Test date: 3/8 PreAP

BAT list
Botany: Photosynthesis and Respiration: Chapter 4

Name: KEY PreAP

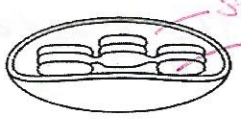
Vocabulary: Cell Energy				
Cellular respiration	ATP and ADP	Aerobic	Anaerobic	Glycolysis
Product	Reactant	Photosynthesis	Pigment	Chlorophyll
Thylakoid	Chloroplast	Stroma	Lactic acid	fermentation

Chapter 4.1 Chemical Energy and ATP (pg 98-100)

1. How are ATP and ADP related?
When ATP loses a phosphate to release energy, it becomes ADP
2. Explain how energy is stored in and obtained from ATP.
Energy is stored in the phosphate bonds. The 3rd phosphate bond is broken to release energy.

Chapter 4.2-4.3 Photosynthesis (pg 101-110)

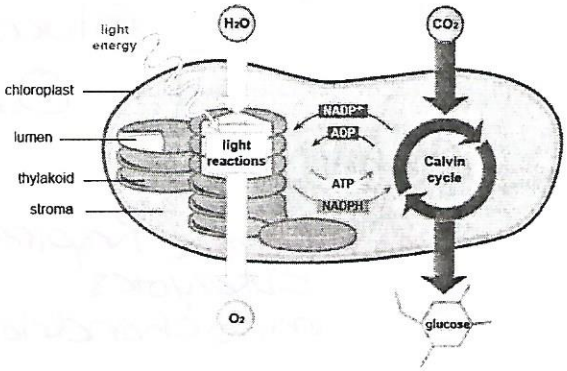
3. ~~Write out the balanced equation for photosynthesis.~~ CIRCLE the products and BOX the reactants
$6CO_2 + 6H_2O + E_{Radiant} \rightarrow C_6H_{12}O_6 + 6O_2$
4. Label the thylakoid and stroma in a chloroplast on the diagram below.



5. What is the pigment that absorbs light energy called?
Chlorophyll
6. Where does photosynthesis not occur in a plant and why?
Roots - NO chloroplasts
7. Compare the light dependent and light independent reactions, include: location and general products/reactants

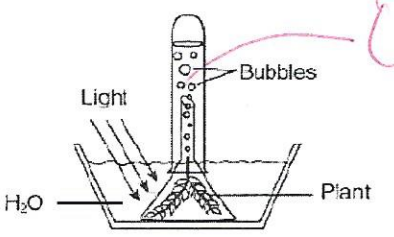
Light dependent **Light independent**

Light dependent:
H_2O and light energy is used to produce O_2 (a waste product) during the light reactions. This occurs in the thylakoid of the chloroplast.



Light independent:
CO_2 is used to produce glucose (a stored product) during the Calvin Cycle. This occurs in the stroma of the chloroplast.

8. What factors affect the rate of photosynthesis and how?
Radiant energy = more energy = more production
Water = more water = more/increased production
CO_2 = more CO_2 = increased production
9. Look at the experimental set up below. Based on this experiment and what you know about cell processes, what gas must the bubbles be made up of? Justify your response.



O_2, Photosynthesis produces O_2 as a biproduct and releases it into the atmosphere.

Chapter 4.4-4.6 Cell Respiration (pg 112-123)

10. Write out the balanced equation for cell respiration. CIRCLE the products and BOX the reactants

$C_6H_{12}O_6 + 6O_2 \rightarrow (6CO_2 + 6H_2O + ATP)$

11. Identify the organelle that carries out cell respiration. What organisms cellular respirate?

mitochondrion — All eukaryotes

12. Compare lactic acid fermentation with alcoholic fermentation:

Lactic Acid Pathway:
GLUCOSE → pyruvic acid → lactic acid + 2 ATP

Alcohol Pathway:
GLUCOSE → pyruvic acid → CO_2 + Ethyl alcohol + 2 ATP

How many ATP molecules produced in each? 2
What gas is used in alcoholic fermentation? CO_2
Which uses glucose? Both

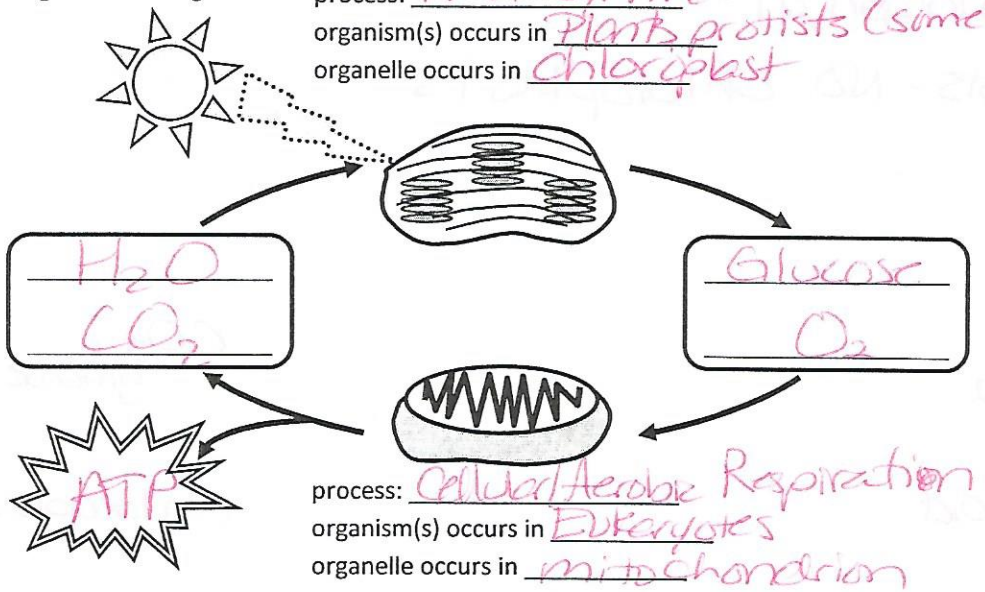
13. Explain why oxygen consumption can be used to measure the rate of respiration.

