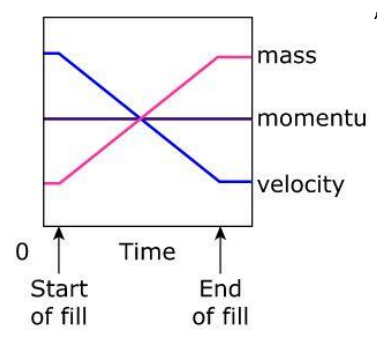


NJSLA-S Online Practice Test Answer and Alignment Document
Science: Grade 11

Unit 1		
Item: 1		
Domain: Life Science		
Phenomenon: Higher concentrations of atmospheric carbon dioxide have led to increased biomass of many species, while biomass of coral reefs has decreased across the Great Barrier Reef in the hydrosphere.		
Item Number	Answer	Standards Alignment
1	Item Type: Multiple Choice (MC) "A. Ocean acidity is increasing because atmospheric carbon dioxide and absorption in the hydrosphere are increasing."	DCI: LS2.B SEP: CEDS CCC: SC
Items: 2–4		
Domain: Life Science		
Phenomenon: Peppered moths, <i>Biston betularia</i> , exhibit light- and dark-color variations. Over the years 1950–2000, changes to the trees inhabited by a population of peppered moths were observed.		
Item Number	Answer	Standards Alignment
2	Item Type: MC "D. Light-colored moths became more common than dark-colored moths when tree color changed from mostly dark to mostly light."	DCI: LS4.C SEP: EAE CCC: PAT
3	Item Type: Technology Enhanced (TE) Natural selection acted on variation in the original population and favored the <input type="text" value="dark-colored"/> moths when the environment was darker, making them more <input type="text" value="successful"/> than the light-colored moths. When the environment changed, natural selection favored the <input type="text" value="light-colored"/> moths, so their numbers increased and they became more <input type="text" value="successful"/> than the <input type="text" value="dark-colored"/> moths.	DCI: LS4.B SEP: CEDS CCC: C and E
4	Item Type: TE Enter your answer in the space provided. <input type="text" value="1960"/>	DCI: LS2.C SEP: UMCT CCC: S,P, and Q

Items: 5–6		
Domain: Earth and Space Science		
Phenomenon: There are over one million more solar power installations than fossil fuel plants in America. However, fossil fuels generate the most electricity, and solar power contributes the least.		
Item Number	Answer	Standards Alignment
5	Item Type: MC “D. Yes, using wind power produces a lower GHG emission intensity than using fossil fuels.”	DCI: ETS1.B SEP: OECI CCC: S, P, and Q
6	Item Type: TE Click and drag the energy sources to arrange them from the greatest (top) to the least (bottom) amount of electricity produced per facility. <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px; text-align: center;">nuclear energy</div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px; text-align: center;">fossil fuels</div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px; text-align: center;">hydropower</div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px; text-align: center;">wind power</div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px; text-align: center;">solar power</div>	DCI: ETS1.B SEP: UMCT CCC: S, P, and Q

Items: 7–9		
Domain: Physical Science		
Phenomenon: As a railcar (Car 1) moves through the Oak Island Yard in Newark, New Jersey, it collides with a stationary railcar (Car 2), changing the velocity of both cars, as shown in Figure 1.		
Item Number	Answer	Standards Alignment
7	Item Type: MC “A. 0”	DCI: PS2.A SEP: UMCT CCC: S & SM
8	Item Type: MC “C.” 	DCI: PS2.A SEP: DUM CCC: C and E

9	<p>Item Type: TE</p> <p><input type="checkbox"/> A. heat</p> <p><input type="checkbox"/> B. sound</p> <p><input checked="" type="checkbox"/> C. wind resistance</p> <p><input checked="" type="checkbox"/> D. friction between the railcar and the rails</p> <p><input type="checkbox"/> E. internal friction between parts of the railcar</p>	<p>DCI: PS2.A</p> <p>SEP: EAE</p> <p>CCC: S &SM</p>
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Item: 10

Domain: Earth and Space Science

Phenomenon: A object circling Earth will either fall toward Earth if it is too slow or escape Earth’s gravity and move into space if it is too fast. The International Space Station (ISS) must move at a specific velocity to stay in Earth’s orbit.

Item Number	Answer	Standards Alignment
10	<p>Item Type: MC</p> <p>“C. 380,000 m”</p>	<p>DCI: ESS1.B</p> <p>SEP: UMCT</p> <p>CCC: S &SM</p>

Items: 11–13

Domain: Life Science

Phenomenon: Even though bison generally require large, open areas with dense grass coverage to survive, they are sometimes observed living in small areas with sparse grass coverage.

