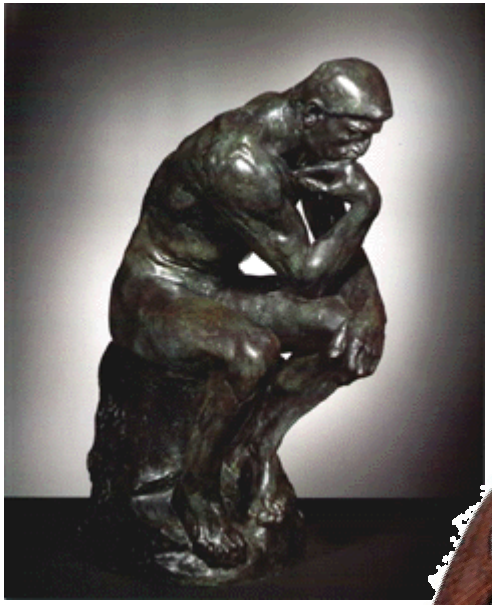
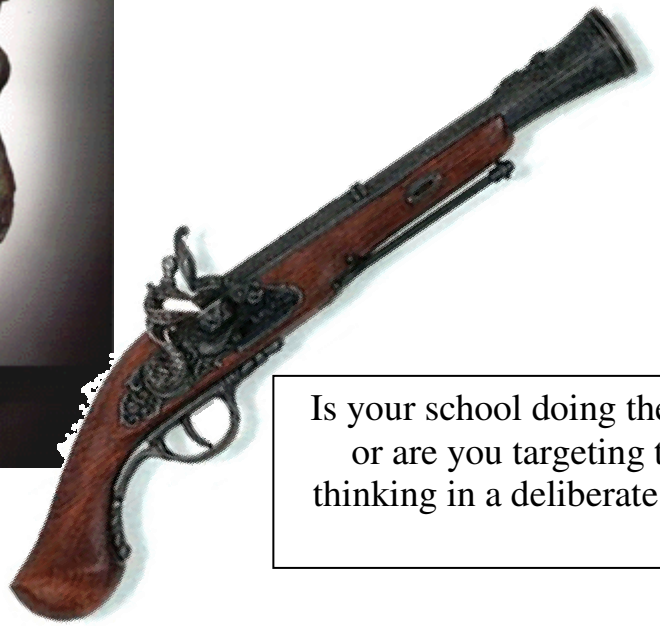
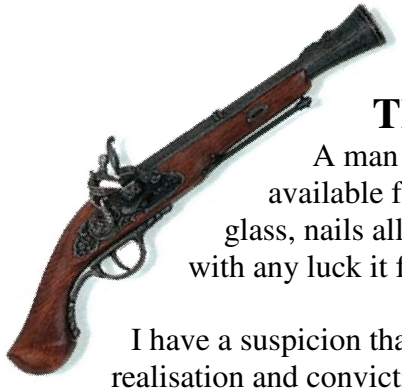
Thinking
In
School





Is your school doing the blunderbuss thing, or are you targeting the developing of thinking in a deliberate structured manner?



Thinking: The Blunderbuss Approach

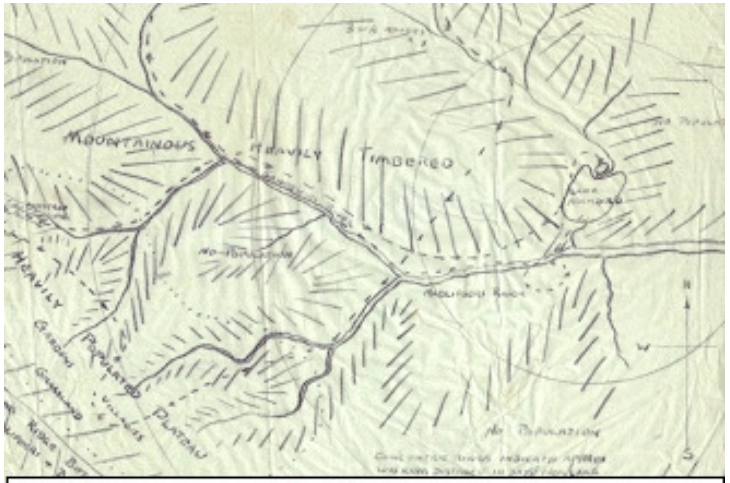
A man from time past had his newly acquired weapon, a wonderful piece of technology. However ready made projectiles were not available for this weapon. The technique was to prime it and then load it with whatever hard sharp objects were available. Stones, glass, nails all became useful resources for loading this weapon. The practice was then to get as close as possible to the target, fire it, and with any luck it fired, didn't blow up in your face, and something hit the target. It was an unreliable process at best.

