Thinking Skills

and

Inquiry Learning

for

Anzac Terrace Primary School

T Charts

Double Bubble

Jigsaw

KWHL

Concept Maps

ASK - SEARCH - SHARE

Contents

INQUIRY LEARNING

Forming Questions
Exploring Answers

Students being both

PROBLEM POSERS

and

PROBLEM SOLVERS

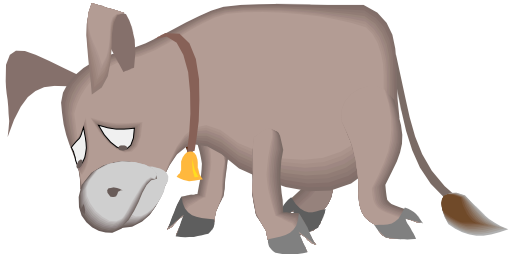
INQUIRY LEARNING

Inquiry learning is an approach that provides learners opportunities to actively develop skills that enable them to locate, gather, analyse, critique and apply information in a wide range of contexts as they develop understanding.

When inquiry learning is implemented well in a school the following criteria are being met, or there is demonstrable progress towards these criteria being met.

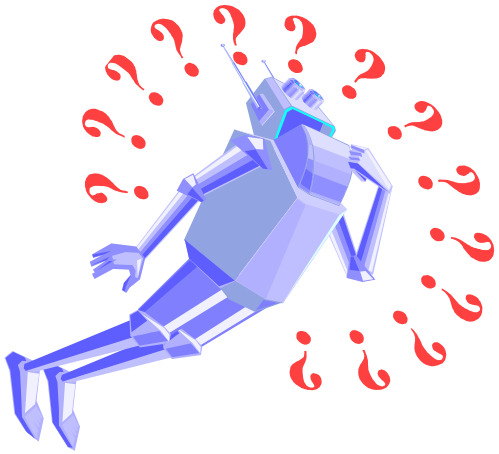
1. Students are at some stage of progression along a continuum that starts at teacher directed units, includes negotiated units through to student driven learning.
2. Students are actively supported and scaffolded by teachers in the acquisition of relevant skills.
3. Students are engaged in learning.
4. Students deepen or gain understanding of core concepts relevant to the context.
5. Students work collaboratively in small groups.
6. Students use and apply the information then share their solutions, decisions, thinking and outcomes in a celebration of understanding. They are not involved in a process of shifting and sharing information.
7. Students will access a range of information sources.
8. Students predicate their work on prior knowledge.
9. Students will be actively engaged in asking and following up on questions as a central skill.

Don’t be a Donkey!



Be an ASS

ASK
SEARCH
SHARE



ASK QUESTIONS

SEARCH for Answers

SHARE your Work

Tuning In

What do I already know?

What do I need to know?

What would I like to know?

Where will I find out?

How will I find out?

What do I want to do?

How will I share my work?

"The ASKING part"

Finding Out

Sorting Out

Gather **Locate**

Search for

Describe **Identify**

Select **Talk about**

Compare **Order**

Explain **Classify**

Analyse **Sort**

"The SEARCHING part"

Sharing

Talking to **Talking about**

Written **Pictures**

Charts

PowerPoint

Graphs **Tables**

Reflecting **Thinking about**

Self—Assessing

"The PRESENTING part"

ANZAC TERRACE PRIMARY SCHOOL
THINKING SKILLS SCOPE and SEQUENCE YEARS K - 7

Kindergarten / PrePrimary	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
T – Chart ➢ *Looks like* ➢ *Sounds like* **Y – Chart** ➢ *Looks like* ➢ *Sounds like* ➢ *Feels like* **Venn diagram (2)** **KWL** ➢ *What do I **KNOW**?* ➢ *What do I **WANT** to know?* ➢ *What have I **LEARNED**?*	**X – Chart** ➢ *Looks like* ➢ *Sounds Like* ➢ *Feels Like* ➢ *Thinks Like* **Cause and Effect Maps** **KWHL** ➢ *What do I **KNOW**?* ➢ *What do I **WANT** to know?* ➢ ***HOW** will I find out?* ➢ *What have I **LEARNED**?*	**Alphabet Ladder** **PMI** ➢ *Plus* ➢ *Minus* ➢ *Interesting* **Double Bubbles**	**Graffiti** **BROW** ➢ *Brainstorm* ➢ *Read* ➢ *Organise* ➢ *Write* **Five Whys**	**Venn Diagram (3)** **Fishbone** **Concept Maps**	**The Rake** ➢ *Touch* ➢ *Smell* ➢ *Taste* ➢ *Look* ➢ *Listen* ➢ *Think* **TREC** ➢ *Think* ➢ *Read* ➢ *Estimate* ➢ *Calculate* **Inside – Outside Circle**	**Jigsaw** **SCAMPER** **Mind Maps**	**WINCE** **Thinkers Keys** **6 Thinking Hats**

Thinking Worksheets and Easiteach

Blank proformas have been prepared and stored in a folder in the Staff drive.

In the section "School Folders" there is a folder called "Thinking Skills"
In this folder are folders representing each year group.
Contained within each of these year level folders are blank proformas that you can;

1. Open and print off for class use in hard copy
2. Copy and save to a personal folder
3. Add to the "Multimedia Bank" in Easiteach.

The proformas will be continually updated / added to as I find more to include.

Adding the Thinking Skills worksheets to Easiteach (permanently):

It is really easy!
Step 1:
Find the "Thinking Skills" folder on the staff drive.
Click on it ONCE only – do not open it.

Step 2:
Click on EDIT then COPY or
Right mouse click then COPY

Step 3:
Go to MY COMPUTER and open
Double click on your "C" drive

Step 4:
Double click on "PROGRAM FILES" (ie open it)

Step 5:
Open the folder named "RESEARCH MACHINES" (this is where Easiteach is stored)
Open the EASITEACH folder

Step 6:
Once you have opened the Easiteach folder, find the folder called "MULTIMEDIA" and open it.

Step 7:
You will see a whole host of multimedia files. You want to add the Thinking Skills folder to this group. It's easy!
Just right mouse click in the white space – find PASTE – and click it. Your Thinking Skills folder will now be in the resource bank.

Step 8:
When using Easiteach, open your multimedia bank in the normal way – finding Thinking Skills – the right year group – then simply drag the proforma into Easiteach as normal.

T Chart

T-Charts are a type of chart, a graphic organizer in which a student lists and examines two facets of a topic, like the pros and cons associated with it, its advantages and disadvantages, facts vs. opinions, what does it look like – sound like etc.

