

STRATEGY: Thinking Maps - Tools for Learning

The Thinking Maps are a common visual language based on FUNDAMENTAL COGNITIVE PROCESS that is transferable across disciplines and among grade levels. Administrators, parents, teachers and students use this toolkit to facilitate content learning, reading comprehension, decision-making, problem-solving, written and verbal communication and knowledge creation. Used together as a language, whole schools apply these graphically and cognitively consistent, flexible tools to support students' continuous cognitive development through their entire schooling career and to promote the development of a collaborative professional learning community.

SKILLS ADDRESSED: 8 FUNDAMENTAL COGNITIVE SKILLS

Each thinking skill is paired with a graphic primitive map. **Page 1-9 manual**

DEFINING IN CONTEXT

DESCRIBING

COMPARING AND CONTRASTING

CLASSIFYING

SEQUENCING

CAUSE AND EFFECT REASONING

PART-WHOLE RELATIONSHIPS

SEEING ANALOGIES

STEPS INVOLVED IN BUILDING THINKING FLUENCY

1. **Introducing the maps:** Teachers model one map/ week to the students introducing the cognitive vocabulary attached to that particular graphic. Students immediately practice the map and skill.
2. **Shared Responsibility:** After the introductory period, teachers should continue to emphasis the thinking vocabulary that occurs in content to help students identify the thinking process. Teachers should coach students to find key words in text and ask, "What kind of thinking? Which map(s) could we use? How can we think about this?" Students can start selected the appropriate thinking depending on the task?
3. **Student Ownership:** Students build fluency with their thinking by selecting appropriate maps based on the thinking skills they are performing.
4. **Student Fluency:** Students use multiple-maps to process information.

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - The Frame

SKILLS ADDRESSED

COGNITIVE SKILL: CONTEXT AND PERSPECTIVE

- Answering the questions: What prior knowledge, experiences, emotions, customs, beliefs, values and cultural influences are shaping my understanding of this thing, idea, topic or concept? From what perspective am I viewing and understanding this thing? How do I know what I know? Where did I get my ideas? What other perspectives exist?
- Frame of reference and point of view
- identifying sources, influences, motivations
- establishing and recognizing personal bias, lenses, angles or filters

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand terms such as: perspective, source, influences, etc.
- Students have practice with reflection and thinking beyond the surface.

STEPS INVOLVED

1. Teachers or students can place a Frame of Reference around any map at any time during instruction.
2. Students should examine the information that already exists on the map and ask themselves, "Why do I think about it in that way? What is influencing or shaping my understanding?" Or ask any of the other frame questions mentioned above.
3. Students should record their ideas in the Frame of Reference around the outside of the map. Students could:
 - prioritize, assess, question or categorize the influences
 - Try to identify which perspectives or points of view are missing
 - Identify which filters seem to dominate: emotional, spiritual, familial, political
4. Students should think how someone else might perceive the same topic. Look at the topic from another point of view with a new frame of reference.

RELATED LEARNING PRINCIPLES

- Self discovery and connection to support meaning making.
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding reflection and metacognition.

APPLICATION

- Examining multiple perspectives from history, literature, political issues/stances
- Evaluating and questioning sources of information
- Pre-Writing tool for persuasive essays, diaries, journals, point of view writings

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Bubble Map

SKILLS ADDRESSED

COGNITIVE SKILL: DESCRIBING

- Answering the questions: What are its attributes, qualities, traits, characteristics and properties? How would you describe this thing? What does it look like, feel like, etc?
- Describing using adjectives: sensory, emotional /aesthetic, and logical qualities
- Vocabulary development and enrichment
- Distinguishing between fact and opinion
- Improving observation skills in science and vivid language use in writing

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand senses and words related to emotions

STEPS INVOLVED

1. Teacher or students decide on an object, event, thing to be "qualified" and place that word in the center bubble of the Bubble Map.
2. Students individually, in partners, groups or as a whole class generate words to describe that thing by using sensory words (rough, striped), emotional words (dangerous, threatening) and logical (heavy, large). Those words are added one word/bubble as they are generated.
3. Teacher might have to ask follow-up questions like, What does it look like, feel like, etc to help students or use a concrete object to describe to support the use and understanding of adjectives or adjective phrases.
4. Depending on the purpose/direction of the lesson and on the information in the Bubble Map, students could:
 - write a sentence using several adjective phrases that describes the topic
 - categorize the qualities on a Tree Map with color coding
 - frame the Bubble Map to provide evidence to support the adjectives stated
 - sort qualities into fact or opinion
5. Students should revise the Bubble Map as they learn new information and refer to it when composing writing or giving oral presentations. They could use different colors each time they update the information to see what they had learned over time.