I have a suspicion that many schools are currently taking a similiar approach to developing thinking skills in their students. There is the realisation and conviction that thinking is important for our students and that our classroom practice needs to be deliberately targeting this competency. However in our enthusiasm we have had a tendency to grab any thinking resource, any thinking strategy, any thinking skill and throw it all at our students with the hope that something will make an impact on their thinking ability.

I am convinced that we can do much better than this, I also believe that it is time to have a much more targeted and more effective approach to facilitating our students into being more effective thinkers.

What are the issues of incorporating thinking effectively into daily classroom practice?

I believe most teachers have fairly extensive and detailed maps of curriculum areas in their heads. These conceptual maps allow them to look at individual children (or cohorts of children) evaluate strengths and weaknesses, determine needs and next learning steps. Many teachers however would struggle to do this in the area of thinking. This is not meant to be a derogatory statement; rather it is a simple function of a new and changing focus on thinking. Most of our teachers have limited and sparse conceptual maps of thinking. They are in fact moving into new and relatively unexplored territory.



Hand drawn map created by W.R. Bond as first white explorer of new territory in New Guinea. 1952.

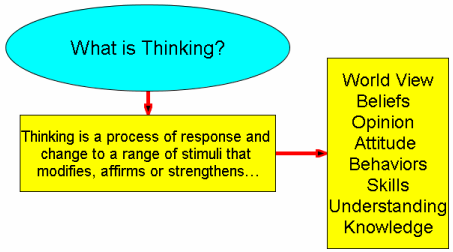
If we are going to effectively target the deliberate facilitation of thinking as a corporate exercise then our schools really need to develop commonly held maps of thinking. We need to do some serious and deep thinking and discussion about thinking to help us develop and flesh out our conceptual map. Edward De Bono has said that "Questions are the engine house of thinking" and that all effective thinking is driven by questions. On this basis I feel that there are a number of useful questions that we can ask ourselves and others to help add detail to our maps. The rest of this document outlines some of those questions and some possible answers.

11 questions about thinking:

1. What is thinking?
2. Why should we have an increased focus on thinking?
3. What is an effective thinker?
4. What attitudes does an effective thinker have?
5. What skills does an effective thinker need?
6. What are the basic, foundational or core skills of thinking?
7. What is the reasoning process?
8. What stimulates thinking?
9. What is the difference between thinking tools and thinking skills?
10. How do we determine which tools to use in our classrooms?
11. What is the best way to facilitate thinking?

Question 1: What is thinking?

I believe that thinking is, at its most simplistic, where an individual in reaction to a range of stimuli starts a process that modifies or strengthens their world view, beliefs, opinions, attitudes, and behaviours.
(NB: World view is how I see myself in terms of the immediate and wider world. It includes my knowledge and understanding that are shaped by a combination of my culture and experiences)

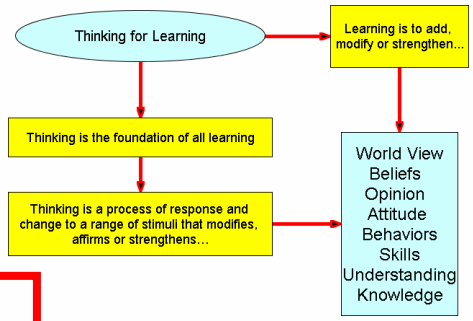


Question 2: Why should we have an increased focus on thinking?

