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|  | 1.0 | What is the best lab equipment used to measure a liquid? | Graduated cylinder |
|  | 1.0 | What is an instrument that allows light to pass through the specimen and uses two lenses to form an image called? | Compound light microscope |
|  | 1.0 | What type of glassware would be used when culturing bacteria? | Petri dish |
|  | 1.0 | What do you place over a microscope slide to protect the microscope lens? | Cover slip |
|  | 1.0 | What is another name for an eyepiece on a microscope? | Ocular lens |
|  | 1.0 | What is the best instrument to use to separate the liquid portion from the solid portions in whole blood? | centrifuge |
|  | 1.0 | Which is the most appropriate piece of equipment to use when measuring the mass of a leaf? | Triple beam balance |
|  | 1.0 | Which is the most appropriate piece of equipment to use when measuring 40 mL of water? | Graduated cylinder |
|  | 1.0 | Which microscope might a scientist use to observe a virus? | Electron microscope |
|  | 1.0 | What is the greatest magnification that a compound light microscope currently can have? | 2000x |
|  | 1.1 | On the Celsius temperature scale, how many degrees are between the freezing and boiling points of water? | 100 |
|  | 1.1 | A scientist noticed that the number of salamanders in ponds in the Rocky Mountains was declining. This is an example of which step of the scientific method? | observation |
|  | 1.1 | A controlled experiment is set up in duplicate. A single factor is changed in one setup but no change is made in the other setup. What is the factor that was changed? | variable |
|  | 1.1 | When enough experimental data supports a hypothesis, what does the hypothesis become? | theory |
|  | 1.1 | Two similar species of rodents live in the same forest. A biologist observes that one rodent population is much larger than the other. The biologist believes that the difference is due to better protective coloration in the larger population. A research project is set up to test this idea.  What is the biologist’s idea that the population numbers are influenced by coloration called? | The hypothesis |
|  | 1.1 | What is the basic unit of mass in SI? | gram |
|  | 1.1 | How many millimeters are in 13 cm? | 1300 |
|  | 1.1 | Upon what is the metric based on? | Multiples of 10 |
|  | 1.1 | What is the basic unit of length in SI? | meter |
|  | 1.1 | What is the basic unit of volume in SI? | liter |
|  | 1.1 | Be able to interpret data presented in a line graph |  |
|  | 1.1 | Be able to read a graduated cylinder |  |
|  | 2.0 | Which of these substances moves across cell membranes by osmosis? | water |
|  | 2.0 | How does active transport differ from passive transport? | Active transport requires energy |
|  | 2.0 | Molecules that are too large to be moved through the membrane are transported into the cell through what process? | endocytosis |
|  | 2.0 | Be able to identify diffusion given a diagram |  |
|  | 2.0 | What is the movement of a substance from an area of high concentration to an area of lower concentration? | diffusion |
|  | 2.0 | The dispersal of food coloring in a beaker of water is an example of what process? | diffusion |
|  | 2.0 | A cell will swell when placed in what type of solution? | hypotonic |
|  | 2.0 | Osmosis is a type of what kind of transport? | Passive transport |
|  | 2.0 | About twelve to twenty-four hours after the previous meal, a person’s blood-sugar level normally varies from 60 to 90 milligrams per 100 milliliters of blood, though it may rise to 130 mg/100 ml after meals high in carbohydrates. The fact that the blood-sugar level is *maintained within a fairly narrow range* despite uneven intake of sugar is due to the body’s ability to carry out what process? | homeostasis |
|  | 2.0 | What happens to the “*surface area -to-volume ratio*” of a cell when the volume increases faster than the surface area? | Ratio decreases |
|  | 2.0 | Be able to determine motion into or out of a cell based on concentration |  |
|  | 2.0 | What is the process of the cell ridding itself of materials by discharging the materials in vesicles? | exocytosis |
|  | 2.1 | The molecules made by living cells are mainly assembled around which element? | carbon |
|  | 2.1 | Which of the following is not a carbohydrate? | lipid |
|  | 2.1 | Proteins are made of which type of subunit? | Amino acid |
|  | 2.1 | All of the following are organic molecules except | salt |
|  | 2.1 | Lipids are composed of fatty acids and which of the following? | glycerol |
|  | 2.1 | What statement describes the major role of lipids within the cell? | They are the main structural components of membranes |
|  | 2.1 | Which of the following: fat, carbohydrates, protein, or heredity information, does DNA store that is important to all cellular functions? | Heredity information |
|  | 2.1 | What type of protein acts as a biological catalyst lowering the activation energy of a reaction? | enzyme |
|  | 2.1 | What are carbohydrates and lipids able to store in their bonds? | energy |
|  | 2.1 | Most of the food and waste materials that move into and out of a cell pass through what type of organic molecule in the cell membrane? | protein |
|  | 2.1 | Phospholipids are molecules that form the lipid bilayer of which important cell part: nucleus, centriole, microfilament, or cell membrane? | Cell membrane |
