Grade 2 science GLEs

**Strand 1: Properties and Principles of Matter and Energy**

1. Changes in properties and states of matter provide evidence of the atomic theory of matter
   A. Objects, and the materials they are made of, have properties that can be used to describe and classify them
      a. Describe and compare the physical properties of objects by using simple tools (i.e., thermometer, magnifier, centimeter ruler, balance, magnet)
      b. Classify objects/substances as “one kind of material” or a mixture (e.g. m & m’s vs. trail mix, water vs. kool aid)
   B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles
      a. Observe and describe how mixtures are made by combining solids
      b. Describe ways to separate the components of a mixture by their physical properties (e.g., sorting, magnets, screening)

2. Energy has a source, can be stored, and can be transferred but is conserved within a system
   A. Forms of energy have a source, a means of transfer (work and heat), and a receiver
      a. Identify air, water, and solids as mediums that sound travels through
      b. Describe different ways to change the pitch of a sound (i.e., changes in size, such as length or thickness, and in tightness/tension of the source)
      c. Describe how the ear serves as a receiver of sound (i.e., sound vibrates eardrum)
      d. Describe how to change the loudness of a sound (i.e., increase or decrease the force causing vibrations)

**Grade 2, Strand 2: Properties and Principles of Force and Motion**

1. The motion of an object is described by its change in position relative to another object or point
   B. An object that is accelerating is speeding up, slowing down, or changing direction
      a. Describe Earth’s gravity as a force that pulls objects on or near the Earth toward the Earth without touching the object

2. Forces affect motion
   A. Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude
      a. Identify magnets attract and repel each other and certain materials
      b. Describe magnetism as a force that can push or pull other objects without touching them
      c. Measure (using non-standard units) and compare the force (i.e., push or pull) required to overcome friction and move an object over different surfaces (i.e., rough, smooth)
   B. Every object exerts a gravitational force on every other object
      a. Describe Earth’s gravity as a force that pulls objects on or near the Earth toward the Earth without touching the object
   D. Newton’s Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion
      a. Describe the direction and amount of force (i.e., direction of push or pull, strong/weak push or pull) needed to change an object’s motion (i.e., faster/slower, change in direction)
      b. Describe and compare the distances traveled by heavier/lighter objects after applying the same amount of force (i.e., push or pull) in the same direction
      c. Describe and compare the distances traveled by objects with the same mass after applying different amounts of force (i.e., push or pull) in the same direction
F. Work transfers energy into and out of a mechanical system
a. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using inclined planes (ramps) of different slopes
b. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using levers
c. Apply the use of an inclined plane (ramp) and/or lever to different real life situations in which objects are raised

Grade 2, Strand 3: Characteristics and Interactions of Living Organisms
1. There is a fundamental unity underlying the diversity of all living organisms
2. Organisms progress through life cycles unique to different types of organisms
a. Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., butterfly, frog, chicken, snake, dog)
b. Record observations on the life cycle of different animals (e.g., butterfly, dog, frog, chicken, snake)

3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through productive processes
D. There is heritable variation within every species of organism
a. Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

Grade 2, Strand 5: Processes and Interactions of the Earth’s Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth’s systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures
A. The Earth’s crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties
a. Observe and describe the physical properties (e.g., odor, color, appearance, relative grain size, texture, absorption of water) and different components (i.e., sand, clay, humus) of soils
b. Observe and describe the physical properties of rocks (e.g., size, shape, color, presence of fossils)

2. Earth’s systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes
A. The Earth’s materials and surface features are changed through a variety of external processes
a. Observe and identify examples of slow changes in the Earth’s surface and surface materials (e.g., rock, soil layers) due to processes such as decay (rotting), freezing, thawing, breaking, or wearing away by running water or wind

3. Human activity is dependent upon and affects Earth’s resources and systems
A. Earth’s materials are limited natural resources affected by human activity
a. Observe and describe ways humans use Earth’s materials (e.g., soil, rocks) in a daily life
Grade 2, Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical

A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation
   a. Pose questions about objects, materials, organisms and events in the environment
   b. Plan and conduct a simple investigation (fair test) to answer a question

B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations
   a. Make qualitative observations using the five senses
   b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers)
   c. Measure length, mass, and temperature using standard and non-standard units
   d. Compare amounts/measurements

C. Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) in light of evidence (data) and scientific principles (understandings)
   a. Use observations as support for reasonable explanations
   b. Use observations to describe relationships and patterns and to make predictions to be tested
   c. Compare explanations with prior knowledge

D. The nature of science relies upon communication of results and justification of explanations (See CLEs: This concept became D, as the original C concept was eliminated)
   a. Communicate simple procedures and results of investigations and explanations through:
      oral presentations
      drawings and maps
      data tables
      graphs (bar, pictograph)
      writings

Grade 2, Strand 8: Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all
   a. Design and construct a musical instrument using materials (e.g., cardboard, wood, plastic, metal) and/or existing objects (e.g., toy wheels, gears, boxes, sticks) that can be used to perform a task (Assess Locally)

B. Advances in technology often result in improved data collection and an increase in scientific information
   a. Describe how tools have helped scientists make better observations, measurements, or equipment for investigations (e.g., magnifiers, balances, stethoscopes, thermometers)

3. Science and technology affect, and are affected by, society

A. People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done
   a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery)
   b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)