I believe that there are three possible factors that we should consider as answers to this question.
Some schools will be happy with just one but I think the three are really inter-related.
We need to focus on thinking because it is central to learning, life and critical citizenship.

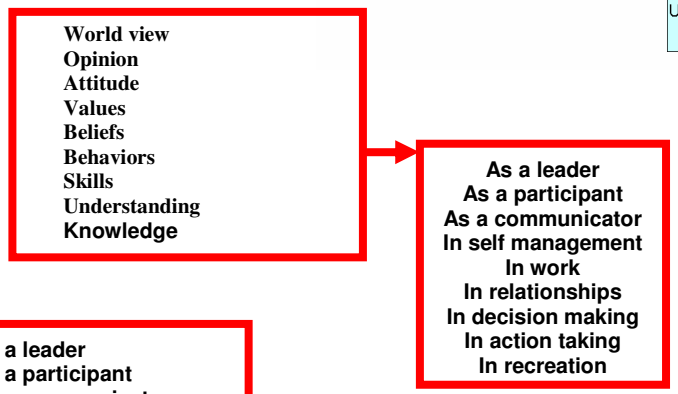
Thinking is Central to Learning

Thinking is central to learning because learning is a process where an individual modifies or strengthens world views, beliefs, opinion, attitudes, behaviors, skills, understandings and knowledge.
There is no learning without thinking.
The better the thinking, the better the learning.
The richer and deeper the thinking, the richer and deeper the learning.



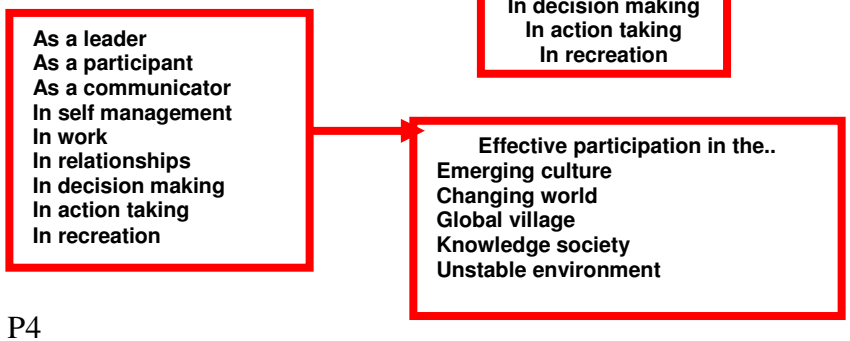
Thinking is Central to Life

Thinking is central to Life because survival and success centre around thinking and learning. World view, Opinion, Attitude, Values, Beliefs, and Behaviors are critical aspects of relationships, work, actions, interactions and decision making.



Thinking is Central to Critical Citizenship

Thinking is central to critical citizenship because surely we are educating our pupils for more than just a world of learning and a world of work. We are providing an education that has a goal of equipping our children to be effective participators and contributors in a range of communities.



Question 3: What is an effective thinker?
There are many definitions of thinking.

"Effective thinking moves beyond self-centered views of the universe to a broader, more abstract realm. This means expanding thinking beyond the egocentric values and limited life experiences" (Meyer, 1986).

"Thinking is about deciding what to believe or do" (Robert Ennis, quoted in Presseisen, p. 24)

"A process that the brain uses to make sense of a confusing world"
De Bono

"The process of determining the authenticity, accuracy and worth of information or knowledge claims"
(Beyer 1985, p. 276).

Effective thinking is not just Creative Thinking or Critical thinking or Lateral Thinking. It is being aware of and improving ones own thinking. An effective thinker consciously works at making his/her thinking more rational, clear, accurate, and consistent. An effective thinker is one who utilises a combination of critical, caring and creative thinking within the reasoning process.

A simplified view of effective thinking can be gained by identifying the major activities we carry out as we reason through an issue.

