This document contains the answer keys, rubrics, and Scoring Notes for items on the Biology Practice Test. Additional Practice Test resources are available in the LDOE Practice Test Library.

<table>
<thead>
<tr>
<th>Session</th>
<th>Set</th>
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<th>Item Type</th>
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</tr>
</thead>
</table>
| 1       | Alaskan Salmon | 1        | MC        | C   | 1           | PE: HS-LS1-6
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)
CCC: Energy and Matter |
| 1       | Alaskan Salmon | 2        | TEI       | See Rubric | 2           | PE: HS-LS1-4
SEP: 2. Developing and using models
DCI: HS.LS1B.c
CCC: Systems and System Models |
| 1       | Scales and Feathers | 3        | TEI       | See Rubric | 2           | PE: HS-LS1-6
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)
CCC: Energy and Matter |
| 1       | Tonewood Trees | 4        | MC        | C   | 1           | PE: HS-LS1-6
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)
DCI: HS.LS1C.b
CCC: Energy and Matter |
| 1       |             | 5        | MC        | C   | 1           | PE: HS-LS4-1
SEP: 8. Obtaining, evaluating, and communicating information
DCI: HS.LS4A.a
CCC: Patterns |
| 1       | Scales and Feathers | 6        | TPD: MC/MC | A/A | 2           | PE: HS-LS1-1
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)
DCI: HS.LS1A.a
CCC: Structure and Function |
| 1       |             | 7        | MC        | D   | 1           | PE: HS-LS4-1
DCI: HS.LS4A.a
CCC: Patterns |
| 1       |             | 8        | CR        | See Rubric | 2           | PE: HS-LS1-1
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)
DCI: HS.LS1A.a
CCC: Structure and Function |
| 1       |             | 9        | MC        | A   | 1           | PE: HS-LS1-7
SEP: 5. Using mathematics and computational thinking
DCI: HS.LS1C.c
CCC: Patterns |
| 1       |             | 10       | MC        | D   | 1           | PE: HS-LS2-4
SEP: 5. Using mathematics and computational thinking
DCI: HS.LS2B.b
CCC: Energy and Matter |
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</table>
| 1       | Tonewood Trees| 11       | TPD: TEI/ MS | TEI: See Rubric; MS: D, E | 2           | PE: HS-LS1-7  
SEP: 5. Using mathematics and computational thinking  
DCI: HS.LS1C.d  
CCC: Energy and Matter |
| 1       |              | 12       | CR        | See Rubric | 2           | PE: HS-LS2-4  
DCI: HS.LS2B.c  
CCC: Energy and Matter |
| 1       |              | 13       | MS        | A, D, E  | 1           | PE: HS-LS3-1  
SEP: 1. Asking questions (for science) and defining problems (for engineering)  
DCI: HS.LS3A.b |
| 1       | Standalone Items | 14   | TEI       | See Rubric | 2           | PE: HS-LS1-5  
SEP: 2. Developing and using models  
DCI: HS.LS1C.a  
CCC: Energy and Matter |
| 1       |              | 15       | TEI       | See Rubric | 1           | PE: HS-LS1-8  
SEP: 8. Obtaining, evaluating, and communicating information  
DCI: HS.LS1E.c  
CCC: Scale, Proportion and Quantity |
| 2       |              | 16       | MC        | B         | 1           | PE: HS-LS4-5  
SEP: 7. Engaging in argument from evidence  
DCI: HS.LS4C.c |
| 2       |              | 17       | TPD: MC/ MC | C/D     | 2           | PE: HS-LS4-4  
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)  
DCI: HS.LS4C.c  
CCC: Cause and Effect |
| 2       | Banded Snails | 18      | TEI       | See Rubric | 1           | PE: HS-LS4-5  
DCI: HS.LS4C.d  
CCC: Cause and Effect |
| 2       |              | 19       | TEI       | See Rubric | 2           | PE: HS-LS4-4  
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)  
DCI: HS.LS4C.a  
CCC: Cause and Effect |
| 2       |              | 20       | ER        | See Rubric | 9           | PE: HS-LS4-4  
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)  
DCI: HS.LS4C.a  
