

# **APPENDIX B**

## **COGNITIVE SKILL DESCRIPTIONS**

## Cognitive Skill Descriptions for Science and Technology/Engineering MCAS

Only one cognitive skill will be designated for a common item, although several skills may apply to a single item. The lists below are general examples, but they are not a complete list. Depending upon how the item is written, these descriptions may not always apply.

Cognitive Skill	Description
<b>Remembering</b>	<ul style="list-style-type: none"> <li>Identify or <u>define a basic concept</u> or term with little or no context</li> <li>Recall facts with little or no context</li> </ul> <p><i>Does the item require recalling or remembering facts or definitions?</i></p>
<b>Understanding</b>	<ul style="list-style-type: none"> <li>Describe, explain, or identify <u>typical classroom examples</u> for a science or tech/eng concept</li> <li>Recognize and differentiate representations and descriptions of familiar models</li> </ul> <p><i>Does the item require the recognition or a description of a familiar concept?</i></p>
<b>Applying</b>	<ul style="list-style-type: none"> <li>Describe, explain, or identify a science or tech/eng concept presented in a <u>novel situation</u></li> <li>Draw conclusions by comparing and contrasting information in novel situations</li> <li>Draw conclusions by interpreting information/data (including simple graphs and tables) or make predictions based on data</li> <li>Solve quantitative problems where an equation must be rearranged to solve the problem</li> <li>Describe or explain multiple processes or system components in a novel situation</li> </ul> <p><i>Does the item require drawing conclusions based on novel information or solving complex problems?</i></p>
<b>Analyzing</b>	<ul style="list-style-type: none"> <li><u>Critically examine and interpret data</u> or maps to draw conclusions based on given information (Note: An item with a graph/diagram/table/map is not necessarily analyzing—it depends on how the information needs to be interpreted.)</li> </ul> <p><i>Does the item require critical examination of information to make conclusions?</i></p>
<b>Creating</b>	<ul style="list-style-type: none"> <li><u>Generate</u> an explanation or conclusion by combining <u>two or more science or technology/engineering concepts</u> in a novel situation</li> <li><u>Construct</u> models, graphs, charts, drawings, or diagrams <u>and generate explanations</u> or conclusions based on the information</li> <li>Propose solutions to scientific or engineering problems based on given criteria/constraints</li> </ul> <p><i>Does the item require the synthesis of different concepts or skills to generate a solution?</i></p>

The information above was provided by the Massachusetts Department of Elementary & Secondary Education.