Rate is measured by amount of reactant (O_2) used. More O_2 = increased rate.

14. Explain how photosynthesis and cell respiration are dependent on each other.

Cyclic - The products of one are the reactants of the other.

15. Complete the diagram to the right.



process: Photosynthesis
organism(s) occurs in Plants protists (some bacteria w/pgmt)
organelle occurs in Chloroplast

process: Cellular Aerobic Respiration
organism(s) occurs in Eukaryotes
organelle occurs in mitochondrion

Botany: Plant Structures and Functions

Chapters 20-22

Botany Unit Vocabulary							
Phloem	Xylem	Vascular bundle	Stoma	Cuticle	Pollen	Monocotyledon	Dicotyledon
Stamen	Filament	Anther	Fruit	Vegetable	Cellulose	Cotyledon	Seed
Pollination	Pistil	Stigma	Style	Root	Stem	Leaf	Transpiration
Auxins	Hormones	Mesophyll	Guard cell	Tropism	Phototropism	Thigmotropism	Geo/Gravitropism

Ch 21 Plant Structure and Function (pg 618-633)

1. Identify the 3 major organs of a plant.

roots, stems, leaves

2. What part(s) of a plant would be made up of dermal tissue?

leaves, stems

3. What part(s) of a plant would be made up of vascular tissue?

Xylem, phloem

4. Xylem is used to primarily transport what substances in a plant? What direction are the materials transported in?

Water (and minerals) up

5. Phloem is used to primarily transport what substances in a plant? What direction are the materials transported in?

food (Glucose/Nutrients) down

6. For a plant to retain turgor pressure, a vacuole full of water, what type of solution must the plant cell be in?

Hypotonic

7. What type of solution will make a plant cell lose water and dehydrate (plasmolyze)?

Hypertonic

8. If a plant doesn't have a vascular system (no roots, stem, xylem or phloem) where could it store water?

Leaves!

9. What is the function of the cuticle?

Protect from dehydration

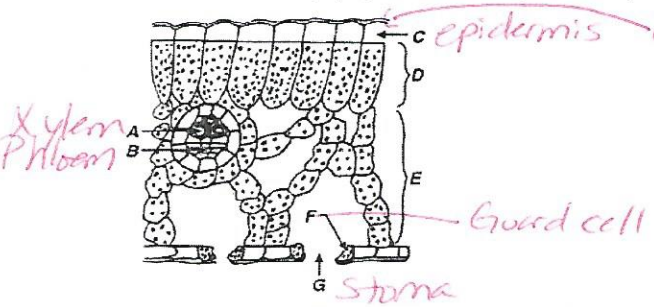
10. What is the function of the guard cell and stomata?

Guard cell open & close stomata allowing movement of CO_2, O_2, & H_2O

11. How does the leaf get carbon dioxide for photosynthesis?

Through stomata

12. Label structures A, B, F, G and identify the waxy covering of the leaf in this lead cross section.



epidermis cuticle

Xylem Phloem

Guard cell

Stoma

13. Identify three major functions of roots. Explain why each function is important to the plant.

store nutrients - for future use stability - growth + security of plant

intake H_2O - photosynthesis

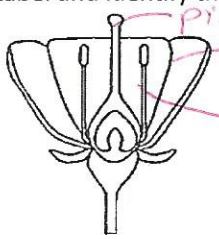
14. Identify the mutualistic relationship between roots and fungi. How does this relationship benefit the plant?

mycorrhizae provides nutrients/minerals to roots, → Grows better/quicker

roots provide minerals/nutrients to fungi

Ch 22 Plant Growth, Reproduction, and Response (pg 640-659)

15. Label and identify the stamen, pistil and petals found on most flowers.



pistil

petal

stamen

16. What two places does meiosis occur in the flower?

anther, ovary

17. What are three ways that seeds of flowering plants can be dispersed? wind, animal, water
18. How can seeds in fruit be dispersed?

Eaten + dropped (bird) while flying
Eaten + pooped out

19. How can a combinations of sexual and asexual reproduction be beneficial for plant populations?

asexual is rapid reproduction - increases # of species/population
sexual leads to genetic variation

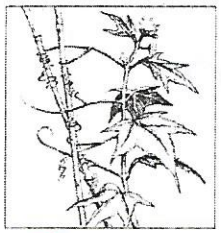
20. What is a hormone and what does it do?

chemical messenger that stimulates plant movement, response

21. Describe the function of auxins.

on shady side of plant auxins cause cells to grow longer to "bend" the plant towards light.

22. Identify the images below as gravitropism (geotropism), thigmotropism, or phototropism; then explain how each of these can help a plant maintain homeostasis



Thigmo - Provides support, plant can grow tall for light

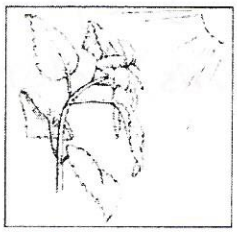
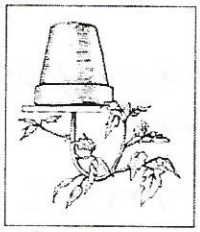


Photo - Allows plant to absorb more light



Gravi - causes roots to grow down toward water source + plant stems to grow up toward light and air.