For example, a student can use a T-chart to help graphically organize thoughts about:

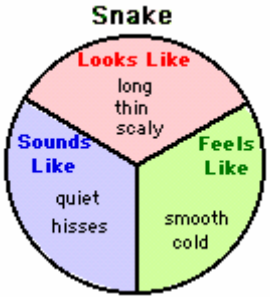
- Making a decision by comparing resulting advantages and disadvantages (like getting a pet or taking a new job).
- Evaluating the pros and cons of a topic (for example, adopting a new invention).
- Enumerating the problems and solutions associated with an action (for example, analysing the plot of a book or a topic like poor nutrition).
- Listing facts vs. opinions of a theme (great to use after reading a selection of text or a news article).
- Explaining the strengths and weaknesses of a piece of writing (useful after reading a piece of persuasive or expository writing).
- Listing any two characteristics of a topic (like the main ideas for a given topic and a salient detail for each idea).

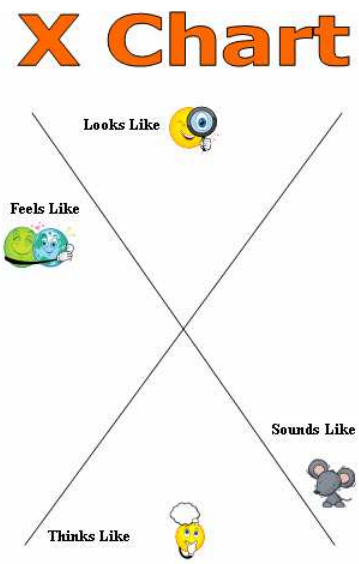
Y Chart

Y-Charts are a type of three-part chart, a graphic organizer.
For example, a student can use a Y-Chart to help organize what they know about a topic by writing and/or drawing what the topic looks like, feels like, and sounds like. The student must think about a topic with respect to three of their senses, sight, hearing, and touch.

In this case, the Y-Chart has sections in which the student writes and/or draws:

- What it looks like,
- What it sounds like,
- What it feels like (or how a character feels).





X Chart

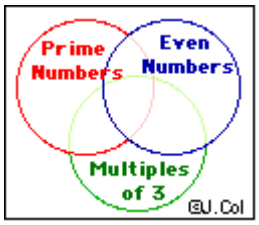
X Charts are a further extension of the T and Y Charts. They get us to think about a 4th quality, or dimension related to the topic – that is;

- What it THINKS like.

Venn Diagram – 2 Aspects and 3 aspects

A Venn Diagram is a graphic organizer that is made up of two or three overlapping circles. In mathematics, Venn diagrams are used to visualize the relationship between two or three sets.

Venn diagrams can also be used to compare and contrast the characteristics of any other items, like groups of people, individual people, books, characters, animals, etc.



KWHL or KWL Chart

KWHL Charts (also called "What I Know" Charts, KWL charts, and Know-Wonder-Learn charts) are a type of chart, a graphic organizer that help the student organize what they know and what they want to learn about a topic before and after the research is done. A variation is the **KWL chart**

A KWHL chart should be used before, during, and after a student reads about a new topic. Filling out this chart prepares a student for reading about a topic, helps in reviewing what has been learned about the material, gives help in obtaining more information, and readies the student to write about what they've learned.

- **K** stands for what you already KNOW about the subject.
- **W** stands for what you WANT to learn.
- **H** stands for figuring out HOW you can learn more about the topic.
- **L** stands for what you LEARN as you read.

What I Know	What I Want to Find Out	How I Can Learn More	What I Have Learned
Sharks eat meat	Which sharks eat people?	Search the Web	Tiger sharks are dangerous
Whale shark is biggest	What sharks is fastest?	Books from school library	Makos & Blues are fastest
Sharks eat animals	What sharks is smallest?	Go to museum	Pygmy shark is 6 inches long
Sharks are fish	What animals eat sharks?	Shark video	Killer whales eat sharks

Question: Content Focus

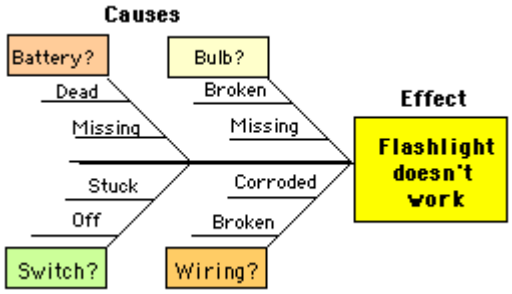
KWL Chart

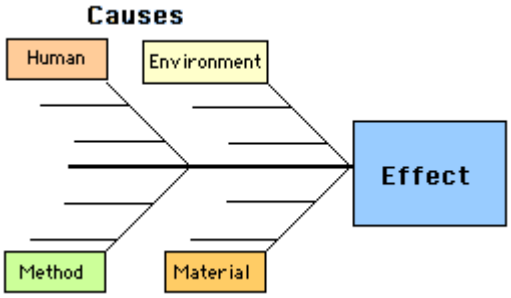
WHAT I KNOW K	WHAT I WANT TO KNOW W	WHAT I HAVE LEARNT? L
	I wonder . . . *What if . . . .* *I would like to know . .*	

Cause and Effect Diagrams

Cause and Effect diagrams, also called sequence of events diagrams, are a type of graphic organizer that describes how events affect one another in a process.

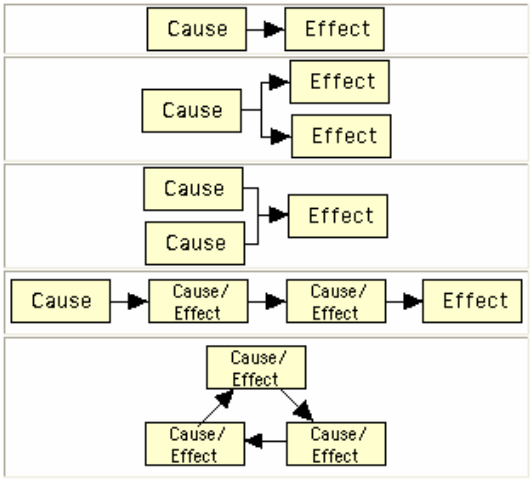
The student must be able to identify and analyse the cause(s) and the effect(s) of an event or process. In this process, the student realizes how one step affects the other.





There are many models of cause and effect events, including:

- Disjointed Events - in which each cause has one effect.
- One Cause Leading to Multiple Events - in which one cause has multiple effects.
- Multiple Causes Leading to One Event - in which multiple causes have one effect (a fishbone diagram can be used for these).
- Chain of Events - in which one event causes another, which triggers another, etc., like the domino effect?
- Cycle of Events - in which a cyclic causes/effects are repeated, like a feedback loop.
- More Complex Events - in which multiple causes and effects interact.



Alphabet Ladder

This strategy allows the class to work as a whole group or in small groups. This is a structured brainstorm, in that there is a clear start and a clear finish with obvious parameters. The resulting list can be used as a classroom resource that is placed on the wall. This strategy can cover any topic.

Process:

1. Create a vertical list from A-Z. You may leave space for 3-4 answers after each letter.
2. Ask students for examples within the topic under consideration, such as healthy foods, elements of friendship, factors which could damage the environment.
3. Students complete the list, either drawing from their general knowledge or with the aid of reference materials.
4. Once the list is completed, this can become the springboard for related activities, such as students recording their healthy food intake over a week and graphing (Mathematics) or designing strategies to promote healthier eating among students at the school (H&PE).

