

Biology for a changing world essay sample

[Food & Diet](#), [Coffee](#)



Chapter 1: Java Report: Making Sense of the latest buzz in health-related news

Studies on the effects of coffee have provided different findings on the risks and benefits related to caffeine. This concept has introduced the idea of ascertaining whether the correct scientific process was carried out in a study. Establishing certain facts requires a certain approach in science. Initially, personal experience is the basis of conducting an investigation. Consider a study to investigate the effect of caffeine on memory.

Research studies done on the subject of interest (coffee studies) can be obtained from peer-reviewed scientific journals. This is because of the unbiased critique that the study presents. Once this research is carried out, one can formulate a hypothesis, which can be testable or falsifiable. An example of a hypothesis in this case is that drinking coffee improves memory. From the hypothesis, the researcher seeks to support the hypotheses by conducting an experiment, which involves a control group (decaf group) and an experimental group (caffeine group). Further, the experiment requires an independent variable and a dependent variable. The sample size of an experiment is emphasized as having much importance. A large sample ensures that the results will have statistical significance. Relationships and patterns in studies can be established by conducting controlled experiments in the laboratory. In the case of epidemiological studies, the presence of a relationship between the independent variable and the dependent variable does not necessarily imply that one variable is the cause of another.

Additionally, to gain new insights and knowledge on recent developments,

scientist can access peer-reviewed journals, which present valid scientific results. As science students, one needs to know that a significant body of knowledge and documented evidence unlike everyday theories normally supports scientific theories.

Chapter 2: Chemistry and Molecules of Life: Evidence from space heats up an old debate

Five functional traits of all living organisms on earth include growth, reproduction, homeostasis (maintaining a stable internal environment), response to stimuli and metabolism. In trying to establish the existence of life in space, scientists employ these functional traits. However, application of some of these criteria to establish the existence of life may be inconclusive. For instance, mules are sterile and thus cannot reproduce. This indicates that basing life only on the trait of reproduction is not accurate. In the process of searching for life on Mars, scientists from NASA search for chemical building blocks of life. One of the most critical chemical elements that form a major building block of life is carbon. Carbon's importance in life is attributed to its ability to make long chains and links. An element such as carbon has an atomic structure that consists of electrons, protons, and neutrons. Living things consist of organic molecules whose main competent is carbon. Examples of organic molecules of importance include carbohydrates, proteins, lipids, and nucleic acids. Water exists in living things as a component in the cells. Several properties of water such as heat regulation and good solvent make it a significant component of life on earth. Substances that can be dissolved in water are referred to as hydrophilic, for example salt, whereas substances that cannot be dissolved are referred to

as hydrophobic, for example lipids. In a solution, the concentration of hydrogen ions determines its pH and most chemical reactions in the cells take place at a neutral pH. A low pH makes the solution to be acidic whereas a strong pH makes the solution to be basic.

Chapter 3: Wonder Drug: How a chance Discovery in a London laboratory revolutionized medicine

The discovery of a mold that could kill bacteria led to the development of penicillin, which has been used in the cure of bacteria related infections. The cell theory postulates that new cells are formed from the sub-division of an existing cell. The cells can be classified as either eukaryotic (large cells containing many organelles) or prokaryotic (small cells lacking organelles). Penicillin targets prokaryotic cells. To understand the action of penicillin on such cells, an understanding of the cell structure is required.

Cells consist of a cell membrane that controls movement of molecules between the cytoplasm and the exterior of the cell. Movement of molecules across the membrane is by diffusion, for small molecules whereas large molecules are transported with the help of membrane proteins. Cases where there is a concentrated gradient, transport down the concentrated gradient is by facilitated diffusion. Where energy is required to transport molecules up the concentration gradient, the process is referred to as active transport.

Penicillin works by inhibiting peptidoglycan synthesis, which is the main competent of the bacteria cell wall and is not found in eukaryotes. This makes prokaryotes susceptible to penicillin attack. Additionally, antibiotics, for example streptomycin, function by interfering with other cell components such as the ribosomes in prokaryotic cells. Caution needs to be observed in

the use of antibiotics. Inappropriate usage has resulted in the development of antibiotic-resistant bacteria, which makes them difficult to treat.

Work Cited

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