

# Building on New Constructivist Ideas and the CmapTools to Create a New Model for Education

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# Typical Classroom Activities

**Lesson Assignments**  
**Pre-testing (rarely)**  
**Readings**  
**Class discussions**  
**Practice or exercises**  
**Collaborative student work**  
**Comparing and contrasting views**  
**Research work**  
**Oral or written reports**  
**Integration with other studies (rarely)**  
**Post comprehensive test**  
**Home/community presentations (rarely)**



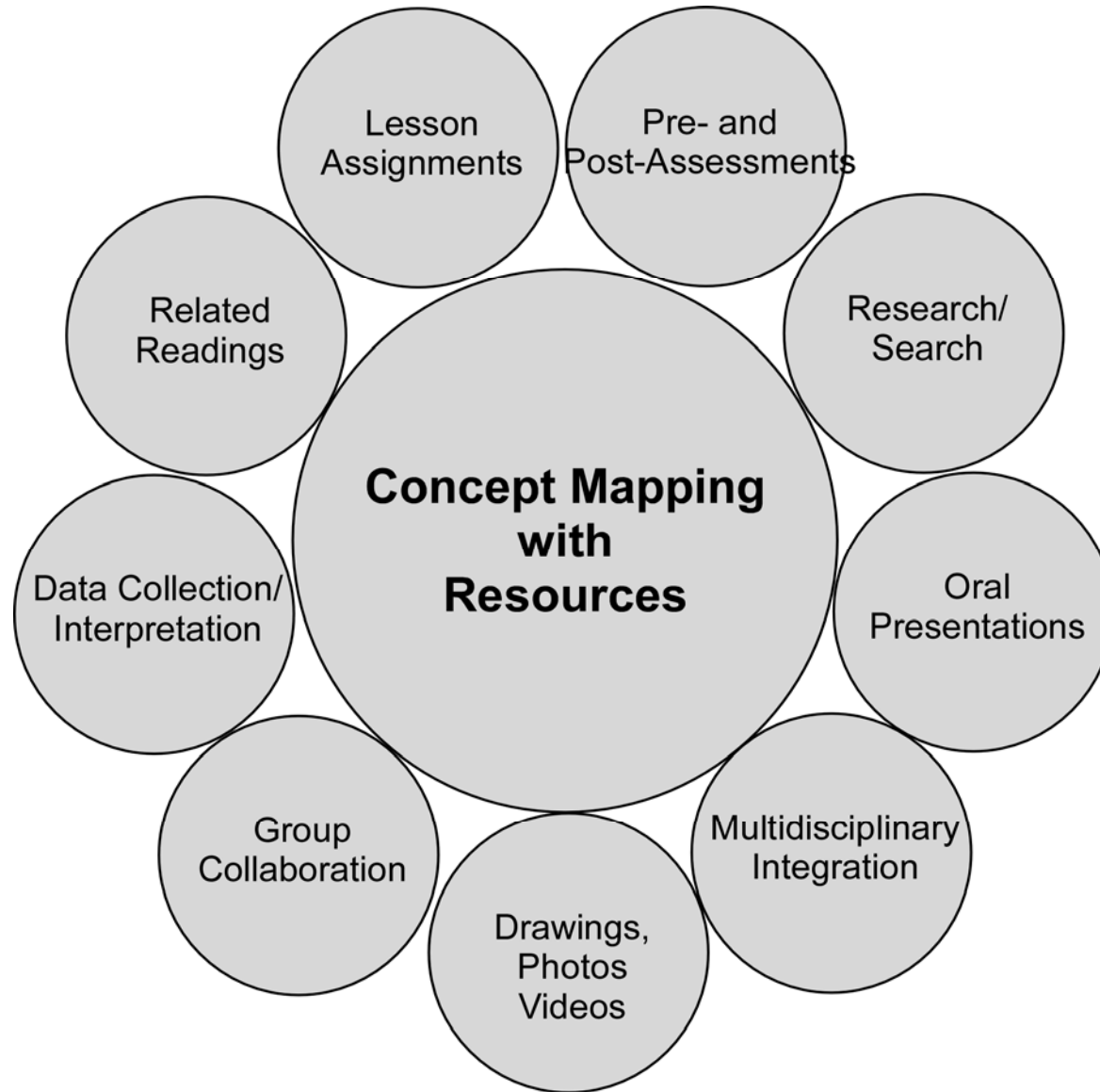
# Typical Concept Mapping Activities Now Utilized

