A Common Visual Language for Learning

Thinking Maps is a language of eight thinking process maps. Each map is graphically consistent and flexible so that students may easily expand the map to reflect the content pattern being learned.
Thinking Maps Overview

BACKGROUND: Thinking Maps is a language, or tool-kit, or eight thinking process maps, developed by David Hyerle. Each map is graphically consistent and flexible so that students may easily expand the map to reflect the content pattern being learned. Thinking Maps are introduced to students as tools for reading and writing, content-specific learning, and for interdisciplinary investigations. Over time, students learn to use multiple maps together and become fluent in choosing which maps fit the immediate context of learning. Thinking Maps and Thinking Maps Software are used in whole schools through faculty training and follow-up.

BASIC TECHNIQUES

? Begin with an application of each of the maps to a concrete object in order to understand the relationship between thinking processes and Thinking Maps.

? Expand each map to show big picture and then prioritize information by deleting ideas from maps for reading comprehension and writing.

? Use multiple maps together to construct related patterns of learning, and use “frame” to identify frames of reference.

Graphic Primitives and Definitions

<table>
<thead>
<tr>
<th>Primitives</th>
<th>Thinking Maps and the Frame</th>
<th>Expanded Maps</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Circle Map" /></td>
<td>The Circle Map is used for seeking context. This tool enables students to generate relevant information about a topic as represented in the center of the circle. This map is often used for brainstorming.</td>
<td><img src="image2" alt="Circle Map Expanded" /></td>
</tr>
<tr>
<td><img src="image3" alt="Bubble Map" /></td>
<td>The Bubble Map is designed for the process of describing attributes. This map is used to identify character traits (language arts), cultural traits (social studies), properties (sciences), or attributes (mathematics).</td>
<td><img src="image4" alt="Bubble Map Expanded" /></td>
</tr>
<tr>
<td><img src="image5" alt="Double Bubble Map" /></td>
<td>The Double Bubble Map is used for comparing and contrasting two things, such as characters in a story, two historical figures, or two social systems. It is also used for prioritizing which information is most important within a comparison.</td>
<td><img src="image6" alt="Double Bubble Map Expanded" /></td>
</tr>
<tr>
<td><img src="image7" alt="Tree Map" /></td>
<td>The Tree Map enables students to do both inductive and deductive classification. Students learn to create general concepts, (main) ideas, or categories headings at the top of the tree, and supporting ideas and specific details in the branches below.</td>
<td><img src="image8" alt="Tree Map Expanded" /></td>
</tr>
<tr>
<td><img src="image9" alt="Brace Map" /></td>
<td>The Brace Map is used for identifying the part-whole, physical relationships of an object. By representing whole-part and part-subpart relationships, this map supports students’ spatial reasoning and for understanding how to determine physical boundaries.</td>
<td><img src="image10" alt="Brace Map Expanded" /></td>
</tr>
<tr>
<td><img src="image11" alt="Flow Map" /></td>
<td>The Flow Map is based on the use of flowcharts. It is used by students for showing sequences, order, timelines, cycles, actions, steps, and directions. This map also focuses students on seeing the relationships between stages and substages of events.</td>
<td><img src="image12" alt="Flow Map Expanded" /></td>
</tr>
<tr>
<td><img src="image13" alt="Multi-Flow Map" /></td>
<td>The Multi-Flow Map is a tool for seeking causes of events and the effects. The map expands when showing historical causes and for predicting future events and outcomes. In its most complex form, it expands to show the interrelationships of feedback effects in a dynamic system.</td>
<td><img src="image14" alt="Multi-Flow Map Expanded" /></td>
</tr>
<tr>
<td><img src="image15" alt="Bridge Map" /></td>
<td>The Bridge Map provides a visual pathway for creating and interpreting analogies. Beyond the use of this map for solving analogies on standardized tests, this map is used for developing analogical reasoning and metaphorical concepts for deeper content learning.</td>
<td><img src="image16" alt="Bridge Map Expanded" /></td>
</tr>
</tbody>
</table>

The Frame

The "metacognitive" Frame is not one of the eight Thinking Maps. It may be drawn around any of the maps at any time as a “meta-tool” for identifying and sharing one’s frame of reference for the information found within one of the Thinking Maps. These frames include personal histories, culture, belief systems, and influences such as peer groups and the media.
Comparing Visual Tools

Below is a Double Bubble Map showing the similarities and differences between graphic organizers and Thinking Maps.

The most important difference between Thinking Maps and graphic organizers is that each Thinking Map is based on a fundamental thinking skill.

