Garden Grove Unified School District
Office of Secondary Education
Department of 7-12 Instructional Services

# 7th Grade Life Science

## 7-12 Science Constructing Meaning Functions Scope and Sequence

*This chart reflects the dominant and supportive language functions for production*

| | Elaboration/ Description* | Compare and Contrast* | Sequencing* | Proposition and Support* (Problem/Solution) | Cause and Effect* |
|---|---|---|---|---|---|
| 7 Life Science | **Introduced** Q1 & 3, Q2 & 4 | **Introduced** Q 1 & 3, Q2 & 4 | **Introduced** Q1 & 3, Q2 & 4 | **Introduced** Q2 & 4 | **Introduced** Q2 & 4 |
| 8 Physical Science | **Continued Practice** Q1, Q2, Q3, Q4 | **Continued Practice** Q1, Q2, Q4 | **Continued Practice** Q1 | **Continued Practice** Q1 | **Continued Practice** Q1, Q2, Q3, Q4 |
| Biology | **Mastery** Q1, Q2, Q3, Q4 | **Continued Practice** Q1, Q2 | **Continued Practice** Q1, Q2, Q3 | **Continued Practice** Q1, Q3 | **Continued Practice** Q1, Q3, Q4 |
| Physical Science (Earth) | **Mastery** Q1, Q2, Q3, Q4 | **Mastery** Q1, Q2, Q3, Q4 | **Mastery** Q2, Q3, Q4 | **Continued Practice** Q2, Q3 | **Mastery** Q1, Q2, Q3, Q4 |
| Chemistry | **Mastery** Q1, Q2, Q3, Q4 | **Mastery** Q1, Q2, Q3, Q4 | **Mastery** Q1, Q2, Q3, Q4 | **Continued Practice** Q2, Q3 | **Mastery** Q1, Q3, Q4 |
| Physics | **Mastery** Q1, Q2, Q3, Q4 | **Mastery** Q1, Q2, Q3 | **Mastery** Q1, Q2, Q3, Q4 | **Mastery** Q1, Q2, Q3 | **Mastery** Q1, Q2, Q3, Q4 |

*** The language function of summarizing is to be used throughout the curriculum in conjunction with the other language functions.**

6/23/2010

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CM Functions - Year At-A-Glance

# 7th Grade Life Science

| Quarter | Topic | Dominant and Supportive Functions |
|---|---|---|
| **1 and 3** | Scientific Method<br>Cells-Structure and Function<br>Cell Processes-Photosynthesis, Respiration, and Mitosis | Elaboration/Description<br>Compare and Contrast<br>Sequencing |
| **2 and 4** | Genetics<br>Evolution | Cause and Effect<br>Compare and Contrast<br>Sequencing<br>Proposition and Support |

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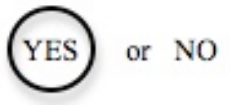
# 7th Grade Science: English Learner Support Supplement to Pacing