- Pre/Post Assessment
- Summarizing Topics/Lessons
- Comparing and contrasting views
- Organizing area of study



**Each is a separate activity**

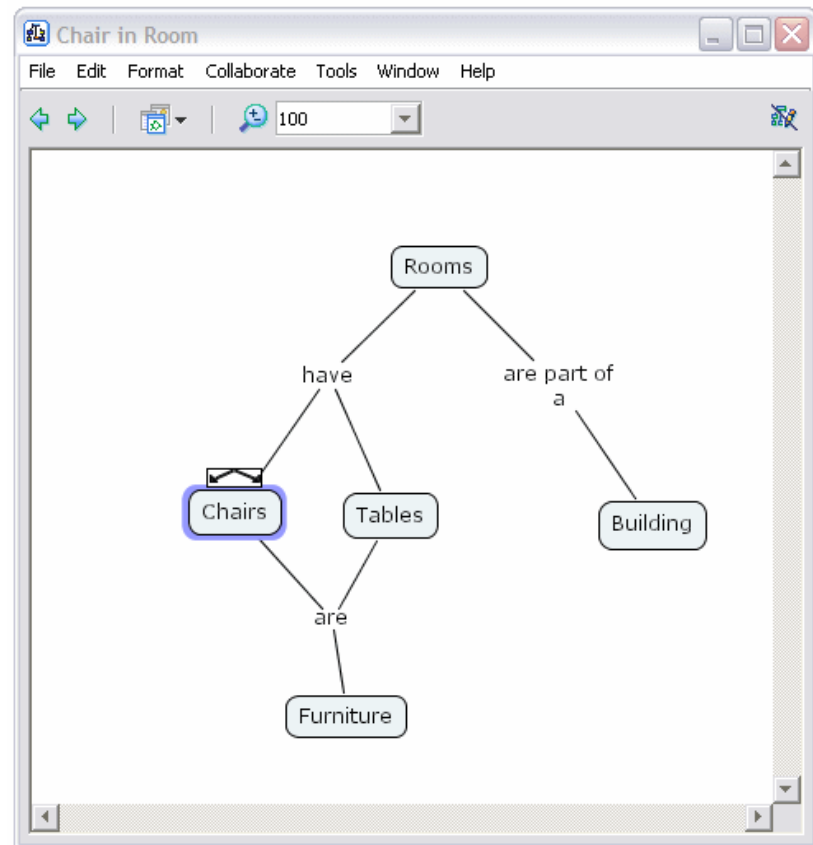
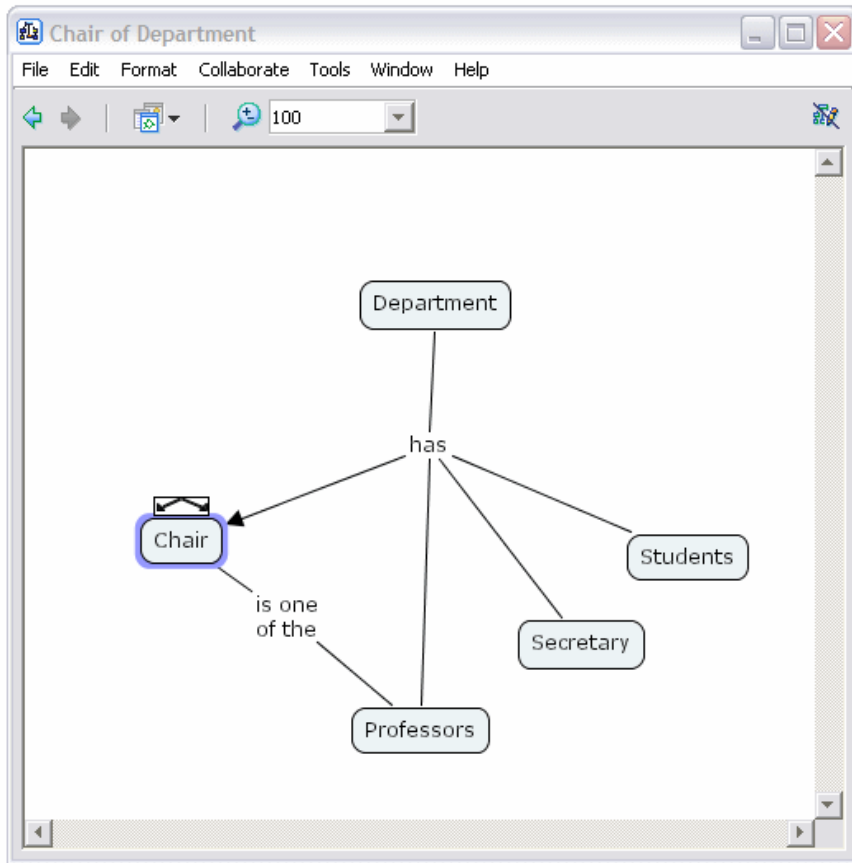
# A Concept Map-Centered Model