Item Number	Answer	Standards Alignment
11	<p>Item Type: MC</p> <p>“A. 1 or 2”</p>	<p>DCI: LS2.A</p> <p>SEP: AID</p> <p>CCC: S, P, and Q</p>
12	<p>Item Type: TE</p> <p>Enter your answer in the space provided.</p> <p><input type="text" value="3960"/> kilograms</p>	<p>DCI: LS2.A</p> <p>SEP: UMCT</p> <p>CCC: S, P, and Q</p>
13	<p>Item Type: TE</p> <p>In Banff National Park, bison preference is based on <input type="text" value="average snow depth"/> . Higher carrying capacity <input type="text" value="is not"/> a factor in bison preference for the study areas.</p>	<p>DCI: LS2.A</p> <p>SEP: AID</p> <p>CCC: PAT</p>

Items: 14–15		
Domain: Earth and Space Science		
Phenomenon: Changes in the concentration of carbon dioxide in the atmosphere impacts global sea level.		
Item Number	Answer	Standards Alignment
14	Item Type: MC “D. What is causing the Greenland ice sheet mass to decrease?”	DCI: ESS2.A SEP: AQDP CCC: SC
15	Item Type: TE <input type="checkbox"/> A. As ice sheet mass increases, sea level rises. <input checked="" type="checkbox"/> B. As atmospheric carbon dioxide increases, sea level rises. <input type="checkbox"/> C. As sea level rises, atmospheric carbon dioxide decreases. <input type="checkbox"/> D. As atmospheric carbon dioxide decreases, ice sheet mass decreases. <input checked="" type="checkbox"/> E. As atmospheric carbon dioxide increases, ice sheet mass decreases. <input type="checkbox"/> F. As ice sheet mass decreases, atmospheric carbon dioxide decreases.	DCI: ESS2.A SEP: AID CCC: C and E
Items: 16–17		
Domain: Life Science		
Phenomenon: Streams surrounded by vegetation typically provide the best trout habitat. However, fewer brook trout are observed in a stream surrounded by high plant cover.		
Item Number	Answer	Standards Alignment
16	Item Type: MC “D. Farming decreases the probability of finding trout over the range of all temperatures recorded.”	DCI: LS4.C SEP: AID CCC: PAT
17	Item Type: TE Agricultural activity increases plant cover and <input type="text" value="decreases"/> the probability of trout occurring across a range of water temperatures. Agricultural activity also <input type="text" value="decreases"/> soil permeability, thus reducing habitat quality.	DCI: LS4.C SEP: EAE CCC: C and E
Items: 18–20		
Domain: Physical Science		

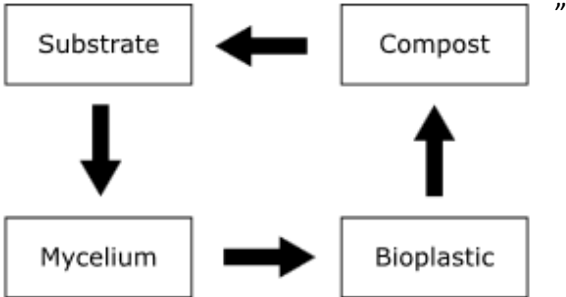
Phenomenon: A clear marble made of a type of absorbent polymer (a type of plastic) is easily visible when held, but seems to disappear when placed in a glass of water.

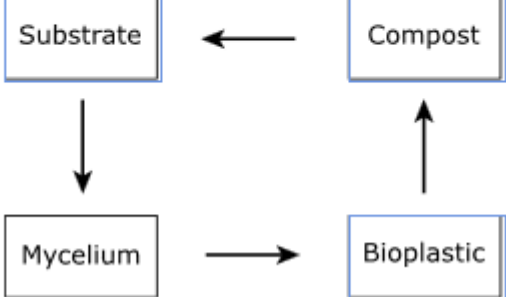
Item Number	Answer	Standards Alignment
18	Item Type: MC "B. 4.02×10^{-7} m"	DCI: PS4.A SEP: UMCT CCC: S &SM
19	Item Type: TE As the light passes from the air into the glass, the velocity of light <input type="text" value="decreases"/> . As the light passes from the glass to the water, the wavelength <input type="text" value="increases"/> . As the light passes from the water into the polymer marble, the velocity of light <input type="text" value="stays the same"/> .	DCI: PS4.A SEP: AID CCC: S &SM
20	Item Type: MC "B. The speed of light is the same in the polymer and water, but different in air."	DCI: PS4.A SEP: OECl CCC: C and E

Items: 21–24

Domain: Life Science

Phenomenon: A species of fungus (*Ganoderma lucidum*) can be used to create a biodegradable alternative to ordinary plastic. Threadlike structures of the fungus, called mycelium, can be grown using different carbohydrates, such as starch and cellulose, for food. When starch is used, the grown fibers are soft and break easily when pulled. When cellulose is used, the grown fibers are harder and do not break easily when pulled.

