

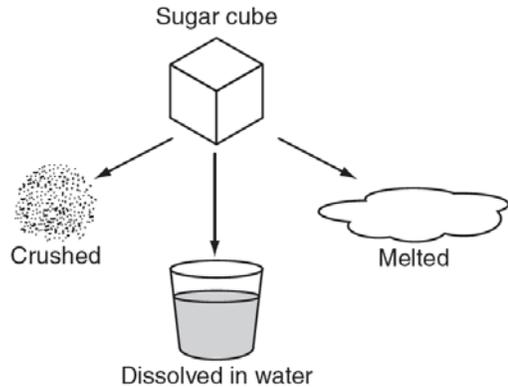
2018 TAME Middle School Science Test – Official Divisional

- (1) The mass of an elephant on the moon would be
- A) less than its mass on Mars.
 - B) the same as its weight on the moon.

- C) the same as its mass on Earth.
- D) more than its mass on Mars.

- (2) The diagram to the right shows three different ways that a sugar cube can undergo a physical change. Which characteristic of the sugar cube does not change?

- A) shape
- B) texture
- C) state
- D) weight



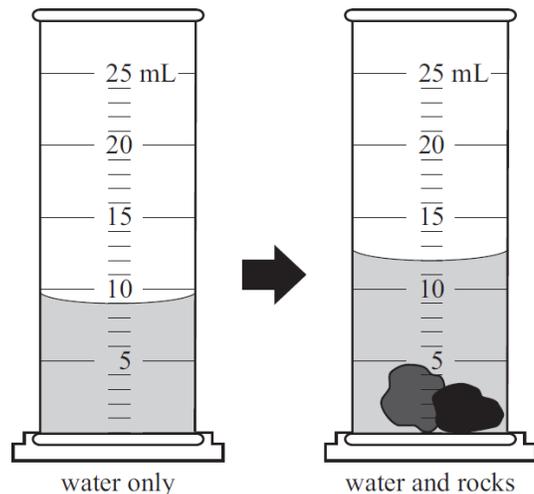
- (3) On which date is there the least amount of daylight in Texas?
- A) March 21
 - B) September 21
 - C) June 21
 - D) December 21

- (4) Mackenzie takes a small sealed jar containing 50 mL of warm water and puts the jar into a bowl containing 500 mL of cold water. Which statement describes what happens to the temperature of the water in the jar and in the bowl?
- A) The temperature of the water in both the jar and the bowl increases.
 - B) The temperature of the water in both the jar and the bowl decreases.
 - C) The temperature of the water in the jar increases, and the temperature of the water in the bowl decreases.
 - D) The temperature of the water in the jar decreases, and the temperature of the water in the bowl increases.

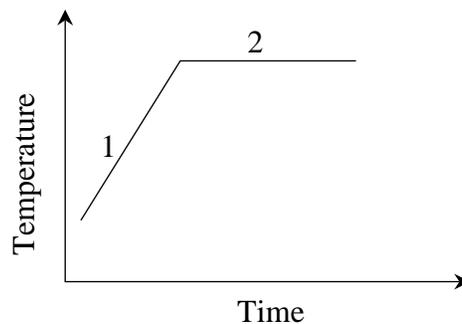
- (5) What prevents plant growth beneath the trees in thick forests?
- A) Little water reaches the ground under the trees.
 - B) The roots of the trees make it difficult for plants to grow.
 - C) The trees limit the amount of sunlight that can reach the ground.
 - D) The temperature of the soil under the trees does not allow plants to grow.

- (6) A student puts water in a graduated cylinder and carefully adds two small rocks. Looking at the illustration to the right, what is the volume of the rocks?

