

# **The Australian Curriculum: Developing a Guided Inquiry & & Web 2.0 Approach**

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**[www.twitter.com/RossJTodd](http://www.twitter.com/RossJTodd)**

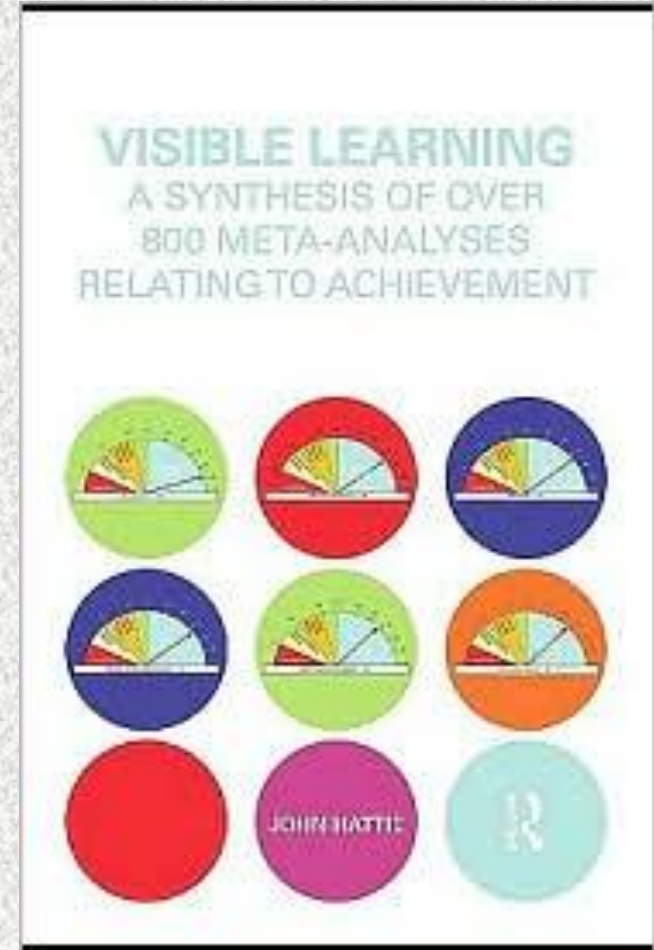
- **Inquiry learning and the Australian Curriculum: an Curriculum: an overview**
- **Implementing the Australian Curriculum through through Guided Inquiry: Design for Learning Learning**
- **Inquiry Learning in a Web 2.0 World**
- **The Australian Curriculum and Tech Tools**
- **Developing an Australian Curriculum Unit for your for your school**



**Meta-analyses of educational research shows that the most significant impacts on student learning & achievement are:**

- **role of teacher and quality of instruction;**
- **developing a supportive learning environment;**
- **engaging students in discovery, inquiry, thinking, meta-cognition, and knowledge building**

(Visible learning: a synthesis of over 800 meta-analyses relating to achievement:  
[John Hattie, Routledge, 2009])



- **Authentic & powerful pedagogy:** instructional designs that support intellectual engagement, deep knowledge, creativity, problem solving and innovation
- **Intellectual quality:** developing higher-order thinking (critical and creative thinking), deep understanding, deep knowledge, substantive conversations, critique of knowledge and engaging with problematic knowledge
- **Social, cultural & personal agency:** respect for different values, knowledges, global awareness, social and ethical values, self-confidence, risk-taking, independence, interdependence; 21<sup>st</sup> C life skills – careers and living
- **ICT competence; Critical and creative thinking; Ethical behaviour**

**Intellectual Agency**

**Deep knowledge**  
**Deep understanding**  
**Problematic knowledge**  
**Higher order thinking**  
**Meta-language**  
**Substantive communication**  
**Application of knowledge**

**Personal Agency**

**Self Confidence**  
**Risk-taking**  
**Problem solving**  
**Trying new ideas and practices**  
**Independence**  
**Autonomy**

**Social and Cultural Agency**

**Respect for different values, cultural knowledges and viewpoints**  
**viewpoints**  
**Team building, collaboration, negotiation and decision making**  
**Knowledge integration**  
**Living and learning in a digital world**  
**Connect with current and future lives**  
**Social and ethical values**

**Productive Pedagogy (Gore & Ladwig)**

Gore, J., Griffiths, T., & Ladwig, J. (2002). *Productive Pedagogy as a Framework for Teacher Education: Towards Better Teaching*. Newcastle: Faculty of Better Teaching. Newcastle: Faculty of Education, University of Newcastle. Available at: <http://www.aare.edu.au/01pap/gor01501.htm>  
<http://www.aare.edu.au/01pap/gor01501.htm>



- **History:** historical inquiry develops transferable skills, such as the ability to ask relevant questions; critically analyse and interpret sources; consider context; respect and explain different perspectives; develop and substantiate interpretations, and communicate effectively
- **Earth and Environmental Science:** a multifaceted field of inquiry
- **Geography:** use an inquiry approach to assist students to make meaning of their world.
- **Science:** ability to use a range of scientific inquiry methods, including questioning; collecting and analysing data; evaluating results; and drawing critical, evidence-based conclusions
- **What are the dynamics of inquiry-centered learning and teaching?**
- **Instructional design for inquiry?**

- Engages students' worlds to establish relevance, interest and motivation **CONNECTION**
- Establishes and develops background knowledge as foundation for new learning **FOUNDATION**
- Students deepen their knowledge to frame a deep question that directs their inquiry **EXPLORATION**
- Students engage in critical thinking, examining diverse and conflicting information as they construct their complex web of knowledge **EXAMINATION**
- Students create meaningful representations of their knowledge and understanding that show their capacity of critical and creative thinking **CREATION**



- **Tuning in:** engagement and activating prior knowledge
- **Selection of topic:** or broad focus of an inquiry: directed by syllabus / curriculum
- **Finding out:** experiences and texts that add to the knowledge base: authentic data and information
- **Generative questions:** key idea; big/ essential question
- **Sorting out:** organizing, analyzing and communicating
- **Drawing conclusions:** stating understandings
- **Reflecting and acting:** knowledge outcomes, metacognitive outcomes, real world application
- **Going further:** raising, revisiting questions (independent inquiry)
- Kath Murdoch: <http://kathmurdoch.com.au/index.php?id=22>

- Inquiry is an approach to learning that involves a process of exploring our world, that leads to asking **questions** and making discoveries in the search for new knowledge
- Creating opportunities for students to be engaged in authentic and active learning based on their own **questions**



- Students learn to generate and evaluate knowledge, and solve problems. Knowledge creators:  
**Declarative Knowledge**
- Knowledge Outcomes require **critical thinking** (process) and **creative thinking** (application).  
**Procedural Knowledge**
- **Critical thinking** involves expert manipulation of information:
- analysing, evaluating, explaining, sequencing, reasoning, comparing, questioning, interpreting, inferring, hypothesising, appraising, testing and generalising; developing arguments, using evidence, and drawing reasoned conclusions.

