

## NJSLA-S Practice Test Answer and Alignment Document

### Science: Grade 5 – Unit 1

#### Items 1-2

**Domain:** Physical Science

**Phenomenon:** An electric current can produce motion.

#### Item 1

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: PS3.B; SEP: CEDS; CCC: E&M

**Screen Reader (SR)/Assistive Technology (AT)/Paper Key:** D

**Key:** A correct response will look like this:

	Battery	Wire Coil	Magnet
Supplies electric current	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carries electric current	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Causes the coil to spin	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

#### Rationale:

The battery produces electrical energy.

The wire coil transmits the electric current.

The magnet causes the wire coil to spin and converts electrical energy to motion energy.

#### Item 2

**Item Type:** Multiple Choice

**Standards alignment:** DCI: PS3.B; SEP: CEDS; CCC: E&M

**Key:** B

#### Rationale:

A toy car converts electrical energy to motion energy, while the three other foils all convert electrical energy into either sound or light energy.

## Items 3–4

**Domain:** Physical Science

**Phenomenon:** Two of the same type of ball are thrown at a wall, but one ball bounces back farther away from the wall than the other.

### Item 3

**Item Type:** Multiple Choice

**Standards alignment:** DCI: PS3.A; SEP: CEDS; CCC: E&M

**Key:** A

**Rationale:**

More energy will cause the ball to bounce farther away from the wall, which would cause the ball to land closer closer to Student 1, as shown in the figure.

Answer B is invalid based on the diagram.

Answers C and D are invalid based on the diagram; both students hit the ball against the wall at the same height.

### Item 4

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: PS3.A; SEP: EAE; CCC: E&M

**SR/AT/Paper Key:** Box Y: B; Box Z: B

**Key:** A correct response will look like this:

When the soccer ball hits the wall,  of the soccer

ball's energy is transferred to the air in the form of

▾

**Rationale:**

Only some of the ball's energy is transferred to the air as sound. Light is not produced at all. If all of the energy were transferred, the ball would not have enough energy to bounce back away from the wall; and if none were transferred, a sound would not be produced.

## Items 5–6

**Domain:** Earth and Space Science

**Phenomenon:** A student on the way to school in January observes that some icy roads had been treated with sand and others with salt.

### Item 5

**Item Type:** Multiple Choice

**Standards alignment:** DCI: ESS3.B; SEP: EAE; CCC: C and E

**Key:** D

**Rationale:**

The table shows that tires skid less because sand helps the tires grip the road, and sand is also less expensive than salt. The table also states that sand does not melt ice and has some environmental impacts, making answers A, B, and C invalid.

### Item 6

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: ESS3.B; SEP: CEDS; CCC: C and E

**SR/AT/Paper Key:** B; A; B

**Key:** A correct response will look like this:

Snow-covered roads with air temperature of 0°F	Icy roads with air temperature of 20°F	Icy roads with air temperature of 5°F
<b>Sand</b>	<b>Salt</b>	<b>Sand</b>

**Rationale:**

The table shows:

Snow-covered roads: Sand helps the tires grip the road and salt does not help melt snow-covered roads when the air temperature is below 10°F.

Icy roads with air temperature of 20°F: Salt works when the temperature is above 10°F.

Icy roads with air temperature of 5°F: Sand would be better, since the temperature is below 10°F, and salt only works when the temperature is above 10°F. Sand helps the tires grip the road.

## Item 7–9

**Domain:** Earth and Space Science

**Phenomenon:** At night, a street light appears bigger and brighter than other street lights on the same street, just like some stars in the sky.

### Item 7

**Item Type:** Multiple Choice

**Standards alignment:** DCI: ESS1.A; SEP: AID; CCC: S, P, and Q

**Key:** B

**Rationale:**

Table 1 shows street light X is closest to the student (1 km), and it appears the brightest (medium). Answer A is the opposite, therefore invalid.

Table 2 shows similar information as Table 1 for the relative distance and brightness of stars. The farther away the star is, the less bright it appears. Answers C and D are opposite of the information in the table, and therefore invalid.

