

Missouri Science Scoring Rubric

Test: Biology

Item: 5

MLS Expectation: 9-12.LS1.B.1

Score	Description
3	<p>The response demonstrates a thorough understanding of constructing an explanation with evidence that DNA replication must occur before mitosis and cell division by discussing</p> <ul style="list-style-type: none">• the result at end of DNA replication• the result at end of mitosis• why replication must occur before mitosis <p><i>*The response is clear, complete, and correct.</i></p>
2	<p>This response demonstrates a thorough understanding of two of the three key elements.</p> <p><i>*The response may contain some work that is incomplete or unclear.</i></p>
1	<p>This response demonstrates a thorough understanding of one of the three key elements.</p> <p><i>*The response may contain some work that is incomplete or unclear.</i></p>
0	<p>The response provides insufficient evidence to demonstrate any understanding of the concept being tested.</p>

Exemplar Responses:

DNA replication results in a copy of the existing DNA. For example, in the image, there are single copies of 2 chromosomes before DNA replication. After DNA replication, there are 2 copies of each of the 2 chromosomes. Mitosis produces 2 nuclei that have identical copies of chromosomes. Before mitosis, the single nucleus has 2 copies of each of the 2 chromosomes. As mitosis occurs, each nuclei will receive 1 copy of each chromosome. Replication must occur before mitosis and cell division so that each new nucleus and each new daughter cell receive identical copies of a complete set of DNA.

Test: Biology

Item: 6, Part B

Score	Description
2	<p>The response demonstrates a thorough understanding of constructing an explanation to predict what will occur with the population by discussing</p> <ul style="list-style-type: none"> • population size staying near carrying capacity • fluctuation around carrying capacity <p><i>*The response is clear, complete, and correct.</i></p>
1	<p>This response demonstrates a thorough understanding of one of the two key elements.</p> <p><i>*The response may contain some work that is incomplete or unclear.</i></p>
0	<p>The response provides insufficient evidence to demonstrate any understanding of the concept being tested.</p>

Exemplar Responses:

Part B (2 points)

If precipitation and resources remain the same, the population of Species B should also remain approximately the same size. Species B should achieve carrying capacity for that environment and that set of available resources. The population of Species B may experience some slight changes, but will continue to hover around the value for carrying capacity.

Score	Description
2	<p>The response demonstrates a thorough understanding of constructing an explanation to reduce migrations by discussing</p> <ul style="list-style-type: none"> • two reasons why humans migrate after a natural disaster • two strategies for how humans can reduce migrations <p><i>*The response is clear, complete, and correct.</i></p>
1	<p>This response demonstrates a thorough understanding of one of the two key elements.</p> <p><i>*The response may contain some work that is incomplete or unclear.</i></p>
0	<p>The response provides insufficient evidence to demonstrate any understanding of the concept being tested.</p>

Exemplar Responses:

Part B (2 points)

Natural disasters can destroy a person's home and eliminate available food supplies. These types of conditions drive people away from their homes in search of safer places to live. Humans can create better building structures which are more resistant to destruction by storms. They can also create stock piles of food so enough is available after a storm.

Other possible reasons why people migrate:

- destruction of buildings and infrastructures such as transportation systems, electricity, water and/or sewage
- contamination of water supplies
- unsanitary conditions that lead to the spread of disease

Other possible strategies for mitigating migration:

- Humans can use historical data on storm patterns to predict high risk locations.
- Humans can make wise choices for urban planning, such as building structures away from earthquake faults and out of floodplains.
- Humans can also employ early warning systems, designate recovery areas that would be stocked with clean water and back-up generators.
- New building codes can be implemented.
- Collaboration across government and not for profit entities to expedite recovery efforts.

Score	Description
2	<p>The response demonstrates a thorough understanding of constructing an explanation to reduce migrations by discussing</p> <ul style="list-style-type: none"> • three reasons why carbon dioxide levels are rising • description of why carbon dioxide levels remain constant <p><i>*The response is clear, complete, and correct.</i></p>
1	<p>This response demonstrates a thorough understanding of one of the two key elements.</p> <p><i>*The response may contain some work that is incomplete or unclear.</i></p>
0	<p>The response provides insufficient evidence to demonstrate any understanding of the concept being tested.</p>

Exemplar Responses:

Carbon that was contained in Earth's systems is being released into the atmosphere. Carbon dioxide is released as organisms undergo respiration. As a product of fossil fuel burning, carbon dioxide is released into the air. Removing forests, eliminates a carbon sink and decreases the number of photosynthetic organisms.

Other ways of wording these ideas:

1. Breathing out CO₂ as a byproduct of respiration.
2. Combustion through burning of fossil fuels .
3. Burning down forests releases CO₂ in the process.
4. Deforestation makes it so there are less plants removing CO₂ from the atmosphere.

Test: Biology

Item: 27

MLS Expectation: 9-12.LS2.C.1

Score	Description
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3	<p>The response demonstrates a thorough understanding of constructing an explanation with evidence that explains reintroduction of wolves to Yellowstone National Park by discussing</p> <ul style="list-style-type: none"> ● a reason for why wolves were reintroduced ● a change that indicates success of the reintroduction ● a second change that indicates success of the reintroduction <p><i>*The response is clear, complete, and correct.</i></p>
2	<p>This response demonstrates a thorough understanding of two of the three key elements.</p> <p><i>*The response may contain some work that is incomplete or unclear.</i></p>
1	<p>This response demonstrates a thorough understanding of one of the three key elements.</p> <p><i>*The response may contain some work that is incomplete or unclear.</i></p>
0	<p>The response provides insufficient evidence to demonstrate any understanding of the concept being tested.</p>

Exemplar Responses:

This sample answer provides five specific pieces of evidence. Student responses only require two specific pieces of evidence for the 2 points attributed to this piece of the essay. The other point comes from addressing the purpose of the reintroduction.

The wolves were reintroduced to reduce the elk population and the damage they caused to the Park ecosystem.

The reintroduction of wolves caused

- an increased number of cottonwood and willow trees which improved the stability of riverbanks and resulted in less erosion of silt into the river
- an increase in the size of fish populations
- an increase in beaver populations
- an increase in songbird populations
- more beaver dams which create more small ponds for fish to lay eggs so that the wolf reintroduction could be considered successful.