This document contains released items from the 2010 Grade 9 Knowledge and Employability Science Achievement Test.

A test blueprint and an answer key that includes the difficulty, reporting category, curricular content area, and item description for each test item are also included. These materials, along with the Program of Studies and subject bulletin, provide information that can be used to inform instructional practice.

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2010 Achievement Test Released Items

The items presented in this document are from the secured 2010 Grade 9 Knowledge and Employability Science Achievement Test. These items are released by Alberta Education.
1. If a species is unable to adapt to a change in its habitat, it may
   A. become extinct
   B. consume more prey
   C. become more specialized
   D. produce stronger offspring

Use the following information to answer question 2.

A food web for a particular ecosystem is shown below.

A student is trying to identify an unknown organism from the food web above based on the following characteristics:

- the organism is a herbivore
- the organism is eaten by only foxes and wolves

2. The unknown organism described above is a
   A. deer
   B. rabbit
   C. mouse
   D. squirrel
3. One difference between an Arctic Grayling and a Whitefish is
   A. spot colour
   B. scale size
   C. fin shape
   D. fin size

4. Which of the following events is an example of a chemical reaction?
   A. Ice melts
   B. Paper is cut
   C. Clothes dry
   D. Wood is burned
5. On the label shown above, ____i____ explain how to handle the chemical, and ____ii____ explain how to treat a person who has been hurt by the chemical.

Which of the following rows completes the statement above?

<table>
<thead>
<tr>
<th>Row</th>
<th>i</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>PRECAUTIONARY MEASURES</td>
<td>RISK PHRASE(S)</td>
</tr>
<tr>
<td>B.</td>
<td>PRECAUTIONARY MEASURES</td>
<td>FIRST AID MEASURES</td>
</tr>
<tr>
<td>C.</td>
<td>FIRST AID MEASURES</td>
<td>RISK PHRASE(S)</td>
</tr>
<tr>
<td>D.</td>
<td>FIRST AID MEASURES</td>
<td>PRECAUTIONARY MEASURES</td>
</tr>
</tbody>
</table>
6. Which of the following WHMIS symbols is **most likely** the unknown symbol on the label on the previous page?

A. ![Symbol A]

B. ![Symbol B]

C. ![Symbol C]

D. ![Symbol D]
Use the following information to answer question 7.

A chemical company needs to transport toxic waste to a specialized disposal site over 500 km away.

7. Which of the following illustrations depicts the **safest** method of transporting toxic waste?

A. ![Illustration A]

B. ![Illustration B]

C. ![Illustration C]

D. ![Illustration D]
8. Which of the following conclusions can **best** be drawn from the data in the graph?

A. A decrease in temperature results in no change in dissolved oxygen levels.
B. A decrease in temperature results in a decrease in dissolved oxygen levels.
C. An increase in temperature results in a decrease in dissolved oxygen levels.
D. An increase in temperature results in an increase in dissolved oxygen levels.
9. Based on the information in the graph above, which of the following statements is correct?

A. Emissions from cars have increased.
B. Emissions from planes decreased between 1990 and 1996.
C. Emissions from large trucks have doubled between 1990 and 2004.
D. Emissions from trains account for most of the CO$_2$ in the environment.
10. Which of the switches in the circuit shown above must be closed in order to turn on the light?
   A. Switch 1  
   B. Switch 2  
   C. Switches 1 and 3  
   D. Switches 2 and 3

11. Materials that allow electricity to flow easily are called
   A. resistors  
   B. insulators  
   C. generators  
   D. conductors

12. Which of the following statements best describes why astronauts weigh more on Earth than on the moon?
   A. Astronauts have more mass on the moon.  
   B. Astronauts have less mass on the moon.  
   C. The moon has more gravity than Earth.  
   D. The moon has less gravity than Earth.
Use the following information to answer question 13.