### Item 8

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: ESS1.A; SEP: AID; CCC: S,P, and Q

**SR/AT/Paper Key:** Box Y: C; Box Z: B

**Key:** A correct response will look like this:

Based on Tables 1 and 2, street light Z has the

same brightness as Arcturus. If the student moves away from Arcturus, the brightness of this star would appear to

decrease. ▼

**Rationale:**

Tables 1 and 2 show street light Z's brightness is “very low,” which is the same level of brightness as Arcturus. The farther away the star, the less bright it appears. The Sun is the closest star and its brightness is very high.

### Item 9

**Item Type:** Multiple Choice

**Standards alignment:** DCI: ESS1.A; SEP: EAE; CCC: S,P, and Q

**Key:** B

**Rationale:**

Table 2 shows that the Sun appears larger because it is the closest star to Earth and it is the brightest.

## Items 10–12

**Domain:** Earth and Space Science

**Phenomenon:** Earthquakes can strike anywhere on Earth, but they occur more frequently in certain areas.

### Item 10

**Item Type:** Multiple Choice

**Standards alignment:** DCI: ESS2.B; SEP: AID; CCC: PAT

**Key:** A

**Rationale:**

The West Coast consists mainly of yellow and orange areas, which, according to the earthquake risk scale, represent the highest risk for earthquakes. The East Coast, Northeast, and South all contain mostly light or dark green areas, with some yellow in the South. According to the risk scale, these colors represent a lower risk than the orange color of the West Coast.

### Item 11

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: ESS2.B; SEP: AID; CCC: PAT

**SR/AT/Paper Key:** B

**Key:** A correct response will look like this:

#### Earthquake Risk in the United States

Highest  ↓  Lowest	Southern portion of the West Coast
	Northern Alaska
	Northern New Jersey
	Southern New Jersey
	Northern Central United States

**Rationale:**

According to the earthquake risk scale, the southern portion of the West Coast has the highest risk for earthquakes, because the colors are mostly orange and yellow. The northern coast of Alaska is next, as the colors are mostly yellow and dark green. Northern NJ is next because the color is dark green. Southern NJ is next because the color is light green. The upper Midwest is last because that area is light blue.

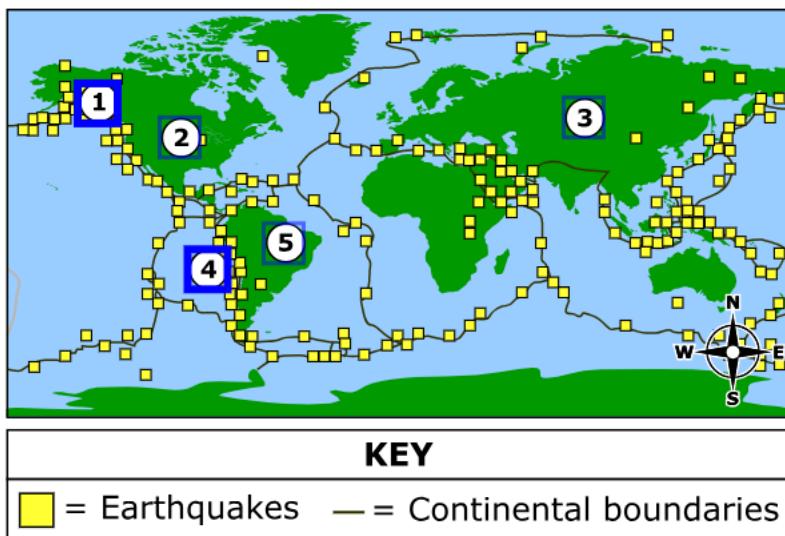
## Item 12

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: ESS2.B; SEP: AID; CCC: PAT

**SR/AT/Paper Key:** A and D

**Key:** 1 and 4. A correct response will look like this:



**Figure 2. Map of Major Earthquakes since 1900**

### Rationale:

Locations 1 and 4 show areas where earthquakes most likely will occur. As shown on the map, both areas have experienced numerous major earthquakes since 1900. Also, locations 1 and 4 are along continental boundaries where two tectonic plates are colliding, making earthquakes occur. Locations 2, 3, and 5 are not located on or directly next to a continental plate boundary, and do not fit either of these descriptions.

