

HOMEOSTASIS



ORGANELLES



ORGANELLES

SPECIALIZED ENTITIES
WITHIN CYTOSOL

ORGANELLES



ORGANELLES

SPECIALIZED ENTITIES

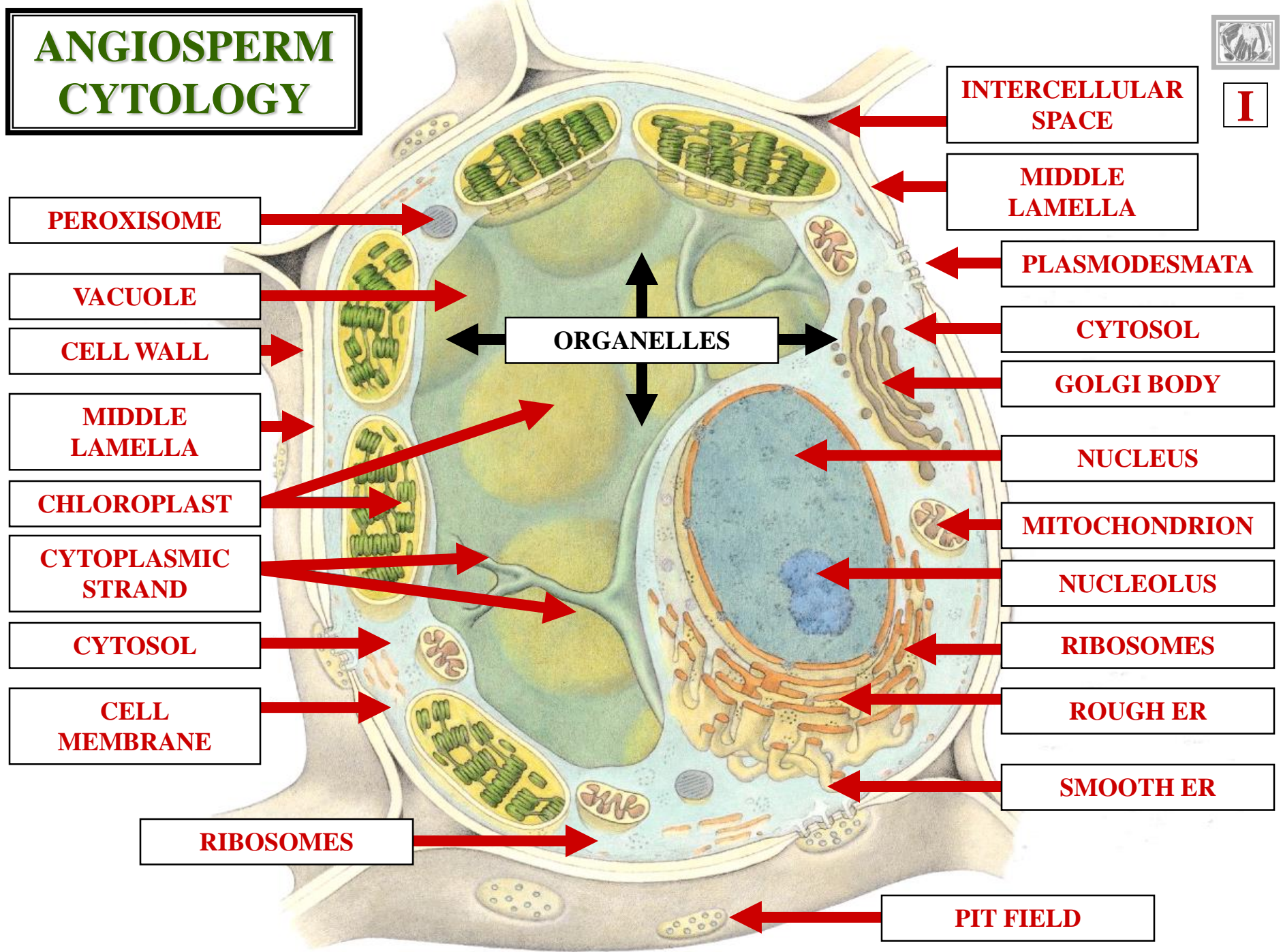
ISOLATE

NON-COMPATIBLE

BIO-CHEMICAL RXTS

ORGANELLES

ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE LAMELLA

CHLOROPLAST

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NUCLEUS

MITOCHONDRION

NUCLEOLUS

RIBOSOMES

ROUGH ER

SMOOTH ER

PIT FIELD

ORGANELLES

I

ORGANELLES

ISOLATE

NON-COMPATIBLE

BIO-CHEM RXTS

***EFFICIENT
METABOLISM***



HOMEOSTASIS





ANGIOSPERM ORGANELLES

ANGIOSPERM ORGANELLE TYPES

**ANGIOSPERM
ORGANELLE TYPES**

DOUBLE MEMBRANE BOUND

**ANGIOSPERM
ORGANELLE TYPES**

ANGIOSPERM ORGANELLE TYPES

**DOUBLE MEMBRANE BOUND
SINGLE MEMBRANE BOUND**

**ANGIOSPERM
ORGANELLE TYPES**



ANGIOSPERM ORGANELLE TYPES

DOUBLE MEMBRANE BOUND
SINGLE MEMBRANE BOUND
NON-MEMBRANE BOUND

ANGIOSPERM ORGANELLE TYPES



**DOUBLE
MEMBRANE
BOUND
ORGANELLES**

**DOUBLE
MEMBRANE
BOUND
ORGANELLE
TYPES**



DMBO ORGANELLE TYPES

PLASTIDS

DMBO ORGANELLE TYPES



DMBO
ORGANELLE TYPES

PLASTIDS

MITOCHONDRION

DMBO
ORGANELLE TYPES



DMBO

ORGANELLE TYPES

PLASTIDS

MITOCHONDRION

NUCLEUS

DMBO

ORGANELLE TYPES

PLASTIDS

PLASTIDS

PLASTIDS



PLANT CELLS ONLY

PLASTIDS



PLANT CELLS ONLY



PLASTID TYPES

PLASTID TYPES

PROPLASTID

PLASTID TYPES

PLASTID TYPES

PROPLASTID
LEUCOPLAST

PLASTID TYPES

PLASTID TYPES

PROPLASTID

LEUCOPLAST

CHROMOPLAST

PLASTID TYPES

PLASTID TYPES

PROPLASTID

LEUCOPLAST

CHROMOPLAST

CHLOROPLAST

PLASTID TYPES

PROPLASTID



PLASTIDS
PROPLASTID

NON-PIGMENTED
IMMATURE PLASTID

PLASTIDS
PROPLASTID



PLASTIDS

PROPLASTID

NON-PIGMENTED
IMMATURE PLASTID

DERIVES OTHER PLASTIDS

PLASTIDS

PROPLASTID

PLASTIDS TYPES



PROPLASTID

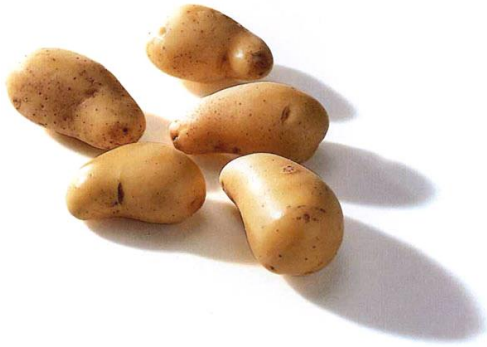
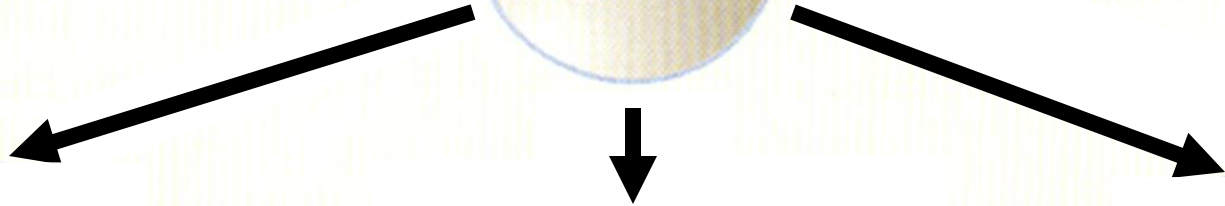


PLASTIDS TYPES

PROPLASTID



L



TUBER



LEAF



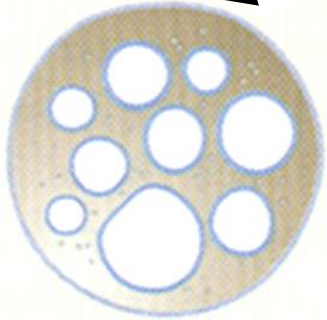
FRUIT

PLASTIDS TYPES

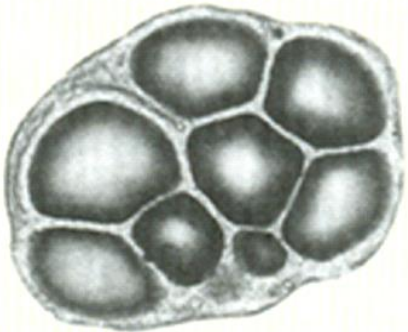
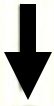
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LEUCOPLAST

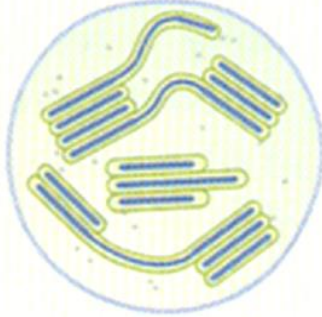
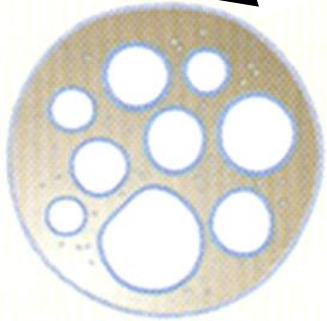


PLASTIDS TYPES

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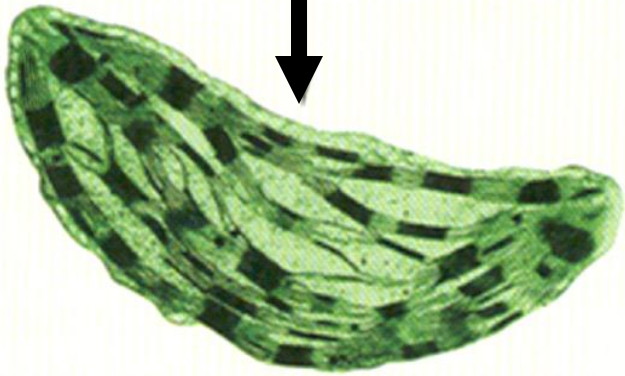
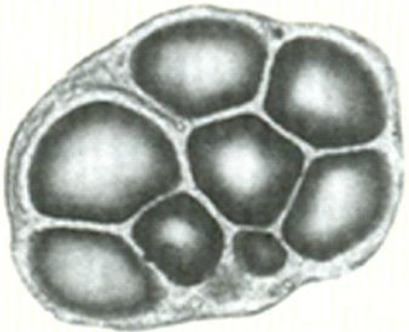