- **Observations.** We make a number of observations
- **Facts.** From a series of observations we draw facts and theories
- **Inferences.** From accepted facts we draw inferences
- **Assumptions.** From one or more inferences we form assumptions
- **Opinions.** Based on observations, facts, theories, inferences and assumptions we form opinions
- **Arguments.** Taking our opinions, we use the principles of logic to develop arguments to promote, defend, justify, test and evaluate opinions
- **Emotions.** We react to experiences, knowledge and understanding with a range of emotions which can empower or limit our thinking processes
- **Empathy.** This is the role of caring thinking when we consider others in our thinking and decision making processes.
- **Intuition.** This is the making of good judgments and decisions that are outside of logic, and what we know and understand about a situation.
- **Critical Analysis.** We employ logic and analytical skills to assist us in evaluations, analysis and decision making
- **Decisions.** We make choices in terms of action and inaction. These may or may not be the result of effective thinking. A good decision or action will be the result of caring, critical, creative thinking and should also have entailed consideration of short and long term possible outcomes and sequels.
- **Metacognition.** Thinking about the our own thinking and our thinking strategies with the ultimate goal of improving our own thinking

To summarise:
For me an effective thinker is one who uses critical, creative and caring thinking appropriately to empower themselves and others as participators and contributors in a range of communities and contexts.
However it is important for each school to define for themselves what effective thinking is.

Question 4: What attitudes does an effective thinker have?

An Effective thinker demonstrates the attitudes of courage, humility, integrity, open-mindedness and perseverance.

Courageous

Willing to challenge and query, determined to understand and make sense of things.

Open-mindedness

A willingness to review their own opinions, beliefs, thoughts and attitudes in the light of further information and input.

Perseverance

Willing to pursue questions, ideas and thoughts regardless of any difficulties and obstructions.

Humility

Recognise that their understanding may be limited or built on false premise, bias or assumptions.
They are willing to suspend judgment when information is insufficient.

Integrity

The determination to examine their own attitudes, beliefs and thoughts by the same standards they apply to others.

However these may still be a shallow collection of the attitudes an effective thinker would portray. As a school what attitudes would you expect to see in an effective thinker?

Question 5: What skills does an effective thinker need?

An effective thinker has a wide range of skills that help them to create meaning, gain understanding, make judgments, make good decisions, self analyse and reflect. These skills include the ability to:

- Analyse and evaluate actions or policies
- Assessing solutions
- Ask relevant questions
- Avoid oversimplifications
- Compare with similar situations
- Create belief, argument & theory
- Compare arguments, theories, interpretations and perspectives
- Clarify and critique texts
- Discern contradictions
- Discern prejudice
- Discern when to suspend judgment
- Differentiate between fact and opinion
- Develop criteria for evaluation
- Evaluate credibility of information & sources
- Evaluate validity of information & sources
- Evaluate arguments, interpretations & beliefs
- Explore belief, argument & theory
- Generating solutions
- Identify root and significant issues
- Interpret complex problems
- Identify underlying assumptions
- Identify bias
- Identify over-simplifications
- Making connections into other contexts
- Make and recognise generalisations
- Make wise decisions
- Narrow or broaden a focus as appropriate
- Recognise distortion
- Recognise inadequate information or evidence
- Simplify issues to core aspects
- Transfer insights to new situations
- Weigh evidence
- Clarify relevant language
- Clarify issues

Beware:
There is no attempt here to say that this is a finished and complete list, I believe that this is just a base list to which I will add more as my understanding deepens.

Question 6: What are the basic, foundational or core skills of thinking?

Considering the large and growing list of thinking skills alluded to in the previous section, it seems that amongst this large group of skills there must be some that we would consider as being base or foundational skills**.** These are the skills that we would not to ensure that we equip our pupils with.
Now obviously there is no one right answer to this question and it is one that could be debated extensively. As I consider the question I have a short list of skills that I currently consider as crucial basic skills. These may well change as my own understanding and knowledge deepens. Watch this space.
There are many approaches one could use to find the answer to this question. Each approach could well provide a different answer.