CCC: Cause and Effect |
| 2       | Standalone Items | 21   | TEI       | See Rubric | 2           | PE: HS-LS1-7  
SEP: 2. Developing and using models  
DCI: HS.LS1C.d  
CCC: Energy and Matter |
| 2       |              | 22       | MC        | C         | 1           | PE: HS-LS3-1  
SEP: 4. Analyzing and interpreting data  
DCI: HS.LS3A.b  
CCC: Scale, Proportion and Quantity |
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</table>
| 2       | Standalone Items | 23       | MS        | C, E, G | 1           | PE: HS-LS1-5  
DCI: HS.LS1C.a  
CCC: Energy and Matter |
| 3       | Kit Fox Ecology | 24       | MC        | B   | 1           | PE: HS-LS2-1  
SEP: 5. Using mathematics and computational thinking  
DCI: HS.LS2A.a  
CCC: Stability and Change |
SEP: 5. Using mathematics and computational thinking  
DCI: HS.LS2A.b  
CCC: Stability and Change |
| 3       | Kit Fox Ecology | 26       | MC        | C   | 1           | PE: HS-LS2-7  
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)  
DCI: HS.LS2C.b  
CCC: Stability and Change |
| 3       | Primate Traits | 27       | CR        | See Rubric | 2           | PE: HS-LS2-7  
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)  
DCI: HS.LS2C.b  
CCC: Stability and Change |
| 3       | Primate Traits | 28       | MS        | A, D, E | 1           | PE: HS-LS3-2  
DCI: HS.LS3B.b  
CCC: Cause and Effect |
| 3       | Primate Traits | 29       | TEI       | See Rubric | 2           | PE: HS-LS3-2  
DCI: HS.LS3B.b  
CCC: Cause and Effect |
| 3       | Primate Traits | 30       | MC        | C   | 1           | PE: HS-LS3-1  
SEP: 1. Asking questions (for science) and defining problems (for engineering)  
DCI: HS.LS3A.a |
| 3       | Primate Traits | 31       | TEI       | See Rubric | 2           | PE: HS-LS3-2  
SEP: 7. Engaging in argument from evidence  
DCI: HS.LS3A.a  
CCC: Cause and Effect |
| 3       | Standalone Items | 32       | TPD: MS/ MS | A, B, E/ A, F | 2           | PE: HS-LS1-3  
SEP: 3. Planning and carrying out investigations  
DCI: HS.LS1A.d  
CCC: Stability and Change |
| 3       | Standalone Items | 33       | TEI       | See Rubric | 2           | PE: HS-LS4-2  
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)  
DCI: HS.LS4B.a  
CCC: Cause and Effect |
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<th>Alignment</th>
</tr>
</thead>
</table>
| 3       |     | 34       | MS        | B, F | 1           | PE: HS-LS1-2  
SEP: 2. Developing and using models  
DCI: HS.LS1A.b  
CCC: Systems and System Models |
| 3       |     | 35       | MC        | A    | 1           | PE: HS-LS4-2  
SEP: 6. Constructing explanations (for science) and designing solutions (for engineering)  
DCI: HS.LS4B.a |
| 3       |     | 36       | MC        | B    | 1           | PE: HS-LS1-8  
SEP: 8. Obtaining, evaluating, and communicating information  
DCI: HS.LS1E.c |
| 3       |     | 37       | MS        | A, D, E | 1          | PE: HS-LS4-3  
SEP: 4. Analyzing and interpreting data  
DCI: HS.LS4C.a  
CCC: Patterns |
| 3       |     | 38       | TEI       | See Rubric | 2         | PE: HS-LS1-3  
SEP: 3. Planning and carrying out investigations  
DCI: HS.LS1A.d  
CCC: Stability and Change |
| 3       |     | 39       | TEI       | See Rubric | 1         | PE: HS-LS1-2  
SEP: 2. Developing and using models  
DCI: HS.LS1A.b  
CCC: Systems and System Models |
| 3       |     | 40       | TPD: MS/ MC | A, D/ B | 2         | PE: HS-LS2-6  
SEP: 7. Engaging in argument from evidence  
DCI: HS.LS2C.a  
CCC: Stability and Change |
| 3       |     | 41       | MC        | D    | 1           | PE: HS-LS4-3  
SEP: 4. Analyzing and interpreting data  
DCI: HS.LS4B.c |
Session 1 Item 2 (TEI)

Develop a model that can be used to explain the stages of growth and development that result in a salmon fry.

Drag each statement into the correct box to show the stages in order.