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LEUCOPLAST

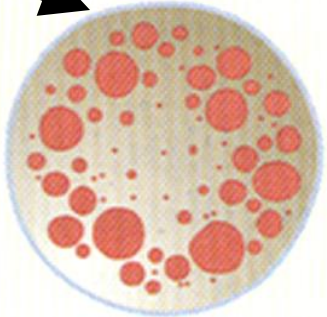
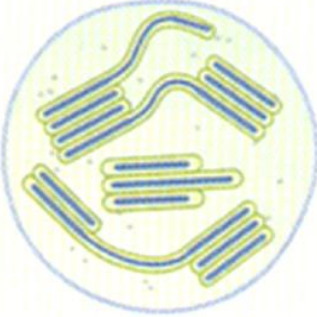
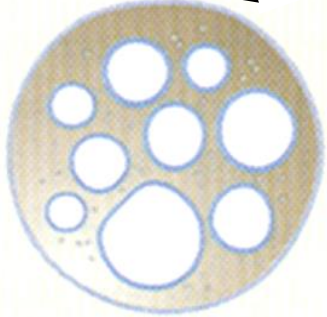
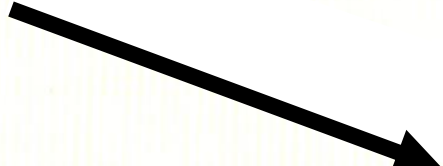
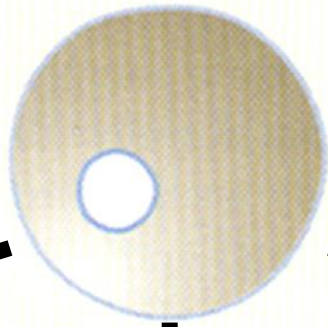
CHLOROPLAST



PLASTIDS TYPES

PROPLASTID

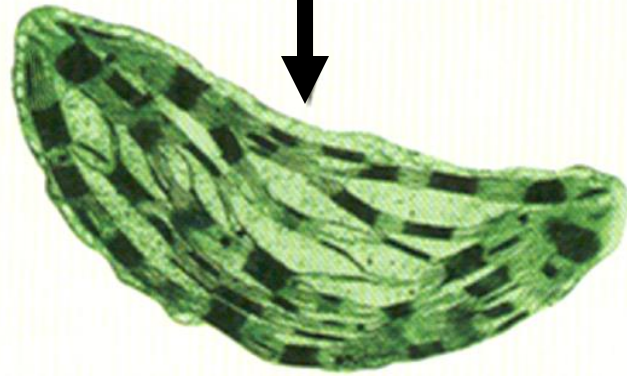
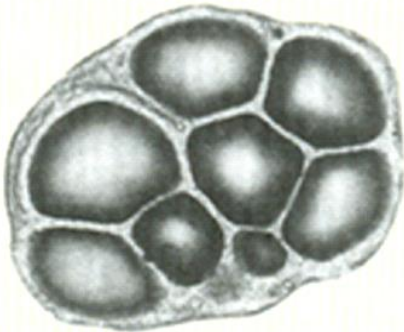
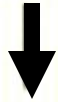
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L



LEUCOPLAST

CHLOROPLAST

CHROMOPLAST



LEUCOPLAST



PLASTIDS
LEUCOPLAST

NON-PIGMENTED
PLASTID

PLASTIDS
LEUCOPLAST



PLASTIDS
LEUCOPLAST

NON-PIGMENTED
PLASTID

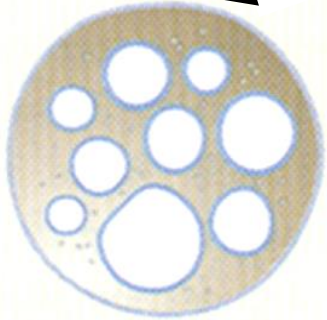
STORES STARCH

PLASTIDS
LEUCOPLAST

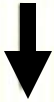
PLASTIDS TYPES



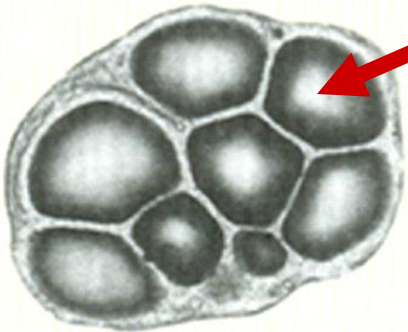
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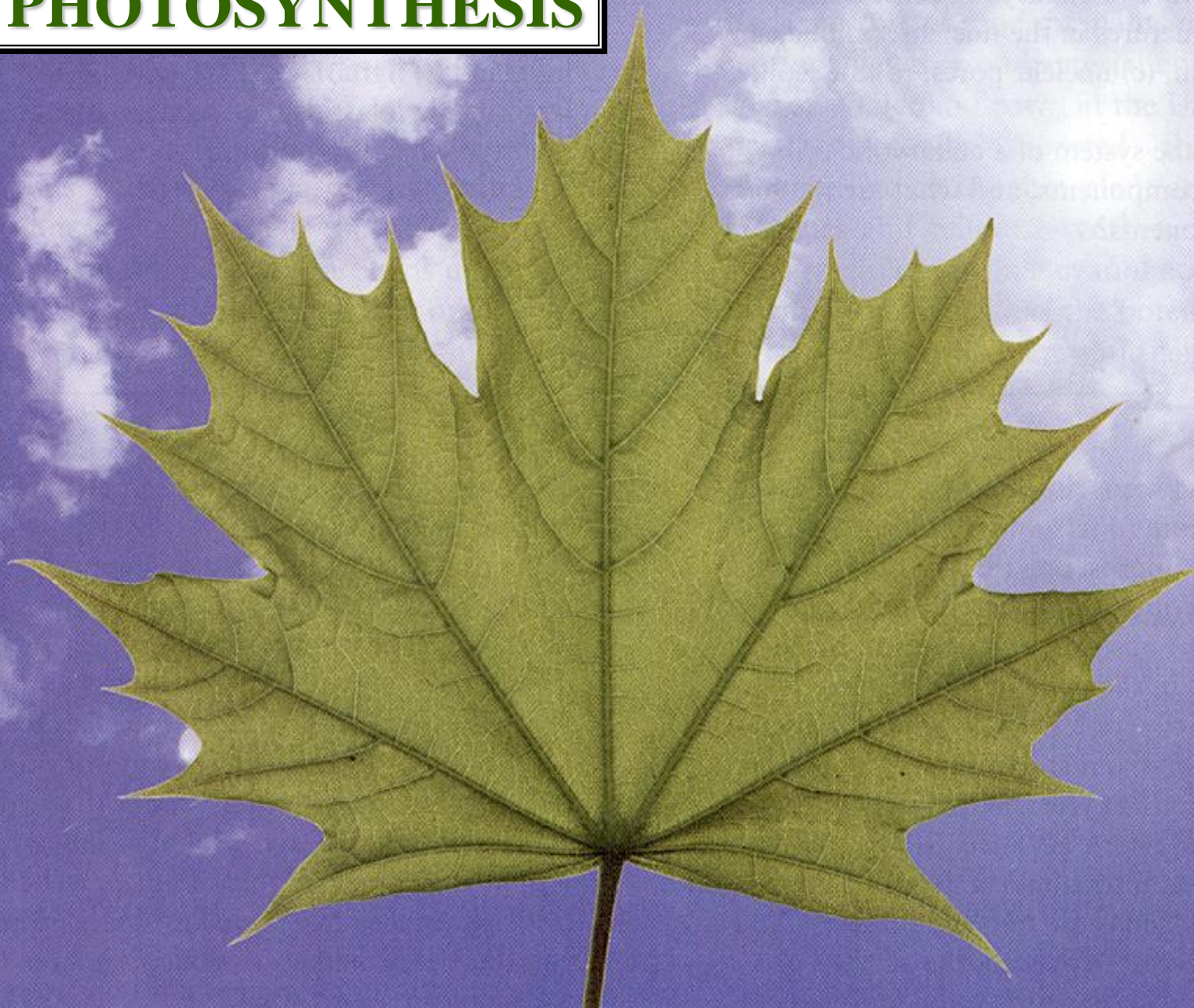
LEUCOPLAST



STARCH GRAIN



PHOTOSYNTHESIS



PHOTOSYNTHESIS

G



WATER

CO₂

LIGHT ENERGY

PHOTO

ATMOSPHERE

E-

PHOTOLYSIS



LT RXT

THYLAKOID

CHEMICAL ENERGY

DK RXT

STROMA

CHLOROPLAST

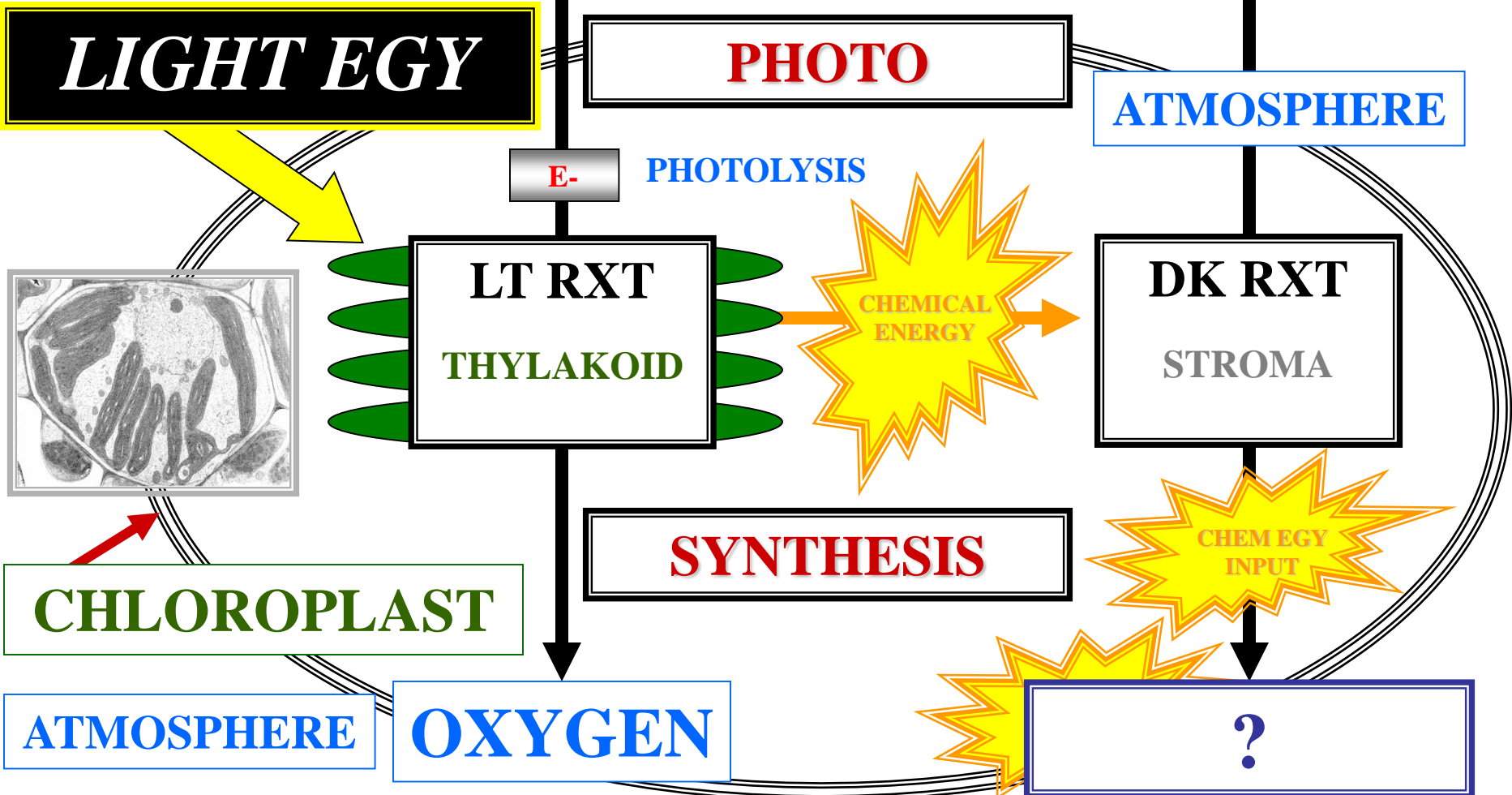
SYNTHESIS

CHEMICAL ENERGY INPUT

ATMOSPHERE

OXYGEN

?



