Grade 6

Science

Unit 1 Review

1. The independent variable
2. A hypothesis
3. A scientific theory
4. empirical evidence
5. law
6. D. hypothesis, experiment, analysis of data, conclusion
7. A. Group 1: The speed of the object increases as time passes
8. A. A scientist bases scientific explanations on a large body of observations of the natural world.
9. D. food poisoning
10. The answer is 75 degrees Celsius.
11. A good scientific investigation must be reproducible, wherein the processes of repetition and replication are both done to provide the validity, credibility, and accuracy of the results and conclusion. Repetition is the process of conducting the study again by the same person who performed the original study to ensure that the same results would be obtained. On the other hand, replication occurs when another scientist conducts the same study.
12. Based on the graph, during the year 1900, the average life expectancy of males in the United States is 48. It continued to increase until the year 2000, wherein the average life expectancy is at 74. The reason for this increase is due to the advancement of science and technology over the years, which led to the significant improvement of healthcare in the United States. The increase in life expectancy may continue to increase over the next years since the trend of science and technology continues to change and improve.
13. A good scientific investigation must be free from errors. Every error must be identified and corrected at all times. In addition, the investigation must have data that are carefully recorded and results that are reliable and reproducible. In order to ensure reliability, the processes of repetition and replication of the study must be done. These characteristics are all required for a scientific investigation to be accepted by the scientific community. If one of these requirements are not met, the investigation is considered an unreliable one.

Grade 6 Science

Unit 2 Review

1. scientific notation
2. simulation
3. physical model
4. measurements
5. The term precision refers to the exactness and consistency of a particular measurement. If a measurement is precise, it can give repeatable and reliable experiments.
6. C. It does not show the gravitational force exerted by each planet.
7. D. The solubility of $NaNO_3$ increases as the temperature of the water increases.
8. The initial mass of the saltwater solution is 145 grams. When heat is applied, the final mass of the salt, which remained inside the flask, is 13 grams. In this case, we have to subtract the initial mass of the solution and its final mass to get what was lost after boiling the solution.

   145 grams - 13 grams = 132 grams

   Therefore, 132 grams of the solvent has evaporated during the experiment.
9. a. 2.9 g: Gram (g) is a unit of mass that is measured by a balance, such as electronic balances and triple beam balances.

   b. 35.20 s: Second (s) is the SI unit for time. It can be measured using a stopwatch

   c. 17 cm: Centimeter (cm) is a unit for length, which is measured using a measuring tape, ruler, or a meter stick.

   d. 37 ^oC: Degrees Celsius (^oC) is a unit of temperature. IT can be measured using a thermometer.
10. A conceptual model is used to help us understand the relationship between the parts of a system. This model usually represents processes that are complex to understand and impossible to be observed directly. An example of this model includes the diagram that contains the tilt of the Earth on its axis when it revolves around the sun. This model lets us understand the concept of seasonal variation in an entire year, wherein the way that the Earth is lit by the sun is illustrated. Other examples of this model are the water cycle, rock cycle, and family tree.

    On the other hand, a mathematical model uses different kinds of data to show how a system or process works. For example, to show the population growth, a graph and an equation are used to represent the rate of growth and the future population. In addition, some chemical formulas and equations are also considered as mathematical models. One example is the chemical formula for water, which is formed when hydrogen gas reacts with oxygen gas. The equation is shown below:

    $2H_2 + O_2 \rightarrow 2H_2O$

Unit 3 Review

1. F (false)
2. T (true)
3. T (true)
4. F (false)
5. T (true)
6. A. A gas has formed and left the mixture
7. D. mass
8. C. Physical properties can be observed without attempting to change the identity of the substance.
9. B. B (neutrons)
10. C. Elements are made of identical atoms, whereas compounds are made of identical molecules.
11. The rock has a volume of $5\ \text{cm}^3$.
12. Aside from density, gold can be distinguished from other samples by observing its other physical properties such as color, luster, ductility, malleability, melting point, thermal conductivity, and electrical conductivity.
13. The reason for this event is due to the reaction of copper when another substance is added to it. Since copper sulfate is an inorganic compound, it contains different kinds of atoms that are chemically combined, which resulted in a new substance that has different chemical properties.