- **SYNTHESIS AND CONSTRUCTION: APPLICATION**
- **Student generate and apply new ideas in specific contexts, see existing situations in new ways, identify alternative explanations, and see or make new links**
- **Skills include:**
  - **combining parts to form something original,**
  - **sifting and refining ideas to discover possibilities**
  - **constructing knowledge representations and artefacts**
  - **constructing implications, applications and solutions**
- **The products of creative endeavour can involve complex representations and images, investigations and performances, digital and computer-generated output, or occur as virtual reality**

- **HISTORY:** capacity to undertake historical inquiry, including skills in the analysis and use of sources, and in explanation and communication.
- **EES:** ability to communicate earth and environmental understanding, findings, arguments and conclusions using appropriate representations, modes and genres.
- **GEOGRAPHY:** ability to respond to questions in a geographically distinctive way, plan an inquiry; collect, evaluate, analyse and interpret information; and suggest responses to what they have learned.
- **MATHEMATICS:** confident, creative users and communicators of mathematics, able to investigate, represent and interpret situations in their personal and work lives and as active citizens
- **ENGLISH:** learn to listen to, read, view, speak, write, create and reflect on increasingly complex and sophisticated spoken, written and multimodal texts across a growing range of contexts with accuracy, fluency and purpose

Reading the word – textual, visual, oral, tactile

Reading the world – self, others, cultures, societies

**When reading is  
at risk, learning  
is at risk**



- **Engage with strong and thorough textual evidence to support analysis**
- **Integrate and evaluate multiple sources of information presented in different media or formats**
- **Analyze and synthesize multiple interpretations**
- **Identify and address conflicting information**
- **Write arguments to support claims with clear reasons and relevant evidence**
- **Show how themes interact and build on one another to produce a complex account**
- **Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience**
- **Use technology, including the Internet, to produce and publish writing and other forms of idea representation**

PETER MAUSS/ESTO





## KEY RESEARCH FINDINGS

- **Reading online is shallow; skimming, scanning**
- **Attention spans for reading are shorter**
- **they rarely read what they print out**
- **When people read on their screens, especially using mobile devices, they read discontinuous text**
- **Reading online is passive and less interactive and non-critical**

<http://www.nngroup.com/reports/how-people-read-web-eyetracking-evidence/>



# My Graduation Speech

"I want to thank Google, Wikipedia, and whoever the hell invented copy and paste. Thank you."



a ciber briefing paper

information behaviour of  
the researcher of the future

11 January 2008

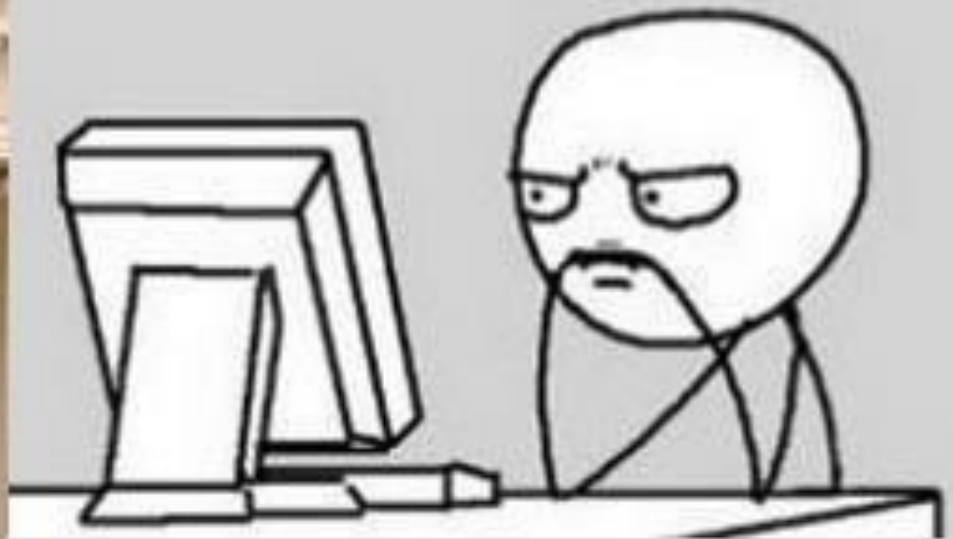


- **Horizontal information seeking and “power browsing”**
- **Use of simple search strategies, limited information assessment**
- **Squirreling behavior: stockpiling content in the form of downloads**
- **Fact foraging, fact finding, and fact fooling**
- **Superficial effort in knowledge construction: stockpiling of retrieved facts with limited intellectual engagement: transport not transformation of information**
- **Pedagogy of knowledge construction largely absent in context of research tasks – rarely explicitly developed, supported, sustained**
- **Limited engagement with multiple perspectives, interrogating conflicting information, information analysis, developing arguments, positions, conclusions, implications**
- **Focus on product construction rather than knowledge construction**
- Rowlands, I. & Nicholas, D. (2008). *Information behaviour of the researcher of the future. A CIBER Briefing Paper*. Commissioned by British Library & Joint Information Systems Committee. Centre for Information Behaviour & the Evaluation of Research (CIBER), University College London (UCL)