PHOTOSYNTHESIS

S



WATER

CO₂

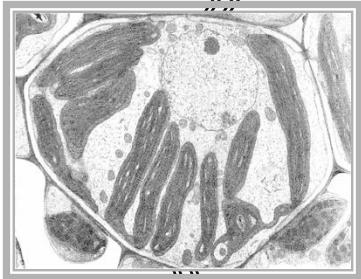
LIGHT ENERGY

PHOTO

ATMOSPHERE

E-

PHOTOLYSIS



LT RXT

THYLAKOID

CHEMICAL ENERGY

DK RXT

STROMA

CHLOROPLAST

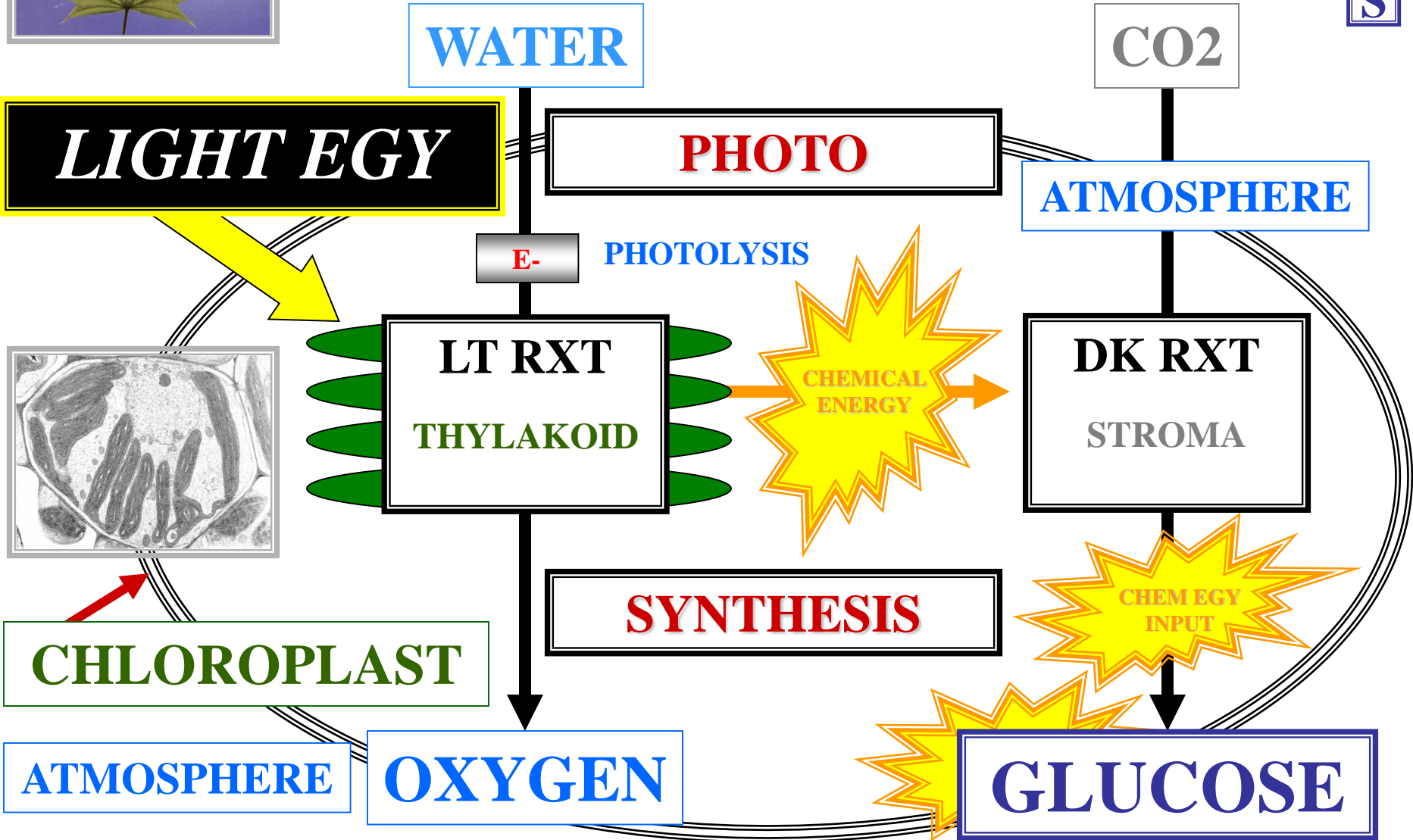
SYNTHESIS

CHEMICAL ENERGY INPUT

ATMOSPHERE

OXYGEN

GLUCOSE



PHOTOSYNTHESIS



SG

WATER

CO₂

LIGHT ENERGY

PHOTO

ATMOSPHERE

E-

PHOTOLYSIS

LT RXT

THYLAKOID

CHEMICAL ENERGY

DK RXT

STROMA

SYNTHESIS

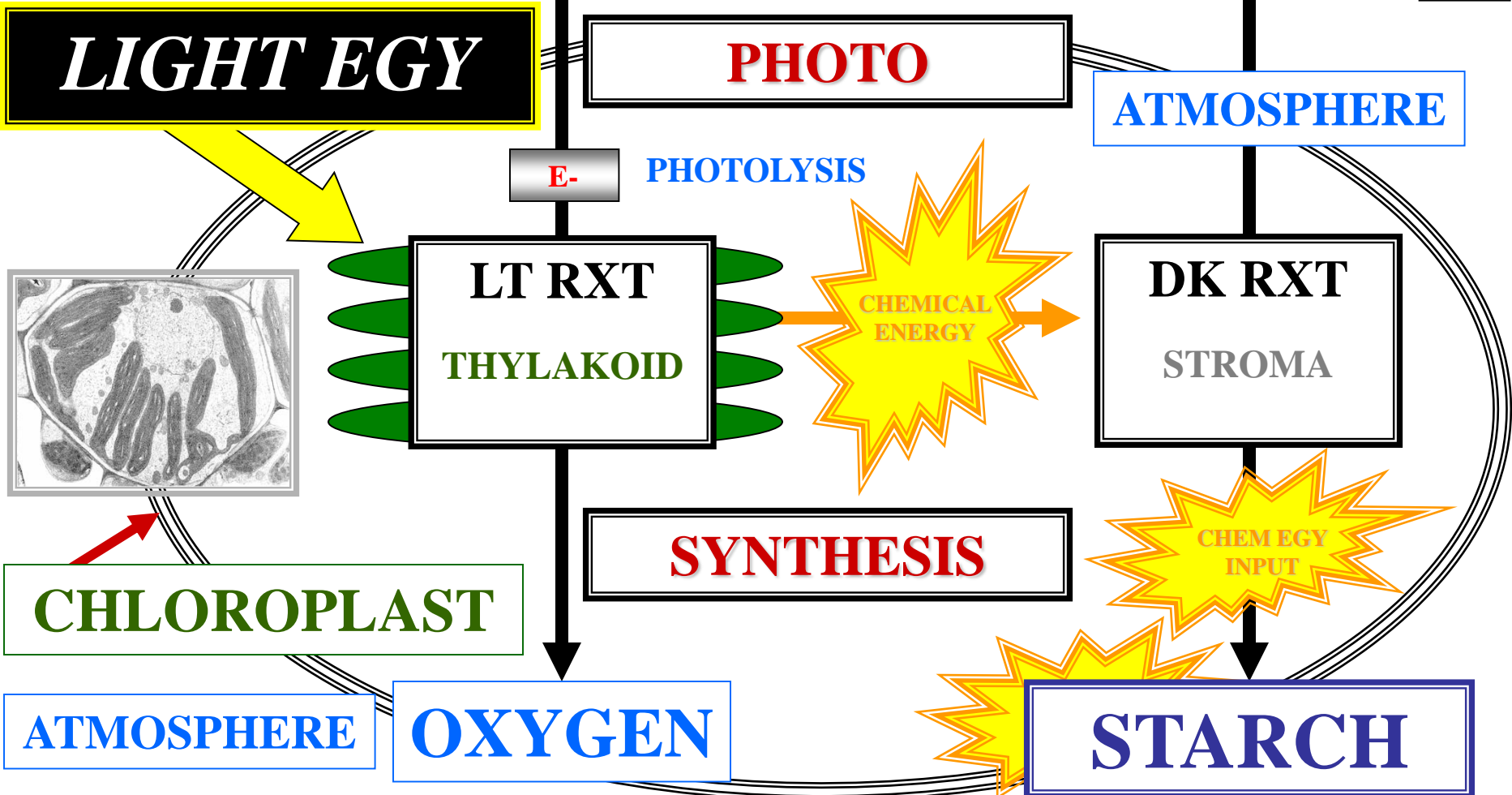
CHEMICAL ENERGY INPUT

CHLOROPLAST

ATMOSPHERE

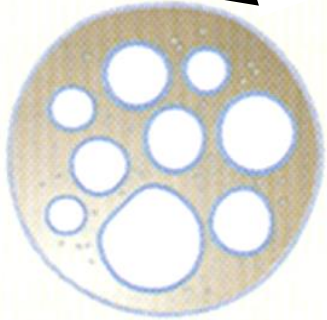
OXYGEN

STARCH

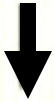


PLASTIDS TYPES

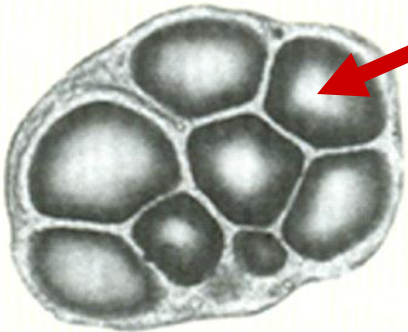
PROPLASTID



LEUCOPLAST

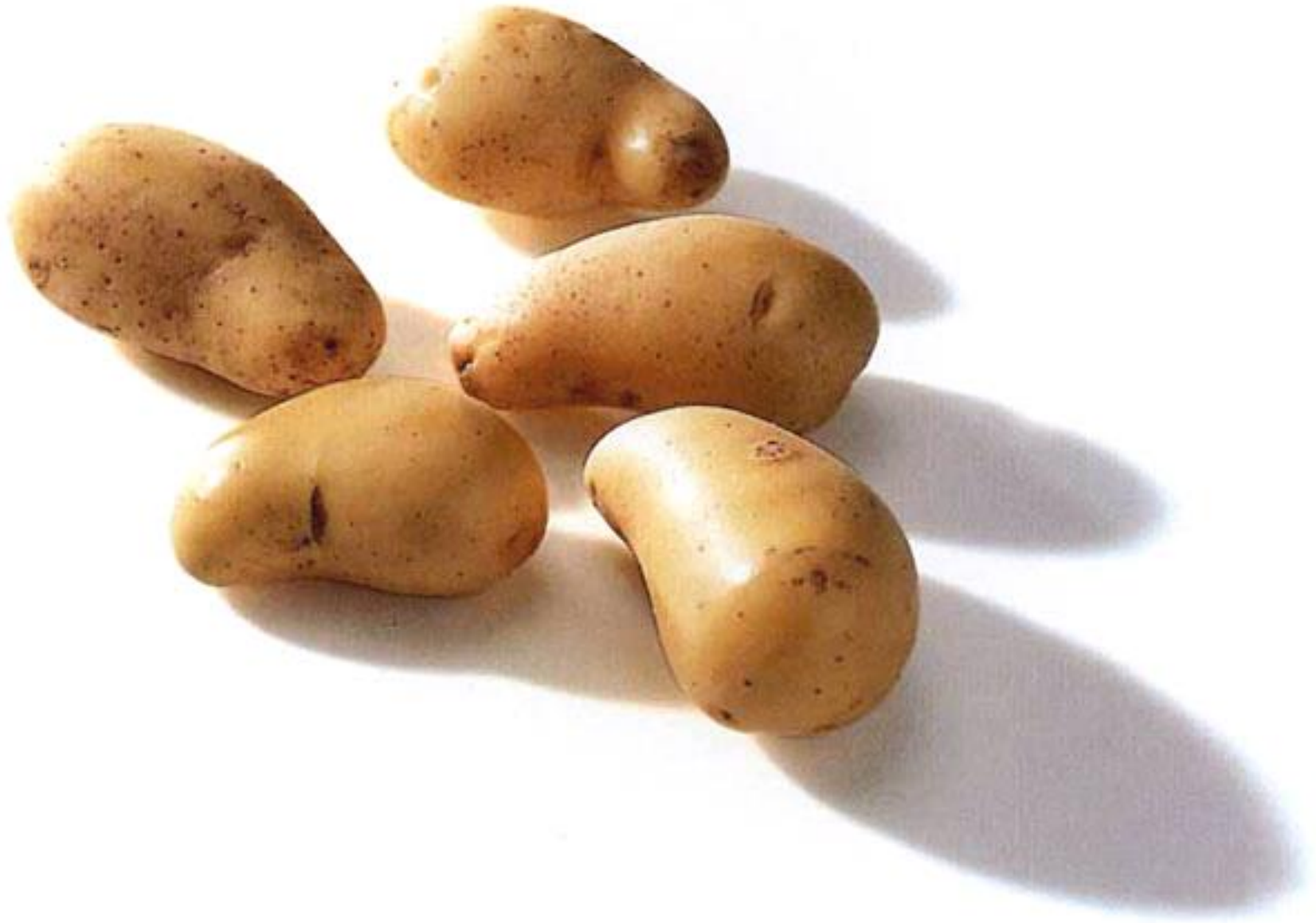


STARCH GRAIN

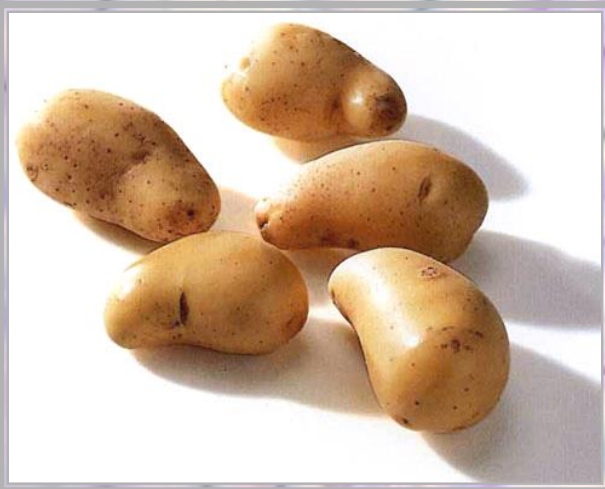




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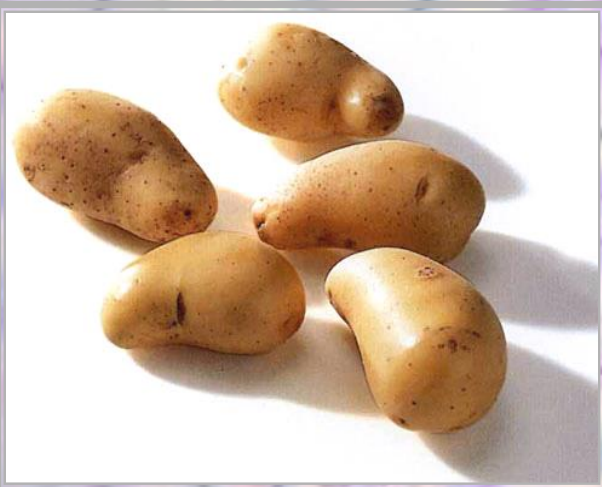
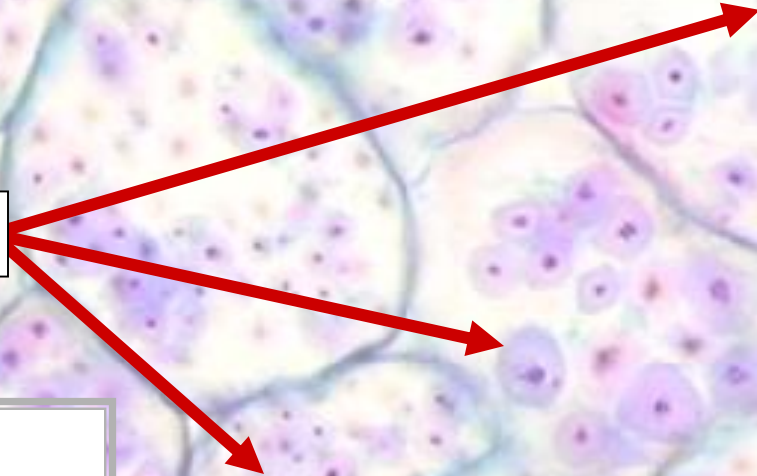


STRACH GRAINS



C.S.

LEUCOPLASTS

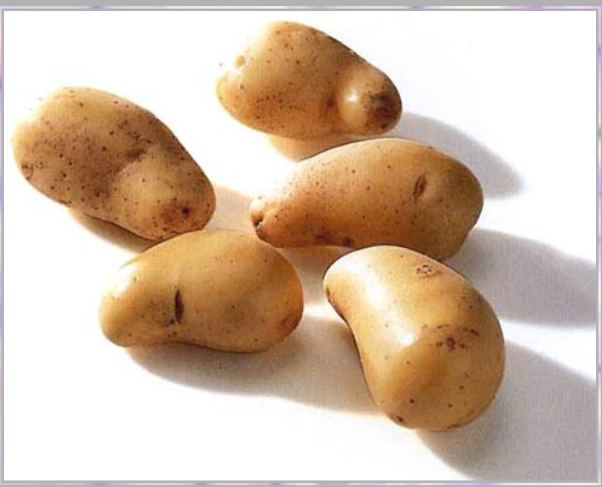