This thinking skills foundation supports three intellectual outcomes:

- First, students learn clearly stated definitions for eight fundamental thinking skills.
- Second, students are applying multiple thinking skills (as Maps) to complex, multi-step problems; and,
- Third, students are empowered to use these visual tools for transferring thinking skills across disciplines.
How the Use of Thinking Maps Evolved at Hanover Street School

Teacher Directed → Shared Responsibility → Student constructed

- Instructed in map choice → Given appropriate map → Assignment given
- Lead through map construction and word/thought placement → Own map expansion on template → Open choice for method of presentation
- Whole-class lessons → Own thought placement → Elect to use maps to share ideas
- Modeling → Group or individual task → Select appropriate map and construct to fit the needs of the task
Draw Your Thinking
Kindergarten Student

The long necks have a long neck so they can reach for food in the water.

The volcano blows up.

footprint

horn

Baby spikes

wing

An egg with a crack in it. It is a Triceratop egg.

Jame
Sun

hot

Big
Parts of a flower
William Tell
The Archer and the Apple
legendary
brave
heroic
historical
The Archer and the Apple
long ago
brave
passionate
exciting
heroic
THINGS THAT FREDERICK DID TO END SLAVERY

1. made speeches
2. wrote books
3. helped get people to fight against the South in the Civil War
4. talked to people

MAJOR ACCOMPLISHMENTS

1. escaped to freedom
2. learned to read and write
3. wrote articles and books
4. American consul to Haiti

OBSTACLES HE HAD TO OVERCOME

1. slavery
2. never seeing his mom when he was little
3. never knowing his father
4. being beaten and whipped
5. not having enough money
6. not having enough food
7. being hunted by the slave owners
Born in 1817 or 1818
Went to work at the big house as a slave at age 6

went to Baltimore to live with the Auld family
began to learn to read and write

went back to live on a farm in Maryland
escaped to the north

started to give speeches against slavery
wrote his first book, an autobiography about his life as a slave

became an abolitionist
died on February 20, 1895
Frederick Douglass was born a slave around 1817 or 1818. He spent most of his early childhood roaming and playing around in the woods. Frederick never really saw his mother for she would be busy working in the fields. Nigh and day she worked in the plantation, and hardly ever got to see Frederick. If she did see him it would be late at night when he was sound asleep.

When Frederick was six, his grandma told him that he was going on a long journey. His grandmother took him to the big house on the plantation, and told him to go and play with the children. After awhile, one of the children said that his grandmother had left. He ran out into the road to see where she was, and realized that she had disappeared. When he realized that she had left him, he cried and cried. This is when his childhood ended and his life as a slave began.

Frederick labored on the plantation, working long, hard days. Life as a slave was really awful. He got very little rest, not enough food, and he never had enough clothing to wear. If he did not obey the owner, he was whipped or hurt in some other way.

When Frederick was eight he was sent to Baltimore to live with the Auld family. There he took care of the master's infant son. Sophia Auld became a friend to Frederick, and began to teach him how to read and write. It was against the law to teach him how to do so. When Mr. Auld found out, he put a stop to the learning. Frederick then realized that reading and writing was important, so he continued to secretly teach himself. He did this by sometimes sneaking newspapers and studying them, on days when he could.

He began to read everything he could about slavery and the abolitionists. the people who fought against slavery. This included reading about the free states in the north where there as no slavery. He hated slavery more and more, and knew that one day he would live in the north.

Before he escaped to the north, he taught other slaves to read and write. He was beaten by his masters a number of times, and this made him even more determined to escape. Finally he escaped to the north and he became an abolitionist. Frederick was a very good speaker and writer and many people did not believe he had been born a slave. This was the reason that he wrote his
A 9th Grader's Double Bubble Map on Julius Caesar

Julius Caesar’s Private Life:
- Treats Anthony well
- Is wise when not overpowered by his ego
- Persuaded by his wife, Calpurnia.
- Looks most other, as fat and sleek headed
- Thinks that none are powerful enough to harm him
- Fails to realize his "friends" bear secret hate

Julius Caesar’s Public Life:
- Does care for the people of Rome
- Large ego and believes he is indestructible
- Doesn't want people to think that his wife persuades him
- Does't want it widely known that he has epilepsy
- Refuses to listen to Artemidorus
- Trusts Brutus immensely
- Does care for the people of Rome
- Very easily persuaded by Brutus.
- Doesn't fear death, Act 2, Scene 2.
- Doesn't want people to think he is weak
- Very popular with people of Rome
- Very concerned with his image in the public eye
- Wants fat sleek-headed men around him
- Doesn't want to be surrounded by those who challenge him
- Doesn't want people to know he is superstitious

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Monkeys

- Strong arms
- Long tails
- Playful
- Cute or ugly
- Human-looking faces
- Colored fur
- Plain or colorful
- Quiet or noisy
Monkeys have strong arms
And long tails. They have
human looking faces.
## MONKEYS