- Sperm fertilizes egg.
- Specialized tissues and organs are produced.
- Cells differentiate.
- Embryo changes from two to four cells.
- Genetic material is evenly divided.
Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 4 correct responses; therefore 1 point will be awarded if the student selects 2 or more correct responses.
Scoring for Session 1 Item 3 (TEI)

Chum salmon fry average 3.8 cm in length, compared to 3 cm for pink salmon fry and 10 cm for coho salmon fry.

Select the correct answer from each drop-down menu to complete the sentences about the relationship between a salmon’s size and matter intake.

Based on the information in Graph 3, chum salmon fry are likely to eat prey that is larger than \[\text{__________}\] prey eaten by the pink salmon fry and smaller than \[\text{__________}\] prey eaten by the coho salmon fry. This is because as a salmon’s size increases, its matter intake needs increase\[\text{__________}\].

Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.
Scoring for Session 1 Item 8 (CR)

Mammals did not descend directly from dinosaurs, but mammal embryos have placodes, as shown in Figure 3.

Use the information about scales and feathers to explain why mammal embryos and dinosaur embryos each have placodes. Identify the information that can be used as evidence to support your explanation, and then explain why this information can be used as evidence.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Student’s response correctly identifies the information that can be used as evidence to support the explanation and correctly explains how the evidence supports the explanation.</td>
</tr>
<tr>
<td>1</td>
<td>Student’s response identifies the information that can be used as evidence to support the explanation but does not correctly explain how the evidence supports the explanation.</td>
</tr>
<tr>
<td>0</td>
<td>Student’s response does not correctly identify the information that can be used as evidence to support the explanation or correctly explain how the evidence supports the explanation. OR Student’s response is blank, irrelevant, or too brief to evaluate.</td>
</tr>
</tbody>
</table>

Scoring Notes:
- Correct explanation (1 point)
- Correct evidence to support explanation (1 point)

Examples include:
- Theropods gave rise to other types of dinosaurs with feathers and scales. This evidence supports an explanation that they emerged from an ancestor with placodes capable of growing different body coverings. Since mammals have placodes as well, it is likely that both theropods and mammals emerged from a common ancestor that had placodes. Those placodes mutated in each species over time to produce fur in mammals, while allowing for different body coverings among the descendants of theropods (feathers and scales).

Accept other reasonable answers.
Scoring for Session 1 Item 11 (TEI)

Part A

The data for 1945 in Table 2 represent the typical relationship between environmental factors and the growth pattern for trees in the Dolomite mountain range.

Select the correct answer from each drop-down menu to complete the claim about which conditions are ideal for producing tonewood trees.

Tonewood trees are most likely to be produced as a result of higher-than-average ▼ temperatures and lower-than-average ▼ precipitation.
Scoring for Session 1 Item 12 (CR)

Scientists have noted a difference in the concentration of atmospheric gases available to Norway spruce trees at site 1 and site 2. Use Table 1 and Figure 2 to describe the difference in atmospheric gases at each site. Explain how the flow of matter and energy differs in these two locations as a result of the concentration difference. Use evidence from any of the tables or figures to support your answer.

**Scoring Information**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Student’s response correctly describes the difference in atmospheric gases and explains how the flow of matter and energy differs in these two locations as a result, using evidence to support the explanation.</td>
</tr>
<tr>
<td>1</td>
<td>Student’s response correctly describes the difference in atmospheric gases but does not explain how the flow of matter and energy differs in these two locations as a result or use evidence to support the explanation. OR Student’s response correctly explains how the flow of matter and energy differs in these two locations as a result of the difference in atmospheric gases, but does not correctly describe the difference in atmospheric gases or use evidence to support the explanation.</td>
</tr>
<tr>
<td>0</td>
<td>Student’s response does not correctly describe the difference in atmospheric gases or explain how the flow of matter and energy differs in these two locations as a result. OR Student’s response is blank, irrelevant, or too brief to evaluate.</td>
</tr>
</tbody>
</table>

**Scoring Notes:**

- Description of difference in atmospheric gases, with evidence (1 point)
- Explanation of flow of energy and matter with evidence (1 point)

**Examples include:**

- Table 1 shows that trees at site 2 grow faster and are at a lower elevation than trees at site 1. Faster growth means that the processes of photosynthesis and subsequent cellular respiration occur more quickly. Photosynthesis requires carbon dioxide, so trees at site 2 have a higher concentration of CO₂ than the trees at site 1. As a result of a higher concentration of CO₂, there is more energy and matter available to all other organisms in the food web at site 2 than at site 1.

