NJSLA–S Online Practice Test Answer and Alignment Document
Science: Grade 5 – Unit 3

Items 1–3

Domain: Physical Science
Phenomenon: Butter melts even though it is not directly heated.

Item 1

Item Type: Multiple Choice
Standards Alignment: DCI: PS3.A; SEP: AID; CCC: C and E
Key: B
Rationale:
Answer B is valid because if the cup of water is left on the counter for two hours, then the temperature will return to room temperature, which is 22°C.
Answer A is invalid because this temperature is too low.
Answer C is invalid because this temperature is too high.
Answer D is invalid because this temperature is too high.

Item 2

Item Type: Technology Enhanced
Standards Alignment: DCI: PS3.A; SEP: EAE; CCC: C and E
SR/AT/Paper Key: Box X: A; Box Y: C; Box Z: B
Key: A correct response will look like this:

The butter would most likely melt [faster] than [both trials] because [more] heat energy would be transferred.

Rationale:
If the water temperature was 100°C, the butter would melt faster than both Trial 1 (55°C) or Trial 2 (80°C) because the temperature of the water is higher and more heat energy, not less, would be transferred from the water to the cup to the bowl of the spoon.

Item 3

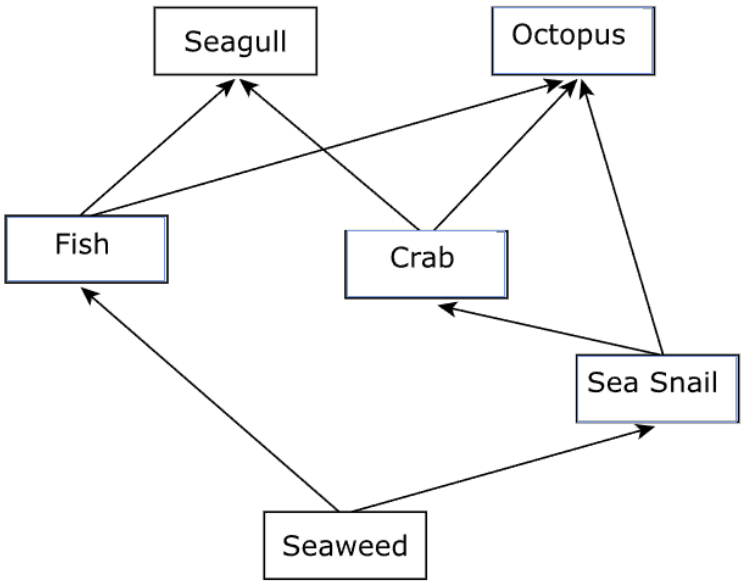
Item Type: Multiple Choice
Standards Alignment: DCI: PS3.A; SEP: AQDP; CCC: C and E
Key: A
Rationale:
Answer A is valid because Table 1 shows the temperature of the water has been changed in both Trial 1 and Trial 2; therefore, that is the question that was being investigated. Higher temperature causes the butter to melt quicker, which shows more heat energy is transferred.
Answer B is invalid because the same amount of butter was melted in both Trial 1 and Trial 2.
Answer C is invalid because the amount of time is dependent upon the temperature of water. The investigation is about the water melting the butter and the time is just an indicator of the amount of heat transferred.
Answer D is invalid because the size of the spoon did not change in either Trial 1 or Trial 2.

Items 4–6

Domain: Life Science
Phenomenon: The overall health of an ecosystem is dependent on interactions between organisms.

Item 4

Item Type: Technology Enhanced
Standards Alignment: DCI: LS2.A; SEP: DUM; CCC: E&M
SR/AT/Paper Key: Box W: C; Box X: B; Box Y: A; Box Z: D
Key: A correct response will look like this:



Rationale:
According to Table 1, Fish eat Seaweed and are eaten by Seagulls; Sea Snails eat Seaweed and are eaten by Crabs, which in turn are eaten by Octopuses.

Item 5

Item Type: Multiple Choice
Standards Alignment: DCI: LS2.A; SEP: AQDP; CCC: C and E
Key: D
Rationale:
Answer A is invalid because knowing the temperature range would not determine if the ecosystem was healthy. Different healthy ecosystems have different temperature ranges.
Answer B is invalid because knowing whether organisms live in freshwater or salt water would not determine if the ecosystem was healthy. Healthy ecosystems can be in freshwater and salt water.
Answer C is invalid because knowing how much precipitation the ecosystem receives each year would not determine whether it was healthy. Different healthy ecosystems receive different amounts of precipitation.
Answer D is valid because the way to determine the health of an ecosystem is to look at its biodiversity, whether there are a lot of different types of plant and animal species.

