACTIONS

ANABOLIC METABOLISM



BUILDING BLOCKS

 = CHEMICAL ENERGY



METABOLISM

GLUCOSE



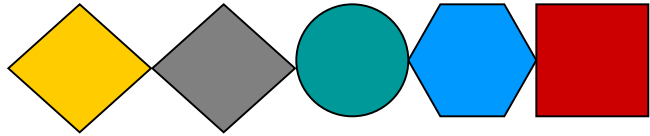
CATABOLIC METABOLISM

EXERGONIC REACTIONS



CO₂

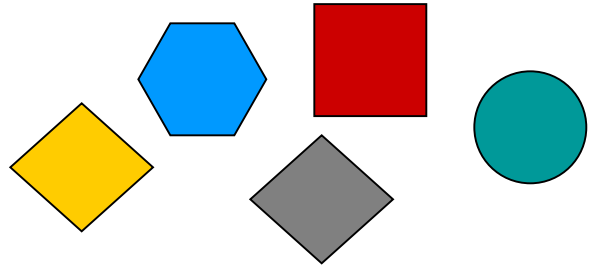
COMPLEX BIO-CHEM-CMPS



ENDERGONIC REACTIONS

ANABOLIC METABOLISM

BIOSYNTHESIS METABOLISM

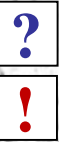


BUILDING BLOCKS



 = CHEMICAL ENERGY

***CELL
GROWTH
&
MAINTENANCE***



HOMEOSTASIS

QUESTION

WHAT DO BIOLOGISTS
CALL GLUCOSE
BREAK-DOWN TO CO₂
WITH A CHEM-EGY
RELEASE WITH
ATP PHOSPHORYLATION?

QUESTION



ANSWER

RESPIRATION

ANSWER

METABOLISM

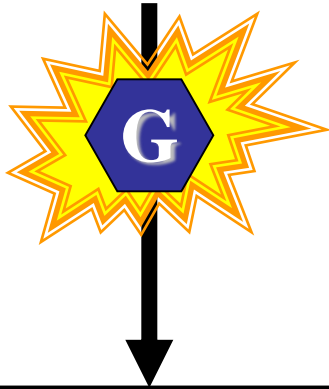
GLUCOSE



 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

 = CHEMICAL ENERGY



METABOLISM

GLUCOSE



BREAK-DOWN
METABOLISM



CO₂

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

**EXERGONIC
REACTIONS**



CO2



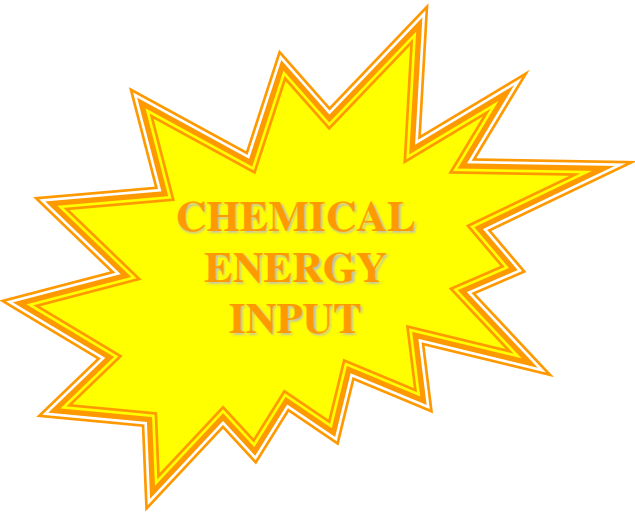
 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**



**EXERGONIC
REACTIONS**



CO₂

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



CATABOLIC METABOLISM

EXERGONIC REACTIONS



CO₂



PHOSPHORYLATION

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



CATABOLIC METABOLISM

EXERGONIC REACTIONS



CO₂



PHOSPHORYLATION

?

 = CHEMICAL ENERGY



METABOLISM

GLUCOSE



CATABOLIC METABOLISM

EXERGONIC REACTIONS



CO₂



PHOSPHORYLATION

RESPIRATION

 = CHEMICAL ENERGY

RESPIRATION

RESPIRATION



RESPIRATION

GLUCOSE BREAK-DOWN

TO

CARBON DIOXIDE (CO₂)



RESPIRATION



RESPIRATION

GLUCOSE BREAK-DOWN

TO

CARBON DIOXIDE (CO₂)



CHEMICAL ENERGY RELEASED



RESPIRATION



RESPIRATION

GLUCOSE BREAK-DOWN

TO

CARBON DIOXIDE (CO₂)



CHEMICAL ENERGY RELEASED



ATP PHOSPHORYLATION

RESPIRATION

RESPIRATION TYPES

RESPIRATION TYPES

AEROBIC RESPIRATION

RESPIRATION TYPES

RESPIRATION TYPES



AEROBIC RESPIRATION
ANAEROBIC RESPIRATION

RESPIRATION
TYPES



RESPIRATION OVERVIEW

AEROBIC RESPIRATION OVERVIEW

METABOLISM

GLUCOSE



CM

AE



METABOLISM

GLUCOSE



**CATABOLIC
METABOLISM**

**AEROBIC
RESPIRATION**



 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



CATABOLIC METABOLISM

AEROBIC RESPIRATION

CO₂

WATER

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



CATABOLIC METABOLISM

AEROBIC RESPIRATION

OXYGEN REQUIRED ?

