

INKBIOLOGY FLASHCARDS

Photosynthesis and primary productivity

Unit B13 · 19 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions in mark-scheme wording, and the misconceptions that lose marks. These cards and each lesson's whole-lesson check run on the website with spaced-repetition scheduling, at inkphysics.co.uk/biology/flashcards.

DEFINITION

Define: Thylakoid.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: Granum.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: Stroma.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: Photosystem.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: Photoionisation.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: Photolysis.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: Chemiosmosis.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: Photophosphorylation.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

A stack of thylakoids, giving a large area of membrane within a small volume.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

A flattened, membrane-bound sac inside a chloroplast; the membrane holds the pigments, the electron carriers and ATP synthase.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

A cluster of pigment molecules held in a thylakoid membrane, funnelling absorbed energy to a single chlorophyll a molecule at its reaction centre.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

The fluid surrounding the thylakoids, containing the enzymes of the light-independent stage, along with DNA and 70S ribosomes.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

The splitting of water using light energy, giving electrons, protons and oxygen.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

The loss of an electron from a chlorophyll molecule after it absorbs light energy, leaving the molecule positively charged.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

The synthesis of ATP from ADP and inorganic phosphate using energy that originally came from light.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

The movement of protons down a concentration gradient through ATP synthase, driving the synthesis of ATP.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

SPOT THE ERROR

Say what is wrong with this claim:

Chlorophyll absorbs green light, and that is why leaves are green.

CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

DEFINITION

Define: RuBP.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THE

DEFINITION

Define: Rubisco.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THE

DEFINITION

Define: GP.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THE

DEFINITION

Define: TP.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THE

SPOT THE ERROR

Say what is wrong with this claim:

The light-independent stage does not need light, which is why it is called the dark stage and why it carries on all night.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THE

DEFINITION

Define: Limiting factor.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

DEFINITION

Define: Plateau.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

DEFINITION

Ribulose biphosphate, a five-carbon compound; the molecule that accepts carbon dioxide.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THEM CHLOROPLASTS: CATCHING LIGHT AND TURNING IT INTO ATP

SPOT THE ERROR

Exactly backwards. Chlorophyll absorbs strongly in the blue and the red and takes almost nothing from the green band between them, so green light is reflected and transmitted. A leaf is green because green is the light chlorophyll has no use for.

DEFINITION

Glycerate 3-phosphate, a three-carbon compound; the first stable product of fixation.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THEM THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THEM

DEFINITION

RuBP carboxylase, the enzyme that joins carbon dioxide to RuBP. Slow, easily out-competed by oxygen, and probably the most abundant protein on Earth.

SPOT THE ERROR

No step absorbs a photon, and the cycle still stops in the dark. Every turn spends ATP and reduced NADP, both made only in the light-dependent stage and neither stored in quantity, so the cycle stalls within seconds of the light going.

THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THEM THE CALVIN CYCLE: THREE STEPS, AND THE ARITHMETIC BEHIND THEM

DEFINITION

Triose phosphate, a three-carbon sugar phosphate; the product of reducing GP, and the molecule that either leaves the cycle or rebuilds RuBP.

DEFINITION

The region of a rate graph where increasing the factor on the horizontal axis no longer increases the rate, because something else has become limiting.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

DEFINITION

The factor, of all those a process requires, whose shortage is holding the rate back at that moment.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

DEFINITION

Define: Compensation point.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

DEFINITION

Define: Compensation period.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

SPOT THE ERROR

Say what is wrong with this claim:

Plants photosynthesise during the day and respire at night.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

DEFINITION

The time taken from first light for a plant to reach its compensation point. The term appears on some specifications rather than all; check whether your board uses it.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

DEFINITION

The light intensity at which the rate of photosynthesis exactly equals the rate of respiration, so there is no net exchange of carbon dioxide or oxygen.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY

SPOT THE ERROR

Every living plant cell respire day and night, and root cells never see light at all. What changes with the light is photosynthesis, which in daylight usually outruns respiration, so the apparent switch is a net figure rather than a switch.

LIMITING FACTORS AND PRIMARY PRODUCTIVITY