- A) 2 milliliters
- B) 3 milliliters
- C) 5 milliliters
- D) 12 milliliters



- (7) Genes are unable to determine a person's
- A) eye color.
 - B) number of teeth.
 - C) athletic ability.
 - D) shape of earlobes.
- (8) The Sun heats the atmosphere of Earth unevenly. Which of the following is the most likely result of this uneven heating?
- A) Convection in the atmosphere causes a change in air density, resulting in winds.
 - B) Conduction through the atmosphere causes evaporation to occur over oceans, resulting in rain.
 - C) Radiation from the Sun will reflect through the atmosphere back into space resulting in cooler evenings.
 - D) Radiation from the Sun will cause atmospheric moisture to collect over mountain ranges resulting in snowfall.
- (9) Steel is a metal that is made from iron and carbon. During the steel making process, iron and carbon are melted, blended together, and then allowed to harden into a solid. The iron and carbon do not chemically react with each other. After steel was made, 20 samples were taken from one piece and tested. Each sample contained 98% iron and 2% carbon. Which of the following terms best describes steel?
- A) element
 - B) homogeneous mixture
 - C) compound
 - D) heterogeneous mixture
- (10) Bromine (Br) is a liquid at room temperature. Oxygen (O) is a gas at room temperature. If room temperature is 25° C, which of the following statements is true?
- A) The boiling point of oxygen is colder than room temperature.
 - B) The boiling point of bromine is colder than room temperature.
 - C) The melting point of oxygen is warmer than room temperature.
 - D) The melting point of bromine is warmer than room temperature.
- (11) The bodies of many cars are designed to compress or crumple during an accident. Why are cars built with such a crumple zone?
- A) The crumple zone is made from cheaper materials, so the car costs less to make.
 - B) The crumple zone is made from cheaper materials, so it costs less to repair after an accident.
 - C) The crumple zone redirects the force as well as making the time to come to a complete stop longer.
 - D) The crumple zone transfers the force of an impact from the car to the object it hits, reducing the chance that passengers will get injured.
- (12) Wesley placed a small beaker of cold water on a hot plate and heated it for 10 minutes. He took the temperature of the water several times during those 10 minutes and recorded his data. Wesley claims that the graph to the right shows the relationship between temperature and time when water is heated. Which statement best explains why the temperature leveled off in section 2 of the graph?



- A) Wesley turned off the hot plate, so the water did not get any warmer.
- B) The water reached the boiling point, so the temperature no longer increased.
- C) An experimental error caused the graph to level off, because the water temperature should keep increasing over time.
- D) Cold water heats faster than warm water, so once the cold water was room temperature, it took more than 10 minutes to make it hot.

- (13) Liz needed to design a science project. She decided that she wanted to focus her project on how an earthworm's behavior helps it survive. Liz wrote down four ideas about earthworm behavior that she wanted to test. Which idea can be tested experimentally?
- A) Earthworms like the taste of dirt better than sand.
 - B) Earthworms are happier in black dirt than red dirt.
 - C) Earthworms exist to decompose decaying materials.
 - D) Earthworms will move away from direct light sources.
- (14) El Cajon Pass in California is becoming higher than the land around it at a rate of nearly one centimeter each year. Which statement is true about the area?
- A) Plates are separating at El Cajon Pass.
 - B) Erosion is slower than uplift at El Cajon Pass.
 - C) Erosion and uplift are balanced at El Cajon Pass.
 - D) Mountain building is slower than erosion at El Cajon Pass.
- (15) Albert threw a ball into the air. It followed a curved path and soon fell to the ground because
- A) air friction stopped the ball.
 - B) the ball was not thrown hard enough.
 - C) gravity changed the ball's direction.
 - D) the ball was not thrown straight up.
- (16) Which example best demonstrates conduction?
- A) a burner warming a pan
 - B) a stove circulating hot air
 - C) a refrigerator cooling air
 - D) a microwave warming food
- (17) Which feature best represents the crust of Earth?
- A) iron-based rocks
 - B) thickest under the ocean floor
 - C) separate moving plates
 - D) composed mainly of molten rock
- (18) How does air pollution in Houston most likely affect residents of surrounding cities?
- A) The residents experience more respiratory illnesses.
 - B) The residents experience fewer eye infections.
 - C) The residents harvest more vegetable crops.
 - D) The residents produce less electricity.
- (19) Plants use energy from the sun to convert
- A) sugars to oxygen and water.
 - B) carbon dioxide and water to sugars.
 - C) oxygen and water to sugars.
 - D) sugars to water and carbon dioxide.
- (20) Waves are produced by many different sources. Which statement best describes the relationship among waves?
- A) All waves transfer energy.
 - B) All waves have equal wavelengths.
 - C) All waves are the same frequency.
 - D) All waves travel at the same speed.
- (21) Which of the following optical devices produces a real image?
- A) plane mirror
 - B) concave lens
 - C) convex mirror
 - D) convex lens
- (22) Andy is looking at himself in a plane mirror. If Andy is 12 feet away from the mirror, how far is Andy from his image?
- A) 48 feet
 - B) 12 feet
 - C) 24 feet
 - D) 6 feet