Alternatively, the Alpha Ladder can serve as an extension activity, by placing the ladder on the wall where students can complete in-between class activities or write their contributions as a result of their overnight research. The strategy can be quite useful as a lead-in to a forthcoming topic.

Examples:

Middle Primary Volcanoes

Search the Internet to find an 'alpha' list of world volcanoes. Use this search string to start an alphabetic list of world volcanoes.

	Volcano	Country
A		
B		
C		
D		

Junior Primary Fairytale Facts

Students record things they found in the fairytale.

	Thing	Fairytale
A	Axe	Jack and the Beanstalk
B	Bricks	Three Little Pigs
C	Constable Pugh	Cops & Robbers
D	Dwarfs	Snow White & the Seven

PMI Chart

PMI Charts are a type of chart, a graphic organizer in which a student examines the **P**lusses, **M**inuses, and **I**nteresting things (or Implications) associated with a topic, decision, or idea.

For example, a student can use a PMI chart to help organize their thoughts about making a decision (like getting a pet), evaluating the pros and cons of a debate topic (like examining the implications of the adoption of a new invention), or comparing the advantages and disadvantages of an action (like thinking about what would happen if going to school was not mandatory). For more complex decision (choosing from multiple alternatives), use decision making graphic organizers.

Moving to a Big City

+	-	i
Many jobs	Expensive	More people
Museums	Traffic	Mass transit
Restaurants	Pollution	Shopping
Parks	Crime	Close to airport

Double Bubble Map

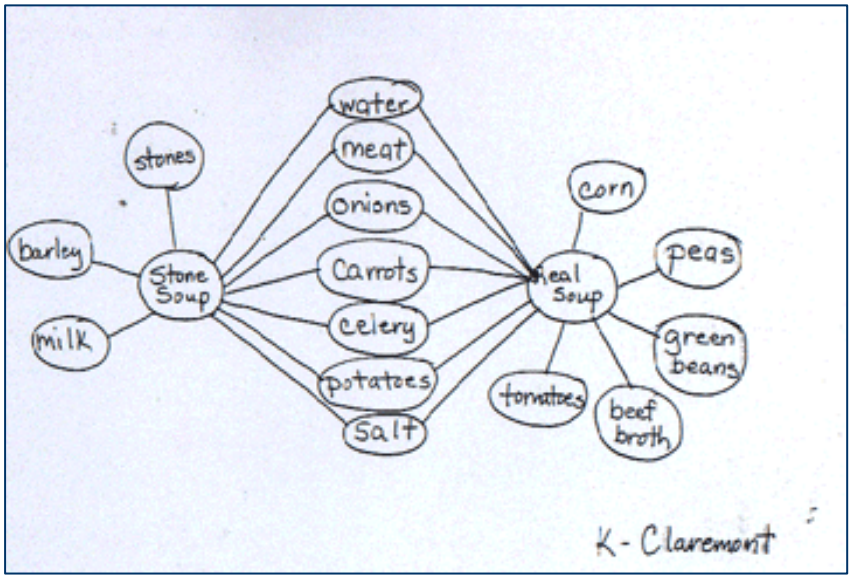
Thinking Process: Comparing and Contrasting

The Double Bubble Map is a tool for comparing and contrasting things.

The Double Bubble Map is used for **comparing and contrasting** things according to their similarities and differences. It is an extension of the Bubble Map where one thing is described. It is used in place of the Venn diagram.

Two centre circles are drawn opposite of each other on the page. In these circles are the two things being investigated. A row of vertical "bubbles" is created between these circles. In the "bubbles" are written adjectives, adjective phrases, or other words and phrases that show how the two things are alike. These "inner bubbles" are connected to both circles. Outside "bubbles" are connected to each circle. These "bubbles" contain words/phrases that describe the unique qualities of each circle

For example; "Examine the similarities and differences between these two geometric figures."



GRAFFITI WALLS / GRAFFITI BOARD

Graffiti walls are free form spaces for brainstorming or communicating words, phrases, or ideas on a topic. These are often used as evolving records. A teacher may use them to facilitate brainstorming on a particular theme at the beginning of a unit, as well as encourage students to add new words or phrases relating to the theme as the unit progresses. In addition to encouraging children to search for new and interesting words, the graffiti wall serves as a class dictionary/thesaurus as students need novel words to enrich their writing.

STICKY-NOTE DISCUSSION:

Overview

This is an active brainstorming strategy that involves your entire class in the discussion of a particular topic or issue related to your course of study or unit. With typical brainstorming in class the same hands go up, and the same kids say, "Whew! At least she did not call on me!" There is minimal active participation by the whole class. With A sticky-note discussion, you pose a question to the class and everyone needs to respond on their sticky note. They can respond with a word, a phrase, or even a picture. That is why this strategy is so powerful as an inclusionary technique. Each student has an equal opportunity to contribute his or her opinions or ideas about a topic in a non-threatening way. The sticky notes are anonymous, so they do not need to be concerned about spelling or if they got "the right answer," It is a powerful way to build background knowledge about a topic or to check for understanding. There is little preparation involved, and the results are amazing in terms of ideas generated in a short period of time.

Implementation

1 Begin by selecting a topic or an open-ended prompt or question to pose to the students. For example, you could ask; "What do you know about the Civil War?" Write this prompt or question on a sheet of chart paper or on the white board. This will become the Graffiti Board where all of the responses will be harvested. Give the students adequate think time.

2. Have students jot down then response to the prompt on their individual sticky note. This response can be in the form of a word, phrase, or picture.

3. Ask the students to share their responses with a learning partner. Have them voice their opinions and share their knowledge about the topic.

4. After the students have had adequate time to discuss their individual and paired responses, designate one of the partners to place both of the sticky-notes on the Graffiti Board.

