<table>
<thead>
<tr>
<th>FIGURE 1. A Picture of Disciplinary Literacy</th>
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<tbody>
<tr>
<td><strong>Read</strong></td>
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</tbody>
</table>
| **Science** | When scientists read, they  
- Ask “why?” more than “what?”  
- Interpret data, charts, lab notes, illustrations, and observations  
- Seek to understand concepts and scientific theories  
- Determine validity of sources and quality of evidence  
- Pay attention to details  
- Estimate, extrapolate, and predict  
- Identify systems and patterns | When scientists write, they  
- Use precise vocabulary  
- Compose in phrases, bullets, graphs, or sketches  
- Favor accuracy over craft or excessive elaboration  
- Communicate in a systematic form  
- Explore theories but rely on evidence  
- Create and revise models | When scientists think, they  
- Generate questions  
- Allow curiosity to drive learning  
- Rely on prior knowledge or research  
- Consider new hypotheses or evidence  
- Propose explanations  
- Create solutions  
- Consider ethical concerns  
- Seek connections, patterns, and systems  
- Ask “what if?” |
| **History** | When historians read, they  
- Interpret primary and secondary sources  
- Identify bias  
- Think sequentially  
- Compare and contrast events, accounts, maps, infographics, documents, photos, and visuals  
- Determine meanings of words within historical contexts  
- Evaluate credibility of sources  
- Seek a wide variety of texts to gain deeper understandings | When historians write, they  
- Create timelines with accompanying narratives  
- Synthesize, compare, and contrast information and evidence from multiple sources  
- Organize ideas coherently  
- Grapple with multiple ideas and large quantities of information  
- Make historical claims supported by evidence  
- Corroborate accounts  
- Utilize argumentative principles | When historians think, they  
- Create narratives  
- Seek credible primary and secondary sources  
- Compare, contrast, and ponder causes and effects  
- Consider big ideas or inquiries across long periods of time  
- Recognize bias  
- Use the past as a mirror to the present  
- Question content and purpose  
- Wonder what has been left out and seek to discover what’s missing |
| **Math** | When mathematicians read, they  
- Use information to piece together a solution  
- Look for patterns and relationships  
- Decipher symbols and abstract ideas  
- Ask questions  
- Apply mathematical reasoning and habits of mind | When mathematicians write, they  
- Explain, justify, describe, estimate, analyze, and solve  
- Favor calculations over words  
- Use precise vocabulary  
- Include reasons and examples  
- Utilize real-word situations  
- Explain reasoning | When mathematicians think, they  
- Consider patterns  
- Rely on previous understandings  
- Find connections  
- Estimate, generalize, and look for exceptions  
- Employ mathematical principles  
- Ask questions |
| **English Language Arts** | When students of English read, they  
- Understand how figurative language works  
- Find underlying messages that evolve as themes  
- Assume a skeptical stance  
- Pay attention to new vocabulary or words used in new ways  
- Employ background knowledge  
- Vary reading skills based on genre, purpose, and audience  
- Explore a wide variety of texts to build background knowledge or corroborate information  
- Consider literary criticism  
- Identify bias and perspective  
- Lose themselves in fiction  
- Make choices about the texts they want to read  
- Experience joy or inspiration | When students of English write, they  
- Engage in a process that includes drafting, revising, and editing  
- Pay mentor texts to aid writing craft  
- Pay attention to word choice, organization, details, and voice  
- Consider feedback from others  
- Avoid formulaic writing  
- Vary writing based on audience, purpose, and format  
- Use evidence to support arguments  
- Develop voice  
- Take risks in composing | When students of English think, they  
- Compare, contrast, synthesize, and reflect on multiple texts  
- Generate questions  
- Consider validity of evidence  
- Employ creativity and curiosity  
- Evaluate and critique  
- Argue both sides of a point  
- Develop empathy  
- Consider what more they want to know  
- Appreciate the beauty of language |
<table>
<thead>
<tr>
<th>Visual Arts</th>
<th><strong>Read</strong></th>
<th><strong>Write</strong></th>
<th><strong>Think</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>When artists read, they</strong></td>
<td><strong>When artists write, they</strong></td>
<td><strong>When artists think, they</strong></td>
</tr>
<tr>
<td></td>
<td>• Interpret meaning, intent, symbols, details, and purpose</td>
<td>• Translate visual input to written output</td>
<td>• Consider various perspectives or hidden meanings</td>
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<td></td>
<td>• Find inspiration</td>
<td>• Explain and evaluate the processes, techniques, materials, and evolution of ideas in artistic pieces, including their own</td>
<td>• Generate ideas</td>
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<td></td>
<td>• Connect artistic ideas and works with societal, cultural, and historical context</td>
