

STAAR Spring 2025 Grade 5 Science Rationales

Item Position	Rationales	
1	Option C is correct	The fossils found in Layer 3 are evidence that the area was once aquatic, as the fossils are of a crab and a snail.
	Option A is incorrect	The frog and leaf fossils found in Layer 1 are evidence that the area was a forest, not a desert.
	Option B is incorrect	The frog, dragonfly, and leaf fossils found in Layer 2 are evidence that the area was a forest, not an Arctic tundra.
	Option D is incorrect	The fish and clam fossils found in Layer 4 are evidence of an aquatic environment, not a forest.

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Item Position	Rationales	
2	Option B is correct	Light reflected off the toy elephant toward the students' eyes allows the students to see the toy.
	Option A is incorrect	Light traveling toward the lightbulb in the room would not explain how the students could see the toy. For the students to see an object, light must travel from that object to the students' eyes.
	Option C is incorrect	The light is reflected, not refracted. Also, light traveling to the lightbulb would not explain how the students could see the toy. For the students to see an object, light must travel from that object to the students' eyes.
	Option D is incorrect	Light must reflect off of the toy, not be refracted by the toy, in order for the students to see it.

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Item Position	Rationales	
3	Option B is correct	The larval and pupa stages of the mosquito's life cycle take place in water.
	Option D is correct	The seed is the first stage of a tomato's life cycle, as is the egg stage for the mosquito and ladybug.
	Option A is incorrect	Tomato plants do not have a pupa stage. The pupa stage occurs between the larva and adult stages of an insect's life cycle.
	Option C is incorrect	The young mosquito and ladybug look very different from the adult organisms.
	Option E is incorrect	Seeds come from adults, so an adult is needed in the plant life cycle.

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Item Position	Rationales	
4	Option B is correct	The chair spinning around one time represents Earth's day-night cycle.
	Option A is incorrect	The chair moving around the table represents the 365-day cycle of Earth orbiting the sun.
	Option C is incorrect	Moving the lamp around the chair would represent the sun orbiting Earth. However, Earth orbits the sun.
	Option D is incorrect	The teacher walking between the chair and the table would represent the moon blocking the light from the sun.

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Item Position	Rationales	
5	2 pts	The student identifies that the fennec fox lives in a desert environment, the badger lives in a prairie environment, and the hare lives in an Arctic environment. The fennec fox's large ears for cooling are evidence that it lives in the desert. The badger flattens its body to get through soil and also has sharp claws to dig burrows in the soil, providing evidence that the badger lives in the prairie. Thick fur and a small body to save heat are evidence that the hare lives in the Arctic.
	1 pt	The student answers half of the questions correctly.
	0 pt	The response is incorrect or irrelevant.

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Item Position	Rationales	
6	Option C is correct	Valleys are formed by slow-moving glaciers weathering and eroding the land.
	Option A is incorrect	Deltas are formed by river water carrying sediment toward a larger body of water. The sediment builds up over time.
	Option B is incorrect	Wind alone would not be strong enough to form canyons. Most canyons are not formed by wind alone. They are formed by fast-moving rivers that erode rock and sediment.
	Option D is incorrect	The continual melting and freezing of water causes weathering.

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Item Position	Rationales	
7	Option D is correct	Objects 1 and 4 float in water, which means they are less dense than water. Object 2 sinks in water, so it is more dense than water.
	Option A is incorrect	Object 5 is suspended in the middle of the beaker, which means it has the same density as water.
	Option B is incorrect	Objects 1 and 4 float in water, which means they are less dense than water. Objects 2 and 3 sink in water, which means they are more dense than water.
	Option C is incorrect	Objects 2 and 3 sink in water, which means they are more dense than water. Object 5 is suspended in the middle of the beaker, which means it has the same density as water.