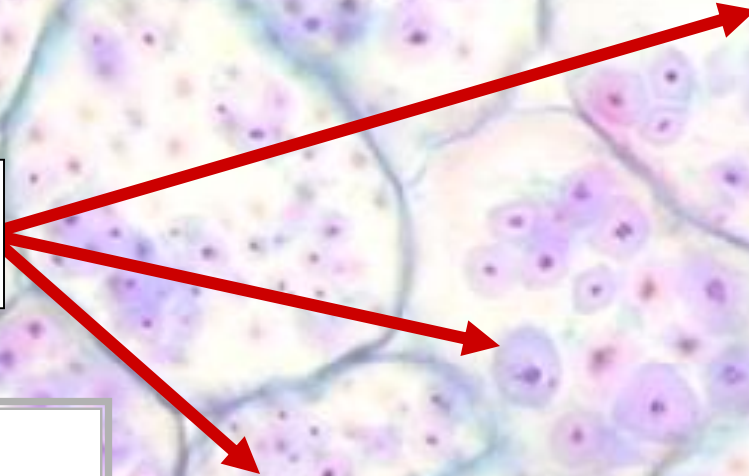


C.S.

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C

**LEUCOPLASTS
STORE STARCH**



C.S.

CHROMOPLAST



PLASTIDS
CHROMOPLAST

PIGMENTED PLASTID

PLASTIDS
CHROMOPLAST



PLASTIDS
CHROMOPLAST

PIGMENTED PLASTID
CAROTENOID PIGMENTS
DOMINATE

PLASTIDS
CHROMOPLAST



PLASTIDS

CHROMOPLAST

PIGMENTED PLASTID

CAROTENOID PIGMENTS

DOMINATE

ATTRACT ANIMALS

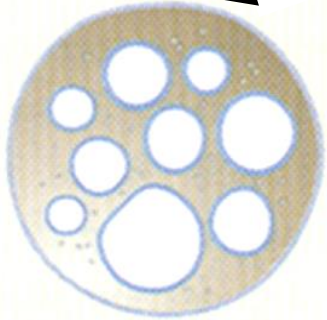
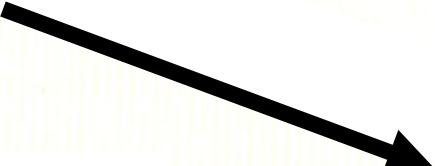
PLASTIDS

CHROMOPLAST

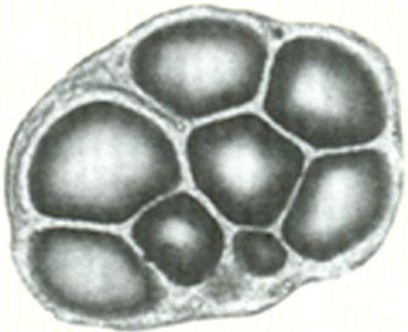
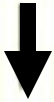
PLASTIDS TYPES



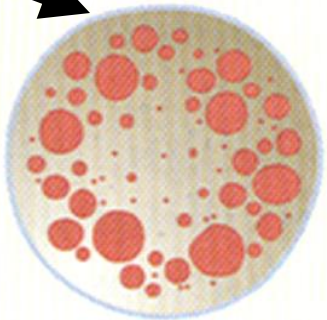
PROPLASTID



LEUCOPLAST



CHROMOPLAST





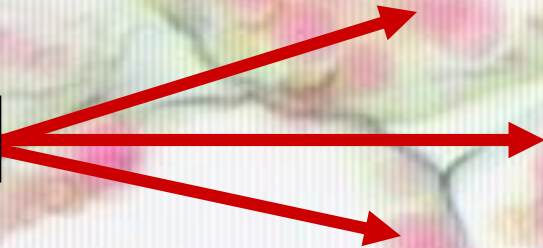
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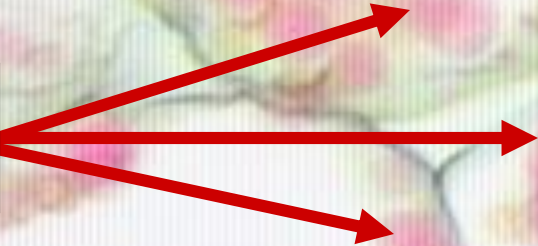
CHROMOPLASTS



C.S.

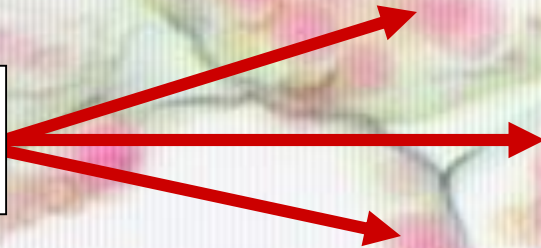


**CHROMOPLASTS
CAROTENOIDS**



C.S.

**CHROMOPLASTS
CAROTENOIDS**



**CHROMOPLASTS
ATTRACT
ANIMALS**

C.S.