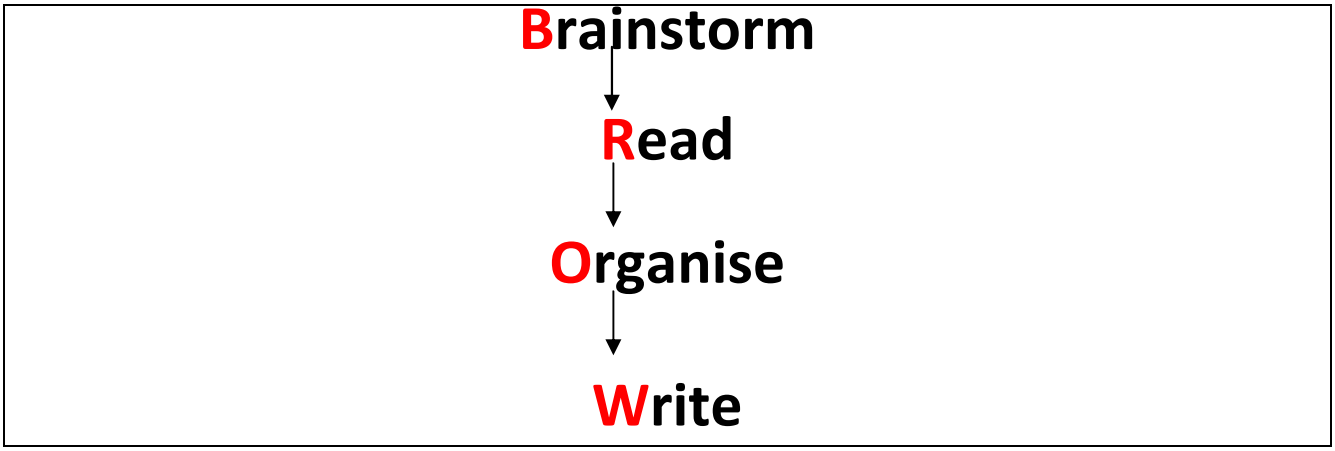
5. Review the multiple responses on the board and talk about common themes that emerge. You can ask the students how to categorize these responses. This helps build their critical thinking skills of analysis and synthesis Invite the students to take a "gallery walk" to view all of the individual responses at recess or the break to learn more.

As an activator activity this technique provides an excellent way to build, extend, and enrich the student's background knowledge about a topic as they share their responses with others and view the responses of the entire class. It provides an opportunity for them to be more focused on the topic to be taught and sets a purpose for their learning. From a teacher's perspective, this strategy us an excellent way to do a needs assessment on what the students know about a topic or issue before teaching.

As a summarizer technique, students are asked to reflect on the topic or unit that was taught. Provide them with a prompt or a question related to the topic. They write down their response on a sticky note as before. After sharing their ideas with learning partners and posting their notes on the Graffiti Board, the teacher has an opportunity to assess the level of understanding of all of the students.

Our Graffiti Board: **Topic: _____**

BROW



Description

In using **BROW** the children go through a four stage process

- **B**rainstorming
- **R**eading and reviewing
- **O**rganising
- **W**riting

Thinking skills

Fluency, flexibility, originality, problem-solving, organising. **Scenario**

You have been chosen to design a marketing campaign for a new boat. You will need to prepare a single page advertisement for the boat. The advertisement may be for a newspaper, magazine or a website.

- Brainstorm all the different techniques that are used in advertising.
- Read and review other advertisements for new boats. Add to your list the important things these advertisements mention and the techniques used.
- Organise your information, pictures and words for your own advertisement. •Write and produce your advertisement.

FIVE WHYS

When is it used?
At any time to promote deep thinking through questioning

Process:
To employ a **"Five Whys"** a question, problem or issue is asked.
This is answered by asking "why?"
The answer then becomes the question and 'why' is then asked again.
The process is repeated five times with the final answer providing a deeper example of student thinking.

Example:

Q. Why am I returning to Year 11?
A. Because I would like to attain my Higher School Certificate

Q Why do I want to receive my Higher School Certificate?
A. Because I would like to study Art at the University?

Q. Why would I like to study Art at the University?
A. Because it will allow me to gain employment in an area I am particularly interested in
.
Q. Why is important to gain employment in an area I am interested in?
A. This will enable me to have job and personal satisfaction

Q. Why is important for me to have job and personal satisfaction?
A. So that my life will be more fulfilling

Fishbone Diagrams

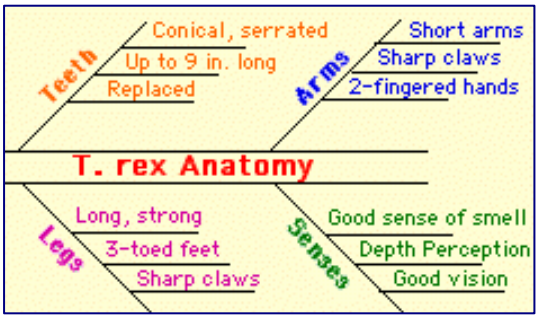
A fishbone map (sometimes called a herringbone map) is a type of graphic organizer that is used to explore the many aspects or effects of a complex topic, helping the student to organize their thoughts in a simple, visual way. The use of colour helps make a fishbone map clearer and easier to interpret.

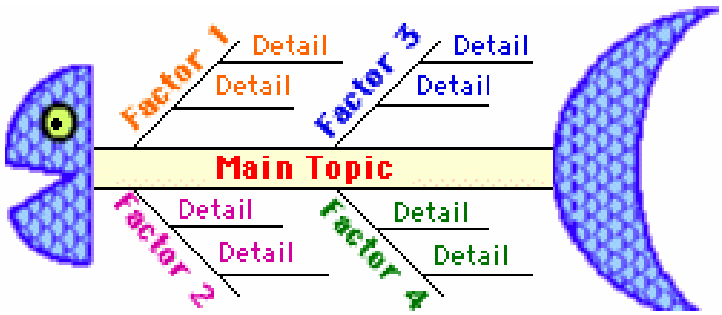
If the topic at hand involves investigating attributes associated with a single, complex topic, and then obtaining more details on each of these ideas, use a fishbone diagram as your graphic organizer. The fishbone diagram is like a spider map, but it works for more complex topics - topics that require more details to be enumerated.

The process of creating fishbone diagram helps the student focus on the topic, requires the student to review what they already know in order to organize that knowledge, and helps the student to monitor their growing comprehension of the topic. It also helps point out the areas where the student must investigate more (where the fishbone is difficult to fill out).

Examples of Fishbones: For example, a fishbone diagram can be used to prepare for a writing assignment; the student must concentrate on the main topic, list the big ideas concerning the topic, and think of the attributes/qualities/functions/effects associated with each of these ideas.

Another example is to use a fishbone map to explore the implications of improved farming methods or a new scientific discovery - or any other cause-and-effect scenario.





Concept Maps

Introduction to Concept Maps

Definition: Concept maps offer a method to represent information visually. There are a variety of such maps.

Purpose: Concept maps harness the power of our vision to understand complex information "at-a-glance." The primary function of the brain is to interpret incoming information to make meaning. It is easier for the brain to make meaning when information is presented in visual formats. This is why a picture is worth a thousand words. It is essential to your studies and career that you can handle complex information; concept maps offer one method to do this.

Practical applications in your courses:

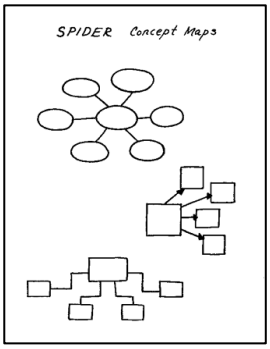
- Handy way to take notes during lecture.
- Excellent aids to group brainstorming.

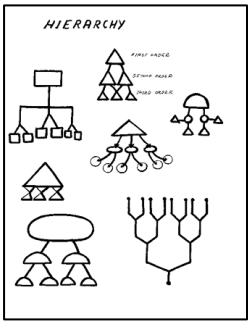
- Planning your studies and career.
- Providing graphics for your presentations and term papers
- A way to outline your term papers and presentations.
- Refine your creative and critical thinking.

