# Quantitative and Symbolic Reasoning

**Definition:** Quantitative Reasoning encompasses abilities necessary for a student to become literate in today’s technological world. Quantitative reasoning begins with basic skills and extends to problem solving.

<table>
<thead>
<tr>
<th>Competency</th>
<th>No Competency</th>
<th>Emerging</th>
<th>Competent</th>
<th>Mastering</th>
</tr>
</thead>
</table>
| 4.1 Evaluate and interpret quantitative and symbolic reasoning information/data. | - Unable to extract data presented in a direct form  
- Unable to extract implied data in most contexts  
- Unable to access resources to find unknown data  
- Unable to discriminate between relevant and irrelevant data | - Needs assistance to extract data presented in a direct form  
- Needs assistance to extract implied data in most contexts  
- Needs assistance to access resources to find unknown data  
- Needs assistance to discriminate between relevant and irrelevant data | - Extracts data presented in a direct form  
- Extracts implied data in most contexts  
- Is able to access resources to find unknown data  
- Discriminates between relevant and irrelevant data | - Extracts data presented in a direct or indirect form  
- Extracts implied data in any context  
- Independently accesses resources to find unknown data  
- Independently discriminates between relevant and irrelevant data |
| 4.2 Recognize which quantitative or symbolic reasoning methods are appropriate for solving a given problem, and correctly implement those methods. | No Persistence  
- Has no clear idea of what task is to be accomplished  
- Unable to brainstorm methods that might apply  
- Unable to apply different methods  
- Unable to assess if a method makes progress in identifying an issue.  
- Unable to clearly identify an issue even with considerable assistance | Low persistence  
- Has a clear idea of what task is to be accomplished  
- Is able to brainstorm a limited number of methods that might apply  
- Is able to apply a limited number of methods  
- May not be able to assess if a method makes progress in identifying an issue.  
- May not clearly identify the issue.  
- May need considerable assistance | Mostly persistent  
- Has a clear idea of what task is to be accomplished  
- Is able to brainstorm methods that might apply  
- Is able to apply different methods  
- Is able to assess if a method makes progress in identifying an issue.  
- Clearly identifies the issue with some guidance | Consistently persistent  
- Can clearly state what task is to be accomplished  
- Is able to brainstorm methods that might apply  
- Is able to apply different methods  
- Is able to assess if a method makes progress in identifying an issue.  
- Clearly identifies the issue independently |
| 4.3 Demonstrate the ability to estimate a solution to a presented problem. | *Is unable, even with considerable assistance,* to:  
- Use minimal but essential parts of a problem solving method along with approximate numbers to get a quick answer  
- Check the reasonableness of an answer | *Needs Considerable Assistance to:*  
- Use minimal but essential parts of a problem solving method along with approximate numbers to get a quick answer  
- Check the reasonableness of an answer | *Needs Limited Guidance to:*  
- Use minimal but essential parts of a problem solving method along with approximate numbers to get a quick answer  
- Check the reasonableness of an answer | *Independently can:*  
- Use minimal but essential parts of a problem solving method along with approximate numbers to get a quick, reasonable answer  
- Check the reasonableness of an answer |

| 4.4 Translate data from and into various formats such as symbolic language, equations, graphs, and formulas. | *Cannot correctly read necessary information from a graph or logic chart*  
- Cannot visually represent symbolic information with a graph or logic chart clearly or correctly | *Can correctly read some necessary information from a graph or logic chart*  
- Can visually represent symbolic information with a graph or logic chart somewhat clearly and correctly | *Can correctly read most necessary information from a graph or logic chart*  
- Can visually represent symbolic information with a graph or logic chart mostly clearly and correctly | *Can correctly read all necessary information from a graph or logic chart*  
- Can visually represent symbolic information with a graph or logic chart clearly and correctly |