<table>
<thead>
<tr>
<th>Food</th>
<th>Enemies</th>
<th>Habitats</th>
<th>Interesting facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves</td>
<td>Monkey-eating Eagles</td>
<td>Wild</td>
<td>Wash food</td>
</tr>
<tr>
<td>Nuts</td>
<td>Leopards</td>
<td>Trees</td>
<td>Groom each other</td>
</tr>
<tr>
<td>Fruits</td>
<td>Lions</td>
<td>Ground</td>
<td>Live in families up to 100</td>
</tr>
<tr>
<td>Crabs</td>
<td>Snakes</td>
<td>Tropical forests</td>
<td>Leaders are the gray-haired males</td>
</tr>
<tr>
<td>Lizards</td>
<td></td>
<td>Warm places</td>
<td>Over 200 kinds</td>
</tr>
<tr>
<td>Insects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birds' eggs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spiders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Figs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>papayas</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Monkeys like different kinds of foods. Some like nuts, leaves, and fruits. Other monkeys like birds’ eggs and insects.
Monkeys have enemies. The monkeys that live in trees must look out for a monkey-eating eagle. The ones on the ground look out for leopards, lions and snakes.
Thinking Maps: A common Visual Language for Learning

Figure 6.5

Tree Map of Assessment

3 KEY INDICATORS
for Assessment using Thinking Maps

CLARIFYING

BY INCLUDING A VARIETY OF DETAILS AND GENERAL CONCEPTS

BY DISCARING IRRELEVANT AND UNSUPPORTED INFORMATION

EXPANDING

NUMBER AND COMPLEXITY OF RELATIONS

CONTENT INFORORMATION / CONCEPTUAL LINKS

CROSS-DISCIPLINE AND THEMATIC CONNECTIONS

ASSIMILATING

OLD AND NEW INFORMATION AND CONCEPTS

CREATIVE IDEAS VIA NOVEL APPLICATIONS AND MULTIPLE PERSPECTIVES

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Lauren’s Flow Map for Writing a Narrative

Testing

I used the flow map, and we have been using them so much that when I got done my first box I didn’t need to use it because the flow map was in my head. I got my topic sentence down and my details just seemed to flow right out.

Once upon a time a pig named Gotham decided to take a walk.

Teachers make the utmost of McAuliffe funds

But the grant program will run out of money in July

By Tracey Wong Briggs
and Tamara Henry
USA TODAY

Math teacher Janie MacIntyre used her $23,000 fellowship to see whether her success with Thinking Maps could be replicated throughout Rocky Mount, N.C. Thinking Maps, which use diagrams such as flowcharts to present lessons so the brain can easily process them, were introduced at Edwards Junior High in 1993. MacIntyre, who teaches low-performing eighth-graders, saw her students make the biggest gains in the school.

Her year-long study included training eighth-grade math teachers at the other junior highs in her district to use Thinking Maps and analyzing three years of state End-of-Grade test scores for 200 low-performing students.

Using teacher logs of their Thinking Map use and videotapes of their teaching, MacIntyre found that the more the teachers used the maps, the better their students did on the EOGs. Overall, developmental growth for low-performing students quadrupled.

"The McAuliffe Fellowship was the perfect thing for me to do," MacIntyre says. Quantifying what works is a big step in improving the teaching profession and improving instruction for all students, she says. In academia, "If you don't document it, it didn't happen."
Appendix B
Reading Comprehension Using Thinking Maps
by Marjann Ball

Description of Treatment
Lesson Plan Using Thinking Maps Questions Sheet

During the 16-week semester, many reading skills were taught. For the purpose of this study, these reading skills were taught to both the experimental and control groups with the only difference being the use of Thinking Maps to teach and reinforce the reading skills in the experimental group.

For the first eight weeks of the semester, students in the experimental group were taught a reading concept using a Thinking Map and the control group was taught the same reading concept without the use of a Thinking Map. A short introduction of each Thinking Map was given at the beginning of each week with the reading concept for that week integrated into that Thinking Map. Only one Thinking Map was introduced per week with the sequence of maps being Circle, Bubble, Double Bubble, Tree, Brace, Flow, Multi-Flow, and Bridge.

After the first eight weeks of instruction in the experimental group, any Thinking Maps that were appropriate for the reading concept being taught were implemented. Thinking Maps were modeled by the instructor during lectures and used regularly by the students for homework assignments, projects, and assessments. Modeling, questioning, and reinforcing of the maps were essential as the students learned to use the tools.