Kinds of Concept Maps

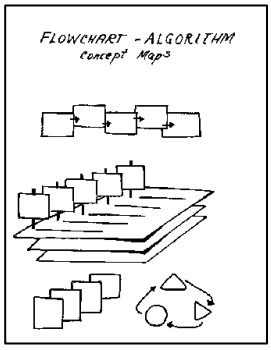
There are four major categories of concept maps. These are distinguished by their different format for representing information. Examples of the various types of concept maps are presented on the following pages. **Four Major Categories of Concept Maps:**

SPIDER CONCEPT MAP
The "spider" concept map is organized by placing the central theme or unifying factor in the centre of the map. Outwardly radiating sub-themes surround the centre of the map.

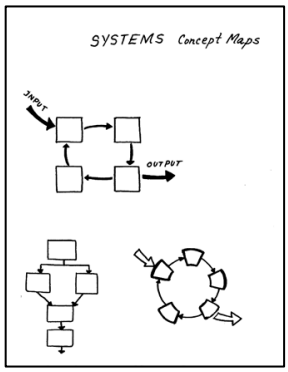




HIERARCHY CONCEPT MAP
The hierarchy concept map presents information in a descending order of importance. The most important information is placed on the top. Distinguishing factors determine the placement of the information.



FLOWCHART CONCEPT MAP



The flowchart concept map organizes information in a linear format.

SYSTEMS CONCEPT MAP
The systems concept map organizes information in a format which is similar to a flowchart with the addition of 'INPUTS' and 'OUTPUTS'.

Special Concept Maps include the following format types:

PICTURE LANDSCAPE CONCEPT MAP
These maps present information in a landscape format.

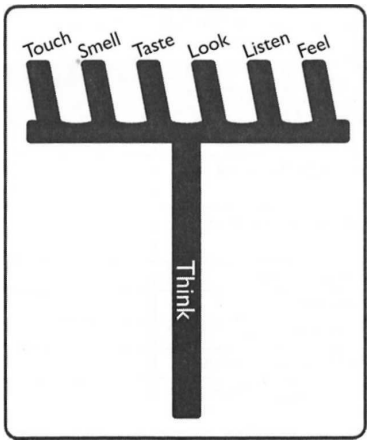
MULTIDIMENSIONAL / 3-D CONCEPT MAP
These describe the flow or state of information or resources which are too complicated for a simple two-dimensional map.

MANDALA / MANDALA CONCEPT MAP
Information is presented within a format of interlocking geometric shapes. A "telescoping" factor creates compelling visual effects which focus the attention and thought processes of the viewer.

THE RAKE

Description

The Rake has seven aspects - one each for touch, smell, taste, sight, hearing, feelings (emotions) and thinking.



Thinking skills

Describing, classifying, explaining, organising, inferring, fluency.

Scenario

You are visiting Antarctica and you find that you have lost your group. Describe your experience and then write a letter to your parents or a friend sharing with them how you have survived in Antarctica..

Often to be used a creative writing tool. It helps children focus on all the sights, sounds, smells, emotions etc associated with an event, place, person action etc.

For example:
"Imagine you are a soldier who has just landed at Gallipoli and you are creating a diary entry"

Touch: soil, body, artillery shells, guns, mud
Smell: smoke, mud, soil
Taste: smoke, food, dirt
Look: men, dirt, guns, trenches
Listen: shouting, screams, gunfire, explosions
Feel: horror, fear, terror, scared
Think : why am I here?, what about my family?

TOUCH	SMELL	TASTE	LOOK	LISTEN	FEEL	THINK
What do the objects **feel** like?	What do you **smell?**	What does it **taste** like?	What do you **see?**	What sounds do you **hear?**	How do you **feel?**	What are you **thinking?**

TREC

A thinking tool to engage children in learning Mathematics

T hink
R ead
E stimate
C alculate

THINK	READ	ESTIMATE	CALCULATE
Get your brain into action. When working with mathematics, what do we normally do?	Read the question. If you do not understand it, read it again. Discuss this problem with your group. Ask your teacher for assistance.	Estimate what you believe the answer should be. Is your estimate similar to your team members?	Carry out the calculations required. How close is your answer to your estimation? How do you know that you have the right answer?

Description

TREC involves children in a four stage framework that directs children to:

- **T**hink about numbers
- **R**ead and discuss the problem to be solved until they understand what is involved in the task
- **E**stimate what the cost of building the boat is likely to be
- **C**alculate answers.

TREC is particularly useful to scaffold children into doing maths. This tool ensures that students know what they need to do by encouraging them to go through a four stage approach. One of the critical stages is for the children to understand the problem that they have to solve. Thus, TREC encourages the children to read the question and if they still don't understand it to read it again, then to discuss it with their group and finally to ask their teacher for assistance.

Thinking skills

Recalling, interpreting, estimating, evaluating.

Scenario

You are the accountant in a small boat building business. The designers have come up with a new design (from a previous activity) and you have been asked to provide a cost for building the boat.

Use TREC to help you do the costing. •Think about numbers.

- Read the way the boat is going to be built and what will need to be included in the costs (e.g. materials and labour).
- Estimate what the cost of building the boat is likely to be.
- Carry out the required calculations.

Inside - Outside Circle

Inside/Outside Circle is a Class building strategy identified by Spencer and Laurie Kagan. It is intended to get all students (or participants) up moving around the room and interacting with one another. Because participants are standing and moving it helps get the blood flowing to their brains and breaks the 'sitting at their desks' routine. It also allows students to interact with several other students in an organized, productive manner.

Inside/Outside Circle works like this:

1. One-half of the participants stand and form a circle facing **OUT**.
2. The other half of the participants forms a circle around (outside) of the first group, the **outside** circle participants face **inside so** that each participant is facing a person from the 'other' circle.
3. Next the teacher instructs one circle to rotate. For example, the teacher may say, "Outside circle move two persons to your right".
4. The newly formed partners then respond to a question. For example: "Inside partner explain to your outside partner one possible cause of erosion".
5. Next the teacher may say, "Inside circle rotate three persons to your left" and then ask, "Outside partner predict how the read-aloud story we are reading might end".

Inside/Outside Circle works well as a review strategy and it can also be used at the beginning of a lesson or unit to bring to mind previous knowledge regarding a concept or topic. Inside/Outside Circle also works well as a get-acquainted strategy at the beginning of the semester or the year….it helps students build community.

Jigsaw

Jigsaw can be used to involve pupils in direct instruction. This term, "Jigsaw", refers to the fact that the information to be learned is taken apart. Each member of a group is required to learn part of the information before coming together to share it with the rest of the group. In this way, the whole group learns all the necessary information together.