|  | 2.1 | RNA plays an integral role in the production of which important molecule made of amino acids? | protein |
|  | 2.1 | Most carbohydrates in the human body are used for what? | A source of energy |
|  | 2.1 | Which of the following organic compounds: nucleic acid, lipid, protein, or carbohydrate, functions in the building of bone and muscle? | protein |
|  | 2.1 | When a signal molecule binds to the receptor protein, the receptor protein speeds up chemical reactions inside the cell. The receptor protein is an example of what type of catalytic substance? | enzyme |
|  | 3.0 | What is the correct equation for cellular respiration? | 6CO2 + 6H2O + Energy  6O2 + C6H12O6 |
|  | 7.0 | Brown eye color is dominant to blue eye color. A heterozygous brown-eyed father and a blue-eyed mother have four children. What are the children’s predicted phenotype(s)? | 50% of the children will have brown eyes, and 50% will have blue eyes. |
|  | 7.0 | In lions, white color is a recessive trait, and brown color is dominant. If a white lion mates with a homozygous brown lion, approximately what percentage of their offspring would be white? | 0% |
|  | 7.0 | In pea plants, the allele for round seeds is dominant over wrinkled seeds. Plant 1 has round seeds, and plant 2 has wrinkled seeds. When these plants are crossed, 50% of their offspring have round seeds and 50 % have wrinkled seeds. Which statement about the parent plants is correct? | Plant 1 is heterozygous, and plant 2 is homozygous recessive. |
|  | 3.0 | What are the reactants in the equation for cellular respiration? | Glucose and oxygen |
|  | 3.0 | Which of these is a product of cellular respiration? | water |
|  | 3.0 | Photosynthesis uses sunlight to convert water and carbon dioxide into what? | Oxygen and sugars |
|  | 3.0 | A green plant is kept in a brightly lighted area for 48 hours. If the light intensity is reduced slightly during the next 48 hours what will most likely happen to the rate at which oxygen is released from the plant? | decrease |
|  | 3.0 | The equation below represents a summary of a biological process. In which cell organelle is this process completed?  carbon dioxide + water → glucose + water + oxygen | chloroplast |
|  | 3.0 | What gas is the major source of weight gain in a growing plant? | Carbon dioxide |
|  | 3.0 | What is the process in which plants capture sunlight for energy and make organic molecules known as? | photosynthesis |
|  | 3.0 | What is the major atmospheric by-product of photosynthesis? | oxygen |
|  | 3.0 | Light energy is converted to chemical energy through what process? | photosynthesis |
|  | 3.0 | As light intensity increases, what happens to the rate of photosynthesis? | Increases until the light saturation point is reached |
|  | 3.0 | Which of the following is true of the process of cellular respiration? | Breaks down food molecules to release stored energy |
|  | 3.0 | What process does the following word equation represent?  glucose + oxygen --enzymes🡪 carbon dioxide + water + energy (in the form of ATP) | Cellular respiration |
|  | 3.0 | The sugar glucose (C6H12O6) is the major source of energy for your body’s cells. What is the general equation that describes the process of cellular respiration? | C6H12O6 + O2 → CO2 + H2O + energy |
|  | 3.0 | Chemical energy stored in food molecules is released through what process? | Cellular respiration |
|  | 4.0 | Be able to identify similarities and differences in cell organelles and their functions given a diagram. |  |
|  | 4.0 | Some ribosomes float freely in the cytoplasm, while others are attached to what organelle? | Endoplasmic reticulum |
|  | 4.0 | Rough endoplasmic reticulum differs from smooth endoplasmic reticulum in which of the following ways? | Rough endoplasmic reticulum has ribosomes attached to smooth endoplasmic reticulum does not |
|  | 4.0 | Which cell organelle is present in plant cells, but not in animal cells? | chloroplast |
|  | 4.0 | The nuclear envelope is similar to the cell membrane in which of the following ways? | Both are selectively permeable |
|  | 4.0 | Which scientist first used the term cell? | Hooke |
|  | 4.0 | Which type of microscope would best be used to observe the three dimensional structure of the cell? | Scanning electron microscope |
|  | 4.0 | What do electron microscopes use to focus and magnify an image? | Electron beams |
|  | 4.0 | Who was the scientist who first described living cells as seen through a simple microscope? | Van Leeuwenhoek |
|  | 4.0 | What is one advantage of electron microscopes over light microscopes? | Higher magnification |
|  | 4.1 | What is one **significant** difference between prokaryotic and eukaryotic cells? | Prokaryotes do not have a nucleus |
|  | 4.1 | A single prokaryotic cell can divide several times in an hour. Few eukaryotic cells can divide as quickly. Which of the following statements best explains this difference? | Eukaryotic cells are more structurally complex than prokaryotic cells |
|  | 4.1 | A cell that requires a lot of energy might contain large numbers of what organelle? | mitochondrion |
|  | 4.1 | Of the following eukaryotic cells: tree, fungi, moss, and animal, which types of cells have a cell wall? | Tree, fungi, and moss only |
|  | 4.1 | Which of the following is more likely to occur in a plant cell than an animal cell? | Formation of a cell wall |