CHLOROPLAST



PLASTIDS
CHLOROPLAST

PIGMENTED PLASTID

PLASTIDS
CHLOROPLAST



PLASTIDS
CHLOROPLAST

PIGMENTED PLASTID
CHLOROPHYLL PIGMENTS
DOMINATE

PLASTIDS
CHLOROPLAST



PLASTIDS

CHLOROPLAST

PIGMENTED PLASTID

CHLOROPHYLL PIGMENTS

DOMINATE

CONDUCTS PHOTOSYNTHESIS

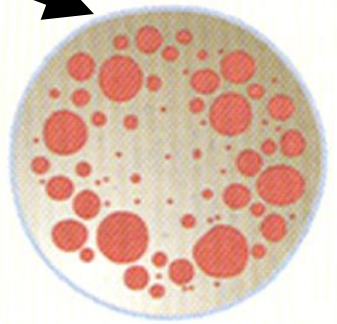
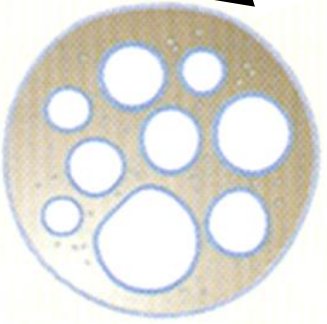
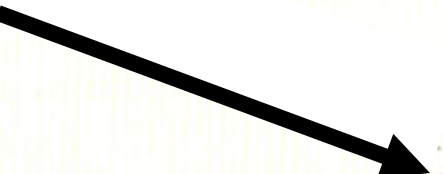
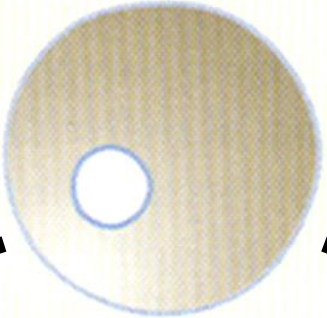
PLASTIDS

CHLOROPLAST

PLASTIDS TYPES



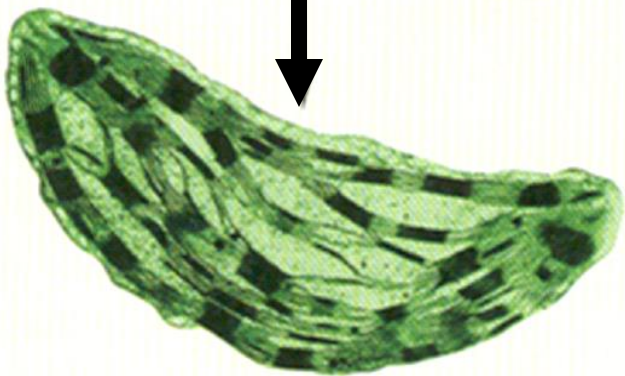
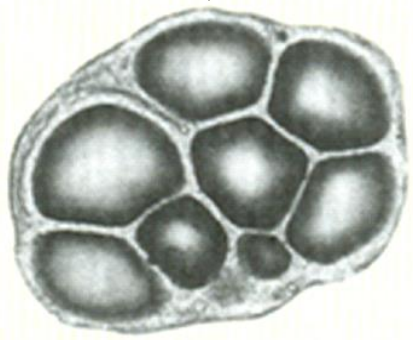
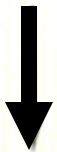
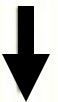
PROPLASTID



LEUCOPLAST

CHLOROPLAST

CHROMOPLAST



MAPLE LEAF



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C

CHLOROPLASTS



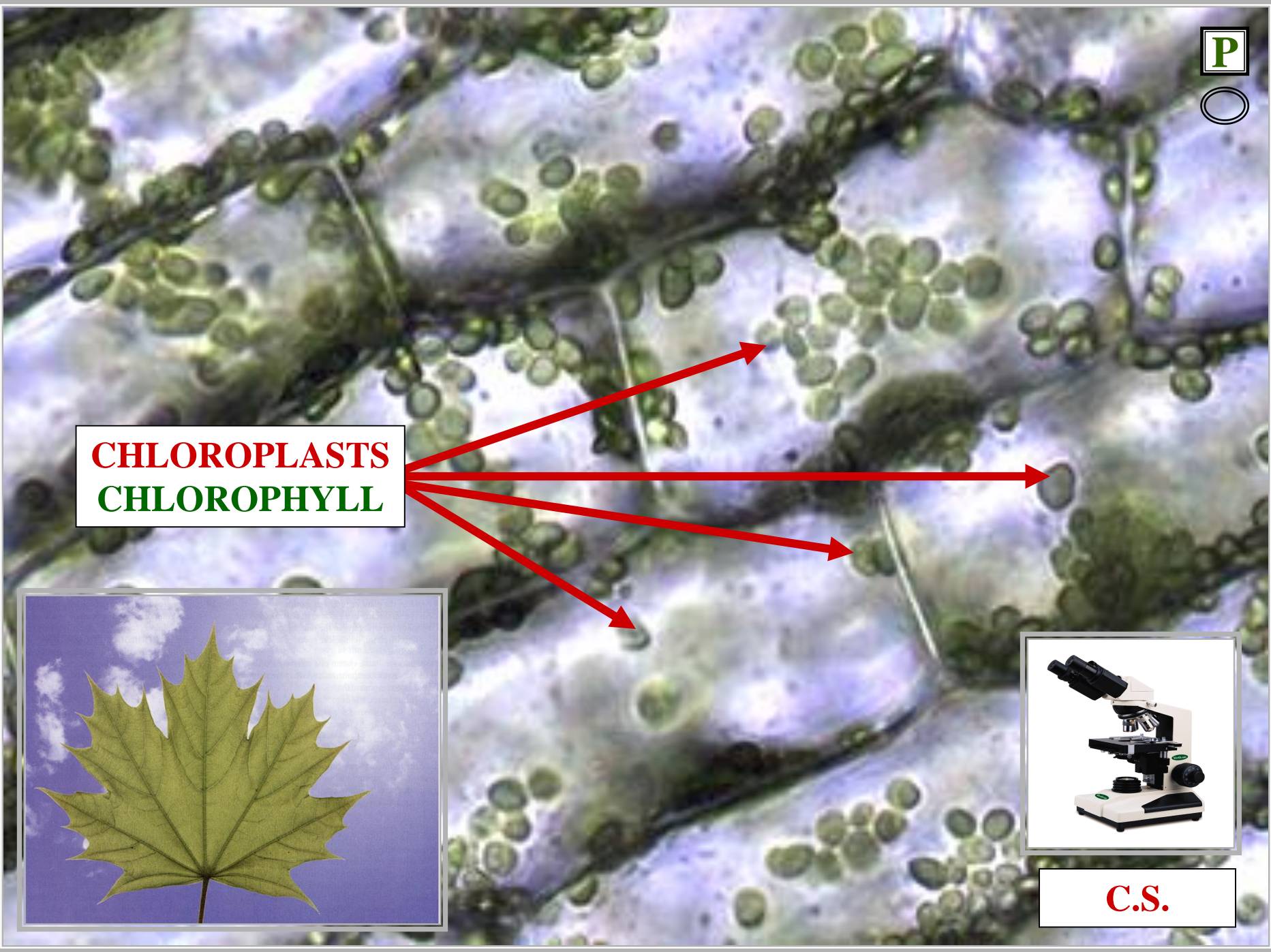
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CHLOROPLASTS
CHLOROPHYLL



C.S.





PLASTID TYPE SUMMARY

PLASTIDS TYPES

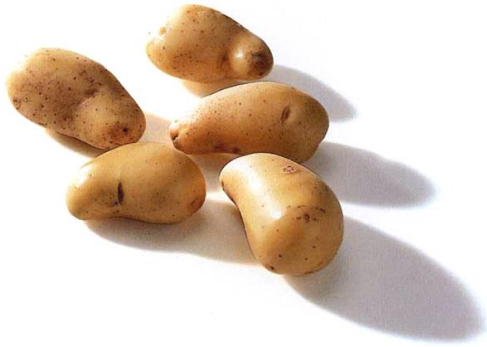
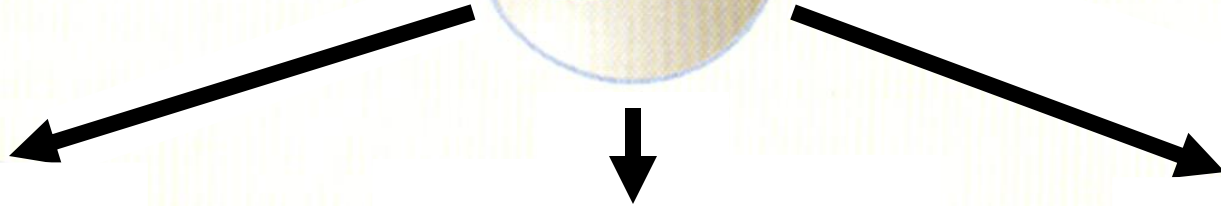
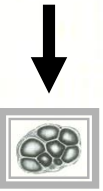


PROPLASTID



PLASTIDS TYPES

PROPLASTID



TUBER



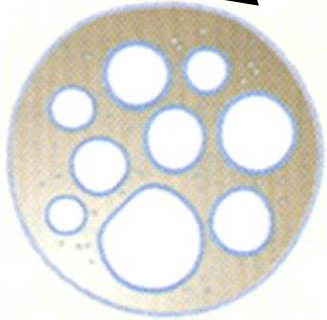
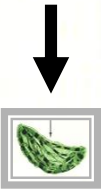
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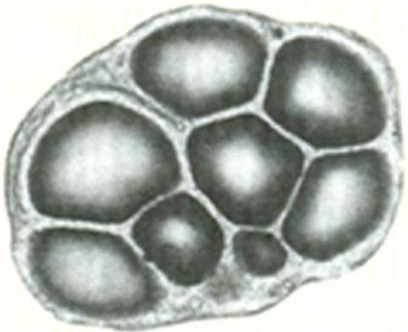
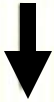
FRUIT

PLASTIDS TYPES

PROPLASTID

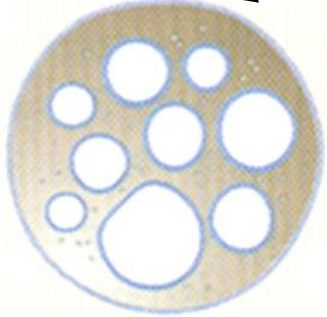
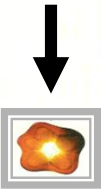


LEUCOPLAST



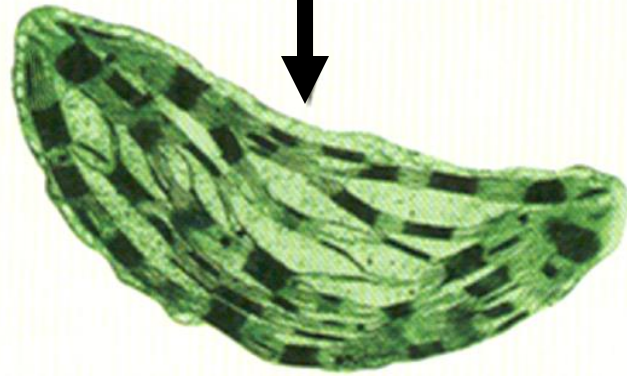
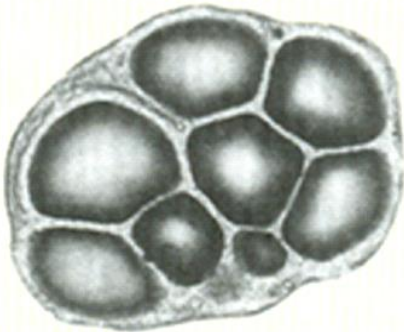
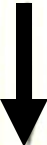
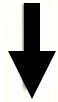
PLASTIDS TYPES