<table>
<thead>
<tr>
<th>Some Characteristics of Three Planets in Our Solar System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance from the sun (millions of km)</strong></td>
</tr>
<tr>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td><strong>Length of year (Earth days)</strong></td>
</tr>
<tr>
<td>59 days</td>
</tr>
</tbody>
</table>

13. Which of the following conclusions can be made from the information in the chart above?

A. As the distance from the sun increases, the length of a year increases.
B. As the distance from the sun increases, the length of a year decreases.
C. As the distance from the sun decreases, the length of a day increases.
D. As the distance from the sun decreases, the length of a day decreases.
Knowledge and Employability Science –
2010 Test Blueprint and Item Descriptions

The following blueprint provides information on 13* test items that appeared on the 2010 Grade 9 Knowledge and Employability Science Achievement Test.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Reporting Category</th>
<th>Number and Proportion of Questions (on 2010 PAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge</td>
<td>Skills</td>
</tr>
<tr>
<td>Biological Diversity</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Matter and Chemical Change</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Environmental Chemistry</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Electrical Principles and Technologies</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Space Exploration</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>* Please note: 37 items have not been released from the 2010 Grade 9 Knowledge and Employability Science Achievement Test.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The table below provides information about each question: the keyed response, the difficulty of the item (the percentage of students who answered the question correctly), the reporting category, the topic, and the item description.

<table>
<thead>
<tr>
<th>Question</th>
<th>Key</th>
<th>Difficulty %</th>
<th>Reporting Category</th>
<th>Topic</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>77.0</td>
<td>Knowledge</td>
<td>Biological Diversity</td>
<td>Recognize that species are dependent on their environment for survival.</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>60.8</td>
<td>Skill</td>
<td>Biological Diversity</td>
<td>Interpret information to identify a relationship based on information in a food web.</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>74.9</td>
<td>Skill</td>
<td>Biological Diversity</td>
<td>Apply given criteria in a classification key to distinguish differences between two organisms.</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>61.5</td>
<td>Knowledge</td>
<td>Matter &amp; Chemical Change</td>
<td>Recognize an example of a chemical change.</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>66.4</td>
<td>Skill</td>
<td>Matter &amp; Chemical Change</td>
<td>Interpret a product information label to identify a statement related to safety measures.</td>
</tr>
<tr>
<td>6</td>
<td>A</td>
<td>63.5</td>
<td>Skill</td>
<td>Matter &amp; Chemical Change</td>
<td>Apply information to determine the appropriate WHMIS symbol for a solution.</td>
</tr>
<tr>
<td>7</td>
<td>B</td>
<td>84.7</td>
<td>Knowledge</td>
<td>Environmental Chemistry</td>
<td>Determine the safest method given, to dispose of hazardous work place chemicals safely.</td>
</tr>
<tr>
<td>8</td>
<td>C</td>
<td>44.5</td>
<td>Skill</td>
<td>Environmental Chemistry</td>
<td>Interpret information from a graph to draw a conclusion.</td>
</tr>
<tr>
<td>9</td>
<td>C</td>
<td>70.7</td>
<td>Skill</td>
<td>Environmental Chemistry</td>
<td>Analyze information in a graph to identify how human actions affect air quality.</td>
</tr>
<tr>
<td>10</td>
<td>C</td>
<td>57.4</td>
<td>Knowledge</td>
<td>Electrical Principles &amp; Technologies</td>
<td>Interpret information to determine components needed to perform a particular function in a given circuit.</td>
</tr>
<tr>
<td>11</td>
<td>D</td>
<td>64.9</td>
<td>Skill</td>
<td>Electrical Principles &amp; Technologies</td>
<td>Identify a characteristic of electrical conductors.</td>
</tr>
<tr>
<td>12</td>
<td>D</td>
<td>67.6</td>
<td>Knowledge</td>
<td>Space Exploration</td>
<td>Recall characteristics of the Moon and Earth to identify a statement related to gravity.</td>
</tr>
<tr>
<td>13</td>
<td>A</td>
<td>48.6</td>
<td>Skill</td>
<td>Space Exploration</td>
<td>Analyze information from a chart to draw a conclusion related to the planets’ distances from the Sun.</td>
</tr>
</tbody>
</table>