

Smarter Science	Writing	Reading	Speaking and Listening
<p><b>STAGE 1</b>  <b>Engage and Explore</b></p> <ul style="list-style-type: none"> <li>question &amp; wonder</li> <li>generate curiosity</li> <li>observe, notice</li> <li>interact with organisms, objects, and phenomena</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>brainstorm &amp; generate ideas</li> <li>predict</li> <li>reflect</li> </ul> <p><b>Types of writing</b></p> <ul style="list-style-type: none"> <li>note taking</li> <li>descriptive</li> <li>graphic organizers</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>engage</li> <li>generate questions</li> <li>activate prior knowledge &amp; make connections</li> </ul> <p><b>Types of texts</b></p> <ul style="list-style-type: none"> <li>fiction</li> <li>non-fiction</li> <li>wonder</li> <li>connects to students' experiences</li> <li>biographies</li> <li>graphic organizers</li> </ul> <p><b>Comprehension strategies**</b></p> <ul style="list-style-type: none"> <li>inferring</li> <li>building vocabulary</li> <li>questioning the author</li> <li>activating prior knowledge &amp; making connections</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>share ideas and wonder</li> <li>generate questions</li> <li>make predictions</li> <li>activate prior knowledge &amp; make connections</li> <li>build vocabulary</li> </ul> <p><b>Types of settings</b></p> <ul style="list-style-type: none"> <li>one-on-one</li> <li>partner or small-group discussion</li> <li>informal large-group discussions</li> </ul>
<p><b>STAGE 2</b>  <b>Design and Conduct Scientific Investigations</b></p> <ul style="list-style-type: none"> <li>identify testable question</li> <li>plan and implement an investigation</li> <li>observe</li> <li>systematically gather and organize data</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>document process and data</li> <li>record emerging thoughts</li> </ul> <p><b>Types of writing</b></p> <ul style="list-style-type: none"> <li>procedural</li> <li>descriptive</li> <li>technical</li> <li>graphic (e.g., table, graph, picture)</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>provide examples of investigations</li> <li>extend experience</li> <li>provide information and vocabulary</li> </ul> <p><b>Types of texts</b></p> <ul style="list-style-type: none"> <li>procedural (e.g., "how to" texts)</li> <li>field guides</li> <li>non-fiction, informational</li> <li>graphic</li> </ul> <p><b>Comprehension strategies**</b></p> <ul style="list-style-type: none"> <li>visualizing (use of sight, sound, smell, colour)</li> <li>building vocabulary</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>discuss strategies and ideas</li> <li>clarify procedures and data collection</li> <li>listen to others' ideas</li> </ul> <p><b>Types of settings</b></p> <ul style="list-style-type: none"> <li>one-on-one</li> <li>partner or small-group discussion</li> </ul>
<p><b>3. Analyze and Interpret Data</b></p> <ul style="list-style-type: none"> <li>identify patterns and relationships</li> <li>develop descriptions, explanations, and models</li> <li>confirm or refute predictions using evidence</li> <li>drawing conclusions</li> <li>making judgements</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>representing observations</li> <li>communicate ideas</li> <li>raise new questions</li> <li>predict</li> <li>reflect</li> </ul> <p><b>Types of writing</b></p> <ul style="list-style-type: none"> <li>descriptive</li> <li>explanation</li> <li>note taking</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>support and validate ideas</li> <li>provide information</li> <li>raise new questions</li> <li>challenge misconceptions</li> <li>draw conclusions &amp; make judgements</li> </ul> <p><b>Types of texts</b></p> <ul style="list-style-type: none"> <li>personal scientific journals, notes, etc.</li> <li>graphic (e.g., table, graphs, picture)</li> </ul> <p><b>Comprehension strategies**</b></p> <ul style="list-style-type: none"> <li>visualizing</li> <li>inferring</li> <li>making connections</li> <li>determining importance</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>organize thinking</li> <li>debate based on evidence</li> <li>reflect on data</li> <li>challenge misconceptions</li> <li>draw conclusions</li> <li>confirm or refute predictions</li> </ul> <p><b>Types of settings</b></p> <ul style="list-style-type: none"> <li>small-group analysis</li> <li>small- and large- group discussion</li> </ul>

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<p><b>4. Present Findings and Understandings</b></p> <ul style="list-style-type: none"> <li>organize and summarize findings and understandings</li> <li>develop report using a variety of media</li> <li>present, publish, report</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>communicate clearly to others</li> <li>elaborate</li> <li>reflect</li> </ul> <p><b>Types of writing</b></p> <ul style="list-style-type: none"> <li>reporting</li> <li>formal (specific target audience)</li> <li>explanation</li> <li>graphic (e.g., posters for poster sessions)</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>exemplify writing styles and presentation strategies</li> <li>provide alternative models</li> <li>peer review</li> </ul> <p><b>Types of texts</b></p> <ul style="list-style-type: none"> <li>informational</li> <li>scientific report</li> <li>graphic</li> <li>reports written by peers</li> </ul> <p><b>Comprehension strategies**</b></p> <ul style="list-style-type: none"> <li>determining importance</li> <li>inferring</li> <li>making connections</li> <li>synthesizing</li> <li>questioning</li> </ul>	<p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>communicate formally</li> <li>elaborate</li> <li>reflect</li> <li>listen carefully and debate respectfully</li> <li>peer review</li> <li>apply scientific vocabulary</li> </ul> <p><b>Types of settings</b></p> <ul style="list-style-type: none"> <li>formal presentation</li> <li>debate</li> </ul>

(Adapted from National Research Council (NRC). *National Science Education Standards*. Washington, DC: National Academy Press.)

**\*\*Tools to Enhance Reading Comprehension:**

Anticipation Guide  
 Graphic Organizers  
 Picture Walk  
 Reread  
 Using Features of Nonfiction  
 Chunking  
 Cloze Passage  
 Questioning the Author  
 Sketch the Stretch  
 Stop and Jot  
 Turn and Talk  
 RTN Chart