Grade 6 Science

Unit 4 Review

1. Velocity
2. Heat
3. Kinetic
4. Mechanical energy
5. B. 60 km/h
6. C. 700 km/hour
7. D. The car is changing direction at a constant speed.
8. D. The net force is zero, and all the forces are balanced.
9. B. X = 50; Y = 100; Z = 150
10. C. convection
11. D. thermometer
12. A. kinetic energy
13. C. thermal
14. C. The ramp is 12 meters long, and the incline is 2 meters high.
15. The height of the inclined plane is 29.75 meters.
16. Aside from the force exerted by the person, the force of gravity is acting upon it due to the weight of the box. This force acts as the downward pull on the object. In addition, there is a normal force that is exerted upwards by the surface that is in contact with the sports equipment inside the box. This force opposes the applied force given by the person pushing the box. Finally, a frictional force exists when the box is in contact with the floor. This force resists the motion or the movement that is caused by pushing the box.
17. The formula indicates that force, which simply refers to the push or pull of an object, is equal to the mass of an object multiplied by the acceleration of an object. This means that a force, particularly an unbalanced one, can actually cause an object that has a mass to change its acceleration. This event is observed in Newton's Second Law of Motion.

    For example, if an applied force was applied to an object with a large mass, there would be a small acceleration. However, when the same force is applied to an object with a smaller mass, the acceleration would be greater.
18. The law of conservation of energy states that the energy that exists in an object is conserved over time, which means that it can never be created or destroyed. Instead, the energy is usually transformed from one form into another.

    For example, when the water is stored, it possesses potential energy. Once it flows, the potential energy is converted to kinetic energy. In turn, the kinetic energy is used to generate electrical energy. On the other hand, this electrical energy can power up a light bulb. In the case of a light bulb, the electrical energy is converted into light energy and heat energy.
19. As the piano remains still on the ground, it contains potential energy. Once the piano is moved into the truck, the potential energy is turned into kinetic energy. Force is applied in the piano in order to accelerate it from rest. Using a ramp to move the piano into the truck requires less force than lifting it straight up. However, there is an increase in the distance in which the piano is moved. On the other hand, once the piano is in place inside a parked truck, the kinetic energy would be converted into potential energy. However, when the truck starts to move, the potential energy turns into kinetic energy.

Grade 6 Science

Unit 5 Review

1. T (true)
2. F (false)
3. T (true)
4. T (true)
5. T (true)
6. C. plants
7. A. smog and global warming
8. A. Energy is released as a result of atomic fission.
9. B. forests being cut down at a quicker rate than they can grow.
10. B. Don't let water run while brushing your teeth.
11. A. chemical energy to thermal energy
12. The remaining 59.3% is the electricity produced by coal energy.
13. According to the graph, petroleum usage would likely increase since more people are using automobiles. In this case, the petroleum resources would deplete at a faster rate since fossil fuels do not replenish on its own.

    To reduce the usage of fossil fuels, using bicycles instead of automobiles must be recommended. In addition, it is important to buy products that are energy-efficient. Installing solar panels and other renewable energy sources can also help reduce the usage of fossil fuels.
14. The picture shows a windmill. It converts wind energy into electricity in the form of wind turbines. When the wind comes in contact with a turbine, the blades of the turbine spin. Then, movement of the turbine produces energy that powers up the generator, which is a device that generates electricity.

    One advantage of this energy source is the fact that it is clean and environment-friendly; hence, it is a non-polluting way of generating electricity. Harnessing wind as energy is quite effective in places that are often windy.

    However, just like solar energy, wind energy cannot support the high demand for energy since harnessing the wind can be quite unreliable and inconsistent. Moreover, this giant turbine can also be harmful to animals that fly, such as birds and bats.

Grade 6 Science

Unit 6 Review

1. rock cycle
2. uplift
3. rock
4. luster
5. B. galena
6. C. the layers within the rock
7. B. layers of material become compressed to form rock
8. C. It would point downward from the metamorphic rock.
9. C. a shiny, metallic mineral
10. A copper penny has a hardness that is about 3.5 in the Mohs hardness scale. In this case, a penny can scratch a calcite, gypsum, and a talc.
11. The term texture is determined by the size and shape of the grains that are found in a rock. The rock's texture would give us a clue about the process of how the rock is made and the place where it is formed. An example is the texture of an igneous rock. If the magma cools rapidly, the crystal formed in the rock very small; hence, the rock has a fine-grained texture. On the other hand, if the magma cools slowly, the crystal formed is large; hence, the rock has a coarse-grained texture.

