

STAAR Spring 2026 Middle School Science Rationales

Item Position	Rationales	
1	Option C is correct	Water is scarce in the desert, so these rats get all their water from seeds, which helps them survive.
	Option A is incorrect	Jumping will not always help them survive in the desert.
	Option B is incorrect	This is a useful trait, but not one that will help them survive in the desert.
	Option D is incorrect	This is an advantage of being nocturnal that is not specific to surviving in the desert.

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2	Option B is correct	Brakes apply opposing frictional forces that slow a moving object. The lower-mass car requires less opposing frictional force.
	Option A is incorrect	Regardless of inertia, the cars will exert equal and opposite forces on the ground.
	Option C is incorrect	The lower-mass car will slow down faster because it has less inertia.
	Option D is incorrect	The brakes are exerting the same (frictional) force on each car.

Item Position	Rationales	
3	Part A	
	Option C is correct	Continental drift is a theory that explains how the continents separated.
	Option A is incorrect	Superposition does not support an explanation of the continents' separation; it supports readings of the fossil record.
	Option B is incorrect	The big bang theory does not support an explanation of the continents' separation; it proposes that the universe is continuously expanding.
	Option D is incorrect	The fossil record supports continental drift.
	Part B	
	Option D is correct	Oceanic rifts, mountains, valleys, and volcanic activity provide evidence of plate movement.
	Option A is incorrect	A smooth ocean floor does not provide evidence of plate movement.
	Option B is incorrect	A bare ocean floor does not indicate that the ocean floor is in motion.
	Option C is incorrect	A relationship between the ocean floor's temperature and its depth does not provide evidence for plate movement.

Item Position	Rationales	
4	Option B is correct	Natural selection favors the development of traits that help a species survive in its environment.
	Option A is incorrect	Random mutations create genetic variation, but natural selection determines which traits become common over generations.
	Option C is incorrect	Predators select the weaker individuals.
	Option D is incorrect	There is no indication that these traits were present in the ancestors.

Item Position	Rationales	
5	Option A is correct	Newton's second law states that $F/m = a$, so $1 \text{ N}/0.87 \text{ kg} = 1.15 \text{ m/s}^2$. This is the greatest acceleration.
	Option B is incorrect	Newton's second law states that $F/m = a$, so $0.5 \text{ N}/0.78 \text{ kg} = 0.64 \text{ m/s}^2$.
	Option C is incorrect	Newton's second law states that $F/m = a$, so $1 \text{ N}/0.98 \text{ kg} = 1.02 \text{ m/s}^2$.
	Option D is incorrect	Newton's second law states that $F/m = a$, so $0.5 \text{ N}/0.49 \text{ kg} = 1.02 \text{ m/s}^2$.

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Item Position	Rationales	
6	Option B is correct	A greater amplitude = a brighter light, while a longer wavelength = a lower frequency of light.
	Option A is incorrect	Wave X has a smaller amplitude, so it does not represent a bright light.
	Option C is incorrect	Wave X has a shorter wavelength, so it represents a higher-frequency wave than Wave Y.
	Option D is incorrect	Wave Y has a longer, not shorter, wavelength.

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Item Position	Rationales	
7	Option D is correct	The drawing illustrates subduction, with the higher-density crust pushing lower-density crust upward to form a mountain.
	Option A is incorrect	Though there is plate movement along a boundary, this boundary is convergent, not divergent, and the type of crust is not changed by this movement.
	Option B is incorrect	The lithosphere has a lower density than the asthenosphere.
	Option C is incorrect	This is not a transform boundary. The description is of a subduction boundary.

Item Position	Rationales	
8	Option C is correct	The chloroplast is being indicated, and it carries out photosynthesis.
	Option A is incorrect	The chloroplast does not reproduce genetic information.
	Option B is incorrect	The chloroplast does not produce water molecules; it uses them as a reactant for photosynthesis.
	Option D is incorrect	The chloroplast does not control cell membrane activities.

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Item Position	Rationales	
9	Option A is correct	A star's initial mass is the factor that determines the life cycle of the star.
	Option B is incorrect	Stars can be located at various locations within a galaxy and have different masses.
	Option C is incorrect	The number of planets orbiting a star does not determine the life cycle of the star.
	Option D is incorrect	The number of nearby stars of similar age does not determine the life cycle of the star.

