Key Concepts – Grade 7 Assessment

Science as Inquiry

Designing and Investigation

[ ] Identify testable questions, questions that guide investigations/experiments, and questions to consider during an investigation
[ ] Identify problems in an investigation
[ ] Identify the components of an investigation
[ ] Use multiple sources to answer questions
[ ] Select appropriate experimental design or setup
[ ] Predict outcomes of an investigation
[ ] Identify correct procedure in an investigation
[ ] Identify independent variable, dependent variable, and variables that should be controlled /constant
[ ] Select appropriate tools, equipment, and technology to use in an investigation
[ ] Measure using appropriate or accurate units of the metric system
[ ] Identify appropriate safety tools and procedures
[ ] Identify correct setup between varying investigations
[ ] Identify ways to improve the investigation
[ ] Identify mistakes in procedures
[ ] Identify alternate methods for investigation using same tools

Communication

[ ] Understand and be able to identify the difference between a description and an explanation
[ ] Understand and be able to identify the difference between an observation and an inference
[ ] Use data tables, charts, circle graphs, line graphs, bar graphs, diagrams, scatter plots, and symbols to collect, record, and report data
[ ] Develop an explanation of experimental results
[ ] Identify patterns in data
[ ] Use models to explain natural phenomena or conclusions from investigations
[ ] Predict trends supported by data
[ ] Recognize that there are multiple ways to interpret data that may result in alternate explanations
[ ] Identify statements not supported by data/faulty reasoning
[ ] Communicate results of investigations
[ ] Identify statements that explain data

Technology and the Work of Scientists

[ ] Recognize that scientists use logical processes to solve problems
[ ] Review other scientists' work before beginning an investigation
[ ] Recognize that technology expands the human senses
[ ] Recognize that present technology limits answering all questions
[ ] Recognize that there is an acceptable range of variation in collected data
[ ] Identify mean, median, mode, and range from a given set of data
[ ] Identify problems in models, experimental design
[ ] Understand how scientists communicate about investigations in progress and findings
[ ] Describe how/why scientific theories change
[ ] Verify experiments through multiple investigation/trials
[ ] Solve problems and form new ideas as a result of scientific investigations
[ ] Identify ways technology has changed human life
[ ] Evaluate the impact of research on scientific thought, society, and the environment

Life Science

Plant and Animal Cells

[ ] Identify and compare cell structures and functions
[ ] Describe osmosis and diffusion
[ ] Compare plant and animal cell structures
[ ] Explain the processes of photosynthesis and respiration using a word equation
[ ] Differentiate between aerobic and anaerobic respiration in cell

Human Development

[ ] Describe the function of organs within major systems (digestive, respiratory, nervous, circulatory)
[ ] Describe how one or more major organ systems interact to sustain human life (endocrine, reproductive, nervous, respiratory, skeletal, muscular, circulatory, digestive)
[ ] Describe human development from infancy to old age
[ ] Describe how external factors and genetics influence quality and length of human life
[ ] Explain how communicable and noncommunicable diseases are transmitted, treated, and prevented

Genetics and Reproduction

[ ] Identify statements that describe sexual and asexual reproduction
[ ] Compare mitosis and meiosis and differentiate between the cell divisions in each process
[ ] Explain why chromosomes in body cells exist in pairs
[ ] Explain the relationship of genes to chromosomes
[ ] Explain the relationship of genotypes to phenotypes
[ ] Recognize genetic errors caused by changes in chromosomes
[ ] Use a Punnett square to determine offspring in simple monohybrid crosses
[ ] Identify dominant, recessive, and incomplete dominant traits from a given scenario
[ ] Identify examples of selective breeding

Organisms and Ecosystems

[ ] Use a dichotomous key to classify organisms
[ ] Identify organisms with complete and incomplete metamorphosis
[ ] Compare life cycles of plants and animals
[ ] Determine energy transfer among organisms by analyzing food webs
[ ] Describe the major biomes of the world and identify organisms
[ ] Identify the levels of organization of living things within an ecosystem
[ ] producers, primary consumers, secondary consumers, decomposers
[ ] individual, population, community
[ ] Identify mutualistic, parasitic, and producer/consumer relationships among plants and animals
[ ] Differentiate between habitat and niche
[ ] Predict the changes that a species population has on an ecosystem using a given scenario
[ ] Differentiate between behavioral and structural adaptations
[ ] Determine the impact of introducing nonnative species into an ecosystem
[ ] Determine an organism's ability to survive during changes that occur in various ecosystems
[ ] Know that variations in individuals within a population determine the success of the population
[ ] Identify environmental factors that impact the survival of a population

Science and the Environment

[ ] Identify resources that humans derive from ecosystems (wetlands, tropical rainforests, tundra)
[ ] Identify the roles of biotic and abiotic components in various ecosystems
[ ] Describe the effects of limiting factors on a given population
[ ] Determine the carrying capacity of an ecosystem using a given scenario
[ ] Identify the consequences of human actions on ecosystems
[ ] Explain why the nitrogen cycle is important to the survival of organisms
[ ] Relate photosynthesis and respiration to the carbon cycle
[ ] Identify positive and negative effects that human use of technology has on the environment