Accept other reasonable answers.
Session 1 Item 14 (TEI)

Use the information and your knowledge of science to answer the question.

The model shows the process of photosynthesis.

\[
\text{energy} + 6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow 6\text{O}_2 + \text{C}_6\text{H}_{12}\text{O}_6
\]
Session 1 Item 14 (TEI), continued

Drag each phrase into the appropriate column of the table to show what this model of photosynthesis can and cannot be used to explain.

<table>
<thead>
<tr>
<th>Can Be Explained Using This Model of Photosynthesis</th>
<th>Cannot Be Explained Using This Model of Photosynthesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>how carbon dioxide is split</td>
<td>how oxygen gas is released from water molecules</td>
</tr>
<tr>
<td>how sugars are broken down to release energy</td>
<td>how energy is stored within carbohydrates</td>
</tr>
<tr>
<td>how glucose is built from smaller molecules</td>
<td>how the Sun’s energy is stored within carbon dioxide molecules</td>
</tr>
</tbody>
</table>

OK
### Scoring for Session 1 Item 14 (TEI)

<table>
<thead>
<tr>
<th>Can Be Explained Using This Model of Photosynthesis</th>
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<tr>
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<td>how oxygen gas is released from water molecules</td>
<td></td>
</tr>
<tr>
<td>how carbon dioxide is split</td>
<td></td>
</tr>
</tbody>
</table>

**Scoring Notes:**

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 6 correct responses; therefore 1 point will be awarded if the student selects 3 or more correct responses.
Scoring for Session 1 Item 15 (TEI)

Use the information and your knowledge of science to answer the question.

The characteristics of infectious diseases vary greatly. The table shows differences in the number of deaths caused each year by certain diseases, as well as the treatment and prevention of each disease.

**Information about Infectious Diseases**

<table>
<thead>
<tr>
<th>Infectious Disease</th>
<th>Number of Deaths Worldwide (millions)</th>
<th>Treatment</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>1.0</td>
<td>antiviral drugs</td>
<td>education; avoid contact with body fluids</td>
</tr>
<tr>
<td>tuberculosis</td>
<td>1.7</td>
<td>six-month course of antibiotics</td>
<td>wear face mask around people with untreated disease</td>
</tr>
<tr>
<td>influenza (flu)</td>
<td>0.65</td>
<td>bed rest, antiviral drugs</td>
<td>annual vaccine (varies in effectiveness)</td>
</tr>
<tr>
<td>measles</td>
<td>0.09</td>
<td>bed rest, fever reducers, vitamin A</td>
<td>childhood vaccination</td>
</tr>
</tbody>
</table>

Select the correct answer from each drop-down menu to complete the sentences.

One reason that the number of deaths due to measles is significantly lower than the number of deaths due to HIV/AIDS is the introduction of [vaccines].

The large number of cases of tuberculosis despite an effective treatment strategy suggests that complete control of an infectious disease depends on educating patients about [proper use of antibiotics].
Scoring for Session 2 Item 18 (TEI)

Select the correct answer from each drop-down menu to complete the sentence.

As the climate in northern regions changes, the population of snails with darker-colored shells will likely decrease because they have higher body temperatures than snails with lighter-colored shells.
Session 2 Item 19 (TEI)

Use Graph 1, Figure 1, and the information about banded snails to answer the question.

Drag the correct statement into each box to show an effect that each cause is likely to have on a snail population with a high degree of genetic diversity.

Not all statements will be used.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
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<tbody>
<tr>
<td>Regions begin experiencing cooler than average winter climates.</td>
<td></td>
</tr>
<tr>
<td>A new species of predator is able to detect darker colors better than song thrushes can.</td>
<td></td>
</tr>
<tr>
<td>Warmer temperatures cause wood environments to change into hedge environments.</td>
<td></td>
</tr>
</tbody>
</table>

- Dark-colored banded snails become more common than yellow-colored banded snails.
- Only snails with a lighter shell color and banding are able to survive in the new environment.
- Snails with a darker shell color are less likely to survive and reproduce to pass traits on to offspring.
- Snails of any color with the most banding survive better than snails with any color and no banding.
Scoring for Session 2 Item 19 (TEI)

Only snails with a lighter shell color and banding are able to survive in the new environment.

