

Practice Worksheet — Grade 11 Biology

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Cells

1. In which organelle does the light-dependent reaction of photosynthesis take place?
 - a) the inner matrix of the mitochondrion
 - b) the cytoplasm outside the chloroplast
 - c) the thylakoid membrane of the chloroplast
 - d) the fluid stroma surrounding the thylakoids

Circulation and gas exchange

2. Which blood vessel carries oxygen-poor blood from the heart to the lungs?
 - a) the pulmonary vein
 - b) the pulmonary artery
 - c) the aorta
 - d) the vena cava
3. Where does gas exchange between air and blood actually take place?
 - a) the bronchi
 - b) the alveoli
 - c) the trachea
 - d) the pleura
4. What causes air to move into the lungs during inhalation?
 - a) blood pressure forces air into the alveoli
 - b) the diaphragm relaxes and pushes the air inward
 - c) the diaphragm contracts, lowering pressure in the chest
 - d) the lungs pull the air in with their own muscle
5. Which component of blood transports most of the oxygen?
 - a) haemoglobin in red blood cells
 - b) plasma, which dissolves and carries almost all of it directly
 - c) white blood cells, which collect oxygen as they patrol the body
 - d) platelets, which release oxygen wherever a clot has formed
6. Which features make capillaries well suited to exchange? Select all that apply.
 - a) thick muscular walls
 - b) walls one cell thick
 - c) very large total surface area
 - d) blood flows slowly through them

Energy flow matter cycling

7. What is the ultimate source of energy for almost all ecosystems on Earth?
- a) the Sun
 - b) the soil
 - c) decomposers
 - d) the Earth's core
8. Producers in an ecosystem capture 10 000 kJ of energy. Using the usual 10% rule, how much energy reaches the secondary consumers?

Answer: _____ (kJ)

9. Which of these cycle through the biosphere and are reused? Select all that apply.
- a) water
 - b) nitrogen
 - c) carbon
 - d) energy
10. What role do decomposers play in the biosphere?
- a) they capture sunlight for the whole food chain
 - b) they remove carbon dioxide from the atmosphere directly
 - c) they sit at the top of every food chain
 - d) they break down dead matter and return nutrients to the soil
11. Which statement about the greenhouse effect is correct?
- a) it prevents sunlight from reaching the Earth's surface at all
 - b) it is caused entirely by human activity
 - c) greenhouse gases trap outgoing infrared and warm the Earth
 - d) it only ever occurs over cities

Food webs

12. Why does an energy pyramid get narrower towards the top?
- a) top predators eat much less often
 - b) larger animals need less energy overall
 - c) energy is destroyed as it moves up the chain
 - d) most energy is lost as heat at each transfer

Photosynthesis respiration pathways

13. What are the products of the light-dependent reactions that the Calvin cycle then uses?
- a) pyruvate and NADH
 - b) ATP and NADPH
 - c) glucose and oxygen
 - d) carbon dioxide and water

14. Where does glycolysis occur?
- a) the nucleus
 - b) the cytoplasm
 - c) the mitochondrial matrix
 - d) the inner mitochondrial membrane
15. In aerobic cellular respiration, what is the final electron acceptor in the electron transport chain?
- a) carbon dioxide
 - b) oxygen
 - c) NAD^+
 - d) pyruvate
16. How many net ATP molecules are produced by glycolysis alone, per molecule of glucose?

Answer: _____ (ATP)

Population change equation

17. A survey counts 450 deer in a park of 90 km². What is the population density?
- Answer: _____ (deer/km²)
18. A population of 1000 rabbits has 200 births, 50 deaths, 30 immigrants and 80 emigrants in a year. What is the population at the end of the year?
- Answer: _____
19. What distinguishes primary succession from secondary succession?
- a) primary succession begins where there is no soil at all
 - b) primary succession happens only in forests
 - c) primary succession is always faster
 - d) primary succession involves no living organisms
20. What is the carrying capacity of an environment?
- a) the point at which a population becomes extinct
 - b) the total number of species present
 - c) the maximum number of offspring one pair can produce
 - d) the largest population the environment can sustain over time