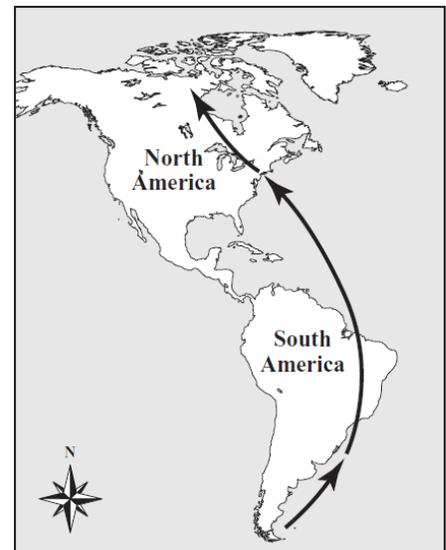
- (23) A semidiurnal tidal pattern is more typical of which of the following locations?
A) the East Coast of the U.S. C) the West Coast of the U.S.
B) the Gulf of Mexico D) the North Pole
- (24) Which of the following biomes takes up more square area of the world than any other biome?
A) rainforest C) savanna
B) taiga D) tundra
- (25) Hydrogen bonding is not important in the physical and chemical properties of which of the following?
A) liquid water C) water ice
B) DNA D) methane gas
- (26) What are the basic structural units of living organisms?
A) cells C) nuclei
B) organs D) tissues
- (27) An engineer is analyzing which areas in a city might become flooded if there are heavy rains. Which of the following maps is best to use for this analysis?
A) a map showing the locations of streets
B) a map showing the locations of houses
C) a map showing the routes of city buses
D) a map showing the elevations of ground surfaces

- (28) The illustration below shows three types of unicellular organisms commonly found in pond water. Based on the illustration, which of the following can be used to separate these organisms into three different groups?



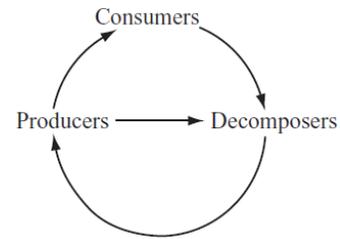
- A) length of lifespan
B) number of offspring
C) presence of a nucleus
D) method of movement

- (29) A species of bird migrates from South America across the Atlantic Ocean to its summer breeding ground in northern Canada. The birds stop on the east coast of the United States to eat the eggs of horseshoe crabs. The migration route of these birds is shown on the map to the right. Which of the following changes would most threaten this species of bird with extinction?



- A) less rainfall in South America
B) longer summers in North America
C) increased sizes of horseshoe crab eggs
D) decreased populations of horseshoe crabs

- (30) The diagram to the right represents a cycle in an ecosystem. Which of the following do the arrows most likely represent?



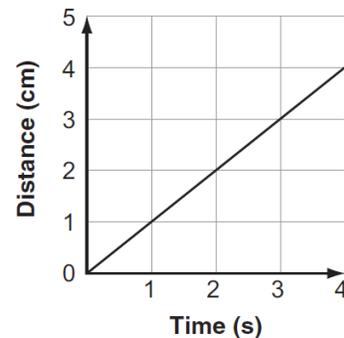
- A) heat
- B) nutrients
- C) sunlight
- D) water

- (31) The International Space Station (ISS) is currently orbiting Earth about once every 90 minutes. Only certain nations can send astronauts to man this station. Which nation listed below does not have this privilege?

- A) China
- B) Italy
- C) Russia
- D) United States

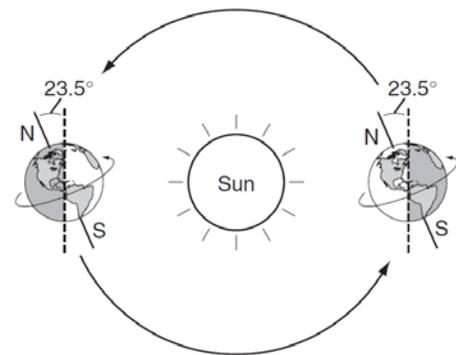
- (32) The motion of a toy car is graphed to the right. What does this graph show about the motion of the toy car?

Motion of a Toy Car



- A) The toy car is moving 1 cm every second.
- B) The toy car is moving 2 cm every second.
- C) The toy car is moving 3 cm every second.
- D) The toy car is moving 4 cm every second.

- (33) The diagram to the right shows Earth's motion around the Sun. As Earth orbits the Sun, it also rotates or spins on its axis. How many times will Earth rotate on its axis during one complete orbit around the Sun?