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<tr>
<td>Regions begin experiencing cooler than average winter climates.</td>
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<tr>
<td>A new species of predator is able to detect darker colors better than song thrushes can.</td>
<td>Snails with a darker shell color are less likely to survive and reproduce to pass traits on to offspring.</td>
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<tr>
<td>Warmer temperatures cause wood environments to change into hedge environments.</td>
<td>Snails of any color with the most banding survive better than snails with any color and no banding.</td>
</tr>
</tbody>
</table>

Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.
Scoring for Session 2 Item 20 (ER)

Extended Response
As you respond to Part A, Part B, and Part C, follow the directions below.

- Address all of the instructions in each prompt.
- Use the evidence from the information provided and your own knowledge of science to support your responses.

Part A
Based on the information in Graph 1, explain the relationships between shell color, presence of banding, and habitat. Use the evidence from the graph to support your answer.

Part B
The characteristics of two snail populations are shown.

- Population 1: high degree of genetic variation among snails living in a wood environment at higher elevations
- Population 2: all snails have the same traits specialized for a hedge environment that is found in warmer locations

Explain how each snail population will likely be affected if the trend shown in Graph 2 continues. Use evidence from Graph 1, Graph 2, and Figure 1 to support your explanation.

Part C
Describe the snail color that will offer the greatest selective advantage if the trends shown in Graph 2 continue. Use evidence from the information on banded snails to support your claim.
Session 2 Item 20 (ER), continued

Score Points
- The student’s score is the sum total of all the points earned across all parts (up to an item-maximum of 9 points) of the item.
- The student’s score is 0 if the response is blank, incorrect, or does not address the prompt.

PART A (0-3 points maximum)
- 1 point for explaining relationship between shell color, banding, and habitat for meadow environment shown in graph
- 1 point for explaining relationship between shell color, banding, and habitat for wood environment shown in graph
- 1 point for explaining relationship between shell color, banding, and habitat for hedge environment shown in graph

PART B (0-4 points maximum)
- 1 point for explanation of how Population 1 will be affected
- 1 point for explanation of how Population 2 will be affected
- 1 point for evidence to support the explanation of Population 1
- 1 point for evidence to support the explanation of Population 2

PART C (0-2 points maximum)
- 1 point for description of snail color with greatest selective advantage
- 1 point for using evidence to support the claim

Score information:
Part A: explaining relationship between shell color and habitat for each environment (1 point each)
- Snails with yellow coloring and a high to medium degree of banding do best in meadow environments (1 point)
- Snails with brown color and a medium degree of banding to no banding do best in wood environments (1 point)
- Snails that are yellow- or brown-colored with a higher degree of banding do best in hedge environments (1 point).
Session 2 Item 20 (ER), continued

Part B: explaining how Population 1 will be affected (1 point),
using evidence to support explanation (1 point),
explaining how Population 2 will be affected (1 point),
using evidence to support explanation (1 point)

- Population 1 will likely survive the climate change (warming) (1 point)
- Evidence to support: because they have a high degree of genetic diversity that increases the chances that some individuals will have traits suited to the new/changed/warmed environment. Being at higher elevations, shell colors are likely to become more yellow over time as those individuals have lower body temperatures when compared to darker-colored snails (1 point).
- Population 2 is at a greater risk of extinction (1 point)
- Evidence to support: because individuals are specialized for a particular environment that is already warm and will continue to warm, as the trend in Graph 2 indicates. Without genetic diversity, it is less likely that enough individuals will have traits that are favorable in the changed environment (1 point).

Part C: description of snail color (1 point),
evidence to support claim (1 point)

- Yellow snails will have a greater advantage in a warmer climate because they can keep their body temperatures cooler than darker-colored snails (1 point).
- Evidence: Figure 1 shows that snails are moving north and into higher elevations as the temperature warms, and that these snails have a selective advantage over darker snails (which likely get too warm) (1 point).
Use the information and your knowledge of science to answer the question.

Like all fruit, pears continue to undergo cellular respiration after they are harvested. As pears ripen, they begin respiration, and carbohydrates in the fruit are converted to other forms. If enough time goes by, the fruit may begin to rot. Growers want to keep the pears unripe for as long as possible, and ripen the fruit just before sending them to the supermarket. For this reason, growers have investigated storing pears under different conditions. The graph shows the results of one investigation.