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Item Position	Rationales	
8	Option C is correct	The students will most likely observe that the amount of water in the beaker is decreasing because the water is boiling and evaporating.
	Option A is incorrect	Condensation would occur if the beaker were cold in a warm environment. The amount of water in the beaker is decreasing because of evaporation as the water boils, not because of condensation.
	Option B is incorrect	Freezing is a change of state from liquid to solid that occurs when thermal energy is removed, not when it is added.
	Option D is incorrect	Condensation would occur if the water vapor were cooled, not heated.

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Item Position	Rationales	
9	Option C is correct	Fire is a nonliving part of the environment.
	Option A is incorrect	Birds are a living part of the environment.
	Option B is incorrect	Organisms that get their food from trees are living parts of the environment.
	Option D is incorrect	Plants growing near trees are living parts of the environment.

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Item Position	Rationales	
10	Option A is correct	High heat is needed to form organic material into fossil fuels, but heat is not needed for the formation of sedimentary rock.
	Option B is incorrect	Cementation occurs in both fossil fuel and sedimentary rock formation.
	Option C is incorrect	Decaying organisms must be present for the formation of fossil fuels, not sedimentary rocks.
	Option D is incorrect	Time is needed for both fossil fuel and sedimentary rock formation.

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Item Position	Rationales	
11	2 pts	The student selects the three bulbs on the top two lines. If Switch 1 is open and Switch 2 is closed, the three lightbulbs on the same line as Switch 1 will not be part of a closed circuit, as the flow of electricity is broken. The lightbulbs that are on the top two lines have a closed circuit, allowing the current to flow and light up the three light bulbs.
	1 pt	The student answers half of the questions correctly.
	0 pt	The response is incorrect or irrelevant.

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Item Position	Rationales	
12	Option C is correct	Sugar dissolves in water. The resulting solution would remain clear like the water.
	Option A is incorrect	Melting the sugar would require a change in temperature but the temperature does not change during the investigation.
	Option B is incorrect	Even though sugar is white in its solid state, the water would not turn white, because the sugar dissolves in the water. The resulting solution of sugar and water would remain clear. Melting the sugar would require a change in temperature, but the temperature does not change during the investigation.
	Option D is incorrect	Even though sugar is white in its solid state, the water would not turn white, because the sugar dissolves in the water. The resulting solution of sugar and water would remain clear.

Item Position	Rationales	
13	Part A	
	Option A is correct	The sun is high in the sky at noon and gets lower in the sky to the west in the afternoon.
	Option B is incorrect	The sun will be in a higher position at noon than in the afternoon so the suns in the sky could not be represented at the same height. Also, the sun rises in the east and sets in the west.
	Option C is incorrect	The height of the sun in the sky changes from highest at noon to lower in the afternoon.
	Option D is incorrect	The sun is in a high position in the sky at noon and lower during the afternoon.
	Part B	
	Option D is correct	Earth's rotation causes the apparent location of the sun to change across the sky.
	Option A is incorrect	This statement is true, but it does not explain why the position of the sun changes in the sky throughout the day.
	Option B is incorrect	The position of the sun in the sky changes due to Earth's rotation, not changes in the distance between the sun and Earth.
	Option C is incorrect	Earth's rotation, not the sun's, is what causes the apparent motion of the sun across the sky from east to west.

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Item Position	Rationales	
14	2 pts	The student identifies that starlings lay more eggs at one time and lay eggs more frequently, which means that they lay more eggs per year. OR Puffins lay fewer eggs at one time and lay eggs less frequently, which means that they lay fewer eggs per year.
	1 pt	The student answers half of the questions correctly.
	0 pt	The response is incorrect or irrelevant.

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Item Position	Rationales	
15	Option C is correct	Liquid water changes to water vapor during evaporation so the amount of water in the kettle decreases.
	Option A is incorrect	Water droplets on the plate represent condensation, not runoff.
	Option B is incorrect	Water droplets falling from the plate represent precipitation, not condensation.
	Option D is incorrect	The water beginning to boil represents evaporation, not precipitation.

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Item Position	Rationales	
16	Option B is correct	All the materials are solids.
	Option A is incorrect	The wood will float, but bricks and copper wire do not float.
	Option C is incorrect	The wire is flexible, but the brick is not.
	Option D is incorrect	Only the wire conducts electricity.