- A) 1
- B) 24
- C) 365
- D) 1000

- (34) A scientist wants to determine whether a bar of gold is pure. Which information would best show the scientist that the bar is made of pure gold?

- A) The bar is heavy.
- B) The atoms making up the bar are identical.
- C) The bar is a gold color.
- D) The compounds making up the bar are identical.

- (35) An atom of gold with 79 protons, 79 electrons, and 118 neutrons would have a mass number of

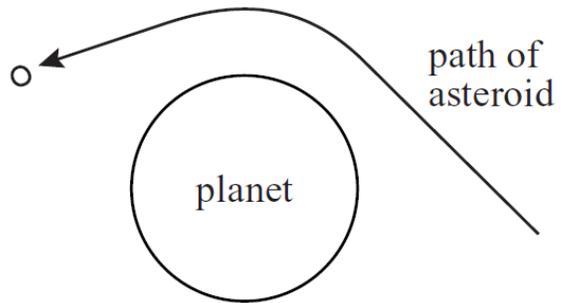
- A) 39.
- B) 158.
- C) 197.
- D) 256.

- (36) Who discovered that there are small particles inside the atom?

- A) Rutherford
- B) Dalton
- C) Einstein
- D) Thomson

- (37) Albert pushes a couch that has a mass of 50 kilograms across the floor. If the net force of his pushing and the resistive friction force of the floor is 20 Newtons, what happens?
- A) The couch accelerates in the direction of the net force with a velocity of 0.4 m/s.
 - B) The stays couch still since the net force is not large enough.
 - C) The couch accelerates in the direction of the net force with an acceleration of 0.4 m/s^2 .
 - D) The couch accelerates in the direction of the net force with an acceleration of 2.5 m/s^2 .
- (38) What are ways that meteorologists collect data?
- A) Doppler radar
 - B) weather satellites
 - C) weather balloons
 - D) All of these
- (39) Which of the following is the chemical formula for carbon dioxide?
- A) C_2O
 - B) 2CO
 - C) CO_2
 - D) C^2O
- (40) Algae obtain their food by
- A) eating plants.
 - B) eating dead organic matter.
 - C) making their own food through photosynthesis.
 - D) invading another organism's body.
- (41) Which of the following organ systems regulates body functions?
- A) urinary system
 - B) endocrine system
 - C) reproductive system
 - D) lymphatic system
- (42) Which of the following is the only ocean current that flows nearly unimpeded around the Earth?
- A) the gulf stream
 - B) the Antarctic Circumpolar Current
 - C) the North Equatorial Current
 - D) the South Equatorial Current
- (43) Which of the following infectious diseases cannot be cured with current antibiotics?
- A) strep throat
 - B) scarlet fever
 - C) toxic shock syndrome
 - D) influenza
- (44) Which of the following is a phylum of plants that is characterized by uncovered seeds?
- A) Gymnosperms
 - B) Algae
 - C) Angiosperms
 - D) Monocots
- (45) Over millions of years, coal formed from decayed plants that grew in hot, moist climates. Today, coal is found in northern regions such as Europe and North America. Why is coal now found where the climate is cool?
- A) The plants that form coal adapted to cool climates over time.
 - B) Europe and North America were once located near the equator.
 - C) Northern regions of Earth had a warm, desert climate many years ago.
 - D) The plants that form coal grow during the summer months when the weather is warm.
- (46) A solid piece of plastic, shaped like a cube, measured 2 centimeters on each edge. If the mass of the cube is 24 grams, what is the density of this cube in units of grams per cubic centimeter (g/cm^3)?
- A) 4 g/cm^3
 - B) 3 g/cm^3
 - C) $\frac{1}{3} \text{ g/cm}^3$
 - D) $\frac{1}{4} \text{ g/cm}^3$

(47) The diagram to the right shows how the straight path of a 3-meter-wide asteroid was changed by a planet's gravitational pull. Suppose the planet disappeared before the asteroid reached the point where its flight path began to curve. What would happen to the asteroid?



- A) The asteroid's path would remain a straight line.
- B) The asteroid's path would still curve, but into a circular orbit.
- C) The asteroid's path would curve in the opposite direction (toward the top of the page).
- D) The asteroid would come to a complete stop since there was no longer a gravitational field.

(48) Euglena is a single-celled photosynthetic organism. Clover is a multicellular green plant. Which of the following activities is carried out by both euglena and clover?

- A) using light energy to produce sugar
- B) moving nutrients to specialized tissues
- C) producing sex cells for reproduction
- D) transmitting impulses along nerve pathways

(49) Which of these minerals listed below is a carbonate?