The method I used to arrive at this list was to think of a problem solving situation and then to identify the simple essentials of the process that would take a person through to establishing a workable solution. This would give us 10 broad skills that we could start to concentrate on.

Essential or Basic Thinking Skills:

- Recognise a need or problem
- Recognise inadequate information or evidence
- Clarify relevant language
- Ask relevant questions
- Differentiate between fact and opinion
- Evaluate credibility of information & sources
- Generating solutions
- Assessing solutions
- Consider long and short term consequences, sequels and outcomes
- Make wise decisions

Of course some of these are fairly broad skills and many actually include further skills sets in their own right.

I suppose an interesting sub-question would be… "Is there one central skill that is absolutely vital?"
For myself I would consider the skill of questioning to be central to the whole exercise of effective thinking. I would agree with Edward De Bono who states that "Questioning is the engine house of thinking". It seems to me that without the ability to ask effective, relevant and probing questions then thinking itself would cease to be effective.

Another approach that I have used with a school is to look at the Inquiry Learning process that the school is using and determine which thinking skills match with each part of the inquiry process. When we examine the SAUCE model we get the possible answer to the question of basic skills, again it is still a debatable answer.

Setting the Scene

Skills: Clarify relevant language, Clarify issues, Ask relevant questions

Acquiring Information

Evaluate validity/credibility of information & sources, Clarify and critique texts,
Weigh evidence, Ask relevant questions

Using the Information

Make wise decisions, Consider long and short term possible outcomes and consequences,
Assess possible solutions, Generating solutions, Ask relevant questions

Communicating outcome, thinking and decisions

Ask relevant questions

Rather than try and identify further specific thinking skills for this stage we felt it was more relevant to point from here towards the schools documentation on communication skills… which will also have thinking skills embedded.

Evaluating product and process

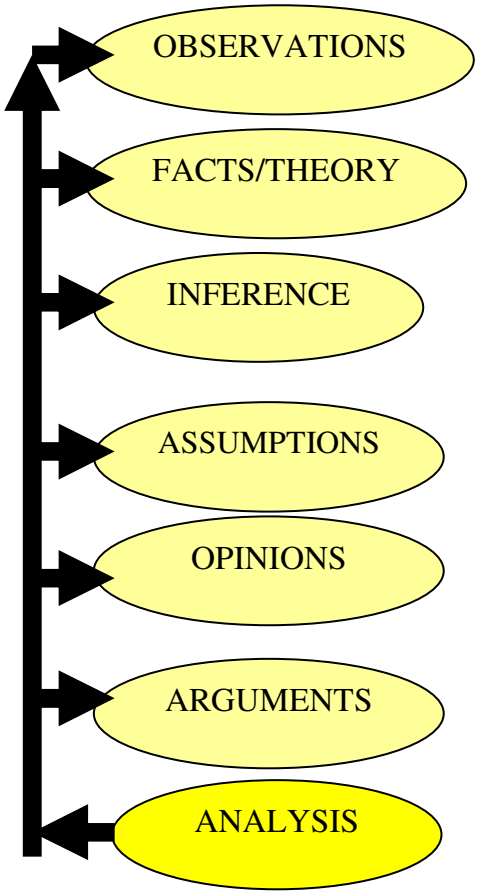
Ask relevant questions, Analyse and evaluate actions

Again there is the very obvious factor that questioning seems to be a central skill.
We also end up with a very similar set of base skills with only a couple of variations.

- Ask relevant questions
- Clarify relevant language,
- Clarify issues,
- Evaluate validity/credibility of information & sources,
- Clarify and critique texts,
- Weigh evidence,
- Make wise decisions,
- Consider long and short term possible outcomes and consequences,
- Assess possible solutions,
- Generating solutions,
- Analyse and evaluate actions

To summarise:
I believe it is important for schools to look seriously at what they see as being the foundational skills of thinking, I suggest about 5 or 6 to be realistic and practical.
Once you have chosen these and can justify your choices, establish success criteria for pupils leaving your school with those skills.
Once success criteria have been developed then go and find the resources, strategies and tools that will enable your teachers to facilitate the development of those skills in your students.
Establish methods of evaluating and monitoring student progress in those skills.
Be open to consistently reviewing your choices.