    On the other hand, the term mineral composition refers to the minerals and organic matter that are found in a rock. Determining the mineral composition can help us classify the rocks and identify how the rocks are formed, particularly the physical and chemical reactions that took place. For example, if the rock contains a high amount of silica, it is an igneous rock. On the other hand, a limestone, which is a sedimentary rock, is usually composed of calcite minerals.
12. Sedimentary rocks are formed by the following processes: weathering, erosion, deposition, compaction, and cementation. Over time, when the preexisting sedimentary rocks are exposed again to weathering, the cycle continues again. In most cases, the eroded materials or sediments are moved into different places by wind or water erosion; hence, they become sedimentary rocks in another location.
13. Metamorphic rocks can undergo a transformation into a sedimentary rock or an igneous rock. In order for a metamorphic rock to become a sedimentary rock, the rock must undergo erosion. Once the rock has eroded, it will produce rock fragments or sediments which accumulate to form a sedimentary rock.

    On the other hand, the intense heat coming from a volcanic activity can cause metamorphic rocks to melt into igneous rocks. In turn, when igneous and sedimentary rocks are exposed to heat and pressure, the rocks become metamorphic.

Grade 6 Science

Unit 7 Review

1. mantle
2. plate tectonics
3. Folding
4. volcano
5. earthquake
6. D. The physical layers of the inner core and the outer core form a single compositional layer.
7. B. The inner core is solid, and the outer core is liquid.
8. B. physical properties
9. D. convergent boundary
10. The total number of earthquakes that are classified as moderate to great is 1,471 times each year.
11. When two tectonic plates meet and collide, it occurs in a convergent plate boundary. This type of boundary causes a reverse fault. On the other hand, a transform boundary is where tectonic plates slide sideways past each other. This boundary produces a strike-slip fault due to the lateral shearing of plates. One common event that occurs in these boundaries is that there is a contact or collision between plates.
12. Folded mountains: Compression triggers the formation of folded mountains. These mountains, which exist as mountain ranges, are formed when the plates are squeezed upwards to produce a series of folds.

    Volcanic mountains are formed when the oceanic crust sunk beneath the continental crust along a subduction zone, which is within a convergent boundary. As a result, the oceanic plate melted and formed a line of volcanoes. In turn, the eruption of the volcanoes formed mountains.

    Fault-block mountains are formed due to the normal faults that occurred in a divergent boundary. As a result, the plates are pulled apart and they break into blocks.
13. Layer A is the lithosphere, layer B is asthenosphere, and layer C is mesosphere. The lithosphere is the solid outer layer of the Earth that is made up of the crust and upper mantle. It is divided into several pieces called tectonic plates. The asthenosphere is the layer of soft, hot rocks that flow slowly. This can be compared to a butter that can be easily deformed. This is the layer where the lithosphere floats. On the other hand, the mesosphere is found below the asthenosphere. Unlike the asthenosphere, the mesosphere is a dense region that consists of strong and solid rocks.

Grade 6 Science

Unit 8 Review

1. nuclear fusion
2. solar nebula
3. terrestrial planets
4. asteroid
5. solar system
6. D. as an area of bright white light
7. C. photosphere
8. A. The orbit of a planet around the sun is an ellipse with the sun at one focus.
9. C. Mars is less dense than Mercury
10. C. There is the least temperature variation for planets with higher pressures.
11. C. Mercury and Venus have slower periods of rotation (longer days) than Earth.
12. A. The Galilean moons orbit Jupiter
13. A. Jupiter, Saturn, Uranus, and Neptune
14. A. geocentric model
15. The Earth's highest temperature is 58 degrees Celsius. On the other hand, Mercury's highest temperature is at 427 degrees Celsius. In this case, the difference between their highest temperatures is 369 degrees Celsius.
    Therefore, Mercury is hotter than the Earth by 369 degrees Celsius.
16. Here are the characteristics that make gas giants different from terrestrial planets:

    a. Gas giants are massive planets, whereas terrestrial planets are small and dense planets.
    b. Gas giants have a thick atmosphere that is made up of helium and hydrogen. Unlike terrestrial planets, they do not have solid surfaces and metals.
    c. Gas giants have many moons and a set of rings.
    d. Gas giants are regarded as outer planets, which means that they are far from the sun. This is the reason why they have an unusually cold temperature.
17. Meteoroids are the chunks of rocks and dust that are seen in space. Eventually, if they enter the Earth's atmosphere, they burn due to the friction in the air. As a result, they release a light in the sky, which is called a meteor. There are instances when meteoroids do not completely burn because of their massive size. Instead, they hit the Earth's surface and become meteorites.
    Therefore, meteorites are likely seen on the Earth's surface.
18. Gravity is the most powerful force that keeps our Universe glued together. It is responsible for the movement of plants, moons, stars, asteroids, comets, and meteoroids in the solar system.
    Due to the strong gravitational pull of the Sun, hydrogen and helium gases are compressed and heated in the sun's core. This event causes nuclear fusion, which is how the sun produces energy. Moreover, gravity is what keep the planets to stay in their orbit as they revolve around the sun. If there is no gravity, all the celestial bodies would collide with one another, break apart and float off in space.
    how the sun produces energy. Moreover, gravity is what keep the planets to stay in their orbit as they revolve around the sun. If there is no gravity, all the celestial bodies would collide with one another, break apart and float off in space.