![Graph showing the effect of varying oxygen concentrations on respiration rate of pears at three different temperatures.](source: Journal of Experimental Botany.)
Scoring for Session 2 Item 21 (TEI)

Select the correct answer from each drop-down menu to complete the sentences related to cellular respiration in pears.

For long-term storage of pears, the oxygen concentration should be 5% and the temperature should be 7°C. This will result in the least amount of energy being used by the pears.

Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.
Scoring for Session 3 Item 27 (CR)

Constructed Response

Scientists studying San Joaquin kit foxes have proposed the three strategies shown in an effort to increase the kit fox population.

- Strategy 1: Work with landowners to create artificial dens that prevent coyotes and bobcats from entering.
- Strategy 2: Place tracking devices on lizards and rodents to understand how the kit fox’s prey use the territory.
- Strategy 3: Restore a portion of agricultural land back to its original saltbush habitat.

Identify which strategy is likely to result in the greatest increase in the San Joaquin kit fox population. Explain why the strategy you identified is more likely than the other two strategies to lead to the greatest increase in the kit fox population. Use evidence from the information about kit foxes to support your explanation.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Student’s response correctly identifies which strategy is likely to result in the greatest increase in the kit fox population and explains why this strategy is more likely than the other two strategies to succeed, using evidence from the information about kit foxes to support the explanation.</td>
</tr>
<tr>
<td>1</td>
<td>Student’s response correctly describes which strategy is likely to result in the greatest increase in the population of kit foxes and explains why this strategy is more likely than the other two strategies to succeed, but does not correctly use evidence from the information about kit foxes to support the explanation.</td>
</tr>
<tr>
<td>0</td>
<td>Student’s response does not correctly describe which strategy is likely to result in the greatest increase in the kit fox population, or explain why the strategy is more likely than the other two strategies to succeed, or use evidence from information about kit foxes to support the explanation.</td>
</tr>
</tbody>
</table>
Session 3 Item 27 (CR), continued

Scoring Notes:

- Identification and explanation of strategy (1 point)
- Evidence to support the explanation (1 point)

NOTE: Identification of a strategy without an explanation is worth 0 points.

Examples include:

- Strategy 1 (working with landowners to create artificial dens for San Joaquin kit foxes) is more likely than the other two strategies to increase the kit fox population because artificial dens will allow kit foxes habitat in which to escape their main predators (shown in Table 1). This strategy also provides locations for kit foxes to raise their offspring in a protected area, so that more offspring are likely to survive and grow to adulthood.
- Strategy 2 will not be as successful as strategy 1 because strategy 2 will only provide information on prey animals of kit foxes, but will not provide direct information about any increases in the prey populations or kit fox populations over time, nor will this strategy make any changes that help to increase the kit fox population.
- Strategy 3 may provide additional habitats that were once part of California, but, as Table 1 shows, saltbush is not the main historic habitat for kit foxes—their main habitat is grassland. Increasing saltbush does not restore the kit foxes’ main habitat.

Accept other reasonable answers.
Session 3 Item 29 (TEI)

Drag each word or phrase into the correct box to identify whether or not each word or phrase represents a reason for the change in chimpanzee hands.

<table>
<thead>
<tr>
<th>A Reason for the Change in Chimpanzee Hands</th>
<th>Not a Reason for the Change in Chimpanzee Hands</th>
</tr>
</thead>
<tbody>
<tr>
<td>crossbreeding</td>
<td>differences in enhancer sequences</td>
</tr>
<tr>
<td>differences in the ways chimpanzees use their hands</td>
<td>sexual reproduction</td>
</tr>
<tr>
<td>mutations in chimpanzee DNA</td>
<td></td>
</tr>
</tbody>
</table>
**Biology Practice Test**  
**Answer Key**  

### Scoring for Session 3 Item 29 (TEI)

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 5 correct responses; therefore 1 point will be awarded if the student selects 3 or more correct responses.