Item Number	Answer	Standards Alignment
21	Item Type: MC "D. Increased protein and nucleic acid content leads to greater strength of the bioplastic."	DCI: LS1.C SEP: EAE CCC: PAT
22	Item Type: MC "A.  "	DCI: LS2.B SEP: DUM CCC: S &SM

23	<p>Item Type: TE</p> <p>Increased <input type="text" value="protein and nucleic acid"/> content leads to <input type="text" value="greater strength"/> of the bioplastic.</p>	<p>DCI: LS1.C SEP: EAE CCC: PAT</p>
24	<p>Item Type: TE</p> <div style="border: 1px solid gray; background-color: #e0e0e0; padding: 5px; margin-bottom: 20px;">Nucleic Acid</div>  <pre> graph TD Compost --> Substrate Substrate --> Mycelium Mycelium --> Bioplastic Compost --> Bioplastic </pre>	<p>DCI: LS2.B SEP: DUM CCC: S & SM</p>

Items: 25–29

Domain: Physical Science

Phenomenon: A single hard disk drive can contain all the information from many libraries. When putting the information onto the disk, the disk does not change in size or composition.

Item Number	Answer	Standards Alignment
25	<p>Item Type: TE</p> <p><input checked="" type="checkbox"/> A. the sign of the current</p> <p><input type="checkbox"/> B. the size of the hard disk drive</p> <p><input type="checkbox"/> C. how fast the write head moves</p> <p><input checked="" type="checkbox"/> D. the different magnetic field directions</p> <p><input type="checkbox"/> E. how many previously written bits there are</p>	<p>DCI: PS4.C SEP: OECl CCC: SF</p>
26	<p>Item Type: TE</p> <p>Enter your response in the box provided.</p> <div style="border: 1px solid gray; padding: 2px; width: fit-content;">8,000,000</div>	<p>DCI: PS4.C SEP: UMCT CCC: S, P, and Q</p>

27	<p>Item Type: TE</p> <table border="1"> <thead> <tr> <th>Bit Number</th> <th>Current Meter = Positive</th> <th>Current Meter = Negative</th> </tr> </thead> <tbody> <tr> <td>Bit #1</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Bit #2</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> <tr> <td>Bit #3</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Bit #4</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> <tr> <td>Bit #5</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> <tr> <td>Bit #6</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Bit #7</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> <tr> <td>Bit #8</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> </tbody> </table>	Bit Number	Current Meter = Positive	Current Meter = Negative	Bit #1	<input checked="" type="radio"/>	<input type="radio"/>	Bit #2	<input type="radio"/>	<input checked="" type="radio"/>	Bit #3	<input checked="" type="radio"/>	<input type="radio"/>	Bit #4	<input type="radio"/>	<input checked="" type="radio"/>	Bit #5	<input type="radio"/>	<input checked="" type="radio"/>	Bit #6	<input checked="" type="radio"/>	<input type="radio"/>	Bit #7	<input type="radio"/>	<input checked="" type="radio"/>	Bit #8	<input checked="" type="radio"/>	<input type="radio"/>	DCI: PS4.A SEP: AID CCC: SF
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28	<p>Item Type: TE</p> <p>Enter your response in the box provided.</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">J</div>	DCI: PS4.C SEP: AID CCC: SF																											
29	<p>Item Type: CR</p> <p>To store information on a hard disk drive, conversion from current to magnetism is required.</p> <p>AND</p> <p>If “N” is chosen, the bit string is “01001110.” OR If “R” is chosen, the bit string is “01010010.”</p> <p>AND</p> <p>A positive sign of current produces a repulsive magnetic field to store a “0” bit. This results because “like” poles repel each other. OR A negative sign of current produces an attractive magnetic field to store a “1” bit. This results because “opposite” poles attract each other.</p> <p>Rubric: 4 points:</p> <p>(1 pt.) Student successfully makes a claim about how wave interactions store information on a hard disk drive. The student supports the claim using evidence from Figure 1.</p> <p>AND</p> <p>(1 pt.) Student successfully makes a claim about the sequence of the magnetic interactions between the write head and the magnetic grains that are required to store the information. The student supports the claim using evidence from Figure 1 and Table 2.</p> <p>AND</p> <p>(2 pts.) Student successfully makes a claim about the type of magnetic interaction that is produced when a positive current is applied to the write head, why it occurs, and the bit that results from this interaction. The student supports the claim using evidence from Figure 1.</p>	DCI: PS4.A SEP: CEDS CCC: SF																											