Item 6

Item Type: Technology Enhanced
Standards Alignment: DCI: LS2.A; SEP: OECI; CCC: C and E
SR/AT/Paper Key: Box X: B; Box Y: B; Box Z: A
Key: A correct response will look like this:

If the snail population rapidly decreases, both [octopus and crab] populations would decrease and the [seaweed] population would [increase].

Rationale:
If the snail population decreases, then the octopuses and crabs will also decrease because snails are eaten by both. Since there will be fewer snails to eat seaweed, the seaweed population would increase.

Items 7–9

Domain: Physical Science
Phenomenon: Three tokens may look the same, but when inserted into the same arcade game, only one of the tokens works.

Item 7

Item Type: Technology Enhanced
Standards Alignment: DCI: PS1.A; SEP: PACI; CCC: SF
Key: B, C
Rationale:
Answer B is valid because to determine if the token is magnetic or not, a magnet is needed.
Answer C is valid because to determine the mass of the tokens, a balance is needed.
Answer A is invalid because to determine the mass of a token or whether the token is magnetic, a beaker would not be helpful.
Answer D is invalid because to determine the mass of the token or whether it is magnetic, a test tube would not be helpful.
Answer E is invalid because to determine the mass of the token or whether it is magnetic, a microscope would not be helpful.

Item 8

Item Type: Technology Enhanced
Standards Alignment: DCI: PS1.A; SEP: OECI; CCC: PAT
SR/AT/Paper Key: Box X: C; Box Y: B; Box Z: A
Key: A correct response will look like this:

Table 2. Properties of Three Tokens

Token	Metal	Mass (grams)	Magnetic
1	Copper	9	No
2	Nickel	9	Yes
3	Zinc	7	No

Rationale:
Token 1, according to Table 1, is gold and not magnetic. Copper is gold and is not magnetic. Therefore, Token 1 is copper.
Token 2, according to Table 1, is silver and magnetic. Nickel is silver and magnetic. Therefore, Token 2 is nickel.
Token 3, according to Table 1, is silver and not magnetic. Zinc is silver and is not magnetic. Therefore, Token 3 is zinc.

Item 9

Item Type: Multiple Choice
Standards Alignment: DCI: PS1.A; SEP: CEDS; CCC: C and E
Key: A
Rationale:
Answer A is valid because according to Table 1, only Token 2 was accepted by the claw arcade game and that is the only token that is magnetic.
Answer B is invalid because according to Table 1, both Token 1 and Token 3 are non-magnetic. Therefore, the claw game must have been designed to accept magnetic tokens since they were both rejected by the claw arcade game.
Answer C is invalid because according to Figure 1, Token 3 is silver, so it would be accepted if that was how the claw arcade game was designed.
Answer D is invalid because according to Table 1, Token 1 has a mass of 9 grams, so it would be accepted if that was how the claw arcade game was designed.

Items 10–13

Domain: Life Science

Phenomenon: Knowing the life cycle of brood cicadas helps people know if and when their New Jersey town will be overrun by them.

Item 10

Item Type: Technology Enhanced

Standards Alignment: DCI: LS1.B; SEP: DUM; CCC: PAT

Key: B, E

Rationale:

Answer B is valid because the life cycle of the cricket does not contain a pupal stage, so it is least similar to that of a cicada.

Answer E is valid because the life cycle of the dragonfly does not contain a pupal stage, so it is least similar to that of a cicada.

Answer A is invalid because the life cycles of the ladybug and the cicada both have a larval and a pupal stage, so they are similar.

Answer C is invalid because the life cycles of the mosquito and the cicada both have a larval and a pupal stage, so they are similar.

Answer D is invalid because the life cycles of the butterfly and the cicada both have a larval and a pupal stage, so they are similar.

Item 11

Item Type: Technology Enhanced

Standards Alignment: DCI: LS1.B; SEP: EAE; CCC: PAT

SR/AT/Paper Key: Claim 1: B; Claim 2: A; Claim 3: B; Claim 4: A

Key: A correct response will look like this:

Claim	Supported	Not Supported
Nymphs molt underground.	○	◉
A cicada has a nymph stage before it reaches the adult stage.	◉	○
Reproduction takes place in both the nymph stage and the adult stage.	○	◉
Molting must take place in order for the cicada to reach the adult stage.	◉	○

Rationale:

Figure 1 shows and Table 1 describes that in Step 5, nymphs molt aboveground.

Figure 1 shows and Table 1 describes that in Step 2 and Step 3, cicadas have a nymph stage before becoming an adult.

Figure 1 shows that only adults reproduce.