The following plan was used:

<table>
<thead>
<tr>
<th>Week</th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Building vocabulary. How words come into our culture.</td>
<td>Building vocabulary with Circle Map. How words come into our culture using Circle Map.</td>
</tr>
<tr>
<td>4</td>
<td>Figurative language.</td>
<td>Figurative language using Tree Map.</td>
</tr>
<tr>
<td>5</td>
<td>Parts of a textbook. SQ3R (Survey, Question, Read, Recall, Review) and QRST (Preview, Question, Read, Self-Recite, Test (Review).</td>
<td>Parts of a textbook using Brace Map. SQ3R and PQRST using Brace Map.</td>
</tr>
<tr>
<td>Week</td>
<td>Control Group</td>
<td>Experimental Group</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------------------------</td>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>Prediction and point of view.</td>
<td>Prediction and point of view using Multi-Flow Map.</td>
</tr>
<tr>
<td>8</td>
<td>Analogies.</td>
<td>Analogies using Bridge Map.</td>
</tr>
<tr>
<td>9</td>
<td>Test-taking strategies.</td>
<td>Test-taking strategies using Circle Map and Tree Map.</td>
</tr>
<tr>
<td>10</td>
<td>Analyzing through structure.</td>
<td>Analyzing through structure using Tree Map and Brace Map.</td>
</tr>
<tr>
<td>11</td>
<td>Main idea and supporting details.</td>
<td>Main idea and supporting details using Tree Map.</td>
</tr>
<tr>
<td>14</td>
<td>Recreational reading.</td>
<td>Recreational reading with Thinking Maps.</td>
</tr>
<tr>
<td>15</td>
<td>Reading selections.</td>
<td>Reading selections with Thinking Maps.</td>
</tr>
<tr>
<td>16</td>
<td>Reading selections.</td>
<td>Reading selections with Thinking Maps.</td>
</tr>
</tbody>
</table>

Appendix A
Thinking Maps Test Scores Summary

This is a selected list of school results from several states around the country. All of the teachers in each of these schools and systems received comprehensive, cross-discipline training and classroom follow-up coaching for a minimum of one school year. The analysis and presentation of the test score results shown below were reported by the administrators representing the schools or school system in which the Thinking Maps were implemented. These results were submitted because they showed significant gains on the different test instruments used by the respective institutions. In all cases, the administrators have evidence that the results were directly related to the use of Thinking Maps by students. The scores are comparisons of results using state tests from year to year.

<table>
<thead>
<tr>
<th>School/Description</th>
<th>Location</th>
<th>Test Instrument</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margaret Fain Elementary/Title I</td>
<td>Atalanta (GA)</td>
<td>Georgia State Test of Basic Skills</td>
<td>In 1996, reading scores rose from 29% to 69% in 1996; math</td>
</tr>
<tr>
<td>(urban school)</td>
<td>City Schools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friendship Valley Elementary</td>
<td>Carroll County, Maryland</td>
<td>MSPAP (Maryland School Performance Assessment Programs)</td>
<td>Scores rose across all six areas assessed with large gains in writing (27%), language (20.1%), and science (18.2%). Friendship Valley scores were second highest in the whole state in 1996 and have continued to grow in recent years</td>
</tr>
<tr>
<td>School/Description</td>
<td>Location</td>
<td>Test Instrument</td>
<td>Result</td>
</tr>
<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td>Windemere Elementary</td>
<td>Wet Orange County, Florida</td>
<td>Florida Writes! State Assessment, Stanford-8 Achievement Test</td>
<td><strong>Writing:</strong> Significant rise in combined writing scores (from 2.7 - 3.4) on a 6-point scale. <strong>Reading:</strong> For two years scores were Level at 68% and rose to 80% after implementation of Thinking Maps. In 1997. <strong>Math:</strong> For two years scores were level at about 79% and rose to 92% after implementation.</td>
</tr>
<tr>
<td>(suburban school)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carl Waitz Elementary/100%</td>
<td>Mission, Texas</td>
<td>Texas State: TAAS (Texas Assessment of Academic Skills)</td>
<td><strong>Reading:</strong> Rose from 62.7% to 88.2% in 1994. <strong>Math:</strong> Rose from 41.2% to 76.5%</td>
</tr>
<tr>
<td>Title I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Catawba County School</td>
<td>North Carolina</td>
<td>North Carolina State End-of-Year Tests</td>
<td><strong>Results and Awards:</strong> All school in Catawba County were trained in Thinking Maps form 1993 - 98. Below are results from several of the pilot schools that showed significant growth over multiple years. Fourteen schools received &quot;exemplary&quot; status form the state, and five of these received the &quot;Schools of Distinction&quot; status.</td>
</tr>
<tr>
<td>Claremont Elementary</td>
<td>Catawba County</td>
<td>North Carolina State End-of-Year Tests</td>
<td><strong>Writing:</strong> From 1993-96, scores rose from 33% to 46% to 68% at the 4th grade level.</td>
</tr>
</tbody>
</table>