PROPLASTID



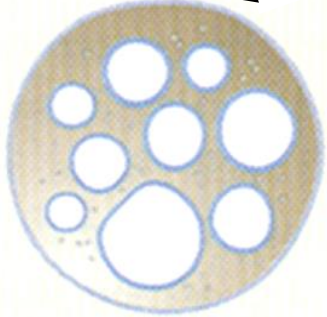
LEUCOPLAST

CHLOROPLAST

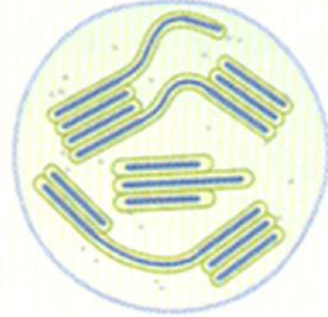


PLASTIDS TYPES

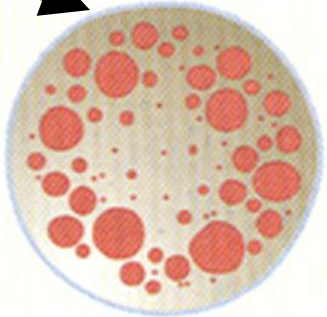
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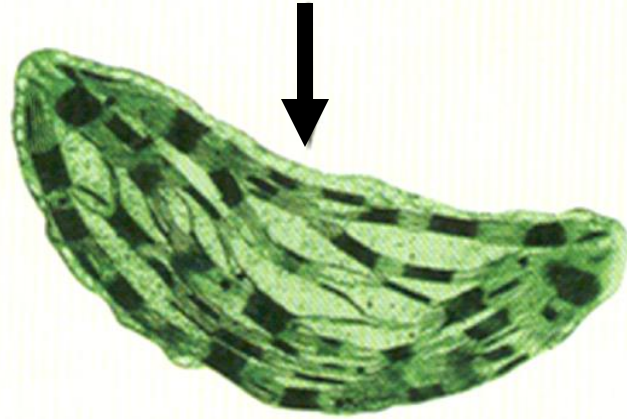
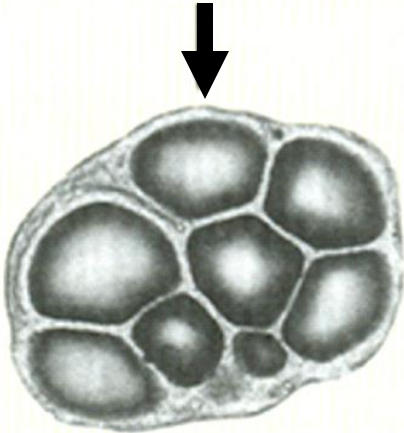
LEUCOPLAST



CHLOROPLAST



CHROMOPLAST



PLASTIDS INTERCONVERT



**PLASTIDS
INTERCONVERT**

**PLASTIDS
INTERCONVERT**

**PLASTIDS
INTERCONVERT**



PLASTIDS

INTERCONVERT

PLASTIDS

INTERCONVERT

GIVEN DIFFERENT

ENVIRONMENT

PLASTIDS

INTERCONVERT

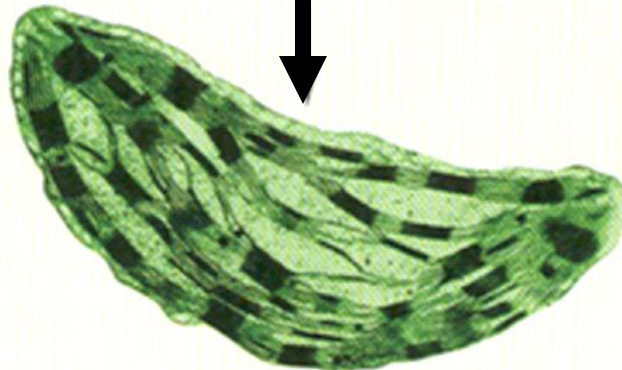
PLASTIDS INTERCONVERT



PROPLASTID



CHLOROPLAST

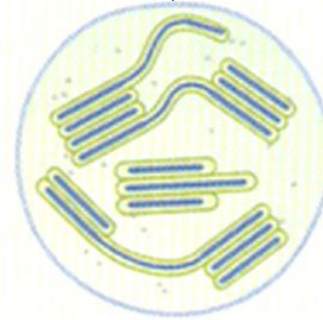


PLASTIDS INTERCONVERT

PROPLASTID

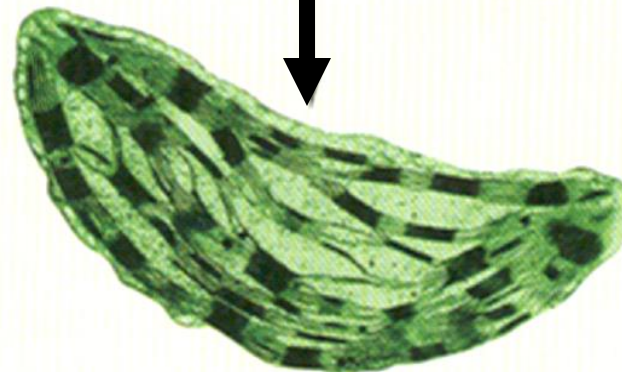


**DIFFERENT
ENVIRONMENT**



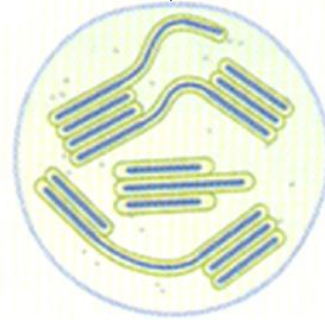
**DIFFERENT
ENVIRONMENT**

CHLOROPLAST



PLASTIDS INTERCONVERT

PROPLASTID

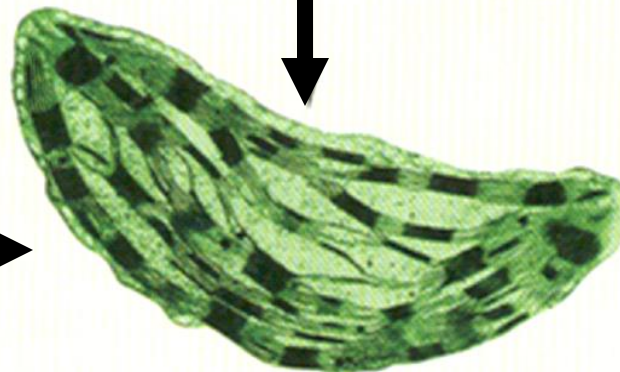
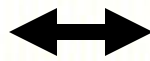
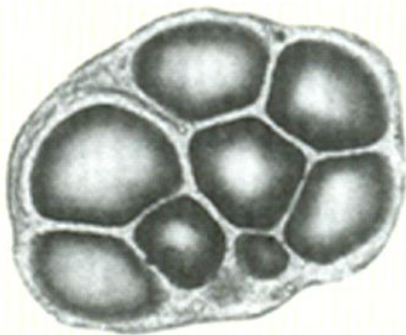


**DIFFERENT
ENVIRONMENT**

**DIFFERENT
ENVIRONMENT**

LEUCOPLAST

CHLOROPLAST

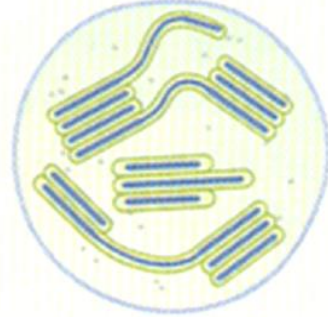


PLASTIDS INTERCONVERT

PROPLASTID



DIFFERENT ENVIRONMENT

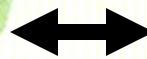
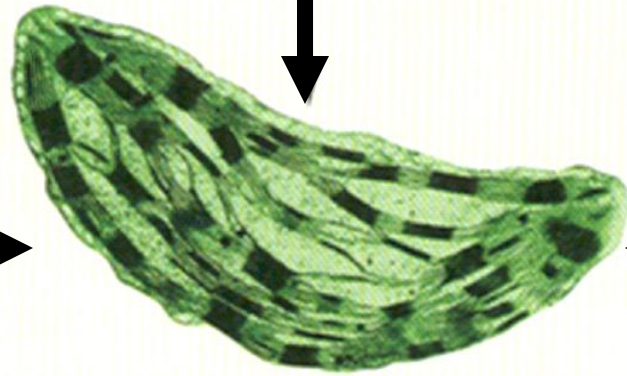
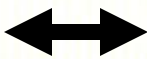
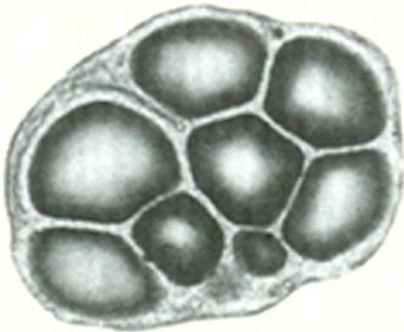
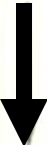