Figure 1 shows and Table 1 describes that in Step 5, cicadas shed their skin before becoming an adult.

Item 12

Item Type: Technology Enhanced
Standards Alignment: DCI: LS1.B; SEP: UMCT; CCC: PAT
SR/AT/Paper Key: Box Y: B; Box Z: A
Key: A correct response will look like this:

After 2064, the next appearance of Brood II cicadas will likely be in 2081 . After 2072, the next appearance of Brood X cicadas will likely be in 2089 .

Rationale:
The pattern in Figure 2 shows that cicadas appear every 8, then after that every 9 years. Since from 2064 to 2072 is 8 years, then 9 years should be added to 2072, which is 2081, and then 8 years should be added to 2081, which is 2089.

Item 13

Item Type: Multiple Choice
Standards Alignment: DCI: LS2.A; SEP: PACI; CCC: C and E
Key: A
Rationale:
Answer A is valid because lizards eat cicadas, so if the cicada nymphs died, then the lizard population would decrease due to losing their food source.
Answer B is invalid because the snake population would decrease, not increase, because their food source of lizards would decrease.
Answer C is invalid because the plant population would increase because cicadas would decrease and not be eating the plants.
Answer D is invalid because there would be an impact since lizards would not change their diet and start eating plants.

Items 14–18

Domain: Earth and Space Science
Phenomenon: Composting is nature's way of recycling.

Item 14

Item Type: Multiple Choice
Standards Alignment: DCI: ESS3.C; SEP: AQDP; CCC: C and E
Key: D
Rationale:
Answer D is valid because the town planners would love to have more residents recycle, so knowing how to encourage residents to stop putting recyclable waste in the trash would be helpful.
Answer A is invalid because knowing why some materials are recyclable and why some are not would not help town planners reduce the amount of recyclable solid waste.
Answer B is invalid because knowing if more landfills are needed would not help town planners reduce the amount of recyclable solid waste.
Answer C is invalid because knowing why it takes so long to break down some materials would not help town planners reduce the amount of recyclable solid waste.

Item 15

Item Type: Technology Enhanced
Standards Alignment: DCI: ESS3.C; SEP: EAE; CCC: S,P, and Q
SR/AT/Paper Key: Claim 1: B; Claim 2: A; Claim 3: B

Key: A correct response will look like this:

Claim	Supported	Not Supported
More solid waste is recycled in New Jersey than ends up in landfills.	○	●
A glass jar should always be recycled because it takes the longest to break down.	●	○
A plastic container would take less time than a metal container to break down in the landfill.	○	●

Rationale:
There are no data to support the fact that more solid waste is recycled than ends up in landfills in New Jersey.
Glass bottles take the longest time (possibly millions of years) to break down.
A plastic container takes more time, not less time (450 years) to break down than a metal container (50–200 years).

Item 16

Item Type: Technology Enhanced
Standards Alignment: DCI: LS2.A; SEP: DUM; CCC: SF
SR/AT/Paper Key: Box Y: A; Box Z: C
Key: A correct response will look like this:

Decomposers [break down] food and yard waste to produce compost. To complete the process, decomposers require [both air and water].

Rationale:
Figure 3 shows that decomposers are acting on the compost pile model, so they are breaking down food and waste, not adding nutrients. The model also shows that both air and water are being added to the compost pile.

Item 17

Item Type: Constructed Response
Standards Alignment: DCI: ESS3.C; SEP: OECI; CCC: C and E
Sample Student Response: (3pts)
Composting is a good way to dispose of scraps of food and yard waste that can take months to break down in landfills. Compost is good for the soil because it is high in soil and plant nutrients.
Landfills have so much waste packed together that it does not allow in enough air for composting to happen effectively.

Rationale:
2 points for describing two positive environmental effects of composting and the use of compost in New Jersey.
1 point for providing a reason the composting process does not happen as efficiently in landfills.
Students can give other reasons as long as they are able to justify those reasons with information from the data.

Item 18

Item Type: Technology Enhanced
Standards Alignment: DCI: ESS3.C; SEP: PACI; CCC: SF
SR/AT/Paper Key: Feature 1: A; Feature 2: B; Feature 3: B
Key: A correct response will look like this:

Design Feature	Composter 1	Composter 2
Preserves more heat	◉	○
Exposes yard waste to more air and water	○	◉
Holds the greatest amount of food scraps and yard waste	○	◉

Rationale:
Since Composter 1 only contains a few holes, the heat would be better preserved inside the container rather than being open to the air like in Composter 2.
Since Composter 2 is open, more air and water will get to its contents.
Composter 2 is much larger than Composter 1, so it will hold more food scraps and yard waste.