Jigsaw helps to build a sense of positive interdependence and individual accountability among pupils. It provides opportunities for pupils to develop the following skills:

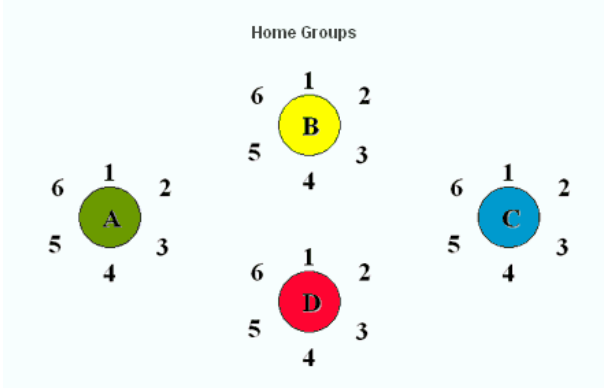
- Reading/Listening
  Pupils need to read or listen carefully in order to learn the required material so that they can teach it to the others
- Speaking
  Pupils need to verbalise the newly acquired knowledge to their group members.
- Reflective Thinking
  Pupils need to reflect and think about what was learnt before they can teach it to others.
- Creative Thinking
  Pupils need to devise new ways of approaching, teaching and presenting the material.

Variations
There are many forms of Jigsaw. Classic Jigsaw and Within-Team Jigsaw are two examples.

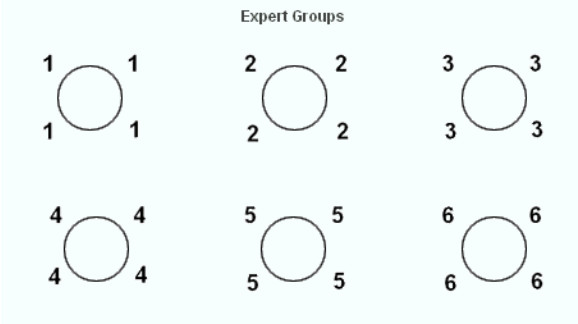
Classic Jigsaw
In this approach, pupils are put into learning groups of the same size. The group members are accountable to one another for mastering the information to be learnt. The steps involved are shown below:

Steps:

1. Divide the pupils into groups of five or six and these will form the "home groups". Assign a number (1 to 5 or 6) to pupils in each group.



2. Assign the pupils to "expert groups" according to their numbers



3. Assign different topics to each expert group. The members of each expert group have the responsibility to help each other to master the material, select the main ideas and prepare to teach the material.
4. Signal to the members of the expert groups to return to their home groups. Each expert takes turn to teach what he/she has learnt to the rest of the group.
5. Circulate from group to group to listen to the discussions, intervening only when needed.

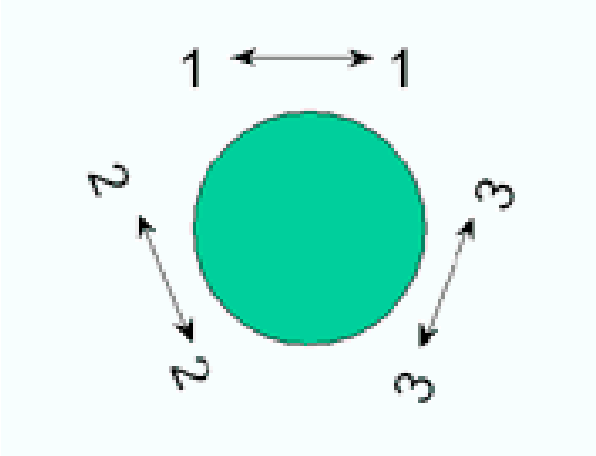
Within-Team Jigsaw

In this version of Jigsaw, there is an even number of pupils in each group. Within each group, pupils are paired off. Each pair is given part of the material to master and present to the other pair(s) in their group. Alternatively, each member of the group can be given a bit of material to master.

Steps:

1. Divide the pupils into groups of six.
2. Form pairs within each group. Give each pair part of the material to master.

3. Pupils present and share what they have learnt to the other pair(s) in their group.



SCAMPER

Reading, viewing, writing, speaking and listening

What is it?

SCAMPER is a strategy that can be used to assist students to generate new or alternative ideas. It is a tool to support creative, divergent thinking. SCAMPER is an acronym for: **s**ubstitute, **c**ombine, **a**dapt, **m**odify/magnify/minify, **p**ut to other uses, **e**liminate, **r**everse/rearrange.

What is its purpose?

SCAMPER helps students ask questions that require them to think "beyond the lines" of a text. As such, it helps develop their critical thinking skills and supports them in constructing their own imaginative texts. It is a useful cooperative learning tool and a great stimulus for role play.

How do I do it?

The strategy is often best used after students have spent some time studying a text. Explain the purpose of the strategy to the students, encouraging them to open up their minds to a range of creative possibilities. The following example shows how SCAMPER can be used to generate interesting questions when working with Goldilocks and the Three Bears.

S: Substitute **(a person, place, time or situation)**

What do you think would have happened if there had been a Crazy Scientist Bear instead of Father Bear?

C: Combine **(bring together assorted ideas and situations)**

What would have happened if the three bears were returning from a reunion with relatives who had escaped from a zoo where they had been badly treated by the zookeepers?

A: Adapt **(or adjust to suit a purpose)**

How might the story have changed if Goldilocks had had a leg in plaster and was using crutches?

M: Modify **(for example, by changing the physical size or personality traits of some characters or changing the setting)**

What would have happened if the bears had been cubs and much smaller than Goldilocks?

P: Put to other uses **(for example, put a different slant on the plot)**

What if Goldilocks was only pretending to be lost and was really looking for an excuse to break into other people's houses?

E: Eliminate **a feature of the story**

How might the story change if there were no Father Bear?

R: Rearrange or reverse **the sequence of the story**

What if Baby Bear had returned home before the others?

How can I adapt it?

It is not necessary to use all the steps in SCAMPER. Steps can be selected and combined in a variety of ways to match your teaching intentions.

How can it be used to evaluate students' language learning?

SCAMPER can be used to assess listening, speaking, reading, viewing and writing. It can help students explore and demonstrate their contextual understanding and their knowledge of the structures and features of texts.

An Example:

FIRST!!!! Brainstorm (and list) all of the things that annoy you or could be improved about this item.

Then use S.C.A.M.P.E.R to try to improve it.
Remember...*Think OUTSIDE THE SQUARE!!*

ITEM:	
S UBSTITUTE	
C OMBINE	
A DAPT	.
M ODIFY	
P UT	
E LIMINATE	
R EVERSE	

Mind Maps

What is a mind map?

A mind map consists of a central word or concept, around the central word you draw the 5 to 10 main ideas that relate to that word. You then take each of those child words and again draw the 5 to 10 main ideas that relate to each of those words.

In this way a large number of related ideas can quickly be produced with virtually no mental effort. The concept of 'writers block' is hard to understand once you have grasped the use of this simple technique!