DIFFERENT ENVIRONMENT

LEUCOPLAST

CHLOROPLAST

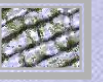
CHROMOPLAST

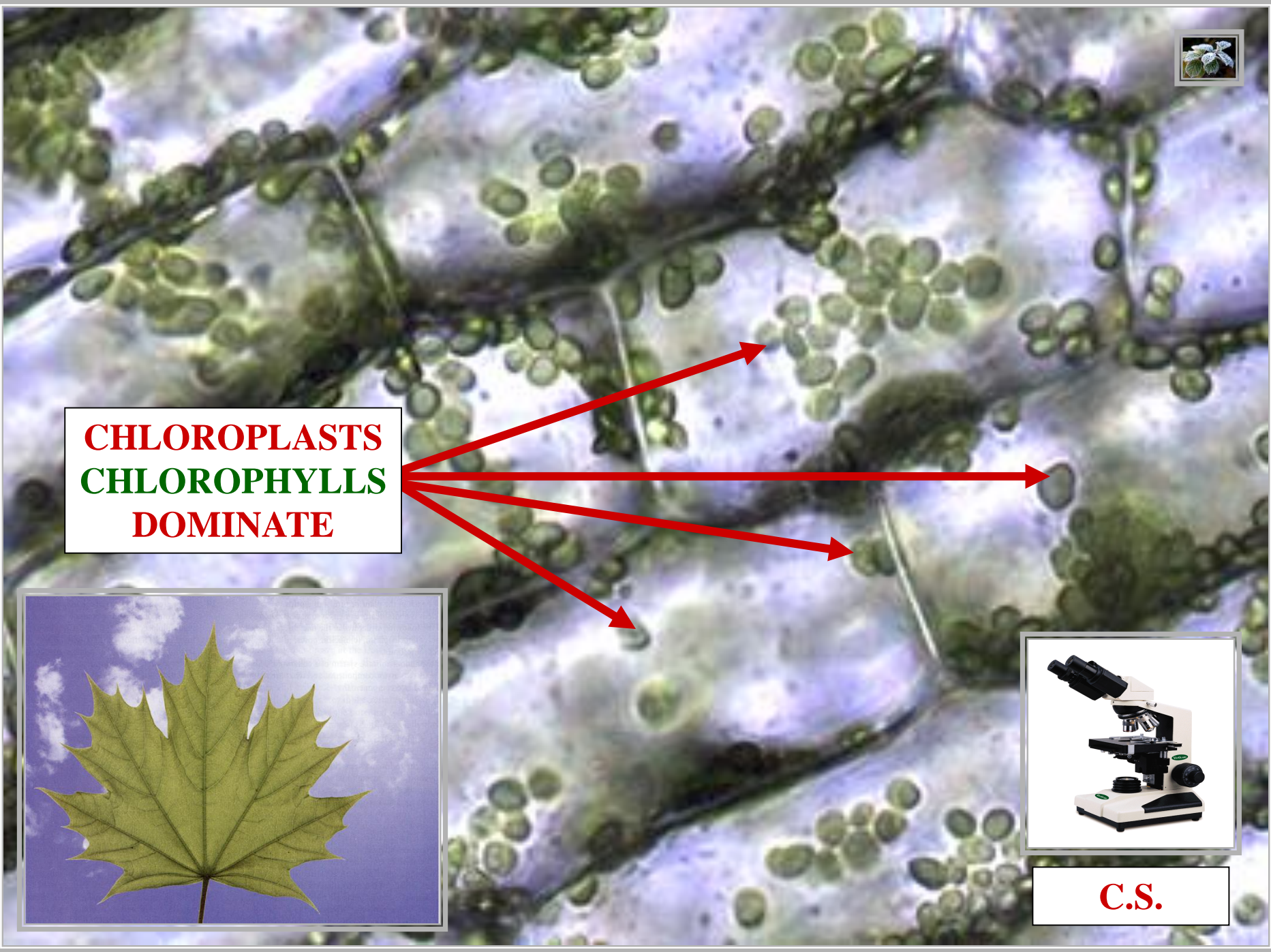




**PLASTIDS
INTERCONVERT
EXAMPLE
FALL COLORS**

SPRING





CHLOROPLASTS
CHLOROPHYLLS
DOMINATE



C.S.

FALL



C

**TEMPERATURE
DECREASES**

**DAY LENGTH
DECREASES**

D

CHLOROPLASTS
CHLOROPHYLLS



C.S.



C

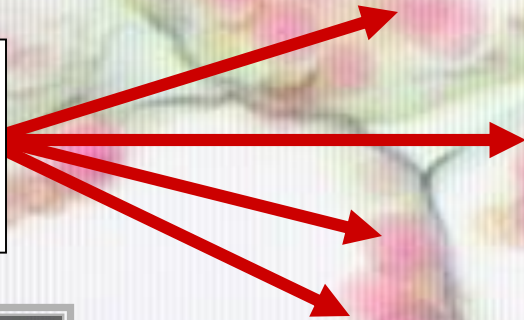
CHLOROPLASTS
CHLOROPHYLLS
DEGRADE



C.S.

C

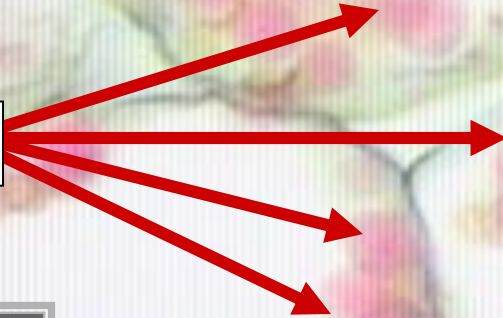
**CHLOROPLASTS
CAROTENOIDS
DOMINATE**



C.S.



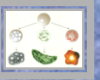
CHROMOPLASTS



C.S.

FALL

S

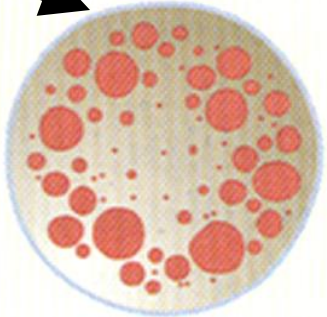
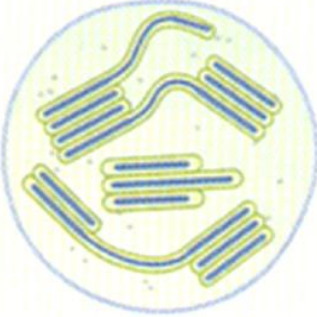
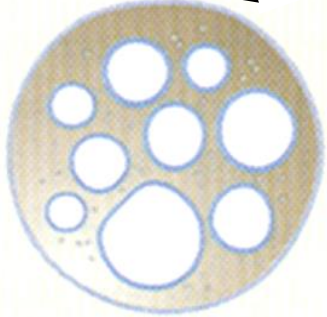
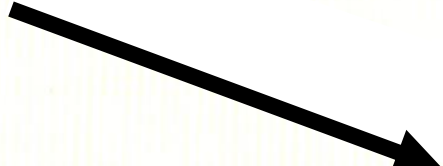


FALL COLORS ALABAMA FOREST

PLASTIDS TYPES



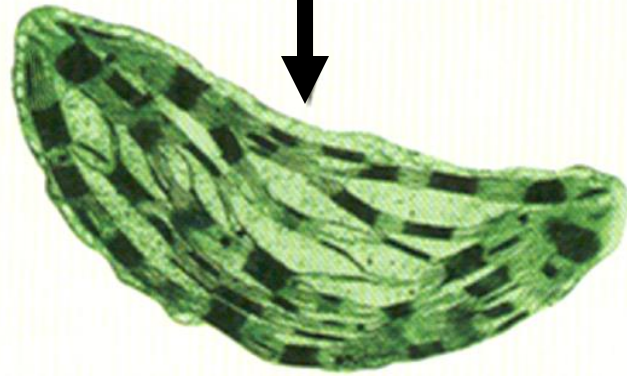
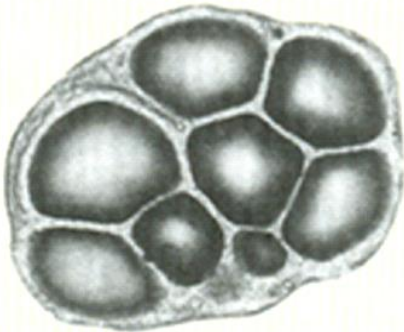
PROPLASTID