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Item Position	Rationales	
10	Option C is correct	The total distance traveled is 6 km + 5 km + 3 km + 6 km = 20 km. The total time is 4 hours. 20 kilometers / 4 hours = 5 km/h.
	Option A is incorrect	20 km / 4 h does not equal 3 km/h.
	Option B is incorrect	20 km / 4 h does not equal 4 km/h.
	Option D is incorrect	20 km / 4 h does not equal 6 km/h.

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Item Position	Rationales	
11	Option A is correct	Lichens breaking down rock from a lava flow to produce soil is an example of primary succession because no soil is present.
	Option B is incorrect	Plants showing new growth after a small brush fire is an example of secondary succession because soil is already present.
	Option C is incorrect	The growth of trees in an area that had been cleared for a garden is an example of secondary succession because soil is present.
	Option D is incorrect	Vegetation regrowing in an area previously flooded is an example of secondary succession because soil is present.

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Item Position	Rationales	
12	Option B is correct	As a result of El Niño, more rain clouds form over the warm part of the Pacific Ocean. These clouds move over land, and much more rain than usual falls in South and Central America and in the United States.
	Option A is incorrect	Greater precipitation is expected as a result of El Niño due to warmer ocean temperatures.
	Option C is incorrect	Mild temperatures and greater precipitation are expected as a result of El Niño.
	Option D is incorrect	More clouds would form, not fewer.

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Item Position	Rationales	
13	2 pts	The student states that the net force is 2 N to the east. AND The acceleration is 0.2 m/s ² .
	1 pt	The student answers half of the questions correctly.
	0 pts	The response is incorrect or irrelevant.

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Item Position	Rationales	
14	Option B is correct	A high-pressure system is influencing the weather in New York, and skies are likely clear.
	Option A is incorrect	A low-pressure system is bringing storms to Dallas.
	Option C is incorrect	A low-pressure system is influencing the weather in San Francisco, so clouds are likely.
	Option D is incorrect	A cold front is bringing precipitation and clouds to Miami.

Item Position	Rationales	
15	2 pts	There are <u>5</u> hydrogen atoms in the reactants and <u>5</u> oxygen atoms in the products.
	1 pt	The student answers half of the questions correctly.
	0 pts	The response is incorrect or irrelevant.

Item Position	Rationales	
16	Part A	
	Option D is correct	The formation of bubbles is evidence of a chemical change since there is no external heat source being applied to the flask.
	Option A is incorrect	The bubbles on their own do not provide evidence of a temperature change.
	Option B is incorrect	While the texture may have changed, this is not relevant to the changes occurring in the experiment. Also, texture is not an appropriate descriptor of liquids and gases.
	Option C is incorrect	A new substance is created through the reaction. This is a chemical change, not a physical change.
	Part B	
	Option C is correct	The chemical change demonstrated the formation of new substances with different chemical properties.
	Option A is incorrect	The bubbles must have formed due to a chemical change because there was no external heat source to change the liquid vinegar into a gas.
	Option B is incorrect	The chemical change demonstrated the formation of new substances with different chemical properties that cannot be reversed by a physical process.
	Option D is incorrect	There is no evidence that energy was released during the reaction.

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Item Position	Rationales	
17	Option B is correct	The atoms in the reactants are rearranged to form the products. No atoms are lost or gained. This demonstrates the law of conservation of mass.
	Option A is incorrect	Atoms are only rearranged; they are not created in the process.
	Option C is incorrect	Atoms are only rearranged; they are not destroyed in the process.
	Option D is incorrect	The atoms are all accounted for in the reaction; they did not escape to the surroundings.

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Item Position	Rationales	
18	Option D is correct	The air and water plume creates an upward, unbalanced force that accelerates the rocket (Newton's second law) with mass and inertia decreasing as the air and water are ejected (Newton's first law).
	Option A is incorrect	The mass and inertia change, but the rocket cannot launch with balanced forces.
	Option B is incorrect	The rocket loses, rather than gains, inertia as mass leaves the rocket.
	Option C is incorrect	The balanced forces keeping the rocket stationary become unbalanced as the rocket launches.

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Item Position	Rationales	
19	Option A is correct	Warm ocean currents provide energy and increase humidity, further strengthening a storm that may become a tropical hurricane.
	Option B is incorrect	Warm ocean currents do not cause a decrease in evaporation.
	Option C is incorrect	Cool ocean currents do not cause tropical hurricane formation by absorbing energy.
	Option D is incorrect	Cool ocean currents do not strengthen tropical hurricanes by releasing energy.

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Item Position	Rationales	
20	1 pt	The student enters "3" as the correct answer for the number of nitrogen atoms in the formula for ammonium phosphate.
	0 pts	The response is incorrect.

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Item Position	Rationales	
21	Option D is correct	Convergent boundaries where one plate is subducted beneath another are the most common cause of volcanic formations. Plate subduction usually results from the density differences between oceanic and continental crust.
	Option A is incorrect	Transform boundaries typically result in earthquakes, not volcanoes, as tectonic plates slide past each other.
	Option B is incorrect	Transform boundaries typically result in earthquakes, not volcanoes, as tectonic plates slide past each other.
	Option C is incorrect	Convergent boundaries where two continental plates collide form folded mountain ranges.

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Item Position	Rationales	
22	Option D is correct	Individual DNA sequences are genes that store heritable information.
	Option A is incorrect	The individual DNA sequences are genes, not ribosomes. Individual DNA sequences do not synthesize proteins.
	Option B is incorrect	The individual DNA sequences are genes, not organelles. Individual DNA sequences do not carry out all the work done by cells.
	Option C is incorrect	The individual DNA sequences are genes, not proteins. The proteins that help hold the shape of genetic material in chromosomes are called histones.

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Item Position	Rationales	
23	1 pt	There is more direct sunlight <u>at the equator</u> than at <u>30°N and 30°S</u> . The <u>cooler</u> air at 30°N and 30°S moves toward the <u>warmer</u> air near the equator.
	0 pts	One or more of the responses is incorrect.

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Item Position	Rationales	
24	2 pts	The student states that mice that are tan in color are most fit for their environment. AND Tan mice can blend in with their surroundings.
	1 pt	The student answers half of the questions correctly.
	0 pts	The response is incorrect or irrelevant.

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Item Position	Rationales	
25	Option C is correct	The snake will cause a decrease in the mammal populations.
	Option A is incorrect	Mammals migrate for food, climate, and reproduction purposes, but whole populations do not migrate because of predators.
	Option B is incorrect	The introduction of a new species of snake will not cause a migration of new predators into the ecosystem.
	Option D is incorrect	The new snake has no natural predators in this ecosystem.

Item Position	Rationales	
26	Option B is correct	The mass of the products is $4\text{ g CaCl}_2 + 1\text{ g H}_2\text{O} + 2\text{ g CO}_2 = 7\text{ g}$. The mass of the reactants must also be 7 g because of the conservation of mass. The mass of CaCO_3 is 4 g , so the mass of HCl must be 3 g .
	Option A is incorrect	The coefficient of 2 in front of " HCl " doesn't represent the mass of the reactant. It is there to balance the chemical equation.
	Option C is incorrect	The mass of the products is 7 g . This doesn't equal the mass of HCl . The student needs to subtract the 4 g of CaCO_3 from the mass of the products to determine the mass of HCl .
	Option D is incorrect	The mass of the products plus the mass of the calcium carbonate is 11 g . This is not the mass of HCl .

Item Position	Rationales	
27	Option A is correct	During its life cycle, our sun will go from being a main-sequence star, to a red giant, and then to a white dwarf.
	Option B is incorrect	White dwarf phase and red giant phase are out of order.
	Option C is incorrect	The order of the phases is reversed.
	Option D is incorrect	The white dwarf phase should occur at the end rather than at the beginning.

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Item Position	Rationales	
28	Option B is correct	The temperature is higher on July 10 than it is on January 10, so the average kinetic energy of the air particles on July 10 is greater than the average kinetic energy of the air particles on January 10.
	Option A is incorrect	The average kinetic energy increases from January to July, not decreases.
	Option C is incorrect	The air particles will always have some kinetic energy.
	Option D is incorrect	The air particles will always have some kinetic energy.

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Item Position	Rationales	
29	Option B is correct	The surface will most likely become covered with grasses and small plants. This is considered secondary succession because there is soil present at the beginning of the process.
	Option A is incorrect	The land will most likely not remain bare because secondary succession will occur.
	Option C is incorrect	Trees will begin to grow after grass and small plants have been established.
	Option D is incorrect	Wind generally erodes bare soil over time.

Item Position	Rationales	
30	Option A is correct	The nucleus, which controls cellular activities, is the indicated structure.
	Option B is incorrect	The cell membrane is the organelle that controls entry into the cell; this is not the indicated structure.
	Option C is incorrect	The cytoplasm is the organelle that provides structural support; this is not the indicated structure.
	Option D is incorrect	The endoplasmic reticulum is the site of protein synthesis; this is not the indicated structure.