**The Thinker 1880**



**The Thinker 2012**





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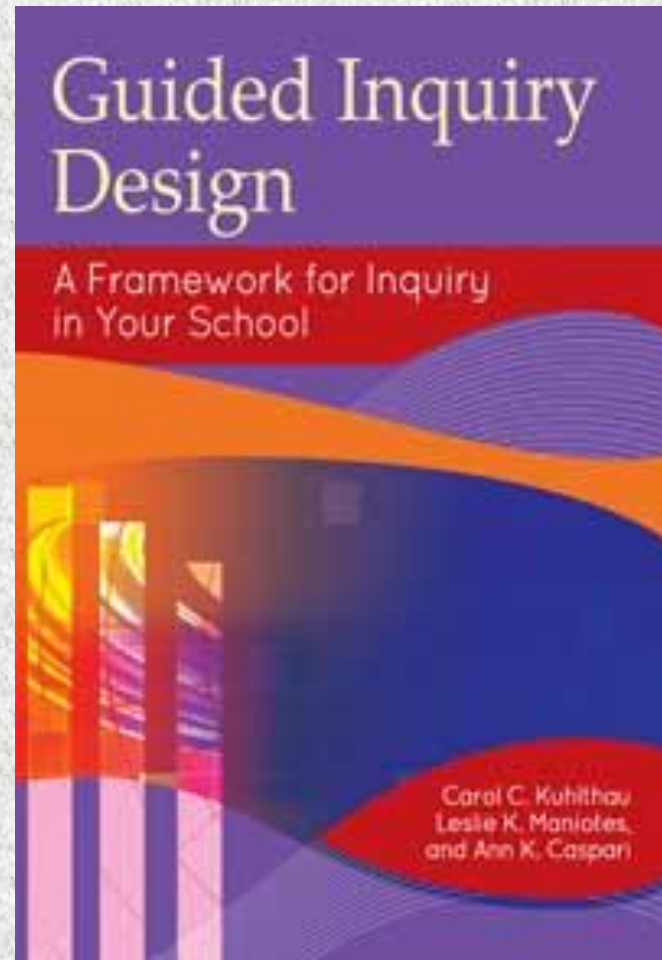
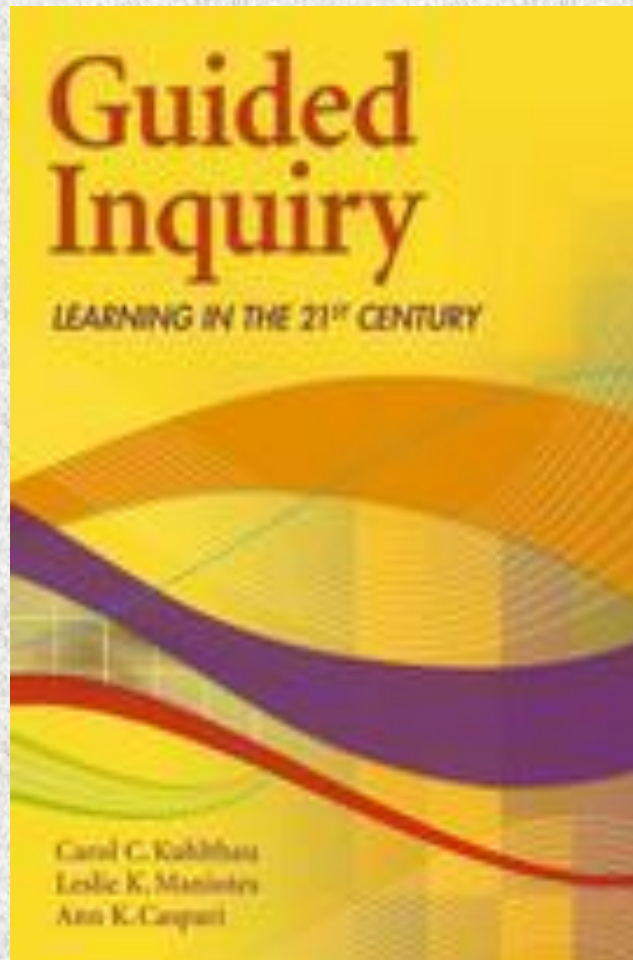
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**Prof. Carol Kuhlthau**



Kuhlthau, C, Caspari, A., & Maniotes, L. (2007) *Guided Inquiry: Learning in the 21st Century*. Santa Barbara, CA: Libraries Unlimited.

Kuhlthau, C.C., Maniotes, L., & Caspari, A.. (2012). *Guided inquiry design: A framework for inquiry in your school*. Santa Barbara, CA: Libraries Unlimited.

**Qualitative exploration of search process of high school seniors (1983)**

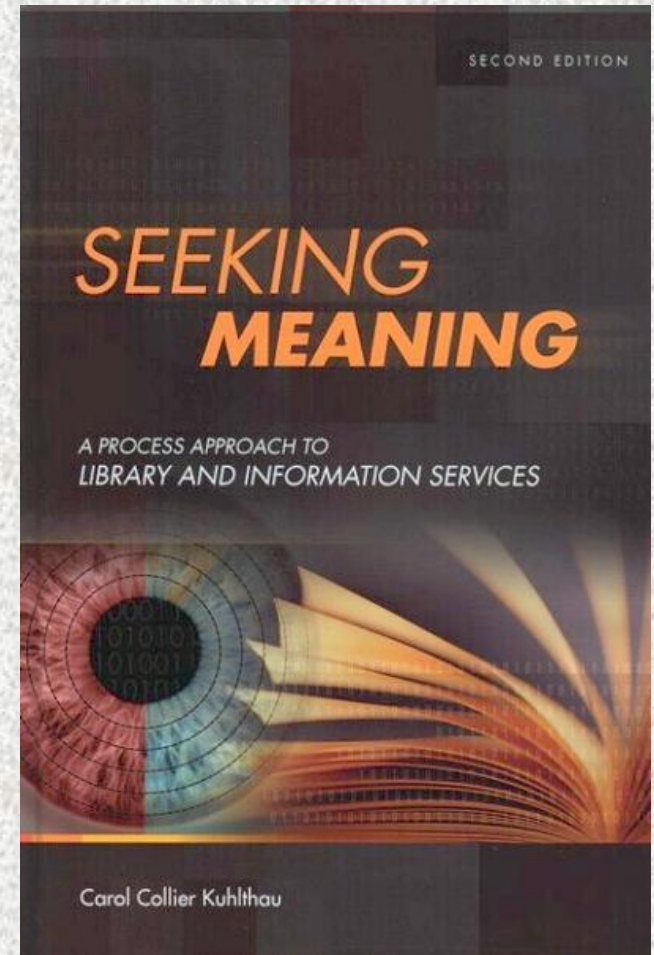
**Qualitative study of original sample after 4 years of college (1988)**

**Longitudinal study (1988)**

**Qualitative and quantitative study of high, middle and low achieving high school seniors (1989)**

**Validation Study: 385 academic, public, and school library users in 21 sites (1989)**

**Since 1990, 50+ validation studies**



**Kuhlthau, C. Seeking Meaning: A Process Approach to Library and Information Services, Second ed. Libraries Unlimited, 2004.**



## Information Search Process Carol Kuhlthau

**Tasks**    Initiation    Selection    Exploration    Formulation    Collection    Presentation    Assessment

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<b>Feelings</b> (affective)	uncertainly	optimism	confusion frustration doubt	clarity		sense of direction/ confidence	satisfaction or disappointment
<b>Thoughts</b> (cognitive)	vague----->focused			----->			
				increased interest			
<b>Actions</b> (physical)	seeking relevant information exploring			-----> seeking pertinent information documenting			