Question 7: What is the reasoning process?



From observations, we draw facts and theory

From facts, or their absence, we draw inferences

From inferences we make assumptions

From observations, facts and theory, inferences, and assumptions we form our opinions

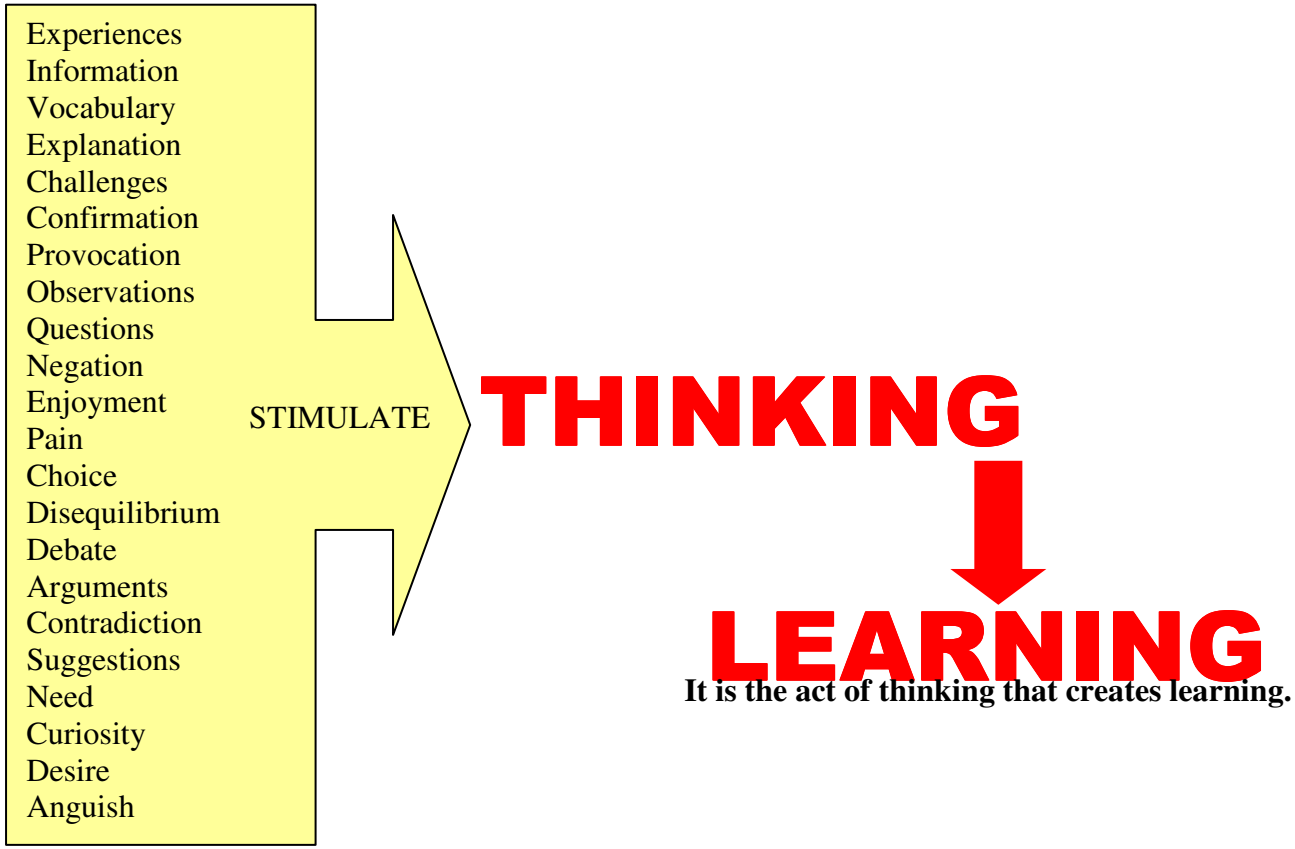
Use logic to develop to develop arguments to support our opinions

We carry out analysis to test the validity of our own and other people's observations, facts/theory, inferences, assumptions, opinions, arguments and analysis.

http://www.dartmouth.edu/~compose/faculty/pedagogies/thinking.html#ele

Question 8: What stimulates thinking?