What can you do with a mind map

Note taking

As a means of note taking Mind Maps have several advantages over other systems:

- You can place each new idea in the right place, regardless of the order of presentation.
- It encourages the reduction of each concept to a single word.
- The resultant mind map can be 'seen' by the eye and memorized by your visual memory which has been shown to be almost perfect.

Creative Writing & Report Writing

A mind map lets you rapidly produce an almost infinite number of ideas, and at the same time organize them by placing each idea next to what it is related to. This makes a very powerful tool for creative writing or report writing, where it is very important to get down all your ideas first. It is then a trivial matter to read the mind map and write a sentence or paragraph on each 'key word'.

Studying the easy way

Instead of simply reading a book on some topic, next time try using a mind map while you read. Just draw your central word and then begin reading, every time you read some idea that strikes you as important or interesting, just add it onto your mind map in the appropriate place.

When you have finished reading the book you will have a one page Mind Map which summarizes everything of interest in that book. You will probably also have added several things which you thought up yourself during your reading. The act of creating the mind map will have greatly increased how much you absorbed from the book, and if you ever want to review the topic all you need to do is to look at the mind map. If you want to learn the information very solidly then try to redraw the Mind Map from memory a few times. You will find it very easy.

Studying as a group (or family)

A group of people can work together to produce a single mind map by following these steps:

1. Individually draw mind maps on what you already know about the subject.
2. Draw a group mind map combining what you already know.

3. Decide what you need to learn based on this group Mind Map
4. Individually study the material, all covering the same areas for depth of knowledge or all covering different areas for speed as appropriate. Each person completing the mind map by his/her self.
5. Again combine as a group and create a final master group mind map.

Families who have started regular weekend study days as a hobby have benefited tremendously. Children typically go from average or below average to second or third from the top in all subjects and the parents also find themselves excelling at work. One Swedish family was besieged by neighbourhood children asking if they could join in the fun!

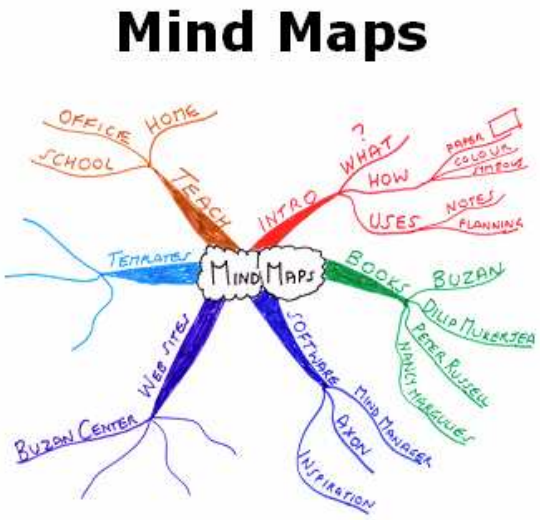
Meetings & Think Tanks

As soon as you write something up on a white board you have immediately lost the creativity which everyone has. So any creative meeting should always start by people spending a couple of minutes individually mind mapping. Then as a way of running a meeting a master mind map on a white board allows every idea or statement to be recorded and placed in an appropriate place so that it can then be discussed at a sensible time. Also no one feels ignored as all ideas are placed on the mind map.

Giving a Talk

When giving a talk a set of notes in the form of a single mind map has several advantages over other memory aids:

- **Brief:** Only a single page is needed
- **Not reading:** As ideas are reduced to single words you will not be 'reading' your speech
- **Flexibility:** If someone asks a question you can move instantly to the place on your Mind Map which relates to that question and then return to where you were without loosing yourself in a pile of cards or papers



To make notes on a subject using a Mind Map, draw it in the following way:

1. Write the title of the subject you're exploring in the centre of the page, and draw a circle around it. This is shown by the circle marked 1 in Figure 1, above.
2. As you come across major subdivisions or subheadings of the topic (or important facts that relate to the subject) draw lines out from this circle. Label these lines with these subdivisions or subheadings.

3. As you "burrow" into the subject and uncover another level of information (further subheadings, or individual facts) belonging to the subheadings above, draw these as lines linked to the subheading lines. These are shown by the lines marked 3 in Figure 1.
4. Finally, for individual facts or ideas, draw lines out from the appropriate heading line and label them. These are shown by the lines marked 4 in Figure 1.

As you come across new information, link it in to the Mind Map appropriately.

A complete Mind Map may have main topic lines radiating in all directions from the centre. Sub-topics and facts will branch off these, like branches and twigs from the trunk of a tree. You do not need to worry about the structure produced, as this will evolve as you develop your mind map.

WINCE

Description

The WINCE strategy is a five-stage problem-solving process.

- **W**hat children would like to know
- **I**dentify the challenge or problem to be solved
- deciding on extra information they may **N**eed to find out
- **C**reating a solution
- **E**valuating what they have learned.

Thinking skills: *Problem-solving, analysing, creating, evaluating.*

Scenario

Make a potato float halfway up the bucket of water, without using any weights and/or strings and by keeping the level of the water at 2 cm below the lid.

- One way of achieving this is to use the information that the children have gathered by carrying out the potato experiment using the PSDR Method.
- However, the children will need an additional bucket which will be referred to as bucket C. This bucket is the same size as buckets A and B. Pour enough salty water from bucket B into C until it is half full. The potato now floats in the middle of the bucket. Then, enough ice cubes are added until the water level reaches 2 cm below the lid whilst the potato floats in the middle of the bucket.
- It is essential that the children now evaluate what they have learned and investigate other ways that this could be achieved.

WANT	IDENTIFY	NEED	CREATE	EVALUATE
What do I WANT to know?	**IDENTIFY what is the main issue / problem**	**What additional information do I NEED?**	**What have I CREATED?**	**What have I learned from EVALUATING this activity?**

Thinker's Keys

- **The Reverse Listing Key**
  - Place words such as cannot, never or not in a sentence.
  - Eg. Name 10 things that you could not eat.
- **The What If Key**
  - You can pose virtually any "What If" question. Students can use a concept map, Kidspiration or Inspiration to record their responses.
  - Eg. What If all dogs turned into mice? What if the sun stopped shining?
- **The Disadvantages Key**
  - Select any item and ask students to list its disadvantages. Students then brainstorm various ways of correcting or eliminating the disadvantages.
  - Eg. A computer, a chair, a pencil, a television
- **The Combination Key**
  - Students list the attributes of two dissimilar or unrelated objects (e.g. newspaper and swimming goggles). Then they combine the attributes into a single object.
  - Eg. A sandshoe and a lamp.
- **The BAR Key**
  - Make an item BIGGER, ADD something to it, REPLACE something on it
  - Eg. A mouse trap, an umbrella, a freezer, a tent.
- **The Alphabet Key**
  - Choose an object or topic and compile a list of words from A- Z which have relevance to the current unit being studied. Students may expand on these.
  - Eg. Alphabet: food, Australia, politicians, animals
- **The Variations Key**
  - Start each question with "How many ways can you…" Students brainstorm different solutions or ways to meet the challenge.
  - Eg. How many ways can you: make new friends; wash a giraffe, catch a lion?
- **The Picture Key**
  - Draw a simple diagram, sketch or drawing and students work out ways to link it to the current topic they are studying.
- **The Prediction Key**
  - Students respond to a situation or circumstance by predicting a series of possibilities.
  - Eg. Predict what children will be like in 50 years, predict what forms of entertainment we will have in 100 years.
- **The Different Uses Key**
  - Students list some different uses for items from their topic or theme (with an emphasis on reusing and recycling).
  - Eg. Find 10 uses for empty plastic yoghurt containers, an old shoe, a broken radio.
- **The Ridiculous Key**
  - Make a ridiculous statement that would be virtually impossible to implement. Students then attempt to substantiate, justify the idea by developing a case to support it.
  - Eg. Every child should be required to pay a tax on their birthday and Christmas presents.

