

Question	Ideal Answer
Q: What is the primary benefit of precision agriculture?	A: Precision agriculture improves crop yields, reduces resource use, and minimizes environmental impact by using technology to monitor and manage field variability.
Q: What is a black hole?	A: A black hole is a region in space where the gravitational pull is so strong that nothing, not even light, can escape from it.
Q: What is the role of ribosomes in a cell?	A: Ribosomes are responsible for protein synthesis in cells, translating messenger RNA into polypeptide chains.
Q: What is the significance of the periodic table in chemistry?	A: The periodic table organizes chemical elements based on their atomic number, electron configuration, and recurring chemical properties.
Q: What is the function of an algorithm in computer science?	A: An algorithm is a step-by-step procedure or set of rules to solve a problem or perform a task.
Q: What causes volcanic eruptions?	A: Volcanic eruptions are caused by the movement of molten rock (magma) from the Earth's interior to the surface, typically due to tectonic plate movements.
Q: What is the difference between civil and mechanical engineering?	A: Civil engineering focuses on infrastructure such as bridges, roads, and buildings, while mechanical engineering deals with machinery, tools, and mechanical systems.
Q: What is the concept of 'alloying' in materials science?	A: Alloying is the process of combining two or more metals to create a material with improved properties, such as increased strength or resistance to corrosion.
Q: What is the Pythagorean theorem?	A: The Pythagorean theorem states that in a right-angled triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other two sides.
Q: What is the function of white blood cells in the immune system?	A: White blood cells protect the body against infections and foreign invaders by identifying and attacking pathogens.
Q: How does crop rotation benefit soil health?	A: Crop rotation helps maintain soil fertility, reduce pests, and prevent soil erosion by alternating crops with different nutrient requirements.
Q: What is the Hubble Space Telescope used for?	A: The Hubble Space Telescope is used to observe distant galaxies, stars, and other celestial bodies, providing high-resolution images of space.
Q: What is the function of mitochondria in cells?	A: Mitochondria are the powerhouses of the cell, generating energy in the form of ATP through cellular respiration.
Q: What is an ionic bond?	A: An ionic bond is a chemical bond formed between two ions of opposite charges, typically involving the transfer of electrons from one atom to another.
Q: What is machine learning?	A: Machine learning is a subset of artificial intelligence where computers use algorithms to analyze and learn from data to make predictions or decisions without explicit programming.
Q: What are the three main types of rocks in the rock cycle?	A: The three main types of rocks are igneous, sedimentary, and metamorphic, each formed through different geological processes.
Q: What is the principle behind hydraulic systems?	A: Hydraulic systems operate based on Pascal's principle, which states that pressure applied to a confined fluid is transmitted equally in all directions.
Q: What is the purpose of heat treatment in materials science?	A: Heat treatment alters the physical and sometimes chemical properties of a material, such as metals, to increase strength, hardness, or durability.
Q: What is a derivative in calculus?	A: A derivative represents the rate of change of a function with respect to a variable, providing the slope of the tangent line to the curve at any given point.
Q: What is the difference between a virus and a bacterium?	A: Viruses are smaller and require a host cell to replicate, while bacteria are single-celled organisms that can live independently.
Q: What is sustainable farming?	A: Sustainable farming practices focus on producing food in a way that preserves the environment, conserves resources, and supports social equity for future generations.
Q: What is the concept of the "Big Bang"?	A: The Big Bang theory proposes that the universe began as a singularity, a point of infinite density, and expanded rapidly approximately 13.8 billion years ago.
Q: What is photosynthesis?	A: Photosynthesis is the process by which plants convert light energy, carbon dioxide, and water into glucose and oxygen, providing energy for the plant and oxygen for other organisms.
Q: What is the role of catalysts in chemical reactions?	A: Catalysts speed up chemical reactions by lowering the activation energy required, without being consumed in the process.
Q: What is the difference between a compiler and an interpreter?	A: A compiler translates an entire program into machine code at once, while an interpreter translates and executes code line-by-line.
Q: What is the difference between weather and climate?	A: Weather refers to short-term atmospheric conditions, while climate is the long-term pattern of temperature, humidity, wind, and precipitation in a region.
Q: What is an electrical circuit?	A: An electrical circuit is a path through which electricity flows, typically consisting of a power source, wires, and electrical components like resistors, capacitors, and switches.
Q: What is the concept of nanotechnology?	A: Nanotechnology involves manipulating matter at the atomic or molecular scale to create materials with novel properties and functions.
Q: What is the difference between an exothermic and endothermic reaction?	A: An exothermic reaction releases energy in the form of heat, while an endothermic reaction absorbs energy from the surroundings.
Q: What is the difference between supervised and unsupervised learning in machine learning?	A: Supervised learning uses labeled data to train models, while unsupervised learning uses unlabeled data to find hidden patterns.
Q: What causes earthquakes?	A: Earthquakes are caused by the sudden release of energy in the Earth's crust due to tectonic plate movements, resulting in seismic waves.
Q: What is the difference between AC and DC in electrical engineering?	A: Alternating current (AC) changes direction periodically, while direct current (DC) flows in one direction only.
Q: What is the role of polymers in materials science?	A: Polymers are long chains of molecules that can be engineered to have diverse properties, such as flexibility, durability, and resistance to chemicals, making them useful in a wide range of applications.
Q: What is a matrix and how is it used in mathematics?	A: A matrix is a rectangular array of numbers or functions, which can be used in solving systems of linear equations, transformations, and many other mathematical operations.
Q: What is the function of the liver in the human body?	A: The liver processes toxins, produces bile for digestion, stores vitamins and minerals, and regulates blood clotting among other essential functions.