If thinking is a response we make to a stimulus, and we want to facilitate thinking, it seems logical that we should have an understanding of what the stimuli are that promote or foster thinking.



The bulk of these stimuli are tools that we as teachers are comfortable with.
They are tools and strategies we use each day to try and encourage and facilitate LEARNING.

Perhaps this exposes a hidden issue in much of our teaching practice over the last few decades. We have been using the right tools, (Experiences, Information, Vocabulary, Explanation, Challenges, Confirmation, Provocation, Observations, Questions, Negation, Enjoyment, Choice, Disequilibrium, Debate, Arguments, Contradiction, Suggestions, Need, and Curiosity) but we have used them as tools to facilitate learning. Sadly much of our endeavor hasn't achieved the success we would have liked, often our teaching using these tools hasn't been as effective as we expected. Possibly if our focus had been on using these tools effectively to facilitate THINKING, and leave the learning to care of itself, we might have had better results. Perhaps a classroom of thinkers is what leads us to a classroom of learners!

Question 9: What is the difference between thinking tools and thinking skills?

Let us start with thinking skills. If we are to facilitate pupils into better thinking we will be targeting improving their thinking skills (examples listed earlier). To do this we may introduce the pupils to certain thinking tools. Each tool, eg. DeBono's Thinking Hats, will have been developed to facilitate a specific skill or skill set. The hats are a tool to scaffold people in to thinking about a situation or problem from a range of different perspectives.

Question 10: How do we determine which tools to use in our classrooms?
First determine which skills you are trying to facilitate and then decide which tools are appropriate to encourage learners to develop and strengthen those skills.
This requires knowledge of the range of skills, accompanied by knowledge of a range of thinking tools.

Some, a limited sampling, of the thinking tools that are available are:

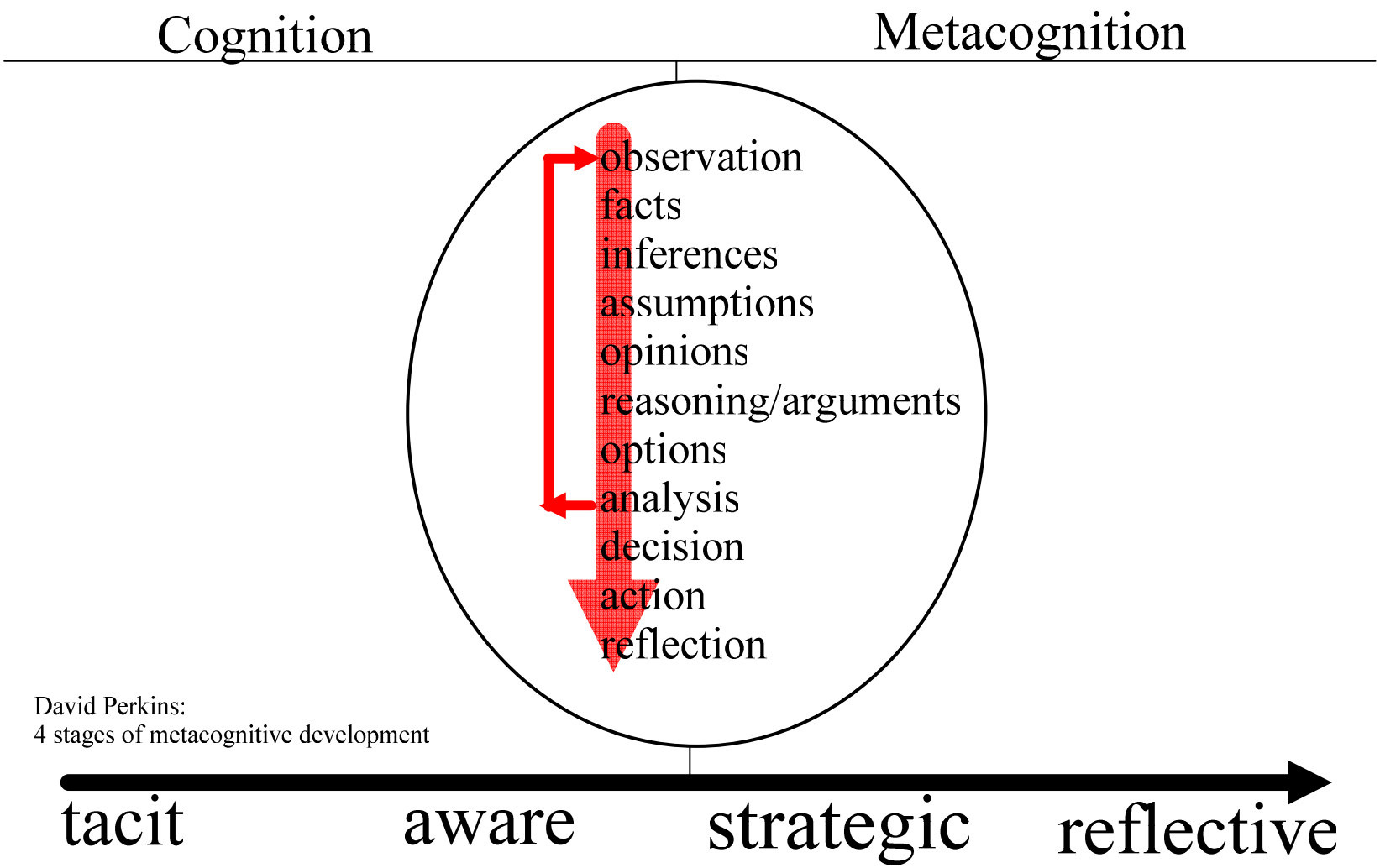
BAR	Bigger Added, Remove/Replace
CAMPER	Consequences-Assumptions-Main Points, Prejudice-Evidence, Relevance
C&C	Compare and Contrast
C&S	Consequence and sequel
CAF	Consider All Factors
Directed Thinking	Why yes? Why no? Why Wait? What else? Way to go?
FIP	First Important Priority
OPV	Other People's Point Of View
PCD	Possibilities-Consequences-Decision
PMI	Plus Minus and Interesting
POOCH	Problem-Options-Outcomes-Choices
Reversal	State the problem, reverse the problem, ask why?
Brainstorm	seek the solution
SCAMPER	Substitute, Combine, Adapt, Modify (magnify/minimise), Put to other use, Eliminate, Remove/reverse.
SCUMPS	Size, colour, use, materials, parts, shape
SWOT	Strengths Weaknesses Opportunities and Threats
Brain Maps	
Graphic Organisers	
Blooms Taxonomy	
Action Shoes	
CORT thinking	
Habits of Mind	

Question 11: What is the best way to facilitate thinking?

If there is any such thing as the best way, then I am sure that the answer would be debated long and hard with no final agreement. However I think that regardless of which thinking skills you see as being core or essential, despite which tools you choose to use there is one approach that will succeed above all others in facilitating improved thinking amongst your pupils. It consists of only a few simple facets.

First: Develop your own professional understanding or 'map of thinking'.
Second: Create learning experiences where there are no right or wrong answers, or solutions.
Third: Be involved with your children as a co-learner, model good learning and good thinking.
Fourth: Be transparent in your thinking, vocalize the reasoning, analysis and decision making.
Fifth: Use the language and vocab of thinking richly

Have fun being a thinker with your pupils, and watching as their minds and abilities expand.


Cognition
Metacognition
observation
facts
inferences
assumptions
opinions
reasoning/arguments
options
analysis
decision
action
reflection
David Perkins:
4 stages of metacognitive development
tacit
aware
strategic
reflective

NOTES: