

2023 STAAR Grade 5 Science Rationales

Item #	Rationale	
1	Option A is correct	When the

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2	Option B is correct	Drawing well is a skill that must be learned
	Option D is correct	Reading is a skill that must be learned.
	Option A is incorrect	Having brown eyes is not a behavior that can be learned. It is an inherited trait.
	Option C is incorrect	Having freckles is not a behavior that can be learned. It is an inherited trait.
	Option E is incorrect	Having blonde hair is not a behavior that can be learned. It is an inherited trait.

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Item #	Rationale	
3	Option C is correct	The penny is the most-dense object because it sank to the bottom of the beam. BBo1 6831 67.2 re W* n B/TT0 T15 (f t)-3 (h)3 (e)9

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4	Option B is correct	When the land is overgrazed there are fewer plants and therefore, fewer roots. With fewer roots in the soil, it's more likely that soil erosion will occur.
	Option A is incorrect	More axis deer would mean that the population of native plants would decrease due to being consumed by the deer.
	Option C is incorrect	The predators of native animals will be affected. The axis deer may become prey for the native predators.
	Option D is incorrect	The axis deer decrease the availability of food because they overgraze the land. Therefore, herbivore populations will not increase.

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Item #	Rationale	
5	Option B is correct	With the wire cut at Position 2, electrical energy can flow through the middle and right bulbs and back to the terminal. The left bulb will remain unlit.
	Option A is incorrect	With the wire cut at Position 1, electrical energy cannot flow through bulbs or to the terminal. All bulbs will remain unlit.
	Option C is incorrect	With the wire cut at Position 3, electrical energy can flow only through the left light bulb. Therefore, only the left bulb will be lit.
	Option D is incorrect	With the wire cut at Position 4, electrical energy flowing through the middle and right bulbs cannot make it back to the negative terminal. Therefore, electrical energy flows only through the left bulb, and only the left bulb will be lit.

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Item #	Rationale	
6	Option B is correct	When water is in gas form, it condenses as it cools changing from a gas to a liquid.
	Option A is incorrect	When water freezes it changes from a liquid to a solid.
	Option C is incorrect	When water evaporates it changes from a liquid to a gas.
	Option D is incorrect	When liquid water is heated it does not melt; it evaporates changing from a liquid to a gas.

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Item #	Rationale	
7	Option A is correct	Light changes direction when it passes into a medium with a different index of refraction.
	Option B is incorrect	The person sees a refracted image, not a reflected image.
	Option C is incorrect	This form of refraction does not occur in this scenario. This also would not explain the distance between the actual fish and the observed fish.
	Option D is incorrect	When light travels from one medium to another, the angle of incidence







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Item #	Rationale	
10	Option D is correct	The grass is a living component of the ecosystem and the water is a nonliving component.
	Option A is incorrect	The rock and the sun are both nonliving components of the ecosystem
	Option B is incorrect	The fawn and the predators are both living components of the ecosystem

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Item #	Rationale	
11	Option B is correct	Wind and water are renewable, while minerals and oil are not.
	Option A is incorrect	Solar energy is a renewable resource.
	Option C is incorrect	Coal and natural gas are not renewable resources.
	Option D is incorrect	Wind is a renewable resource.



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Item #	Rationale	
13	Part A	
	Option D is correct	There is a cold front moving toward Denver, which is currently experiencing a low pressure system.
	Option A is incorrect	Atlanta is far removed from an area of changing pressure and not near a weather front.
	Option B is incorrect	Memphis is in a high-pressure system, and a warm front is moving in. This will not cause any serious changes in weather.
	Option C is incorrect	Dallas is not near a weather front and there are no upcoming weather changes that will affect the high pressure system.
	Part B	
	Option A is correct	Cold fronts moving into low-pressure systems cause clouds and storms.
	Option B is incorrect	There is no high-pressure system and no warm front near Denver.
	Option C is incorrect	The cold front is moving toward Denver, not away from it.
	Option D is incorrect	Denver is not near an area of high pressure and a warm front is not moving away from it.

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Item #	Rationale	
14	Option B is correct	We can see that the distance between Position 3 and Position 4 is greater than the distance between Position 2 and Position 3. This indicates that the ball has sped up. The ball can speed up if a force to the right is applied to the ball at Position 3.
	Option A is incorrect	There is no increase in speed from Position 2 to Position 3. Therefore a force was not applied to the ball at Position 2.
	Option C is incorrect	The force is applied in the wrong direction. A force to the left would cause the ball to slow down as it rolls to the right.
	Option D is incorrect	The force is applied in the wrong direction. A force to the left would cause the ball to slow down as it rolls to the right. Also the position does not indicate a change in speed









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Item #	Rationale	
18	Option A is correct	Fossil fuels such as coal form due to pressure and heat.
	Option B is incorrect	

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Item #	Rationale	
19	Option D is correct	Removing tall trees will result in additional sunlight reaching the floor, allowing organisms that use sunlight, such as ferns, to grow.
	Option A is incorrect	Removing tall trees will result in additional sunlight, which is detrimental to spore growth.
	Option B is incorrect	The roots of plants grow underground and are not affected by sunlight above the ground.
	Option C is incorrect	The amount of decaying wood used by fungi will be affected by the removal of tall trees.



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Item #	Rationale	
23	Option D is correct	the shadows made by objects when the sun position is opposite to the shadow cast by an object
	Option A is incorrect	opposite, not perpendicular to the shadow cast by an object.
	Option B is incorrect	to, not in the same direction as the shadow cast by an object.
	Option C is incorrect	opposite, not perpendicular to the shadow cast by an object.

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Item #	Rationale	
24	Option A is correct	Because an eraser, toothpick, and cotton ball do not allow electricity to flow through the circuit, they are classified as insulators.
	Option B is incorrect	An eraser is an insulator and does not allow electricity to flow through the circuit, but a paper clip and a safety pin will allow electricity to flow and complete the circuit.
	Option C is incorrect	A toothpick is an insulator and does not allow electricity to flow through the circuit, but a paper clip and a safety pin will allow electricity to flow and complete the circuit.
	Option D is incorrect	The paper clip, safety pin, and aluminum foil allow electricity to flow and complete the circuit and are therefore classified as conductors.



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26	From Most to Least Water Retention: Clay, Loam, Silt, Sand, Gravel	

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Item #	Rationale	
27	Option D is correct	The carnivores in the desert food web are lizards, scorpions, snake foxes, and hawks.
	Option A is incorrect	There are two herbivores shown in the food web.
	Option B is incorrect	There are three consumers shown in the food web that eat kangaroo rats.
	Option C is incorrect	There are four consumers shown in the food web that eat only herbivores.



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Item #	Rationale	
31	Option D is correct	The angle at which the light ray reflects off <del>the</del> tilted mirror is the same as the angle at which the light ray <del>strikes</del> the
	Option A is incorrect	A light ray does not refract and exit the tilted mirror when it strikes the
	Option B is incorrect	A light ray reflects when it strikes the surface of a mirror, but the angle of reflection is the same as the angle at which the light <del>strikes</del> the tilted mirror.
	Option C is incorrect	A light ray that interacts with a mirror will reflect from the surface of the tilted mirror but will not refract before reflecting

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