## Items 13–17

**Domain:** Life Science

**Phenomenon:** Scientists observe that some male deer in a habitat have large antlers while others have small antlers.

### Item 13

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: LS3.A; SEP: AID; CCC: SC

**Key:** D and E

**Rationale:**

Table 1 shows that deer of all ages that eat more food and have a more varied diet, have heavier antlers (age 2: 425 grams vs. 250 grams; age 3: 700 grams vs. 600 grams; and age 4: 700 grams vs. 200 grams), and weigh more (age 2: 64 kilograms vs. 54 kilograms; age 3: 79 kilograms vs. 68 kilograms and age 4: 77 kilograms vs. 54 kilograms) than deer that eat less food and have a less-varied diet. Therefore, answers A, B, and C are invalid.

### Item 14

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: LS3.A; SEP: UMCT; CCC: S, P, and Q

**SR/AT/Paper Key:** C

**Key:** A correct response will look like this:

Age (years)	Difference in Antler Mass, Forest A and Forest B (grams)
3	100
4	500

**Rationale:**

Table 1 shows that deer at age 3 in Forest A have an antler mass of 700 grams and in Forest B have an antler mass of 600 grams; therefore, the difference is 100 grams. At age 4, in Forest A, deer have an antler mass of 700 grams, and in Forest B they have an antler mass of 200 grams; therefore, the difference is 500 grams.

## Item 15

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: LS3.A; SEP: AID; CCC: SC

**SR/AT/Paper Key:** Box Y: D; Box Z: B

**Key:** A correct response will look like this:

Deer with large-antlered fathers have antlers that weigh more than deer with small-antlered fathers at all ages ▼. At 4 years old, deer with large-antlered fathers have antlers that are heavier than ▼ the antlers of deer with small-antlered fathers.

### Rationale:

Table 2 shows that deer at all ages that have large-antlered fathers have antlers that weigh more than the antlers of deer that have small-antlered fathers (age 2: 625 grams vs. 400 grams; age 3: 1,150 grams vs. 600 grams; age 4: 1,300 grams vs. 650 grams).

## Item 16

**Item Type:** Constructed Response

**Standards alignment:** DCI: LS3.A; SEP: EAE; CCC: PAT

**Sample student response:**

Based on table 1, I can make a claim about how diet affects the size of a deer's antlers. Diet does affect the size of a deer's antlers. In table 1, Forest A, where plenty of food is provided, the deer's antlers weighed more. In Forest B, where less food was provided, the deer's antlers weighed less. This shows how the diet of a deer can affect the size and weight of their antlers.

By examining table 2, I can make a claim that the age of an offspring deer does affect the size of its antlers. I know that the age of the offspring can affect the size of its antlers because in table 2, when the deer was two, their antlers size was less than when they were three. When they were three, the antler size was less than when they were four. This explains to me that the age of an offspring deer does affect the size of their antlers.

**Key:** (4pts)

- 1 point for making a valid claim about whether diet affects the size of a deer's antlers.
- 1 point for supporting the claim using data from Table 1.
- 1 point for making a valid claim about whether the age of the offspring deer affects the size of its antlers.
- 1 point for supporting the claim using data from Table 2.

### Rationale:

The student claims that diet affects antler size and supports the claim using data from Table 1. Table 1 shows that in Forest A, where plenty of food is available, the average mass of antlers in years 2, 3, and 4 is greater than the average mass of antlers in Forest B, where less food is available.

The student makes a second claim that the age of the offspring affects the size of its antlers and supports the claim using Table 2. Table 2 shows that the average mass of the offspring's antlers increases each year as the deer mature.

### Item 17

**Item Type:** Technology Enhanced

**Standards alignment:** DCI: LS1.C ; SEP: CEDS; CCC: S&SM

**SR/AT/Paper Key:** Box Y: B; Box Z: B

**Key:** A correct response will look like this:

If the variety and amount of food in Forest A decreases, the mass of the deer

should  and the mass of the antlers should

.

#### Rationale:

Table 1 shows that deer of all ages living in Forest A have more food, have a more varied diet, have greater body mass, and greater antler mass than deer that live in Forest B. If the variety and amount of food that the deer that live in Forest A had access to decreased, it would likely cause the deer to have lower body masses and the mass of their antlers would decrease.