RELATED LEARNING PRINCIPLES

- Connotation and denotation of words.
- Providing evidence for opinions.
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding information processing and metacognition.

APPLICATION

- Developing synonyms and adjective formation
- Inference tool
- Character/Biographical Analysis
- Notetaking for science observation
- Pre and Post assessment tool for before and after a learning episode
- Pre-writing tool for descriptive writing or character sketch before sequencing (Flow Map)

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Double-Bubble Map

SKILLS ADDRESSED

COGNITIVE SKILL: COMPARING AND CONTRASTING

- Answering the questions: How are these things, ideas, etc similar and different? How are they alike? What are the corresponding qualities to compare and contrast? Are they more alike or different? What are the most important qualities that are similar and different?
- Vocabulary development and enrichment
- Distinguishing between fact and opinion

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand cognitive terms similar/different and compare/contrast

STEPS INVOLVED

1. Teachers or students decide on two things to compare and contrast, and write those two words in bubbles somewhat spaced and centered on the page.
2. Students individually, in partners, groups or as a whole class record the similarities in bubbles located between the two things being compared. Make sure the similarity is connected by a line to each thing being compared. Use color coding(3 colors) to help distinguish between similarities and differences.
3. On the outside of each thing being compared/contrasted, record the things that are different. One line should connect the word to the thing it represents.
4. Depending on the purpose/direction of the lesson and on the information in the Double-Bubble Map, students could:
 - prioritize the comparison by finding the most important similarities and differences and color-coding them
 - frame the Double- Bubble Map to provide evidence to support the thoughts
 - sort ideas into fact or opinion
 - create a metaphor or an analogy (Bridge Map) from the comparison
5. Students should revise the Double-Bubble Map as they learn new information and refer to it when composing writing or giving oral presentations.

RELATED LEARNING PRINCIPLES

LANGUAGE AND CULTURE: The way one evaluates and compares and contrasts information will be different depending on what they perceive, how they have experienced it and what they value.

- Providing evidence for opinions.
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding information processing and metacognition.

APPLICATION

- Comparing and contrasting characters, cultures, historical figures, emotions, creatures, systems, time periods, etc.
- Pre and Post assessment tool for before and after a learning episode
- Pre-writing tool for compare and contrast essay

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Flow Map

SKILLS ADDRESSED

- **COGNITIVE SKILL: SEQUENCING**
- Answering the questions: What is the sequence, order or process of this thing or event? How can I sequence this information or these ideas? What happened first, next, last?
- order, processes, procedures, cycles, chronology, timelines, plot
- transition words: first, then, next, finally ,etc.

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand terms: sequence, procedure, timeline, order, plot

STEPS INVOLVED

1. Teachers or students are learning a particular concept that lends itself to sequencing.
2. Students individually, in partners, groups or as a whole class continue to discuss, read, or explore a subject area and put one idea per box arranging them in order.
3. Depending on the purpose/direction of the lesson and on the information in the Flow Map, students could:
 - look for better or other ways to sequence information
 - frame the Flow Map to provide evidence to support the thoughts
 - look for substages to add, reposition or combine into a major stage
 - look to see if they can synthesize the steps
 - combine the Flow Map with the Multi-flow map to predict effects
4. Students should revise the Flow Map as they learn more information and see the most efficient way of representing the cycle or timeline or procedure to construct a coherent sequence.

RELATED LEARNING PRINCIPLES

LANGUAGE AND CULTURE: Different cultures will view time, steps in a procedure or patterns differently depending on their context.

- Seeing patterns.
- Planning, anticipating obstacles, readjusting and following through.
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding information processing and metacognition.

APPLICATION

- plotting or retelling stories, events in history, or life cycles
- planning an event or writing piece
- predicting what will happen next
- Pre and Post assessment tool for before and after a learning episode
- Pre-writing tool for paragraph writing

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Tree Map

SKILLS ADDRESSED

COGNITIVE SKILL: CLASSIFYING

- Answering the questions: How can I group or categorize these things? What other things belong in this category? Does a thing or idea fit into more than one category? What are the ways to classify these things? What are the types of things?
- What is the main idea and what are the supporting details?
- Compare and contrast
- Identifying qualities
- Hierarchies, taxonomies, themes

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand terms: classify, sort, group, categorize, main idea, details

STEPS INVOLVED

1. Teachers or students are learning a particular concept and can group similar ideas together and name that category which is one branch of the Tree Map.
2. Students individually, in partners, groups or as a whole class continue to discuss, read, or explore a subject area and look for more ways to group information. As they discover patterns, they should group them into more categories and subcategories. Students can use color coding to separate the categories.
3. Depending on the purpose/direction of the lesson and on the information in the Tree Map, students could:
 - look for items that belong to more than one category
 - frame the Tree Map to provide evidence to support the thoughts
 - look for a way to reclassify the information
4. Students should revise the Tree Map as they learn more information and see what categories they need to find more information about before using it as a prewriting or speaking tool.

RELATED LEARNING PRINCIPLES

LANGUAGE AND CULTURE: Different cultures will categorize, re-categorize and use different words for categorizing depending on what influences their perspectives.

- Making connections and reconceptualizing information.
- The more ways information is encoded, the easier the retrieval process, thereby improving memory and retention.
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding information processing and metacognition.

APPLICATION

- Classification of living things, taxonomies
- Grouping vocabulary words, categorizing sounds and spelling rules
- Notetaking for report writing
- Pre and Post assessment tool for before and after a learning episode
- Pre-writing tool for paragraph writing

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Brace Map

SKILLS ADDRESSED

COGNITIVE SKILL: WHOLE TO PART RELATIONSHIPS OF PHYSICAL OBJECTS

- Answering the questions: What are the parts of this whole object or concrete thing? What are the major, minor, and subparts that make the whole?
- analyzing discrete physical parts and components of something
- spatial reasoning, structural analysis
- dissection, anatomy

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand terms: whole, part
- **Brace Map is not a Tree Map on its side. Brace=physical, Tree=abstract**

STEPS INVOLVED

1. Teachers or students are analyzing the anatomy or spatial relationships of a concrete, physical object. The name of the object goes on the line representing the whole.
2. Students individually, in partners, groups or as a whole class continue to discuss, read, or explore the object looking for the parts and their position to the whole. As they find subparts, they should draw a brace of the major and add it to the map.
3. Depending on the purpose/direction of the lesson and on the information in the Brace Map, students could:
 - look for ways this thing could be put together differently
 - frame the Brace Map to provide evidence to support the structure
 - compare the structure of this thing to another object or system to understand its organization and function by using a Double-Bubble or Bridge map.
4. Students should revise the Brace Map as they learn more information and see if general rules or patterns exist in spatial relationships.

RELATED LEARNING PRINCIPLES

LANGUAGE AND CULTURE: Different cultures will see different parts, subparts, and wholes based on how that object is used or what significance it holds in their personal context.

- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding information processing and metacognition.

APPLICATION

- parts of a computer or other mechanical thing
- human body, house, flower
- Pre and Post assessment tool for before and after a learning episode

Pre-writing tool for paragraph writing

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Bridge Map

SKILLS ADDRESSED

COGNITIVE SKILL: SEEING ANALOGIES

- Answering the questions: What is the similar relationship between these two relationships? How does this system or relationship remind me of another relationship? How are these words related?
- making metaphors, connections across content and universal themes

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand terms: similarities, analogy, simile, metaphor
- Students should be instructed to look at the qualities, functions, processes of things to help find relationships.

STEPS INVOLVED

1. Teachers or students are learning a particular concept and groups can look for relationships within that concept and how that reminds them of another system.
2. Students individually, in partners, groups or as a whole class identify the relating factor that links the relationship and write that word that bridges the connection to the line of the left.
3. Students should write their first pair of words that relate to each other on the top and bottom of the left side of the bridge.
4. Students should write the next pair of words that relate to each other in the same way that the first pair relates on the right side of the bridge in the top and bottom format.
5. Read the bridge map from top to bottom with the relating factor in the middle. For example, electrons revolve around the nucleus, just as the Earth revolves around the sun. Electrons and nucleus are one pair and Earth and sun are the other pair. They have the same relationship, "revolve".
6. Depending on the purpose/direction of the lesson and on the information in the Bridge Map, students could:
 - look for other pairs of things across content areas that share the relationship in order to solidify the concept
 - frame the Bridge Map to show the influences shaping the relationships
4. Students should revise the Bridge Map as they extend it to see if all the pairs really relate in the same way. Students should try to refine the relating factor through discussion.

RELATED LEARNING PRINCIPLES

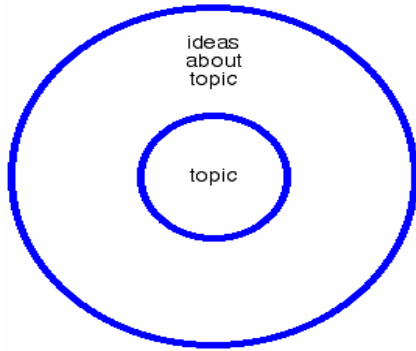
- Making connections and drawing conclusions.
- Extending concepts from one context to another.
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding language development and metacognition.

APPLICATION

- Vocabulary development
- Connecting prior knowledge to new knowledge for conceptual understanding
- Pre and Post assessment tool for before and after a learning episode
- Finding a guiding metaphor or analogy for writing

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Circle Map



SKILLS ADDRESSED

- **COGNITIVE SKILL: DEFINITION AND CONTEXT**
- Answering the questions: What do you know or what would you like to know about this topic? How would you define this thing or idea?
- Brainstorming or generating ideas about topic, issue, concept or idea
- Articulating, Evaluating, and Assessing prior knowledge
- Vocabulary Development
- Linking a concrete visual to abstract thoughts
- Encouraging expansion and refinement of ideas
- Looking for connections and patterns within information on map

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students should be encouraged to write as many ideas as they can without fear of right and wrong answers.

STEPS INVOLVED

1. Teacher or students decide on a topic to define and place in the center circle of the Circle Map.
2. Students individually, in partners, groups or as a whole class generate what they know about that topic through personal knowledge, reading, interviewing, etc., which is recorded in the outer circle.
3. Students look at the information in the map to identify patterns of information, connections, questions and misconceptions.
4. Depending on the purpose/direction of the lesson and on the information in the Circle Map, students could:
 - write a sentence that defines the topic by synthesizing the information in the Circle Map
 - use the information as a starting point for information gathering
 - categorize the information on a Tree Map with color coding
 - sequence the information on a Flow Map to demonstrate the steps in a process or to organize for writing.
5. Students should revise the Circle Map as they learn new information and refer to it when composing writing or giving oral presentations. They could use different colors each time they update the information to see what they had learned over time.

RELATED LEARNING PRINCIPLES

- Recognizing and fostering prior knowledge and personal connections.
- Encouraging patterning and connections to build concepts and improve memory.
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Facilitating and synthesizing brainstorming.
- Modeling and scaffolding information processing and metacognition.

APPLICATION

Defining Vocabulary

- Tool for Key Word Strategy or KWL chart
- Predicting what text will be about based on title, pictures, headings, etc
- Exploring a theme (prejudice, injustice, greed), main idea(things at the beach), mood (suspense) or author's purpose before, during and after reading
- Notetaking for key words as students read expository text
- Reference point for oral presentations or study guide
- Pre and Post assessment tool for before and after a learning episode
- Pre-writing tool before sequencing (Flow Map) or categorizing (Tree Map) ideas

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle

STRATEGY: Thinking Map - Multi-Flow Map



SKILLS ADDRESSED

- **COGNITIVE SKILL: CAUSE AND EFFECT**
- Answering the questions: What are the short term and long term effects of this event, issue or action? What were the causes? How does this system work?
- consequences, implications, results, lead to
- motivating factors, changes, reasons for or why
- inputs and outputs

PREREQUISITES

- Graphic and purpose must be familiar to students
- Students understand terms: cause and effect and their synonyms

STEPS INVOLVED

1. Teachers or students might be learning a particular concept or exploring an issue that demands cause and effect thinking or reading a text that presents information in a cause and effect structure.
2. Students individually, in partners, groups or as a whole class identify the main issue, event, or topic and place that in the center box.
3. Students can brainstorm the multiple causes for that event and put those causes in the boxes to the left of the main event. Repeat the same thing for the effects, recording the effects on the right side of the event.
4. Depending on the purpose/direction of the lesson and on the information in the Multi-Flow Map, students could:
 - complete one side of the map and return to it later
 - frame the Multi-Flow Map to provide evidence to support the thoughts
 - expand their thinking by finding effects of one or more of the effects or causes of one or more of the causes
 - categorize or prioritize the effects or causes. What are the different types of causes and effects? What are the most significant causes and effects and why?

RELATED LEARNING PRINCIPLES

- Making connections and reconceptualizing information.
- Feedback cycles, action and reaction
- Visually representing thoughts in order to manipulate, disaggregate, and construct articulate composition.
- Modeling and scaffolding information processing and metacognition.

APPLICATION

- behavior, discipline
- problem-solution
- historical analysis, prediction
- Pre and Post assessment tool for before and after a learning episode
- Pre-writing tool for paragraph writing

Strategy source: see *Thinking Maps: Tools for Learning Manual* by David Hyerle