**Zone of Intervention: the critical point / need for instruction**

## GUIDED INQUIRY

- **Initiation:** Research task is given to the students
- **Selection:** Choice of topics within a curriculum theme
- **Exploration:** Building background knowledge, encountering many perspectives
- **Formulation:** Selection of focus question
- **Collection:** Accessing and using complex information
- **Presentation:** Presenting outcome of research
- **Assessment:** Reflection on learning process and learning outcome



<http://footage.shutterstock.com/clip-2563823>

## Students develop capacity to:

- think beyond the immediate situation to consider the ‘big picture’ before focusing on the detail (**Exploration**)
- suspend judgment about a situation to consider alternative pathways (**Exploration**)
- pose insightful and purposeful questions (**Formulation**)
- apply strategies to uncover meaning and make reasoned judgments (**Collection**)
- reflect on thinking, actions and processes (**all stages, Assessment**)
- generate and develop ideas and possibilities (**Collection**)
- analyze information logically and make reasoned judgments (**Collection**)
- evaluate ideas and create solutions and draw conclusions (**Collection**)
- assess the feasibility, possible risks and benefits in the implementation of their ideas (**Collection, Assessment**)
- create meaningful representations of their deep knowledge

# Stages of doing research

## Information Search Process Carol Kuhlthau

Tasks — Initiation Selection Exploration Formulation Collection Presentation Assessment

**Feelings**  
(affective)

uncertainly optimism confusion clarity sense of satisfaction or  
 (affective) (affective) (affective) (affective) (affective) (affective) (affective)  
 direction/ disappointment  
 confidence

**Thoughts**  
(cognitive)

vague----->focused  
 ----->  
 increased interest

**Actions**  
(physical)

seeking relevant information----->seeking pertinent information  
 exploring documenting



**Zone of Intervention: the critical point / need for instruction**

**Open Immerse Explore Identify Gather Create Share Evaluate**

Kuhlthau, C.C., Maniotes, L., & Caspari, A.. (2012). Guided inquiry design: A framework for inquiry in your school. Santa Barbara, CA: Libraries Unlimited.

- Icons from Kuhlthau, C.C., Maniotes, L.K., & Caspari, A.K. (2012). *Guided inquiry design: A framework for inquiry in your school*. Santa Barbara, CA: Libraries Unlimited.





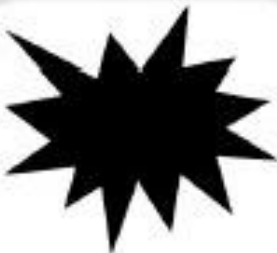
Open

**This phase engages students, gets them excited about the topic / curriculum theme they will be exploring, and encourages them to begin thinking about how the inquiry unit connects to pre-existing knowledge.**



Immerse

**Students develop background knowledge about the research topic as a community without focusing on “too much detail.” Get the BIG picture**



Explore

**Students explore their topic, find new information and consider different perspectives, and develop sufficient knowledge to move forward in the research process.**



**Identify**

**Students choose a research question and focus for their research.**



**Gather**

**Students collect detailed information from a variety of sources. They evaluate sources and record key ideas from the sources. They take detailed notes and learn how to organize, quote, and use information ethically.**



**Create**

**Students are encouraged to go beyond listing a collection of facts. They use technology tools to create a product that shows what they have learned**

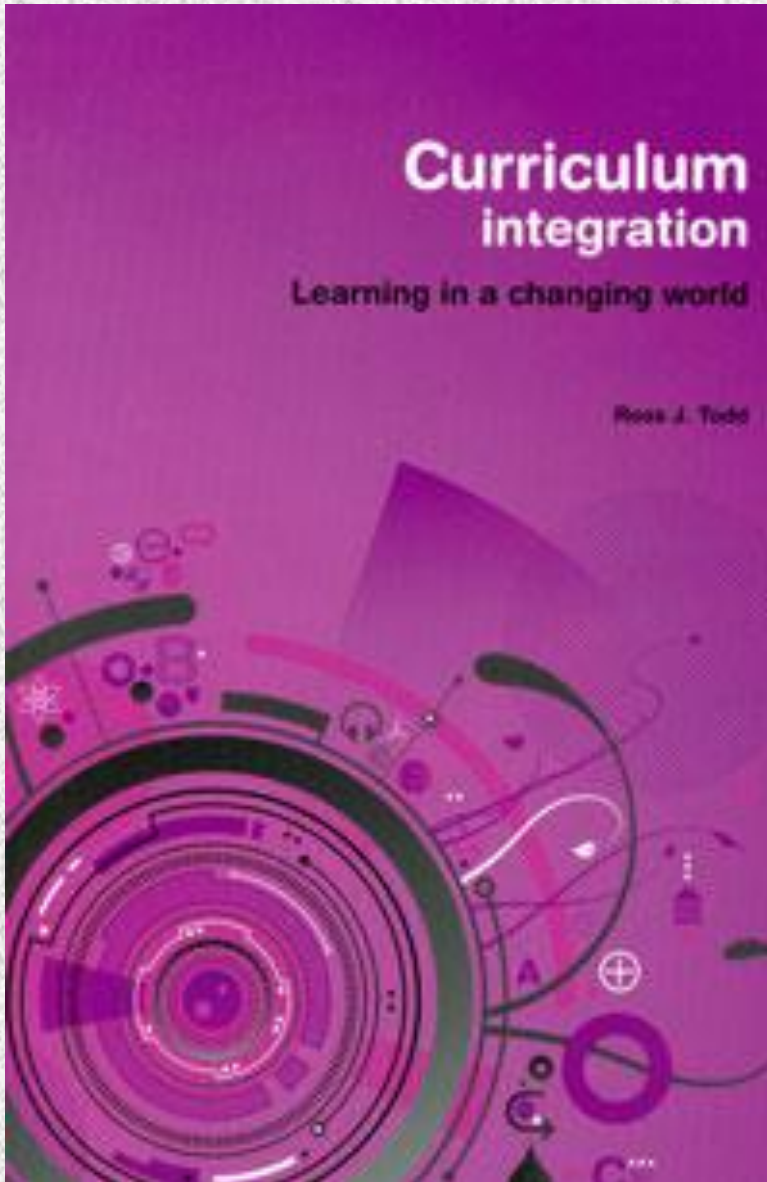


**Students have the opportunity to present their ideas to others. They communicate what they have learned to others**



**Students, teachers and school librarians assess the learning outcomes and reflect on what needs to be done**





## Curriculum Integration

*Ross J. Todd*

**Curriculum Integration** presents a curriculum integration matrix for 21st century learning in complex and diverse information environments. It outlines how Guided Inquiry as in instructional framework in 21st century schools can be developed and implemented to enable students to learn meaningfully from diverse and complex information sources.