LEUCOPLAST

CHLOROPLAST

CHROMOPLAST



CHLOROPLAST

CHLOROPLAST

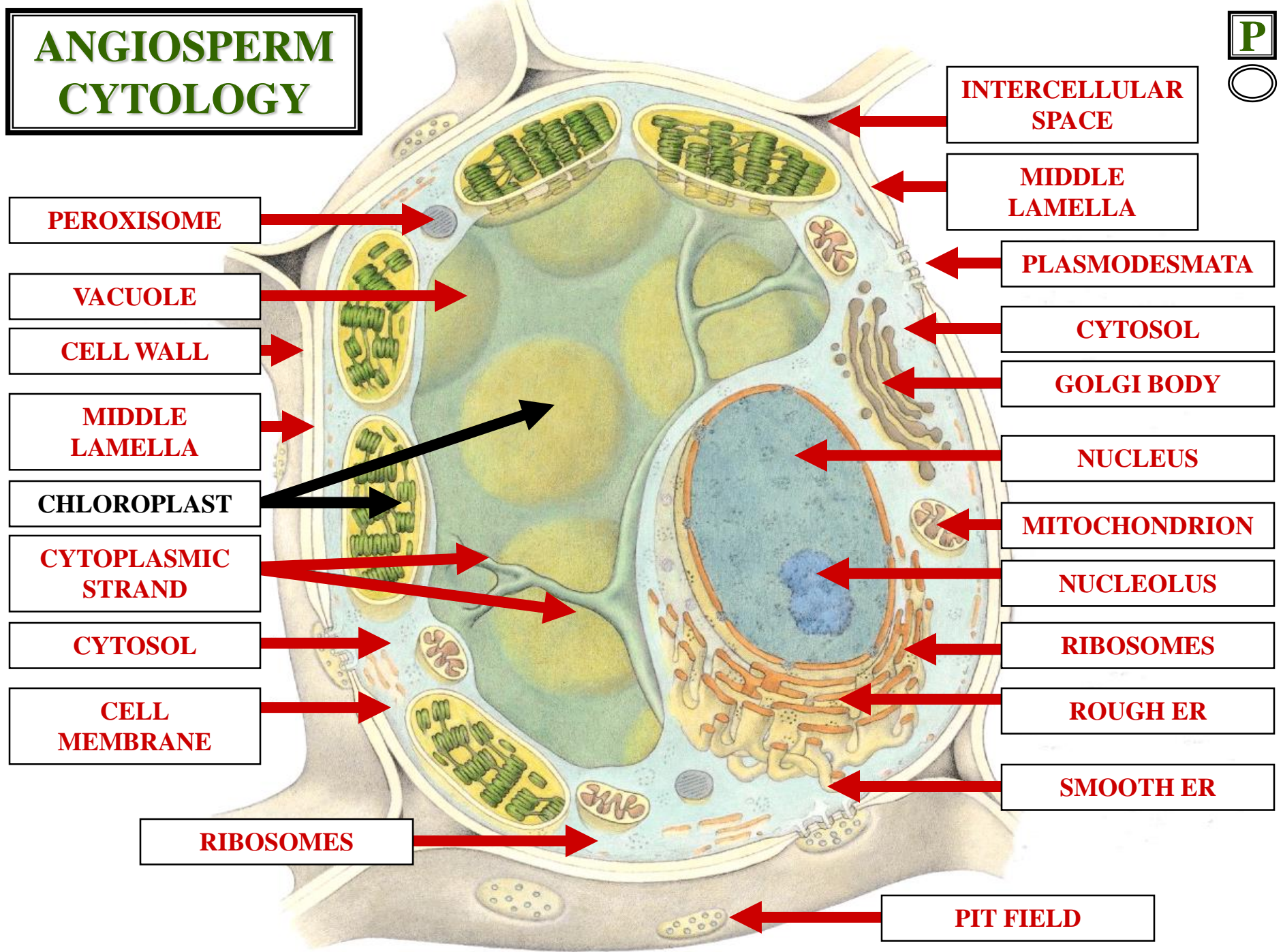


CHLOROPLAST

SITE: PHOTOSYNTHESIS

CHLOROPLAST

ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE LAMELLA

CHLOROPLAST

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NUCLEUS

MITOCHONDRION

NUCLEOLUS

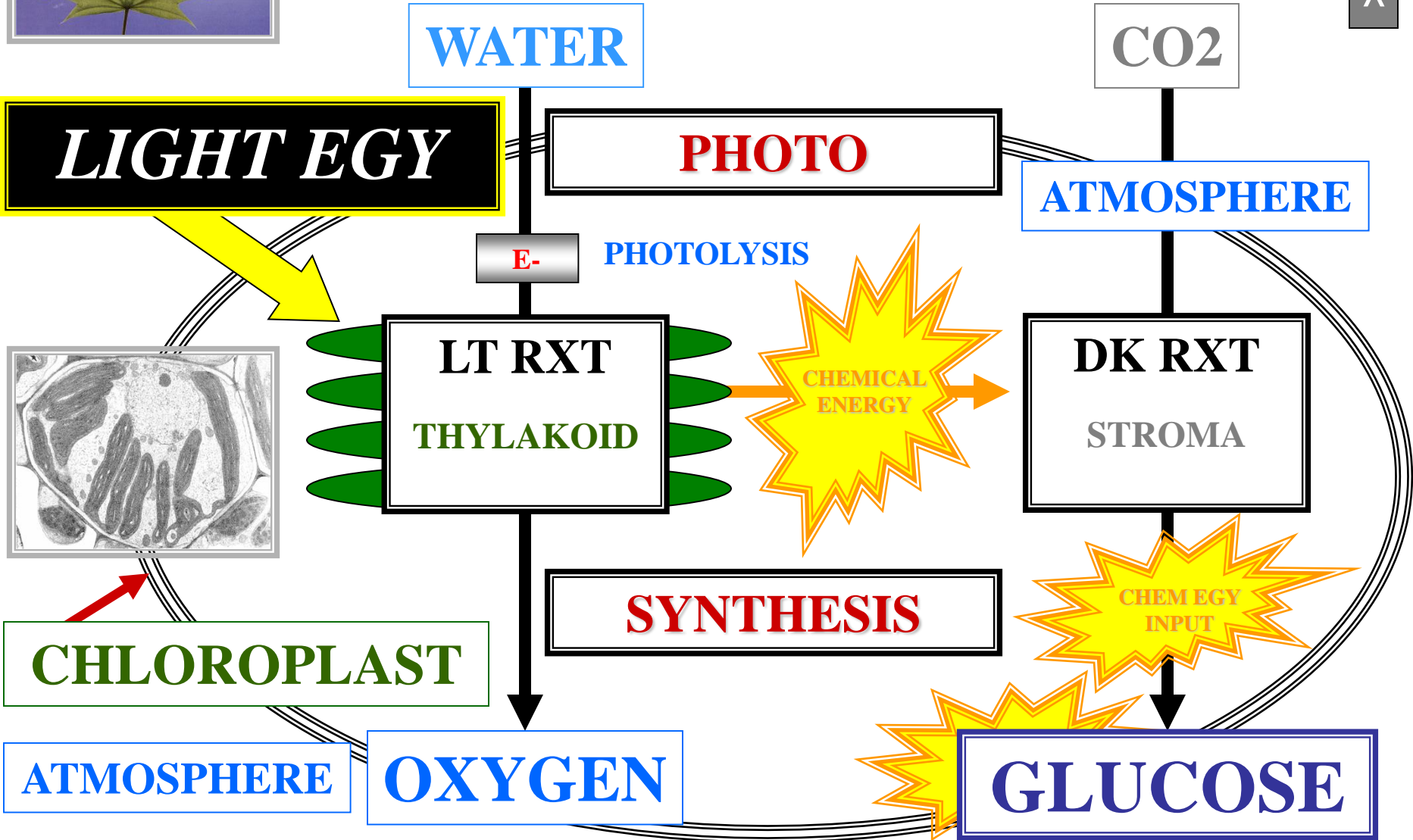
RIBOSOMES

ROUGH ER

SMOOTH ER

PIT FIELD

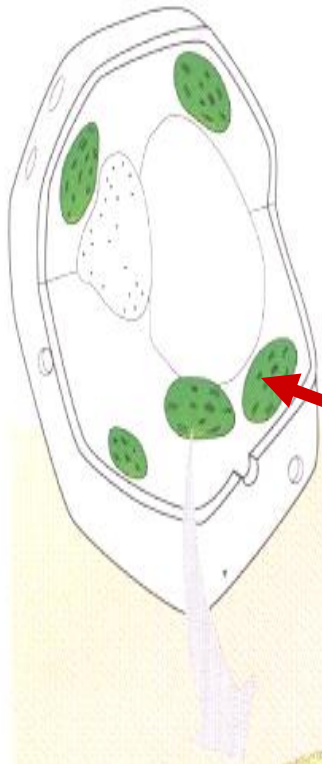
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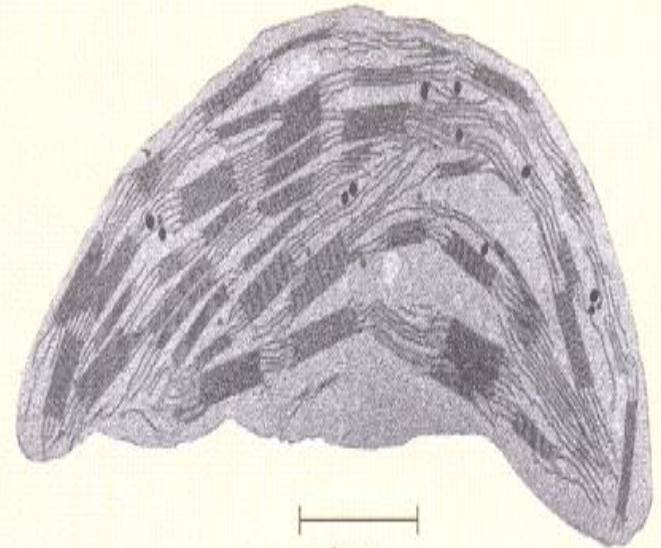


CHLOROPLAST ULTRASTRUCTURE

CHLOROPLAST ULTRASTRUCTURE

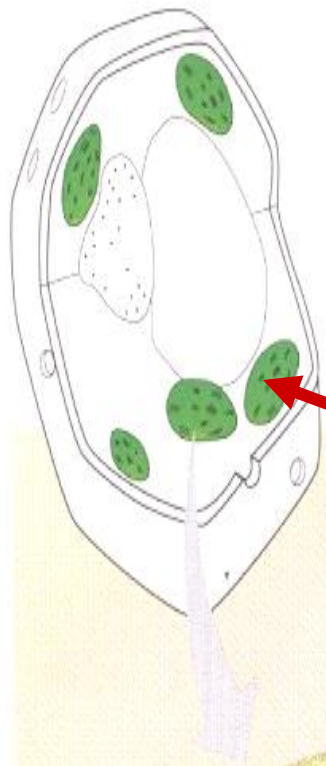


CHLOROPLAST

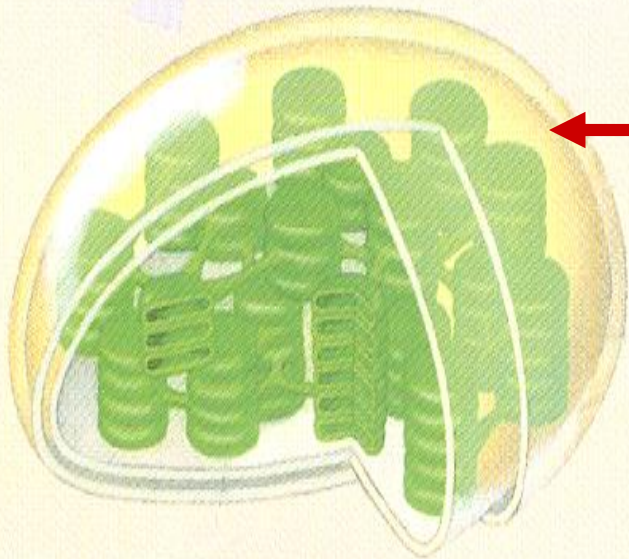


1 μ m

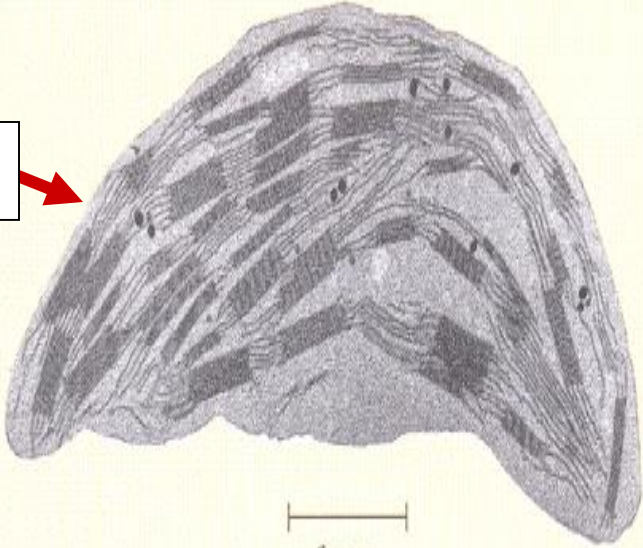
CHLOROPLAST ULTRASTRUCTURE



CHLOROPLAST

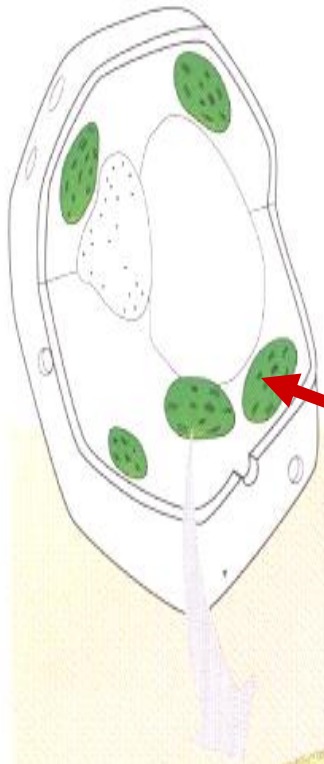


OUTER
MEMBRANE

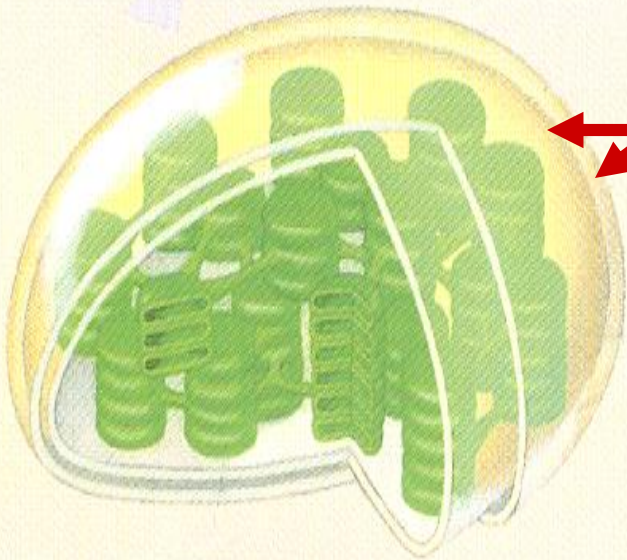


1 μ m

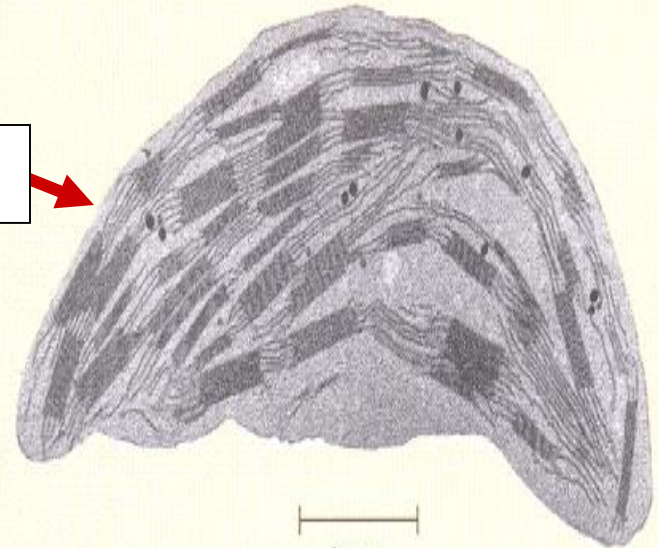
CHLOROPLAST ULTRASTRUCTURE



CHLOROPLAST



OUTER & INNER
MEMBRANE



1 μ m

THYLAKOID MEMBRANE



THYLAKOID MEMBRANE

CHLOROPLAST

PIGMENTED INNERMOST

MEMBRANE

THYLAKOID MEMBRANE