|  | 4.1 | Cellulose fibers are present in what type of cell? | Plant cells only |
|  | 4.1 | Which of the following is more likely to occur in a plant cell than an animal cell? | Formation of cellulose |
|  | 4.1 | What are advantages of highly folded membranes in cell organelles such as the Golgi apparatus? | Increased surface area for cellular processes and the organelles take up less space |
|  | 4.1 | What is a function of the cell membrane in all cells? | Maintaining homeostasis |
|  | 4.1 | What cell organelle would be present large numbers in a plant cell involved in sugar production? | chloroplast |
|  | 4.1 | Where is DNA found in prokaryotic cell? | Floating in the cytoplasm |
|  | 4.1 | What is a cell that contains a nucleus called? | Eukaryotic cell |
|  | 5.0 | What are distinct types of cells that work together to perform a common function called? | tissues |
|  | 5.0 | What are tissues organized into specialized structures with specific functions called? | organs |
|  | 5.0 | What are organs working together that carry out major body functions called? | Organ systems |
|  | 5.0 | What is the lowest level of organization that includes the living and non-living components of an area? | ecosystem |
|  | 5.0 | What is the term for a group of organisms of one type living in the same place? | population |
|  | 5.0 | Ecosystems differ from a community in that ecosystems also contain what? | Physical aspects |
|  | 5.0 | What is a group of ecosystems that have the same climate and similar dominant communities called? | biome |
|  | 5.0 | Which would be more complex than tissues? | organs |
|  | 5.0 | What are all the different species within an ecosystem are collectively called? | community |
|  | 5.0 | What are the combined portions of the planet in which all of life exists, including land, water, and the atmosphere called? | biosphere |
|  | 5.0 | Given a diagram be able to identify levels of the environment |  |
|  | 6.0 | What is the name of the process in which the nucleus is divided into two nuclei? | mitosis |
|  | 6.0 | During normal mitotic cell division, a parent cell having four chromosomes will produce two daughter cells, each containing how many chromosomes? | four |
|  | 6.0 | Be able to identify stages of mitosis given a diagram |  |
|  | 6.0 | What is the name of the process necessary for reproduction, growth, and repair of cells? | Cell division |
|  | 6.0 | Mitosis is a form of what type of reproduction in cells? | Asexual reproduction |
|  | 6.0 | What is a form of cell division that halves the number of chromosomes when forming specialized reproductive cells, such as gametes or spores? | meiosis |
|  | 6.0 | What is the name of the process by which gametes of animals are formed? | meiosis |
|  | 6.0 | If an organism’s diploid number is 12, what is its haploid number? | 6 |
|  | 6.0 | Normal human males develop from fertilized eggs containing the combination of which sex chromosomes? | XY |
|  | 6.0 | What is the point at which two chromatids are attached to each other in a chromosome called? | centromere |
|  | 6.0 | What are chromatids? | Jointed strands of duplicated genetic material |
|  | 6.0 | What are the first three phases of the cell cycle collectively known as? | interphase |
|  | 6.0 | What is the phase of mitosis that is characterized by the arrangement of all chromosomes along the equator of the cell called? | metaphase |
|  | 6.0 | What is the exchange of corresponding segments of DNA of chromosomes during prophase I called? | Crossing-over |
|  | 8.0 | Be able to identify DNA base pairs |  |
|  | 8.0 | DNA replication results in what two DNA molecules? | Each with one new strand and one original strand |
|  | 8.0 | Be able to identify crossing over given a diagram |  |
|  | 8.0 | Transcription is the process by which genetic information encoded in DNA is transferred to what type of molecule? | RNA molecule |
|  | 8.0 | RNA is unlike DNA in that it has only one strand. Why is RNA still very important? | It carries genetic information from the genes out of the nucleus into the cytoplasm where it is translated to produced protein |
|  | 8.0 | Guanine typically occurs in the same amount as what other nitrogen base within an organism? | cytosine |
|  | 8.0 | RNA is chemically similar to DNA except that its sugars have an additional oxygen atom, and the base thymine is replaced by a structurally similar base called what? | uracil |
|  | 8.0 | Which of these statements best explains best explains how genes and proteins are related? | Genes are segments of DNA that code for proteins that code for genes |
|  | 8.0 | What is a change in a gene due to damage or being copied incorrectly called? | A mutation |
|  | 8.0 | What are the three components of a nucleotide? | A sugar, a phosphate group, and a nitrogen base |
|  | 8.0 | Deoxyribonucleic acid (DNA) is named for which part of its nucleotides? | Sugar |
|  | 8.0 | During DNA replication, a complementary strand of DNA is made for each original DNA strand. Thus, if a portion of the original strand is CCTAGCT, what will be the new strand? | GGATCGA |
|  | 8.0 | Be able to identify steps in protein synthesis given a diagram |  |
|  | 8.0 | **Be able to identify the number of codons in a DNA sequence** |  |
|  | 8.0 | **Be able to write complimentary strands of DNA** |  |