- **The Commonality Key**
  - Decide on 2 objects which would normally have nothing in common, and try to find common points between them.
  - Eg. Kurwongbah State School and a circus.

- **The Question Key**
  - Provide students with an answer. Students think of five questions that give only that answer.
  - Eg. Midnight, Seaweed, Monkeys, Migrants, Koalas.
- **The Brainstorming Key**
  - State a problem which needs to be solved. Students work individually or in groups to brainstorm a list of practical, creative or innovative solutions.
  - Eg. Too many people eat fast food. There are too many cane toads in Queensland. There are too many homeless people in Brisbane.
- **The Inventions Key**
  - Students may be presented with a design challenge of brief. Students can outline their ideas/ design on paper and then possibly construct their invention using a variety of materials.
  - Eg. Invent: A new mousetrap, a grape peeler, an automatic vacuum cleaner. (This key links well with the Technology KLA- Technology Practice).
- **The Brick Wall Key**
  - Make a statement which could not generally be questioned or disputed, and then try to "break down the wall" by outlining other ways of dealing with the situation.
  - Eg. Every child needs to go to school to get a good education.
- **The Construction Key**
  - Pose a construction problem-solving task and provide readily available material for students to use. Students can work individually or in groups to build their construction.
  - Eg. Build the longest bridge using one sheet of newspaper, sticky tape and 10 straws. Children can draw a diagram.
- **The Forced Relationships Key**
  - Develop a solution to a problem using 3 totally dissimilar objects. Students cannot use the objects in the way they were intended to be used.
  - Eg. You need to catch a cat with a kite, a marble and a rubber band. Children can draw a diagram.
- **The Alternative Key**
  - Students think of a number of ways to complete a task without the normal tools or equipment.
  - Eg. Work out three ways to take a photograph without a camera, rake up leaves without a rake, see clearly underwater without goggles. Children can draw a diagram.
- **The Interpretation Key**
  - Describe an unusual situation. Students think of different ways to explain that situation.
  - Eg. The clown is standing in the middle of the empty school oval.

Six Thinking Hats

The six hats represent six modes of thinking and are directions to think rather than labels for thinking. That is, the hats are used proactively rather than reactively

What is it?

Six Thinking Hats is a strategy devised by Edward de Bono which requires students (and teachers), to extend their way of thinking about a topic by wearing a range of different 'thinking' hats:

White hat thinking focuses on the information available and needed.

Black hat thinking examines the difficulties and problems associated with a topic.

Yellow hat thinking focuses on benefits and values.

Red hat thinking looks at a topic from the point of view of emotions, feelings and hunches.

Green hat thinking requires imaginative, creative and lateral thinking about a topic.

Blue hat thinking focuses on reflection, metacognition (thinking about the thinking that is required), and the need to manage the thinking process.

The colours help students to visualise six separate modes of thinking and to convey something of the meaning of that thinking, for example, red as pertaining to matters of the heart, white as neutral and objective.

What is its purpose?

Students learn to reflect on their thinking and to recognise that different thinking is required in different learning situations.

How do I do it?

Consider an issue or topic which you would like your students to explore, for example, in Band C, the influence of JJJ on its listening audience, or, in Band A, the influence of a particular cartoon show on a young audience. Explain what thinking is required for each of the hats. Have students working in small groups to ask themselves a range of questions:

White hat - what are the facts about the radio station JJJ?
Black hat - what are some of the negatives about JJJ?
Yellow hat - what do people gain from listening to JJJ?
Red hat - how does listening to JJJ make us feel?
Green hat - what could be changed to make the station more accessible or more appealing?
Blue hat - how do the mass media in general affect our youth culture?

Groups report back to the whole class about the types of ideas generated using the six hats. The teacher points to the breadth of views and thoughts, and explains that this is as a result of making ourselves apply a range of different types of 'thinking'.

How can I adapt it?

Six Hat Thinking can be applied to many situations in which brainstorming, problem solving, creative and lateral thinking are required. This strategy can be a very useful tool in reviewing a range of texts or even creating a character profile.

How can it be used to evaluate students' language learning?

There is a range of possible assessment outcomes in using Six Hat Thinking including:

- Understands and interprets the task
- Uses strategies to assist or facilitate discussion
- Contributes to discussion
- Comprehends and applies the six ways of thinking

	The White Hat calls for information known or needed. "The facts, just the facts."
	The Yellow Hat symbolizes brightness and optimism. Under this hat you explore the positives and probe for value and benefit.
	The Black Hat is judgment - the devil's advocate or why something may not work. Spot the difficulties and dangers; where things might go wrong. Probably the most powerful and useful of the Hats but a problem if overused.
	The Red Hat signifies feelings, hunches and intuition. When using this hat you can express emotions and feelings and share fears, likes, dislikes, loves, and hates.
	The Green Hat focuses on creativity; the possibilities, alternatives, and new ideas. It's an opportunity to express new concepts and new perceptions.
	The Blue Hat is used to manage the thinking process. It's the control mechanism that ensures the Six Thinking Hats® guidelines are observed.

Useful Websites

http://www.cap.nsw.edu.au/QI/TOOLS/INDEX.HTM

http://www3.moe.edu.sg/edumall/tl/it_integration/engaging_it_practices/libstrategies-cooperative(j).htm

http://www.enchantedlearning.com/graphicorganizers/fishbone/

http://www.eduplace.com/graphicorganizer/

http://www.educationoasis.com/curriculum/graphic_organizers.htm

http://www.alburynth-p.schools.nsw.edu.au/think/frontpage/proforma.html

http://ictnz.com/Inquiry%20Learning.htm

http://classes.aces.uiuc.edu/ACES100/Mind/c-m2.html

http://www.essington.nt.edu.au/Resource%20Centre/Cheryl's%20Resource%20File/Learning%20Styles%20-%20Thinker's%20Keys.htm

http://www.primaryschool.com.au/free-teacher-resourcesresults.php?strand=Learning%20Theories%20and%20Models%20of%20Teaching&grade=56

http://www.writedesignonline.com/organizers/