

8th Grade Integrated Science Chemistry Checklist

- 1) I can tell the difference between chemical and physical properties of various substances.
- 2) I can sort and compare substances based on their chemical and physical properties (e.g., reacts with water, does not react with water, flammable or nonflammable, hard or soft, flexible or nonflexible, evaporates or melts at room temperature).
- 3) I can investigate and report on the chemical and physical properties of a particular substance.
- 4) I know when there is a physical change and I can explain why. (e.g., change in shape, size, phase).
- 5) I know when there is a chemical change and I can explain why. (e.g., color change, heat or light given off, change in odor, gas given off).
- 6) I can observe and can tell about chemical reactions involving atmospheric oxygen (e.g., rust, fire, respiration, photosynthesis).
- 7) I can investigate the effects of chemical change on physical properties of substances (e.g., cooking a raw egg, iron rusting, polymerization of a resin).
- 8) I can identify the kinds of energy (e.g., heat, light, sound) given off or taken in when a substance undergoes a chemical or physical change.
- 9) I can tell about how the amount of energy added or taken away from a substance affects the motion of molecules in the substance.
- 10) I can measure and graph the relationship between the states of water and changes in its temperature.
- 11) I can give examples showing that heat may be given off or taken in during a chemical change (e.g., striking a match, mixing vinegar and antacid, mixing ammonium chloride and water).
- 12) I can plan and conduct an experiment, and report on the effect of adding or removing energy on the chemical and physical changes.
- 13) I can identify what reactants and products are in chemical changes and know that the starting and ending types and numbers of atoms must be the same in both the reactants and products.
- 14) I can give examples of common significant chemical reactions (e.g., photosynthesis, respiration, combustion, rusting) in daily life.
- 15) I can do experiments to demonstrate that mass is conserved in a chemical reaction (e.g., mix two solutions that result in a color change or formation of a precipitate and weigh the solutions before and after mixing).
- 16) I can experiment with variables affecting the rates (speed) of chemical changes (e.g., heating, cooling, stirring, crushing, and concentration).
- 17) I can research and report on how scientists or engineers have applied principles of chemistry to an application encountered in daily life (e.g., heat-resistant plastic handles on pans, rust-resistant paints on highway bridges).

I know the definition of the following terms: **chemical properties, physical properties, chemical change, physical change, reaction, reactants, products, respiration, photosynthesis, temperature, molecules, heat energy, chemical energy, atoms, energy**

8th Grade Integrated Science Life Science Checklist

- 1) I can explain the importance of photosynthesis in using light energy as part of the chemical process that builds plant materials.
- 2) I can explain how respiration in animals is a process that converts food energy into mechanical and heat energy.
- 3) I can trace the path of energy from the sun to mechanical energy in an organism (e.g., sunlight to light energy to plants by photosynthesis to sugars - stored chemical energy to respiration in muscle cell usable chemical energy to muscle contraction- mechanical energy).
- 4) I can identify the relationships between organisms (i.e., producer/consumer, predator/prey, mutualism/parasitism/decomposer) and provide examples of each.
- 5) I can use models to trace the flow of energy in food chains and food webs.
- 6) I can make and test a hypothesis on the effects of air, temperature, water, or light on plants (e.g., seed germination, growth rates, seasonal adaptations).
- 7) I can research multiple ways that different scientists have investigated the same ecosystem.
- 8) I can give specific examples of how humans have changed the capacity of an environment to support specific life forms (e.g., people create wetlands and nesting boxes that increase the number and range of wood ducks, acid rain damages amphibian eggs and reduces population of frogs, clear cutting forests affects squirrel populations, suburban sprawl reduces mule deer winter range thus decreasing numbers of deer).
- 9) I can tell the difference between inference and evidence in a newspaper or magazine article relating to the effect of humans on the environment.
- 10) I understand and can explain the potential effects of humans on a specific food web.
- 11) I can evaluate and present arguments for and against allowing a specific species of plant or animal to become extinct, and relate the argument to the flow of energy in an ecosystem.

I know the definitions of the following terms: **food web, food chain, photosynthesis, respiration, predator, energy flow, solar energy, chemical energy, mechanical energy, producer, consumer, prey, mutualism, parasitism, competition, environment, capacity, organism, decomposer**

8th Grade Integrated Science Earth Science Checklist

- 1) I know that most rocks are made up of minerals.
- 2) I have observed and can describe the minerals found in rocks (e.g., shape, color, luster, texture, hardness).
- 3) I can sort rock samples into the following groups: sedimentary, metamorphic, or igneous.
- 4) I can tell about the role of energy in the processes that change rock materials over time.
- 5) I can use a model to demonstrate how erosion changes the surface of Earth.
- 6) I can describe how gravity causes change on the Earth's surface.
- 7) I can tell about the role of weathering of rocks in soil formation.
- 8) I can tell about and model the processes of fossil formation.
- 9) I can tell about how the deposition of rock materials produces layering of sedimentary rocks over time.
- 10) I can identify the assumptions scientists make to determine relative ages of rock layers.
- 11) I can explain why some sedimentary rock layers may not always appear with youngest rock on top and older rocks below (i.e., folding, faulting).
- 12) I have researched how fossils show evidence of the changing surface of the Earth.
- 13) I can explain why more recently deposited rock layers are more likely to contain fossils resembling existing species than older rock layers.
- 14) I can describe how energy from the Earth's interior causes changes to Earth's surface (i.e., earthquakes, volcanoes).
- 15) I can describe how earthquakes and volcanoes transfer energy from Earth's interior to the surface (e.g., seismic waves transfer mechanical energy, flowing magma transfers heat and mechanical energy).
- 16) I can model the process of energy buildup and release in earthquakes.
- 17) I can investigate and report possible reasons why the best engineering or ecological practices are not always followed in making decisions about building roads, dams, and other structures.
- 18) I can model how small changes over time add up to major changes to Earth's surface.

I know the definitions of the following terms: **volcano, earthquake, weathering, minerals, fossils, sedimentary, magma, metamorphic, rock cycle, igneous, sedimentation, deposition, geology, paleontology**

8th Grade Integrated Science Physics Checklist

- 1) I can relate the energy of a wave to wavelength.
- 2) I can compare the transfer of energy (i.e., sound, light, earthquake waves, heat) through various mediums.
- 3) I can describe the spread of energy away from an energy-producing source.
- 4) I can compare the transfer of heat by conduction, convection, and radiation and provide examples of each.
- 5) I can demonstrate how white light can be separated into the visible color spectrum.
- 6) I can distinguish between mass and weight.
- 7) I can give examples of how Earth's gravitational force on an object depends upon the mass of the object.
- 8) I can describe how Earth's gravitational force on an object depends upon the distance of the object from Earth.
- 9) I can design and build structures to support a load.
- 10) I can design and build a machine that uses gravity to accomplish a task.
- 11) I can calculate the mechanical advantage created by a lever.
- 12) I can design and build a device that uses levers or inclined planes to create a mechanical advantage.
- 13) I can design and build a device that uses friction to control the motion of an object.
- 14) I can design and build a complex machine capable of doing a specified task.
- 15) I can investigate the principles used to engineer changes in forces and motion.
- 16) I can analyze the cyclic nature of potential and kinetic energy (e.g., a bouncing ball, a pendulum).
- 17) I can trace the conversion of energy from one form to another (e.g., light to chemical to mechanical).
- 18) I can give examples of how organisms sense various types of energy.
- 19) I can investigate and report the response of various organisms to changes in energy (e.g., plant response to light, human response to motion, sound, light, insects' response to changes in light intensity).
- 20) I can investigate and describe how engineers have developed devices to help us sense various types of energy (e.g., seismographs, eyeglasses, telescopes, hearing aids).

I know the definitions of the following terms: **energy, potential energy, kinetic energy, force, gravity, complex machine, wave, friction, amplitude**