<td>• Create meaning through artistic endeavors</td>
<td>• Apply problem-solving to determine methods and meaning</td>
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<td></td>
<td>• Explore a variety of texts that utilize artistic creations</td>
<td>• Compare, contrast, and critique artistic works</td>
<td>• Consider how art can be used to understand cultures and values</td>
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<tr>
<th>Music</th>
<th><strong>When musicians read, they</strong></th>
<th><strong>When musicians write, they</strong></th>
<th><strong>When musicians think, they</strong></th>
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<tbody>
<tr>
<td></td>
<td>• Integrate knowledge and experience while reading musical pieces</td>
<td>• Deliver feedback to others in writing</td>
<td>• Share personal stories regarding music</td>
</tr>
<tr>
<td></td>
<td>• Decipher symbolic notation and musical scores</td>
<td>• Convey meaning and emotion by creating lyrics and musical scores</td>
<td>• Develop listening and intuitive skills to receive and understand musical messages</td>
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<tr>
<td></td>
<td>• Interpret meaning in lyrics</td>
<td>• Reflect on how to improve and develop technique</td>
<td>• Consider how music tells a story</td>
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<td></td>
<td>• Intuit musical nuances in a piece</td>
<td>• Express subjective reactions to music</td>
<td>• Understand and use specialized vocabulary</td>
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<td></td>
<td>• Utilize historical context when reading music</td>
<td>• Translate musical input to written output</td>
<td>• Consider how collaboration improves performance</td>
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<td></td>
<td>• Determine validity of sources and quality of evidence in critiques and reviews</td>
<td>• Compose or write for a specific audience</td>
<td>• Discover how personal expression relates to music</td>
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<tr>
<th>Physical Education &amp; Health</th>
<th><strong>When students of P.E. and health read, they</strong></th>
<th><strong>When students of P.E. and health write, they</strong></th>
<th><strong>When students of P.E. and health think, they</strong></th>
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<tbody>
<tr>
<td></td>
<td>• Interpret video clips to learn and improve performance</td>
<td>• Provide specific, detailed, written feedback</td>
<td>• Articulate cause and effect relationships in sports and in health</td>
</tr>
<tr>
<td></td>
<td>• Understand specialized vocabulary</td>
<td>• Evaluate feedback from others</td>
<td>• Employ curiosity and look for answers</td>
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<tr>
<td></td>
<td>• Seek to comprehend actions, plays, and movements when viewing games, plays, or fitness activities</td>
<td>• Note similarities and differences when analyzing plays or health content</td>
<td>• Make choices about health or bodily movements</td>
</tr>
<tr>
<td></td>
<td>• Incorporate understanding about bodily movement</td>
<td>• Create infographics, bullets, sketches, or diagrams</td>
<td>• Consider personal goals</td>
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<tr>
<td></td>
<td>• Interpret and analyze numerical data</td>
<td>• Examine personal skills and habits</td>
<td>• Consider their responsibilities to their team</td>
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<tr>
<td></td>
<td>• Read books and informational texts about sports and health</td>
<td>• Utilize background knowledge or personal experience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Make personal connections</td>
<td>• Utilize specialized vocabulary</td>
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<tr>
<th>World Language</th>
<th><strong>When students of world language read, they</strong></th>
<th><strong>When students of world language write, they</strong></th>
<th><strong>When students of world language think, they</strong></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>• Infer meaning from context</td>
<td>• Apply rules of syntax and spelling</td>
<td>• Transfer skills from native language to a new language</td>
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<tr>
<td></td>
<td>• Communicate with others about what they have read or read aloud</td>
<td>• Analyze and then imitate patterns, structures, and organization of mentor texts</td>
<td>• Analyze gestures and facial expressions in communication</td>
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<tr>
<td></td>
<td>• Rely on prediction and guesses to aid understanding</td>
<td>• Prioritize communication of ideas</td>
<td>• Discover how language is used to create meaning</td>
</tr>
<tr>
<td></td>
<td>• Seek to understand cultural practices and perspectives</td>
<td>• Compare and contrast the new language to the home language</td>
<td>• Consider how environment and culture influence language</td>
</tr>
<tr>
<td></td>
<td>• Improve comprehension through syntax and structure of a language</td>
<td>• Employ dialogue, narration, or description</td>
<td>• Utilize sharp listening skills</td>
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