CO₂

WATER





METABOLISM

GLUCOSE



CATABOLIC METABOLISM

AEROBIC RESPIRATION

OXYGEN REQUIRED



CO₂

WATER

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE

G

AEROBIC
RESPIRATION

EXERGONIC
REACTIONS

CO₂

WATER



METABOLISM

GLUCOSE



AEROBIC
RESPIRATION

EXERGONIC
REACTIONS



PHOSPHORYLATIONS

CO₂

WATER

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



AEROBIC
RESPIRATION

EXERGONIC
REACTIONS

CO₂

WATER

36 ATP

PHOSPHORYLATIONS

 = CHEMICAL ENERGY

METABOLISM

B



GLUCOSE



**AEROBIC
RESPIRATION**



**ANABOLIC
METABOLISM**

**EXERGONIC
REACTIONS**



CO₂

WATER

 = CHEMICAL ENERGY

METABOLISM

GLUCOSE



**AEROBIC
RESPIRATION**

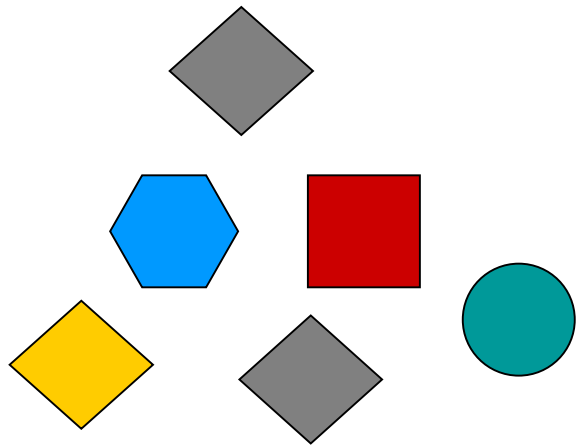
**EXERGONIC
REACTIONS**

CO₂

WATER



**ANABOLIC
METABOLISM**



 = **CHEMICAL ENERGY**

BUILDING BLOCKS

METABOLISM

GLUCOSE

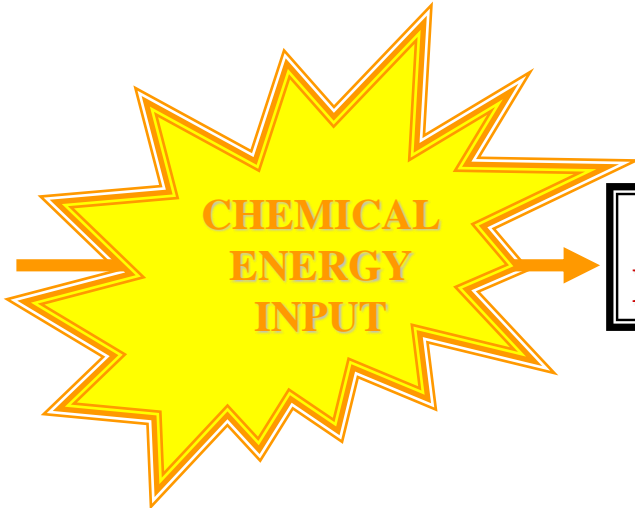


AEROBIC
RESPIRATION

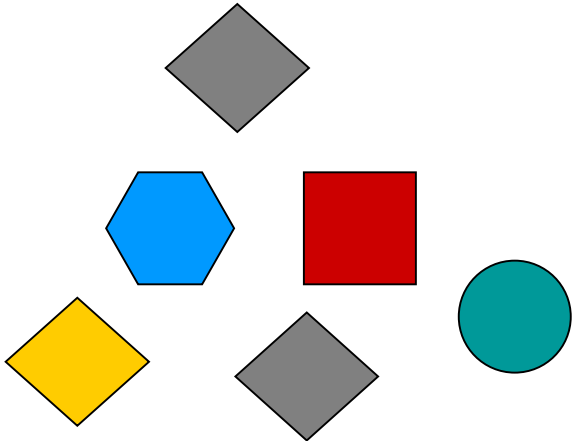
EXERGONIC
REACTIONS

CO₂

WATER



ANABOLIC
METABOLISM



 = CHEMICAL ENERGY

BUILDING BLOCKS