<table>
<thead>
<tr>
<th>A Reason for the Change in Chimpanzee Hands</th>
<th>Not a Reason for the Change in Chimpanzee Hands</th>
</tr>
</thead>
<tbody>
<tr>
<td>mutations in chimpanzee DNA</td>
<td>crossbreeding</td>
</tr>
<tr>
<td>sexual reproduction</td>
<td>differences in the ways</td>
</tr>
<tr>
<td>differences in enhancer sequences</td>
<td>chimpanzees use their hands</td>
</tr>
</tbody>
</table>

**Scoring Notes:**

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 5 correct responses; therefore 1 point will be awarded if the student selects 3 or more correct responses.
Session 3 Item 31 (TEI)

Chimpanzees within a population have a range of different hand shapes and sizes, but all chimpanzees carry the mutant enhancer protein that causes their hands to differ from those of gorillas.

Select the correct answer from each drop-down menu to support a claim about how the mutant enhancer protein became common within the chimpanzee population.

Evidence suggests that chimpanzees and gorillas descended from a common ancestor that produced a normal enhancer protein. At one point, an individual chimpanzee developed a mutation in the DNA that affected hand shape. This trait was passed on to offspring over many generations, and those individuals with the trait were more successful than other individuals. This resulted in the mutant enhancer protein becoming common among all chimpanzees.

Scoring Notes:

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 4 correct responses; therefore 1 point will be awarded if the student selects 2 or more correct responses.
Session 3 Item 33 (TEI)

Use the information and your knowledge of science to answer the question.

Drag each statement into the correct box to identify the causes and effects of Huntington’s disease within a population.

Dutch settlers in South Africa carried the gene for Huntington’s disease.

People of Dutch ancestry in South Africa have an unusually high frequency of the allele that causes Huntington’s disease.

Only 766 male immigrants are the ancestors of 56 million South Africans.

Dutch settlers remained in small communities within South Africa.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Scoring for Session 3 Item 33 (TEI)**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch settlers in South Africa carried the gene for Huntington’s disease. Dutch settlers remained in small communities within South Africa.</td>
<td>People of Dutch ancestry in South Africa have an unusually high frequency of the allele that causes Huntington’s disease. Only 766 male immigrants are the ancestors of 56 million South Africans.</td>
</tr>
</tbody>
</table>

**Scoring Notes:**

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 4 correct responses; therefore 1 point will be awarded if the student selects 2 or more correct responses.
Session 3 Item 38 (TEI)

Use the information and your knowledge of science to answer the question.

Temperature regulation in humans is controlled by feedback mechanisms. If body temperature decreases below the optimal temperature, the central nervous system causes muscles in the skin to contract. This pulls each hair into a vertical position and causes parts of the skin to raise into small bumps called goosebumps. This response helps reduce the amount of blood that is exposed to the environment.

A student wants to investigate the feedback mechanism that causes goosebumps.

Drag the correct statement into each box to show the most appropriate order of the steps a student should take in this investigation.

Not all statements will be used.
Scoring for Session 3 Item 38 (TEI)

Have a participant place one hand into a bowl of warm water.

Ask the participant whether or not his or her skin usually gets goosebumps.

Observe the hand in water for goosebumps.

<table>
<thead>
<tr>
<th>Step</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Prepare one bowl of hot water, one bowl of room-temperature water, and one bowl of cold water.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Drip each water sample on the back of the participant’s neck.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Observe the skin on the arms and legs of the participant.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Record observation data.</td>
</tr>
</tbody>
</table>

**Scoring Notes:**

This item is worth 2 points. Partial credit (1 point) will be awarded if half or more of the student responses are correct. For this item, the key contains 3 correct responses; therefore 1 point will be awarded if the student selects 2 correct responses.
Use the information and your knowledge of science to answer the question.

Vitamin D is a molecule that assists chemical reactions within a cell. Human skin cells produce vitamin D when they are exposed to ultraviolet radiation from the Sun. The model shows how the body metabolizes (alters and uses) vitamin D.

**Vitamin D Metabolism in Humans**

Skin cells absorb UV radiation and build vitamin D molecules.

Liver cells change structure of vitamin D.

Bone cells absorb vitamin D; bones produce red blood cells.

Kidney cells create active form of vitamin D.

Intestines absorb calcium.
Scoring for Session 3 Item 39 (TEI)

Select the correct answer from each drop-down menu to show what the model can be used to explain about vitamin D metabolism.

In order to make vitamin D into a usable form, it must first be transported from the skin to different organs within each system ▼. The model shows that the interaction of different organ systems ▼ is necessary to accomplish specific functions within the body.