Grade 6 Science

Unit 9 Review

1. National Aeronautics and Space Administration (NASA)

2. rocket

3. satellite

4. rover

5. space shuttle

6. C. an uncrewed space probe

7. C. makeup of soil and rock samples

8. A. crewed, orbital space flight

9. D. space station

10. B. summer sea-surface temperature in the Gulf of Mexico

11. D. rover

12. Given that the International Space Station orbits once in every 90 minutes and there are 720 minutes in a 12-hour period, this means that it can orbit the Earth 8 times in 12 hours.

13. Astronomy is concerned about the contents of the Universe, such as the celestial bodies, and measuring their positions, as well as their motions. Astronomers usually use telescopes to explore and study the space. On the other hand, space exploration deals with the discovery of structures and composition of celestial bodies through the use of space technologies, such as the crewed and uncrewed spacecrafts that are sent in space.

14. An artificial satellite functions in several ways. Aside from collecting weather data and assisting in navigation through the use of GPS or global positioning system, it can also relay telecommunications signals through the use of radio and microwave frequencies. Communications satellite usually relay and receive signals that come from one ground station on Earth into another station by bouncing the signal to its destination. For example, when you are making a phone call from the US into another place in Europe, you are sending a signal into space and the satellite bounces the signal back to Earth into its target destination.

15. During 1958, the Explorer I was launched. This is the first satellite launched by the United States. At the same year, the National Aeronautics and Space Administration
(NASA) was formed. It is the government agency that is responsible for facilitating space programs and researches and for sending more missions into space. However, the vehicles used back then were very little and it had its limitations in bringing crews of astronauts on board. To overcome this problem, space shuttles were developed in order to allow more crew to join the space exploration.

After several years, the Apollo 11 spacecraft landed successfully on the moon during 1962. Neil Armstrong became the first person to set his foot on the surface of the moon. This event has led to the exploration of other planets and celestial bodies in space. However, since most celestial bodies are too far away for the astronauts to study and visit, uncrewed spacecraft and technology, such as space telescopes, probes, orbiters, landers, and rovers, were used for exploration. During 1996, the Mars Pathfinder was launched. This is a lander that was brought into space to explore Mars.

Grade 6 Science

Unit 10 Review

1. F (false)
2. T (true)
3. T (true)
4. T (true)
5. F (false)
6. B. Prem saw cells in the object.
7. C. The cells of both kinds of organisms divide to reproduce.
8. C. multicellular, move independently
9. B. He developed two-part scientific names.
10. D. community
11. The ideal water temperature for young salmon is between 10 to 15 degrees Celsius. If the current water temperature is 18 degrees Celsius, the growth of the salmon stops. Therefore, the water must be 3 to 8 degrees cooler in order to attain the ideal temperature of 10 to 15 degrees Celsius. In this way, the optimum growth of young salmons would take place.
12. The drawing below shows the level of organization in a marine ecosystem. (Click to see the drawing)
13. Matthias Schleiden, Theodor Schwann, and Rudolf Virchow are the scientists who came up with the cell theory. The three principles of cell theory include:

    1. Living organisms are made up of cells. This principle was proposed by Matthias Schleiden and Theodor Schwann. It was Schleiden who found out that plants are made up of cells. On the other hand, Schwann found out that plants are animals are made up of cells.

    2. The cell is the basic unit of living things. This principle was proposed by Matthias Schleiden and Theodor Schwann.

    3. All cells arise from pre-existing cells. Both Robert Remak and Rudolf Virchow contributed to this principle.
14. A domain, which is larger than a kingdom, represents the largest differences between organisms. To fit the six kingdoms in the three domains, scientists classified the key characteristics and grouped them accordingly. The domain Bacteria has the kingdom Eubacteria, while the domain Archaea, contains the kingdom Archaebacteria. These two domains contain single-celled prokaryotes.

    To classify organisms under the kingdom Eubacteria, it must have a prokaryotic cell that contains peptidoglycan in its cell walls. On the other hand, members under the kingdom Archaebacteria have cells walls without peptidoglycan.