- A) Calcite (CaCO_3)
- B) Gypsum (CaSO_4)
- C) Galena (PbS)
- D) Magnetite (Fe_3O_4)

(50) At what average speed would a car have to move to travel 20 kilometers in two hours?

- A) 5 km/hr.
- B) 20 km/hr.
- C) 10 km/hr.
- D) 40 km/hr.

(51) A group of people were concerned about a new coal-burning power plant that might be built in their neighborhood. What is probably their main concern?

- A) Burning coal produces more heat than burning wood.
- B) The heat from burning coal can drive loud generators that produce electricity.
- C) Burning coal produces sulfur dioxide which contributes to acid rain.
- D) All the coal in their neighborhood will be used up.

(52) A proton has which of the following charges?

- A) Negative
- B) Positive
- C) Neutral
- D) Magnetic

(53) Which energy changes can be observed in a glacier that is moving slowly down a mountain?

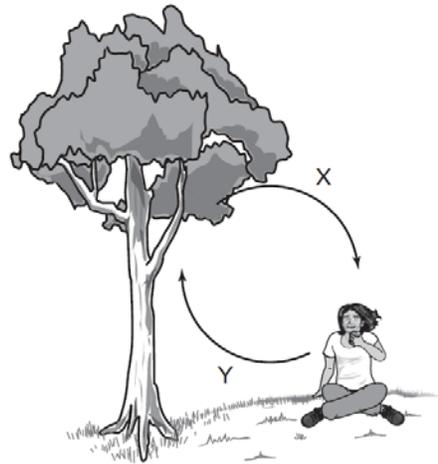
- A) Kinetic energy changes into radiant energy.
- B) Potential energy changes into kinetic energy.
- C) Radiant energy changes into kinetic energy.
- D) Thermal energy changes into radiant energy.

(54) The main function of which system is to help protect inner organs from being damaged by an outside force?

- A) excretory
- B) nervous
- C) skeletal
- D) circulatory

- (55) Some researchers are developing a new fertilizer designed to improve the growth of plants in hot, dry climates. The fertilizer was applied to one hundred desert plants in a greenhouse. The average daytime temperature in the greenhouse was 90°F, and the humidity levels were low. Which is best for the researchers to do next?
- A) Compare plants that received fertilizer to similar plants that received none.
 - B) Begin selling the fertilizer to gardeners living in hot, dry climates.
 - C) Change the conditions in the greenhouse and retest the fertilizer.
 - D) Test the fertilizer on plants that are adapted to cooler climates.

- (56) The illustration to the right shows an exchange of gases between plants and people. What gas is most likely represented by the arrow labeled X?



- A) oxygen
- B) nitrogen
- C) carbon dioxide
- D) hydrogen

- (57) Which structure of a flower is correctly matched with its function?

- A) The petal protects young buds.
- B) The pistil guides pollen to the ovary.
- C) The stamen produces female gametes.
- D) The anther holds the ovule.

- (58) Which is the best example of Newton's first law of motion?

- A) A baseball player swings at an approaching ball.
- B) A basketball thrown in the air falls to the ground.
- C) A soccer ball remains motionless until the ball is kicked.
- D) An ice skater pushes off from a wall and moves backwards.

- (59) For granite to chemically weather into sediment,

- A) ice wedging must occur.
- B) acid precipitation must fall.
- C) abrasion must occur.
- D) bonds between mineral grains must weaken.

- (60) During respiration, what substances combine to release energy for the cell?

- A) glucose and oxygen
- B) glucose and water
- C) oxygen and carbon dioxide
- D) water and oxygen

2017 – 2018 TAME Middle School Division Science Test Answer Key

(1) C
(2) D
(3) D
(4) D
(5) C
(6) B
(7) C
(8) A
(9) B
(10) A
(11) C
(12) B
(13) D
(14) B
(15) C
(16) A
(17) C
(18) A
(19) B
(20) A

(21) D
(22) C
(23) A
(24) B
(25) D
(26) A
(27) D
(28) D
(29) D
(30) B
(31) A
(32) A
(33) C
(34) B
(35) C
(36) D
(37) C
(38) D
(39) C
(40) C

(41) B
(42) B
(43) D
(44) A
(45) B
(46) B
(47) A
(48) A
(49) A
(50) C
(51) C
(52) B
(53) B
(54) C
(55) A
(56) A
(57) B
(58) C
(59) D
(60) A