| Quarter 1 & 3 Standards | Functions for Production (Bold denotes dominant function) | Sample Products (Items with a double asterisk are accessible on SharePoint with "**EL Support.**" 7-12 Instruction SharePoint Site http://k12sp.ggusd.us) | Sentence Frames | Structured Oral Language Practice Routine(s) (CM Binder Tab 3) | Correlating Thinking Map(s) |
|---|---|---|---|---|---|
| 1a. *Students know* cells function similarly in all living organisms.<br><br>1c. *Students know* the nucleus is the repository for genetic information in plant and animal cells. | Does textbook provide language of dominant function for production?<br>  <br><br><br>**Elaboration/ Description**<br><br>Compare and Contrast | • **Cell Song**- Students make up a song including a minimum number of organelles and functions to any tune.<br>• **Flashcard game** – Students make flashcards with name of cell part on one side and function on the back. Pair of students use one set of cards. Place set of flashcards in between pair of students with the cell parts side up. Pairs of students race to find the correct card after teacher states a function. Student with the most cards at the end wins. Can also play with function side up. Teacher states the cell part.<br>• **Group game**- Class divided in two teams. Posters of plant and animal cells posted on white board. Post-its of cell organelles are also placed on the whiteboard. Students race to find the organelle and place it on the correct location of the poster when the teacher states a function. Student then uses sentence frame to state function.<br>• **Cell Organelle Analogy Project****– worksheet gives student spaces to write function and an analogy for each cell part.<br>• **Eukaryotic Cell Organelle Dialectical Journal**** (uses Biology IR references)<br>• **Pro vs. Euk Dialectical Journal**** (uses Biology text references)<br>• **Summary Template****-Single paragraph compare/contrast prokaryotic and eukaryotic cells<br>• **Cell Dialectical Journal****<br>• **Summary Template****-Single paragraph on cell organelles | **Elaboration/ Description**<br>• This (organelle) is called (name of part) and its function is _____.<br>• This (cell part) is essential for the _____because (function).<br>• _____ has _____ and is know for _____.<br>• _____ can be described as_____.<br>• Characteristics (components) of _____ include _____ and _____.<br><br>**For Cell Analogy Project:**<br>• The _____ is like a _____ because_____.<br>• _____ has a similar function because _____. | • **Whip Around**<br>To first survey your students' prior knowledge.<br>• **Think (Write)-Pair-Share**<br>• **Give One Get One**<br>Students write cell part, function and what type of cell it is found in on a card. Then they need to rotate around to get all the information for each cell part by exchanging information. They need to state the function orally before they record it. Use the frame below:<br>My selected organelle is _____ this organelle is found in _____ and its function is _____. | **Circle Map**<br>With "nucleus" or any part that you select in the center:<br>_____ has _____ and is known for _____.<br>_____ can be described as.<br><br>Put "cell" in the center.<br>Characteristics (components) of _____ include _____ and ___ .<br>  <br><br>**Bridge Map**<br>Make a bridge map as a draft for an original cell analogy.<br>_____ and ____ share the same characteristics.<br>Both _____ and _____ can be described as____.<br>  |

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|---|---|---|---|---|---|
| 1b. *Students know* the characteristics that distinguish plant cells from animal cells, including chloroplasts and cell walls. | Does textbook provide language of dominant function for production?<br>YES or NO<br><br>**Compare and Contrast** | • **Double Bubble**<br>• **Foldable** – one side plant cell, one side animal cell.<br>• **Summary** – students create a summary based on their thinking map using compare contrast language. Sample summary template:<br>There are _____main differences between_____ & _____. One difference between _____is _____. Another difference is _____have _____, whereas _____. Lastly, _____.<br><br>• **Summary Template**-**Single paragraph compare/contrast animal and plant cells<br>• **Summary Template**-** Plant cell organelles | **Compare and Contrast**<br>• Although ___ and ___ have some similar characteristics, they are very different because _____.<br>• The primary distinction between ___ and ___ can be described as _____.<br>• The differences/ similarities between ___ and ___ are _____.<br>• Characteristics (components) of _____ include _____ and _____. | • **Think (Write)-Pair-Share**<br>• **Give One Get One** | **Double Bubble Map**<br>plant vs. animal cells<br>  |

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|---|---|---|---|---|---|
| 1d. *Students know* that mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis. | Does textbook provide language of dominant function for production?<br>YES or NO<br><br>**Elaboration/ Description**<br><br>Compare and Contrast | • **Photosynthesis poster** – Teacher gives students the brick words. In groups students draw photosynthesis labeling all of the brick words in the picture. Ex: $CO_2$ – students use arrows to show whether it is going into or out of the plant.<br>Possible Brick Words:<br>Plant, water, leaf, roots, glucose, stomata, sunlight, chloroplast, oxygen, chlorophyll, $CO_2$<br>• **Multi-Flow Map**<br>Students label what goes in and out of the cell during photosynthesis. Another map can be used to show what goes in and out during cellular respiration.<br>• **Summary Template**** - Photosynthesis sequencing<br>• **Summary Template**** - Cellular respiration sequencing<br>• **Photosynthesis Dialectical Journal** (uses Biology Textbook references)**<br>• **Cellular Respiration Dialectical Journal** (uses Biology Textbook references)**<br>• **Gallery walk of posters and summaries.** | **Elaboration/ Description**<br>**Photosynthesis Poster:**<br>• The way that (brick word) relates to (photosynthesis) is_____.<br>**Summary:**<br>• _____ is a process used by _____that involves _____. The essential components needed for (photosynthesis) are _____. The main outcome of (photosynthesis) is _____. In closing _____ is important because_____. | • **Talking Chips**<br>To make sure each student uses a sentence frame while dialoging during poster creation.<br>• **Think (Write)-Pair-Share**<br>• **Lines of Communication** | **Circle Map**<br>Mitochondria are frequently associated with _____ and are associated with _____.<br>  <br>**Double Bubble Map**<br>Cellular respiration vs. photosynthesis: While ____ and ____ are both _____, there are several major differences between them. One of the key characteristics of _____ is _____.<br>  |