Australian Council of Educational  
Research Press 2010

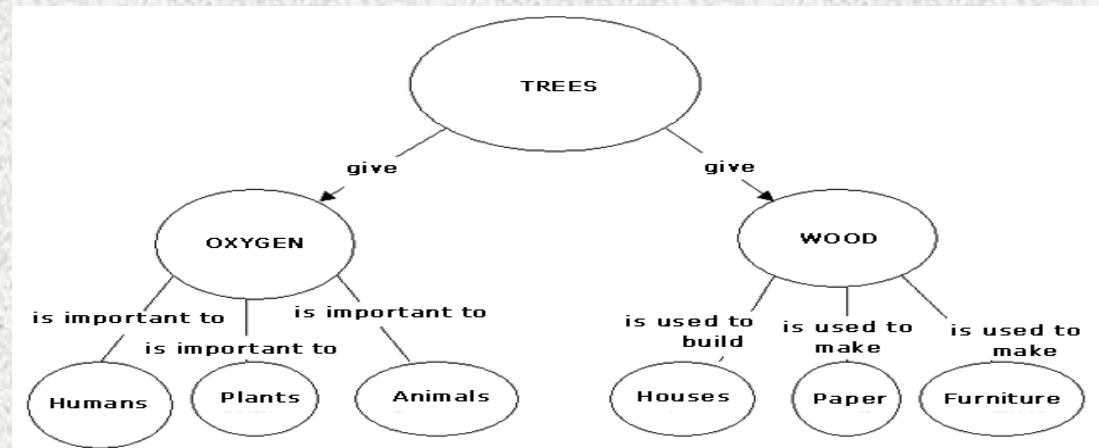
- **Year 6 Level Description**
- **Australia as a nation**
- **The Year 6 curriculum moves from colonial Australia to the development of Australia as a nation, particularly after 1900. Students explore the factors that led to Federation and experiences of democracy...**
- **Key inquiry questions**
- **Why and how did Australia become a nation?**
- **How did Australian society change throughout the twentieth century?**
- **Who were the people who came to Australia? Why did they come?**
- **What contribution have significant individuals and groups made to the development of Australian society?**

- **Class blog: personal viewpoint on greatness / personal fame, significance: analyse and synthesise responses; create table (% distribution of responses, and interpret **OPEN, CREATE****
- **Creative writing: My dream of being known as a great Australian (cross-disciplinary concepts of sustainability [social cultural value]) **OPEN, IMMERSE, CREATE****
- **Sharing writing on class wiki **SHARE****
- **Class blog: synthesis of responses: what seems to be the idea of “greatness” in the class **CREATE, PRESENT****
- **Matching personal dreams with Australian individuals (including Aboriginal and Torres Strait Islanders) who have made contribution **IMMERSE****
- **Building background knowledge: life and times of people of interest; selecting focus question(s) **EXPLORE, IMMERSE, IDENTIFY****
- **Creative knowledge building – interventions focus on collection of ideas, analysis, synthesis, skills /tools to represent knowledge: historical inquiry **GATHER, CREATE, PRESENT****
- **Wiki to share final products: group review and reflection**
- ****PRESENT, EVALUATE:** what core values establish and sustain greatness?**

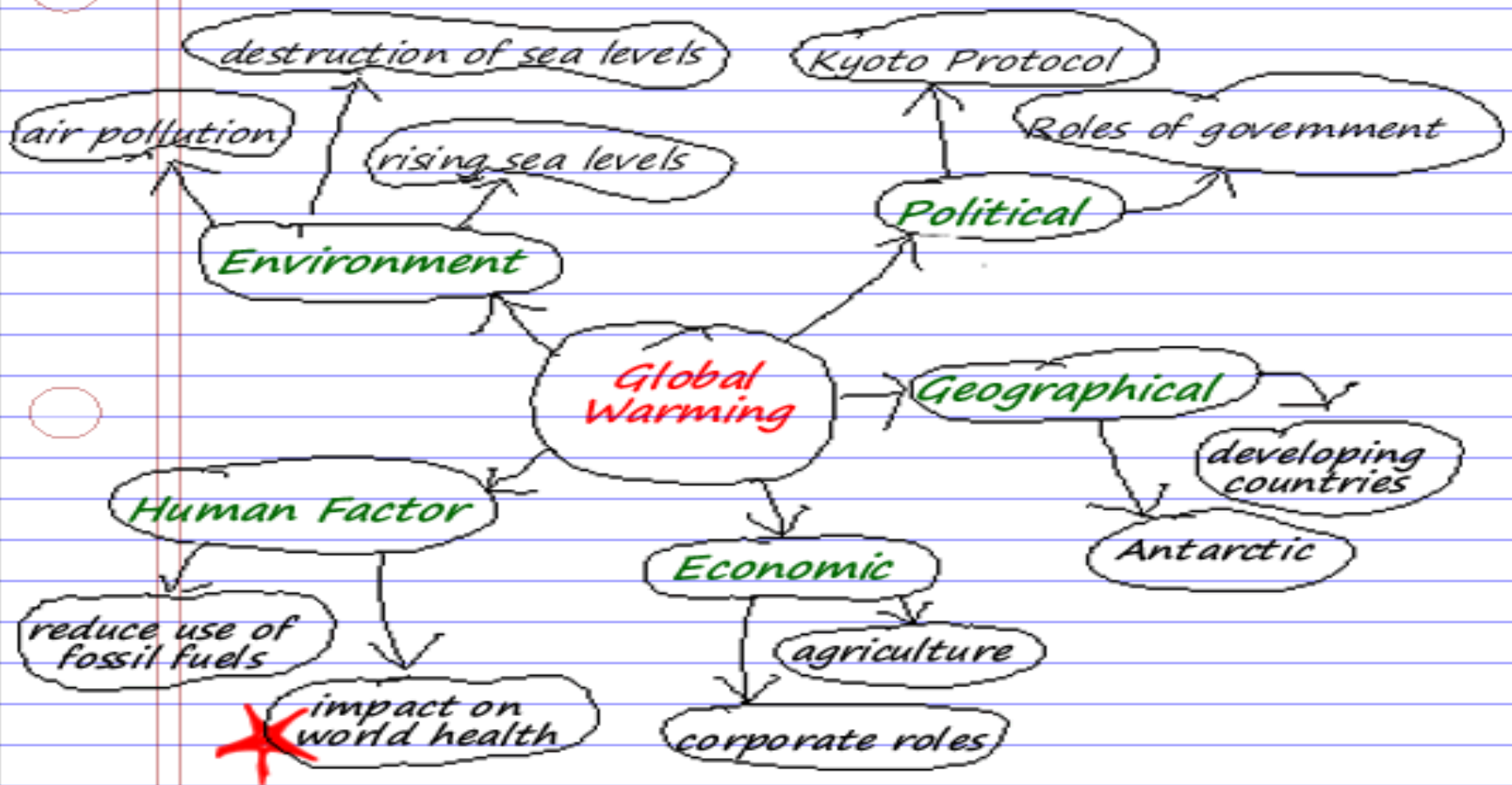
- **Help students get excited about their research: open minds, stimulate curiosity, develop inquiry stance through modeling questions, insights, reflections**
- **Use of compelling visuals, artefacts, stories, scenarios**
- **Dealing with emotions : doubt, uncertainty**
- **Help them be organized: task organization, time, deadlines, stages**
- **Understanding knowledge requirements of task: task assessment**
- **Establish existing / prior knowledge**
- **Develop knowledge wall; Develop a question wall: questions about the topic**



- **Build background knowledge of the topic**
- **Wikipedia articles are good for overviews of topics: comparative analysis with other sources**
- **Field experiences, visits by experts (Twitter dialogue)**
- **Interview each other about aspects of the topic;**
- **Build a concept map of the curriculum topic: facts as the foundation, and the questions it prompts**
- **Developing an inquiry journal: existing knowledge, surprising knowledge, interests, wonderings**



## Mind Map: A Brainstorming Tool



Topics of interest to me	Interesting facts	Positives	Negatives	Rank 1-5
1.				
2.				
3.				
4.				
5.				

Rank your topics on a scale of 1 – 5 (1 = of little interest; 5 = very interesting)  
 Circle your two most interesting topics

Explain your choice in your conference with your class teacher / teacher librarian

D. Loertscher, C. Koechlin, S. Zwann. *Ban Those Bird Units: 15 Models for Teaching and Learning in Information-Rich and Technology-Rich Environments*. Salt Lake City UT: Hi Willow Research & Publishing, 2005,

- **Extending background knowledge**
- **“Look around” strategy: encountering different sources that extend background knowledge and encounter different views**
- **Journaling about ideas, potential research directions and questions: “Pair Share” strategy**
- **Modeling question development; reflective thinking**
- **Journaling and discussing conflicting ideas, multiple viewpoints**
- **Teach search skills**
- **Teach web site evaluation skills**
- **Teach about keywords**
- **Teach basic note-taking**
- **Dealing with conflicting information**



*Image by Salvatore Vuono/  
FreeDigitalPhotos.net*



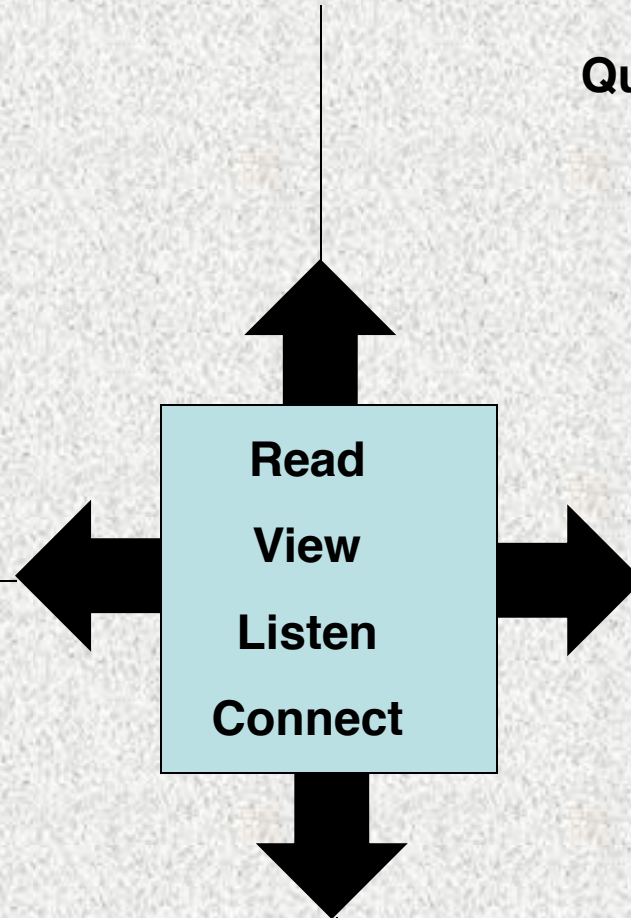


**I didn't know that!**

**Questions I have???**

**I agree / disagree**

**I wonder ....**



**D. Loertscher, C. Koechlin, S. Zwann. Ban Those Bird Units: 15 Models for Teaching and Learning in Information-Rich and Technology-Rich Environments. Salt Lake City UT: Hi Willow Research & Publishing, 2005, p. 45**

# Dealing With Conflicting Information to Develop Knowledge

Central Questions	Source 1 eg encycl	Source 2 eg Poor quality web site	Source 3 eg High quality web site	Source 4 eg Newspaper	Source 5 High quality print source	What I can say? Evidence for my statement?
who						
what						
when						
where						
why						
how						
result						

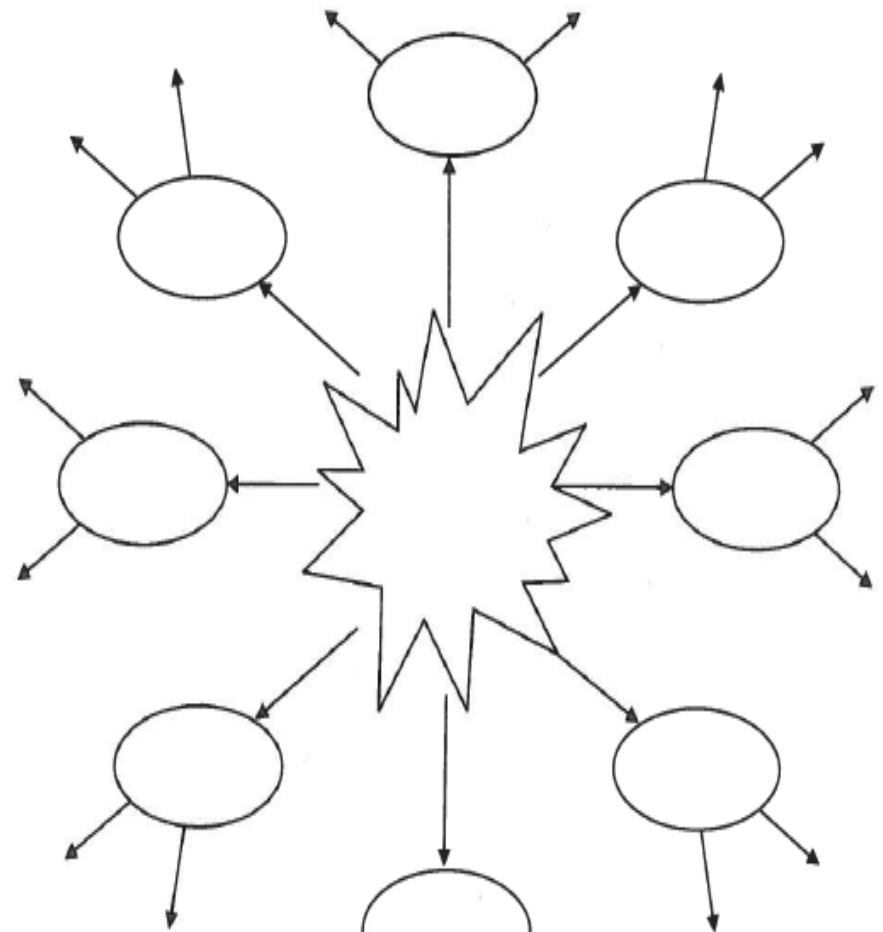
- **Good researchers have good questions**
- **Teaching students to ask the right questions is one of the greatest skills we can instruct.**
- **Thinking is not driven by answers but by questions.**
- **At the heart of inquiry, students:**
  - **produce their own questions**
  - **improve their questions**
  - **strategize on how to answer the question**



- **Students develop background knowledge of topic**
- **Create a web of the range of questions can help them narrow down the topic**
- **Focus students not on what they know, but what they might want to know in form of questions**

## Webbing Questions

Write your topic in the centre starburst. Record questions you have about this topic in the surrounding ovals. Continue to develop questions about these questions to further explore and refine your topic.

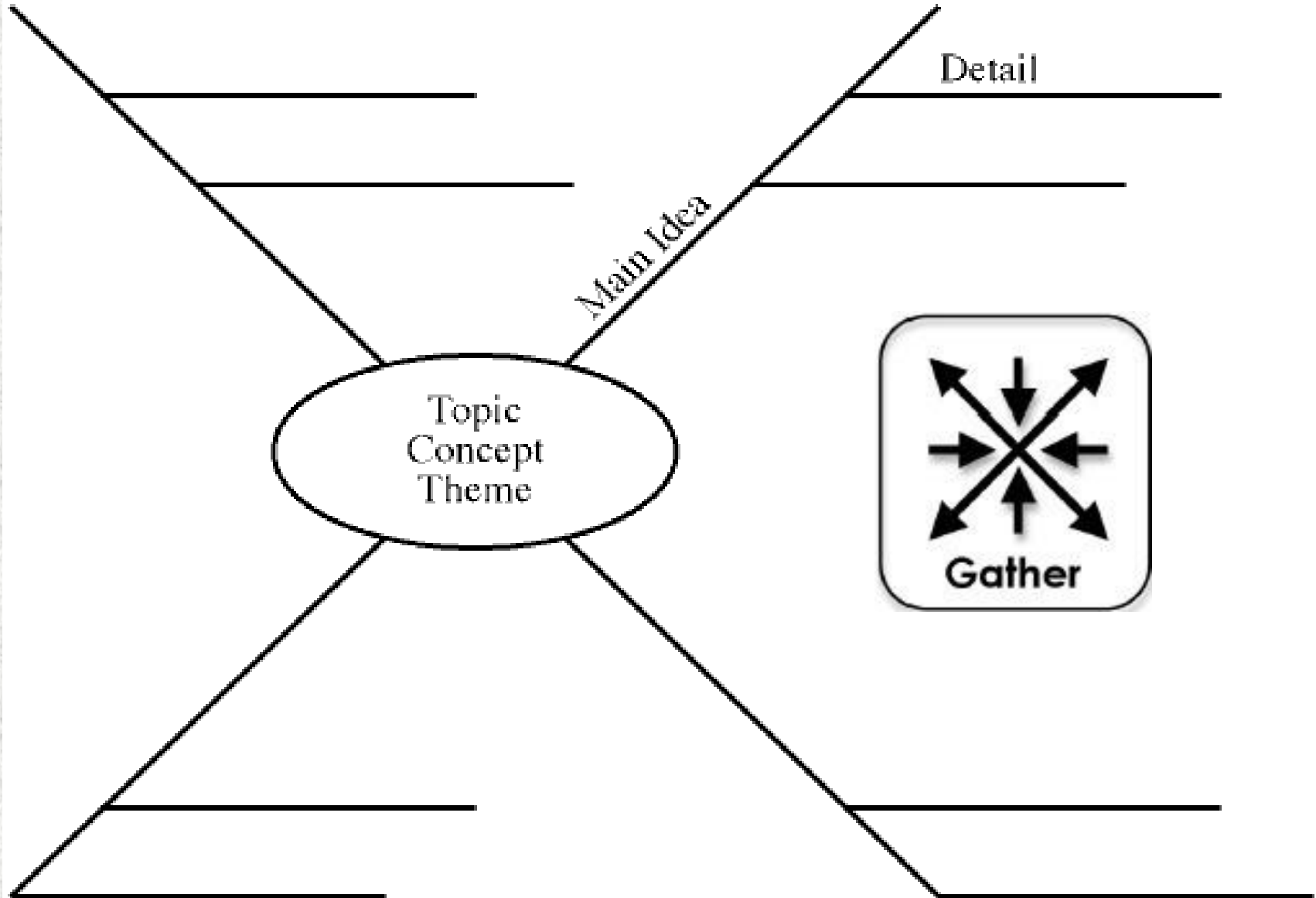


	Is	Did	Can	Would	Will	might
	Surface questions		Digging questions		Digging deeper Q	
Who						
What						
When						
Where						
How						
Why						
Which						

- **Selection of sources: pertinent, complex information rather than superficial information matched to specific focus;**
- **Collect data from interviews, surveys, experiments, observations (authentic research)**
- **Analyze and synthesize information**
- **Construct evidence-based arguments**
- **Form evidence-based opinions / viewpoints**
- **Develop conclusions & positions; posit actions, implications and solutions**

**THE CORE INSTRUCTIONAL FOCUS  
OF INQUIRY**





<http://www.ncrel.org/sdrs/areas/issues/students/learning/lr1grorg.htm>

## COMPARE & CONTRAST

Main Topic

Subtopic

Subtopic

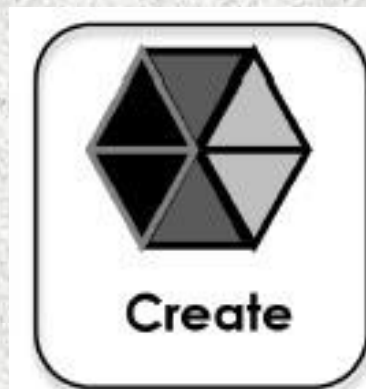
ALIKE

DIFFERENT





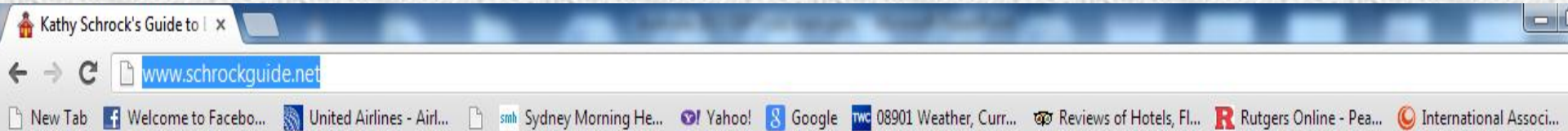
- **Integrating knowledge to showcase deep understanding**
- **Going beyond facts to synthesizing, interpreting and extending**
- **Visualizing most important ideas on a task plan**
- **Positioning focus question on plan**
- **Highlight themes that are emerging**
- **PQP: inquiry circles: Praise Question Polish Student-to-Student evaluation**
- **Critique existing approaches to showcasing knowledge: what does “good” look like?**



- **Representation of new knowledge: what does “good” history, science, economics knowledge like? How is it typically presented in the real world?**
- **Principles / criteria for applying modes of representation – textual, visual, graphical – discipline requirements**
- **Structuring ideas into a coherent, integrated body of knowledge**
- **Using ICT tools to construct appropriate representations of new knowledge**
- **Using ICT tools, techniques and critical thinking skills to communicate new knowledge in appropriate ways – appropriate to the discipline eg infographics**

- **Debate Graph: wiki debate visualization tool**
- **<http://debategraph.org/>**
  
- **Argument mapping**
- **[http://www.austhink.org/critical/pages/argument\\_mapping.html](http://www.austhink.org/critical/pages/argument_mapping.html)**
  
- **Mindmapping: Online Mind Mapping Software**
- **<http://www.mindomo.com/>**
  
- **Concept Mapping / Graphic Organizers**
- **<http://www.graphic.org/>**
  
- **<http://mywebspiration.com/> Collaborative visual thinking**

- **Students' performance in final products are scaled according to a set of criteria that clearly define what is the range of acceptable to unacceptable performances and/or information products look like**
- **Compare with previous assignments where no instructional intervention took place See Kathy Schrock's Guide to Everything**
- <http://www.schrockguide.net/>



## Kathy Schrock's Guide to Everything



# Holistic Critical Thinking Scoring Rubric

Facione and Facione

<b>4</b>	<p>Consistently does all or almost all of the following:</p> <ul style="list-style-type: none"> <li>Accurately interprets evidence, statements, graphics, questions, etc.</li> <li>Identifies the salient arguments (reasons and claims) pro and con.</li> <li>Thoughtfully analyzes and evaluates major alternative points of view.</li> <li>Draws warranted, judicious, non-fallacious conclusions.</li> <li>Justifies key results and procedures, explains assumptions and reasons.</li> <li>Fair-mindedly follows where evidence and reasons lead.</li> </ul>
<b>3</b>	<p>Does most or many of the following:</p> <ul style="list-style-type: none"> <li>Accurately interprets evidence, statements, graphics, questions, etc.</li> <li>Identifies relevant arguments (reasons and claims) pro and con.</li> <li>Offers analyses and evaluations of obvious alternative points of view.</li> <li>Draws warranted, non-fallacious conclusions.</li> <li>Justifies some results or procedures, explains reasons.</li> <li>Fair-mindedly follows where evidence and reasons lead.</li> </ul>
<b>2</b>	<p>Does most or many of the following:</p> <ul style="list-style-type: none"> <li>Misinterprets evidence, statements, graphics, questions, etc.</li> <li>Fails to identify strong, relevant counter-arguments.</li> <li>Ignores or superficially evaluates obvious alternative points of view.</li> <li>Draws unwarranted or fallacious conclusions.</li> <li>Justifies few results or procedures, seldom explains reasons.</li> <li>Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.</li> </ul>
<b>1</b>	<p>Consistently does all or almost all of the following:</p> <ul style="list-style-type: none"> <li>Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others.</li> <li>Fails to identify or hastily dismisses strong, relevant counter-arguments.</li> <li>Ignores or superficially evaluates obvious alternative points of view.</li> <li>Argues using fallacious or irrelevant reasons, and unwarranted claims.</li> <li>Does not justify results or procedures, nor explain reasons.</li> <li>Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.</li> <li>Exhibits close-mindedness or hostility to reason.</li> </ul>

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<p><b>A. GIVEN</b>  <i>Observes and describes given information in relation to a question</i></p>	Identifies appropriate main issue and describes it accurately, selects key component points, recognizes priorities among details in relation to given question, picks up unstated implications.		Identifies inappropriate main issue or none at all, describes issue inaccurately, fails to identify key component points, loses focus on given question.	
<p><b>B. WHEREAS</b>  <i>Analyzes the given material and shows structure of an argument</i></p>	Shows connections among key points with a visible structure (diagram, outline, etc.), indicates contradictions and continuities, shows cause & effect relationships, demonstrates sound logic leading toward a generalization.		Ignores key points or shows inability to manipulate them, shows confusion about relationships among key points, uses faulty logic, fails to create order from details.	
<p><b>C. THEREFORE</b>  <i>Responds to question with conclusion or hypothesis.</i></p>	Clearly states conclusion or hypothesis, shows how it emerges from the evidence, demonstrates its relationship to the given question.		Proposes no comprehensible conclusion or hypothesis, wanders from the given question.	
<p><b>D. AND SO . . .</b>  <i>Evaluates conclusion or hypothesis within relevant context.</i></p>	Appropriately assesses conclusion or hypothesis in terms of reliability and further evidence needed, assesses external implications of the conclusion/hypothesis within a larger context.		Fails to assess conclusion, raises no additional questions, fails to place the argument within a relevant larger context.	

***“Upon this gifted age, in its  
dark hour***

***Rains from the sky a meteoric  
shower***

***Of facts, they lie unquestioned,  
uncombined.***

***Wisdom enough to leech us of  
our ill***

***Is daily spun, but there exists  
no loom***

***To weave it into fabric.”***