Item Position	Rationales	
17	Part A	
	Option B is correct	The angle of the beam of light changes as it moves from the air to the surface material.
	Option A is incorrect	Together Arrow W and Arrow X show reflection of light.
	Option C is incorrect	Arrow Y and Arrow Z show light refracting as it moves from the surface material to the air.
	Option D is incorrect	Arrow W and Arrow Z show that some of the light is transmitted through the surface material.
	Part B	
	Option C is correct	The ray would reflect, transmit, and be refracted by the glass.
	Option A is incorrect	A smooth, shiny surface would reflect some light, but light would not be refracted or transmitted.
	Option B is incorrect	This would allow reflection and scattering of light, but not refraction or transmission.
	Option D is incorrect	No refraction or transmission would take place if the surface does not allow any light to pass through it.

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Item Position	Rationales	
18	Option B is correct	This circuit is not complete because the wires are both going to the negative battery terminal.
	Option A is incorrect	The circuit is complete and will function properly. Even though there is an open switch, the lightbulb will still light up because it has a complete path back to the battery.
	Option C is incorrect	This circuit is complete and will function properly because the switch is closed and the wires are all correctly connected.
	Option D is incorrect	The circuit is complete and will function properly because all the wires are connected correctly.

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Item Position	Rationales	
19	Option D is correct	The mass of the water plus salt will be 112 grams, which shows that the salt's mass is still 12 grams after being dissolved in the water.
	Option A is incorrect	Pouring the water mixture through a paper filter will not help separate the mixture, as the salt is dissolved.
	Option B is incorrect	Adding food coloring to the water will not help the salt be seen in the mixture.
	Option C is incorrect	Salt is not magnetic, so using a magnet will not help separate the mixture.

Item Position	Rationales	
20	Option A is correct	Both swimming prey and prey on the ocean floor can be captured with sharp teeth or flattened teeth, so this piece of evidence provides the least support for the claim.
	Option B is incorrect	The ability to see in all directions is advantageous for an animal swimming in open water, while the ability to see above the body is advantageous for an animal that buries itself in sand.
	Option C is incorrect	The hammerhead's smooth body allows it to move more easily through water, while a stingray's flat body allows it to bury itself shallowly in sand.
	Option D is incorrect	This adaptation in sharks is advantageous for open water, while lacking this adaptation is advantageous for stingrays that live on the ocean floor.

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Item Position	Rationales	
21	Option D is correct	The masses of the sugar and the lemon juice stayed the same.
	Option A is incorrect	The densities of the sugar and the lemon juice decreased when they were mixed with water because the same amount of material was spread throughout a larger volume.
	Option B is incorrect	The sugar was initially white and then became clear after it was mixed with the lemon juice and water.
	Option C is incorrect	The shapes of both the lemon juice and the sugar changed to match the shape of the container.

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Item Position	Rationales	
22	Option D is correct	Location 4 is in a closed circuit even when Switch K is open.
	Option A is incorrect	Location 1 is not in a closed circuit when Switch K is open, because it is not connected to the battery's positive terminal.
	Option B is incorrect	Location 2 is not in a closed circuit when Switch K is open, because it is not connected to the battery's positive terminal.
	Option C is incorrect	Location 3 is not in a closed circuit when Switch K is open, because it is not connected to the battery's positive terminal.

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Item Position	Rationales	
23	Option A is correct	For both the frog and the plant, a new living organism forms during Stage 1.
	Option B is incorrect	Much growth occurs during Stage 3.
	Option C is incorrect	The frog is not finished growing until Stage 5.
	Option D is incorrect	The plant grows additional parts, but the frog loses its tail by Stage 5.

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Item Position	Rationales	
24	Option B is correct	The bottom layer has aquatic animals, which is evidence that the environment was once covered in water.
	Option E is correct	The disappearance of animals occurs in Layer 2, which is before Layer 1.
	Option A is incorrect	There is no evidence that large trees grew in Layers 4 and 5.
	Option C is incorrect	The formation of Layer 5 occurred before the formation of Layer 4.
	Option D is incorrect	Layer 1 has no aquatic plants.

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Item Position	Rationales	
25	Option C is correct	Water moving quickly over the land would weather and erode the land into a V-shaped canyon.
	Option A is incorrect	A glacier moving slowly would create a U-shaped valley.
	Option B is incorrect	Long-term flooding of rivers and lakes does not create V-shaped canyons. Over time, flooding over time causes erosion along riverbanks and can lead to landslides.
	Option D is incorrect	Continuous melting and freezing of glaciers does not create V-shaped canyons. Melting glaciers create lakes or run off into rivers and oceans.

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Item Position	Rationales	
26	Option A is correct	The crocodile is a living organism, and water is a nonliving component of the crocodile's environment.
	Option B is incorrect	The crocodile is a carnivore, so it eats meat. This is a relationship between living organisms.
	Option C is incorrect	The plover does not prey on the crocodile. As these are both animals, this is an example of a relationship between two living organisms.
	Option D is incorrect	This is a relationship between two living organisms.

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Item Position	Rationales	
27	Option D is correct	Adding glue to fill in the gaps would complete the model of cementation.
	Option A is incorrect	Adding food coloring would change the color of the materials but would not result in cementation of the sediments.
	Option B is incorrect	Adding a heat source would heat the materials but would not result in cementation of the sediments.
	Option C is incorrect	Shaking the container would distribute the materials but would not result in cementation of the sediments.

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Item Position	Rationales	
28	Option C is correct	To ensure valid results, the magnets should be placed at the same distance from the paper clips in each trial.
	Option A is incorrect	The students are testing the strength of the magnets. Using different objects would make the comparison invalid.
	Option B is incorrect	The paper clips should be placed the same distance away from the magnets each time to ensure valid results.
	Option D is incorrect	Plastic paper clips would not move toward the magnets.

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Item Position	Rationales	
29	Option D is correct	A volcanic eruption releasing a lava flow will lead to the formation of a new rock layer on the surface of the area.
	Option A is incorrect	A landslide is the mass movement of rock and debris; however, a landslide would not result in the formation of a new rock layer on the surface of the area. Also, living organisms can remain in the area where a landslide occurred.
	Option B is incorrect	A hurricane is a storm with torrential rain, high winds, and storm surges; however, a hurricane would not result in the formation of a new rock layer on the surface of the area.
	Option C is incorrect	An earthquake is the violent shaking of the ground that may cause great destruction; however, an earthquake would not result in the formation of a new rock layer on the surface of the area.

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Item Position	Rationales	
30	Option B is correct	Absorbing nutrients from the roots of other plants will tend to slow their growth, leaving more room for the parasitic plant to grow.
	Option A is incorrect	There is no indication that the interaction between the Texas paintbrush and other plants protects the Texas paintbrush from animals.
	Option C is incorrect	Absorbing nutrients and water from nearby plants is unlikely to change the growing season of this plant. Also, the photo shows other plants in bloom with and next to the Texas paintbrush.
	Option D is incorrect	There is no indication that the interaction between the Texas paintbrush and other plants increases the Texas paintbrush's attractiveness to pollinators.

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Item Position	Rationales	
31	Option A is correct	Applying more force to one side versus the other would move the bookcase.
	Option B is incorrect	Applying more downward force would not move the bookcase.
	Option C is incorrect	Applying less force would not move the bookcase.
	Option D is incorrect	Applying equal force to all sides would cause the forces to be balanced, and the bookcase would not move.

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Item Position	Rationales	
32	Option B is correct	Position 2 models deposition, which is when sediment is dropped in a new location.
	Option A is incorrect	Position 2 does not model layers of sediment being pressed together. That is position 3.
	Option C is incorrect	Position 2 does not model rocks being carried to a new location. That is Position 1.
	Option D is incorrect	Position 2 does not model cementation. That is Position 4.