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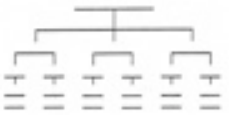
|---|---|---|---|---|---|
| 1e. *Students know* cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes.<br><br>1f. *Students know* that as multicellular organisms develop, their cells differentiate. | Does textbook provide language of dominant function for production?<br>(YES) or NO<br><br>**Sequencing** | • **Mitosis flip book****<br>Students draw steps of mitosis as it progresses from one phase to another to validate understanding of what is happening phase to phase.<br>• **Model mitosis using manipulatives**<br>Students use yarn and other materials to model each phase of mitosis.<br>• **Human flow map**<br>6 students are given pictures of the phases of cell division. They are to order themselves in the proper sequence. Then other students are called on to report the events pictured using the sentence frames. (Students will write as well)<br>Sample frame: (name of student holding picture) is holding (phase). One piece of evidence to support this is _____.<br>• **Alternative activity**<br>Have two sets of pictures and students race to see who can put them in the proper order first.<br>• **Mitosis Flow Map ****<br>(cell cycle) has sentence frames for details within phases | **Sequencing**<br>• In the beginning,_____. In the middle, _____. In the end, _____.<br>• First, _____ happened. Then, _____ occurred and _____. Eventually, _____. | • **Think (Write)-Pair-Share**<br>• **Numbered Heads Together**<br>Teacher describes an event in mitosis and the students discuss what phase it occurs in. | **Flow Map**<br>Steps of Mitosis<br>  <br><br>**Tree Map**<br>With all the different phases and the details of each phase listed below:<br>(phase) is characterized by (event).<br>_____ is a key event that happens in (phase).<br>  |

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|---|---|---|---|---|---|
| 7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. | Does textbook provide language of dominant function for production?<br>YES or NO<br><br>**Sequencing** | • **Drops on a penny lab****<br>Variations available on the internet.<br>www.thesciencequeen.net/**Drops**%20on%20a%20**penny**.doc<br><br>http://sciencespot.net/Media/pennylab.pdf<br><br>• **Advertisement activity**<br>Students in groups write a controlled experiment testing the claim of an advertisement from a magazine.<br>• **Mealworm Lab****<br>Students conduct various experiments on mealworms demonstrating all the steps of the scientific method.<br>• **Scientific Method Summary Template**** (one version includes a rubric), student sample | **Sequencing**<br>• In the beginning,_____. In the middle, _____. In the end, _____.<br>• First, _____ happened. Then, _____ occurred and _____. Eventually, _____. | • **Lines of Communication**<br>To share their map<br>• **Gallery Walk**<br>To share their map. (Not in CM Binder) | **Flow Map**<br>The steps of the scientific method<br>  |

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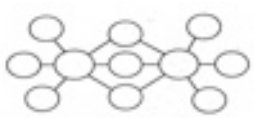
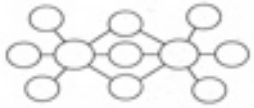
|---|---|---|---|---|---|
| 2a.*Students know* the differences between the life cycles and reproduction methods of sexual and asexual organisms. | Does textbook provide language of dominant function for production?<br>YES or NO<br>**Compare and Contrast** | • **Double Bubble Map**<br>Sexual vs. Asexual reproduction<br>• **Summary Template****<br>Based on the double bubble map, compare/contrast using template. | **Compare and Contrast**<br>• While _____ and _____ are both _____, there are several major differences between them. The most noticeable is _____. | • **Talking Chips** Groups of four, students share one of their differences. | **Double Bubble Map**<br>Use the following frames to have students interpret the map:<br>_____ is different than _____ because _____.<br>  |
| 2b. *Students know* sexual reproduction produces offspring that inherit half their genes from each parent. | Does textbook provide language of dominant function for production?<br>YES or NO<br>**Sequencing**<br>Elaboration/ Description<br>Compare and Contrast | • **Meiosis CM Lesson**** uses Biology text as reference<br>• **The day in the life of a cell** Students create a comic/biography. Each phase of meiosis is told through the perspective of the cell.<br>• **Summary Template****<br>Compare/contrast of mitosis/meiosis using summary template. | **Sequencing**<br>• The first step of (Meiosis) is _____which is illustrated by _____.<br>• _____ is characterized by several distinct features, such as_____.<br>• _____ can be identified by _____.<br>Compare and Contrast<br>• Both _____ and _____ are_____.<br>• However _____ is associated with _____. Whereas _____ involves _____. | • **Think (Write)-Pair-Share**<br>Using the following prompt and sentence frame:<br>Prompt = At the end of meiosis, why does the daughter cells get only half of the chromosomes?<br>Between the two of us we think that the daughter cells get only half of the chromosomes because _____.<br>• **Lines of Communication** What is the difference between mitosis and meiosis | **Flow Map**<br>Have students use the sample frames below to explain the steps of meiosis shown in their map:<br>First _____, then _____ next _____.<br>The first step of (meiosis) requires _____.<br>  <br>**Double Bubble Map**<br>Mitosis vs. Meiosis<br>  |

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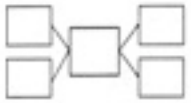
|---|---|---|---|---|---|
| 2c. *Students know* an inherited trait can be determined by one or more genes.<br><br>2d. *Students know* plant and animal cells contain many thousands of different genes and typically have two copies of every gene. The two copies (or alleles) of the gene may or may not be identical, and one may be dominant in determining the phenotype while the other is recessive. | Does textbook provide language of dominant function for production?<br>YES or NO<br><br>**Elaboration/ Description**<br><br>Does textbook provide language of dominant function for production?<br>YES or NO<br><br>**Cause and Effect** | • **Genes & Alleles Dialectical Journal****<br>• **Summary Template****-- Genes and Alleles<br>Students write a summary describing genes and alleles.<br>• **Punnett squares**<br>• **Genetic traits labs****<br>http://sciencespot.net/Media/gen_smilewkst1.pdf smiley face lab<br><br>Students flip coins to assign traits. Demonstrating understanding of dominant/recessive traits, polygenic traits (traits controlled by more than one gene). Students draw their individual depicting all their traits. Students can then present their products using frames for speaking and writing. Variations online (baby lab, supermodel lab)<br>• **Summary Template for Lab Activity****<br>Generic Summary template | **Elaboration/Description**<br>• The dominant trait is _____, whereas the recessive trait is _____.<br>• One example of _____ is _____.<br>• _____ can be described as _____.<br>• Indicators of _____ are defined as _____.<br><br>**Cause and Effect**<br>• If the genotype is _____ then the phenotype is _____.<br>• Due to the fact that ____, it will most certainly _____.<br><br>**Genetic Trait Lab**<br>• Some dominant traits my offspring expressed are _____.<br>• Some recessive traits expressed are _____. | • **Numbered Heads Together**<br>Each group gets a punnett square to solve. Then one student shares how they completed the problem.<br>• **Give One Get One**<br>To discuss what they learned from this standard. Then share out using the sentence frame: I learned from _____ that _____. | **Multi-Flow Map**<br>Genotypes going into the map and phenotypes going out of the map. Sample frames:<br>If _____ was the genotype then the result will be _____.<br>Because of _____ the _____ is _____.<br>Due to the fact that _____ mostly certainly _____.<br>_____ have/has caused _____. Which in turn, results/resulted in _____.<br>  |

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|---|---|---|---|---|---|
| 2e. *Students know* DNA (deoxyribonucleic acid) is the genetic material of living organisms and is located in the chromosomes of each cell. | Does textbook provide language of dominant function for production?<br>YES or NO<br><br>**Elaboration/ Description** | • **DNA model activity**** – Students cut out pieces (adenine, guanine, cytosine, thymine, sugar, phosphate) DNA only goes together one way since the pieces are like puzzle pieces http://www.karenmayes.com/pages/dna.pdf<br>• **Dog trait activity**** – Students pull pieces of DNA that code for specific traits. They then draw a dog that corresponds with their DNA. http://learn.genetics.utah.edu/content/begin/traits/activities/<br>• **Summary Template for Dog Trait Lab Activity**** (using content specific vocab)<br>• **Summary Template for Lab Activity****<br>Generic Summary template | **Elaboration/ Description**<br>• Components of _____ include _____.<br>• _____ can be described as _____. | • **Think (Write)-Pair-Share**<br>• **Talking Chips**<br>To share their summary in their groups.<br>• **Gallery Walk**<br>Students post the pictures of their dogs on the walls. Students check other student's work to make sure the DNA matches the dog with the accompanying summary on the bottom of the picture. (Not in CM Binder) | **Bridge Map**<br>Relating factor is "carries instructions for" e.g. DNA carries instructions for the cell whereas, a recipe carries instructions for baking a cake.<br>Sample sentence frames:<br>_____ carries instructions for _____ whereas, _____ carries instructions for _____.<br>_____ and ____ are similar because they are both .<br>  |

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|---|---|---|---|---|---|
| 3a.*Students know* both genetic variation and environmental factors are causes of evolution and diversity of organisms.<br><br>3b. *Students know* the reasoning used by Charles Darwin in reaching his conclusion that natural selection is the mechanism of evolution.<br><br>3e. *Students know* that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient for its survival. | Does textbook provide language of dominant function for production?<br>YES or NO<br><br>**Cause and Effect**<br><br>Proposition and Support | • **Multi-Flow Map Poster project**<br>Causes – specific features of the animal (ex whiskers, ears etc.)<br>Effects – how that particular feature helped it survive in that environment.<br>In center – Adaptation of (animal)<br>• **Peppered Moth Lab**** – Students race to see how many moths they can collect in a given time. A variety of Moths are used, some that blend in with the background and others that do not.<br>• **Peppered Moth PPT****- teacher created resource<br>• **The Natural Selection of Stick Worms** http://www.indiana.edu/~ensiweb/lessons/ns.st.wm.html<br>• **Summary Template for Lab Activity****<br>Generic Summary template<br>• **RAFT- Survival of the Fittest**** | **Cause and Effect**<br>• Because of _____, the _____ is _____.<br>• Due to the fact that _____, it will most certainly _____.<br>• Without _____ an organism will _____.<br>• I predict that _____ since I observed _____. | • **Talking Stick**<br>Students share the sentences they created.<br>• **Give One Get One**<br>Students share their ideas from their multi-flow map | **Circle Map**<br>Introduction activity<br>Adaptation of a _____(choose animal)<br>Students collaborate to discuss specific characteristics of the animal and justify why those characteristics allow it to survive in its environment.<br>Students use the sample frames to discuss their map:<br>I believe that _____ has _____because_____ .<br>_____ is evidence that _____.<br>  |

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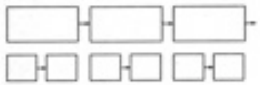
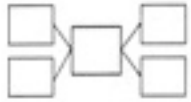
|---|---|---|---|---|---|
| 3c. *Students know* how independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution. | Does textbook provide language of dominant function for production?<br>YES or NO<br>**Proposition and Support** | • **Whale flow map** - get generic whale evolution diagram through Google images. Students identify the different characteristics from one fossil to the next. Students predict the environmental factors that may have caused the physical differences between each fossil. Variation – students can cut out whale fossils and attempt to place them in the correct order first. Then do the above activity.<br>• **Summary Template**** Sequence of Whale Evolution | • **Proposition and Support**<br>• I believe that _____. I believe this because _____.<br>• The evidence suggests that _____.<br>• Nevertheless, the evidence strongly suggests that ___.<br>• In support of ____ I would argue that _____. | • **Three Step Interview-** Students discuss their predictions of the whale flow map. | **Flow Map**<br>  <br>**Multi- Flow Map**<br>  |
| 3d. *Students know* how to construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and how to expand the diagram to include fossil organisms. | Does textbook provide language of dominant function for production?<br>YES or NO<br>**Elaboration/ Description** | • **Fossil/Branching Activity** Students cut out organisms and place them in the appropriate spot on the cladogram (branching diagram). Then students can add the common characteristics shared between the organisms. (See pgs. 347-348 in textbook as an example of the type of diagram to use in the activity)<br>• **Design a Branching Diagram Activity****<br>• **What Did *T. rex* Taste Like?** An online simplified version of the process used to generate cladograms. http://www.ucmp.berkeley.edu/education/explorations/tours/Trex/index.html | • **Elaboration/Description**<br>• Characteristics shared between _____ and ____ include _____.<br>• _____ are characterized by several distinct features, such as _____. | • **Talking Stick** The common characteristics between the two organisms are _____.<br>• **Lines of Communication** Students ask each other the common characteristics they shared. They can also discuss the purpose of a cladogram or how it is used. | **Double Bubble Map**<br>Students can compare and contrast two organisms from the double bubble map verbally and in writing. _____ and _____ are similar because they share the characteristics of _____. Although _____ and _____ have some similar characteristics, they are different because _____. The most noticeable/notable is that the ____ has _____ whereas, the _____ has _____.<br>  |

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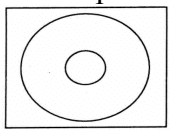
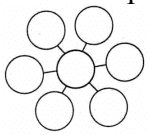
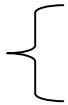
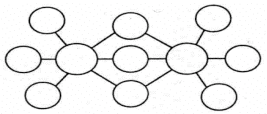
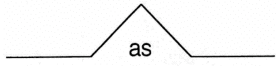
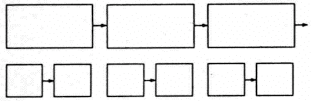
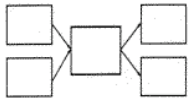
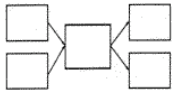
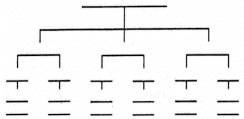
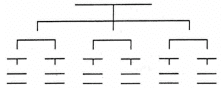
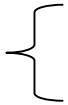
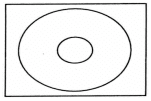
Department of 7-12 Instructional Services

# Constructing Meaning Functions and Thinking Maps

**The chart below shows the alignment between the dominant language functions (Systematic ELD and Constructing Meaning) and the eight Thinking maps. Aligning the two will support English Learners in their receptive and expressive language acquisition.**

| Language Function | Language Function | Thinking Map |
|---|---|---|
| Elaboration/ Description | Defining content and text<br>Describes attributes, qualities, characteristics and properties<br>Explain relationships of objects in space<br>Comparing whole to parts<br>Analysis of text | Circle Map  Bubble Map  Brace Map  |
| Compare/ Contrast | Compare and Contrast<br>Understand and express how two or more things are similar and how they are different<br>Understand and express the relationship between two ideas, concepts, or things | Double-Bubble Map  Bridge Map   |
| Sequencing | Sequencing and ordering<br>Relate steps in a process<br>Express time relationships and actions within a larger event | Flow- Map  |
| Cause-Effect | Cause and Effect<br>Explain the cause of an outcome<br>Explain why something occurred | Multi-Flow Map  |
| Proposition and Support | Defend an opinion<br>Explain reasoning, or justify a position<br>Classifying and sorting | Multi-Flow Map  Tree Map  |
| Summarizing | Express main ideas and significant details | Tree Map  Brace Map  Circle Map  |