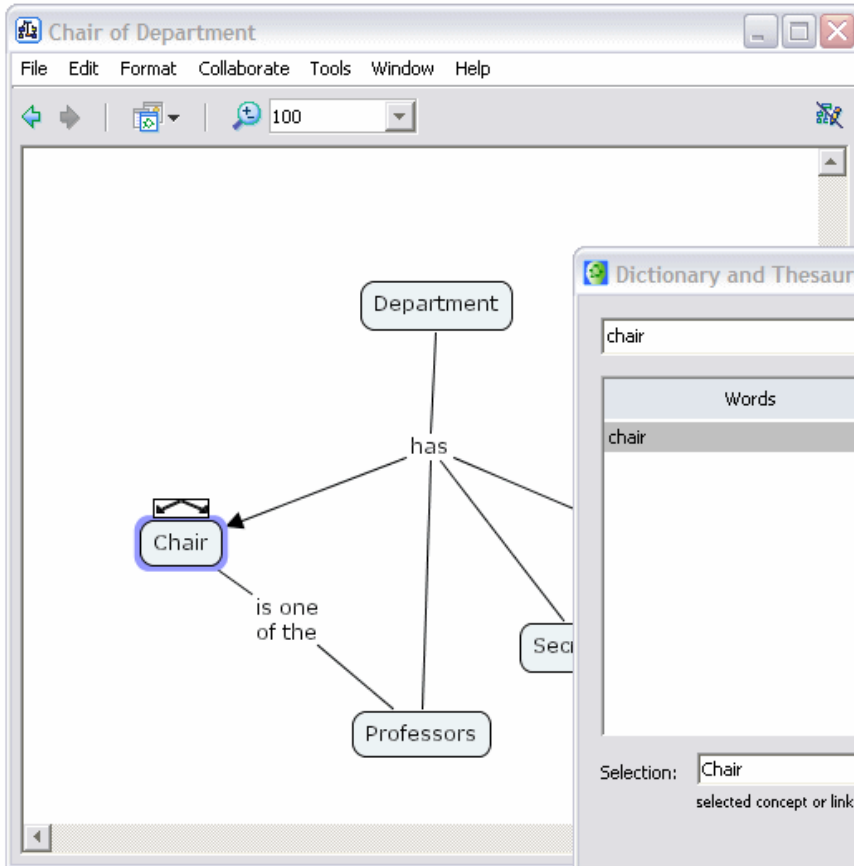


# Concept Maps

- Theory
- Methodology
- Technology







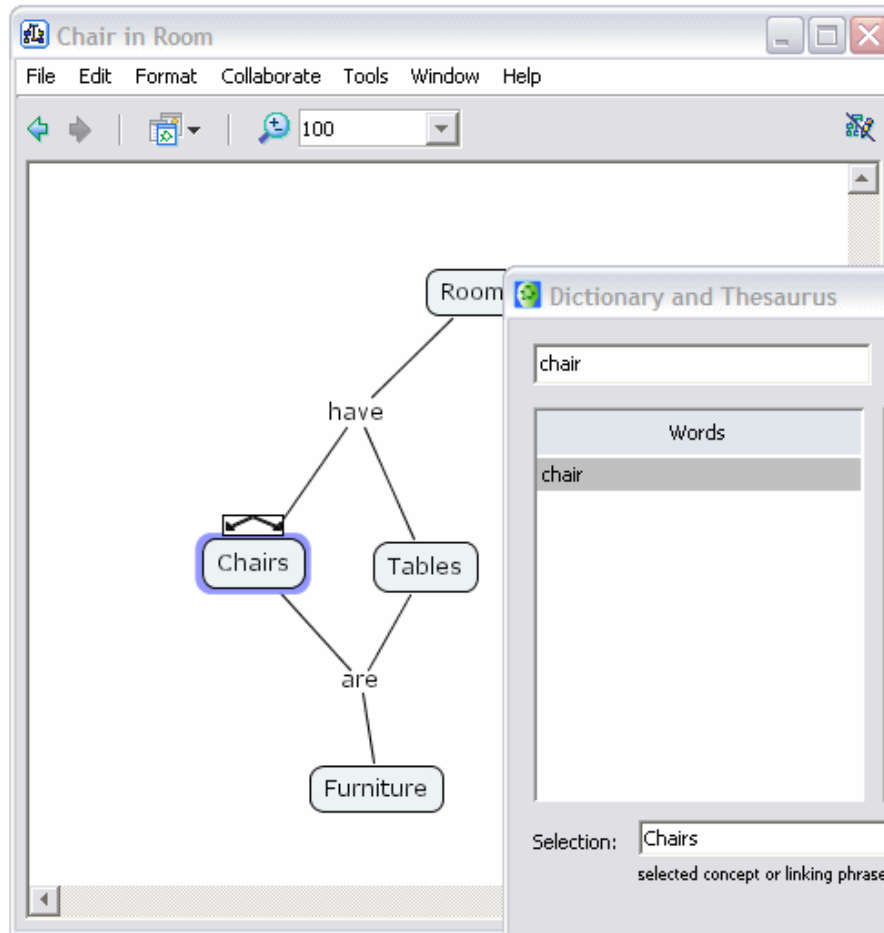
Dictionary and Thesaurus

chair

Words	Definitions	Related Words
chair	<p><b>Nouns</b></p> <ul style="list-style-type: none"> <li>- {president, chairman, chairwoman, chair, chairperson, }</li> <li>- {chair, }</li> <li>- {electric chair, chair, death chair, hot seat, }</li> <li>- {professorship, chair, }</li> </ul> <p><b>Verbs</b></p> <ul style="list-style-type: none"> <li>- {moderate, chair, lead, }</li> </ul>	<p><b>Synonyms</b></p> <ul style="list-style-type: none"> <li>president</li> <li>chairman</li> <li>chairwoman</li> <li>chairperson</li> </ul> <p><b>Is a kind of</b></p> <ul style="list-style-type: none"> <li>presiding officer</li> </ul> <p><b>Related to</b></p> <ul style="list-style-type: none"> <li>moderator</li> <li>double click to see definition</li> </ul>

Selection:   Replace with:

selected concept or linking phrase



Dictionary and Thesaurus

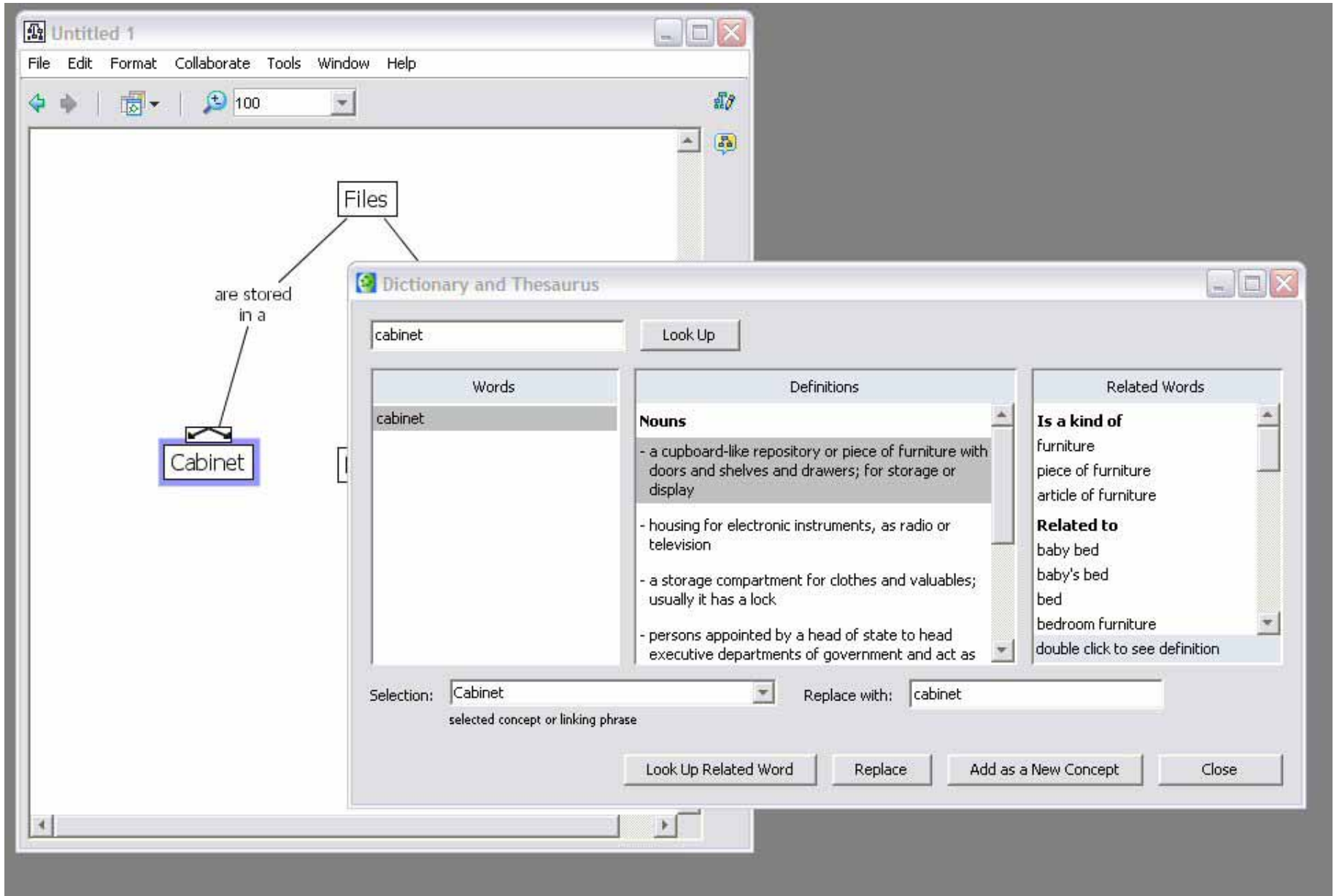
chair

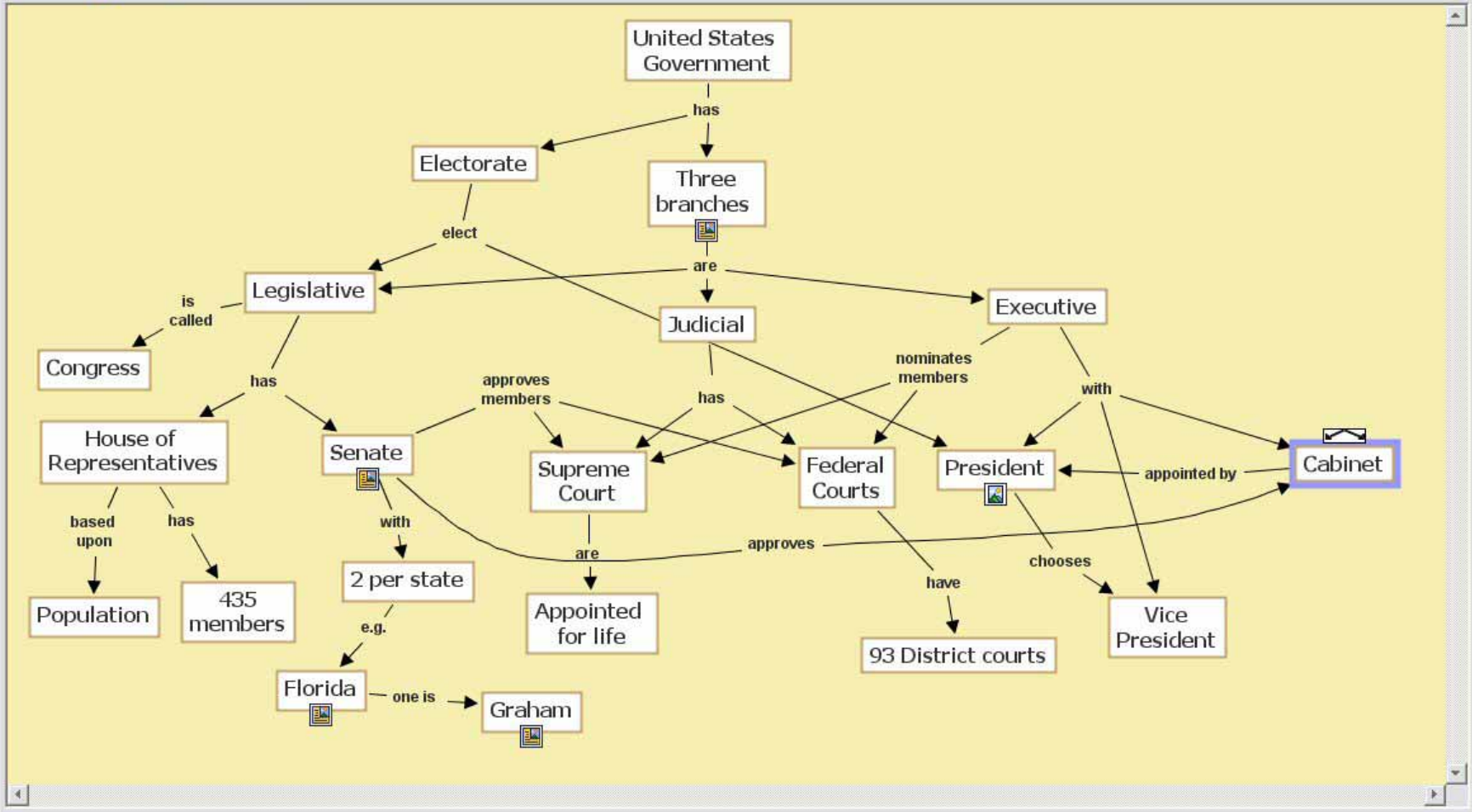
Words	Definitions	Related Words
chair	<p><b>Nouns</b></p> <ul style="list-style-type: none"> <li>- {chair,}</li> <li>- {electric chair, chair, death chair, hot seat,}</li> <li>- {professorship, chair,}</li> <li>- {president, chairman, chairwoman, chair, chairperson, }</li> </ul> <p><b>Verbs</b></p> <ul style="list-style-type: none"> <li>- {moderate, chair, lead,}</li> </ul>	<p><b>Is a kind of</b></p> <ul style="list-style-type: none"> <li>seat</li> </ul> <p><b>Is part of</b></p> <ul style="list-style-type: none"> <li>back</li> <li>backrest</li> <li>leg</li> </ul> <p><b>Related to</b></p> <ul style="list-style-type: none"> <li>bench</li> <li>banch</li> <li>double click to see definition</li> </ul>

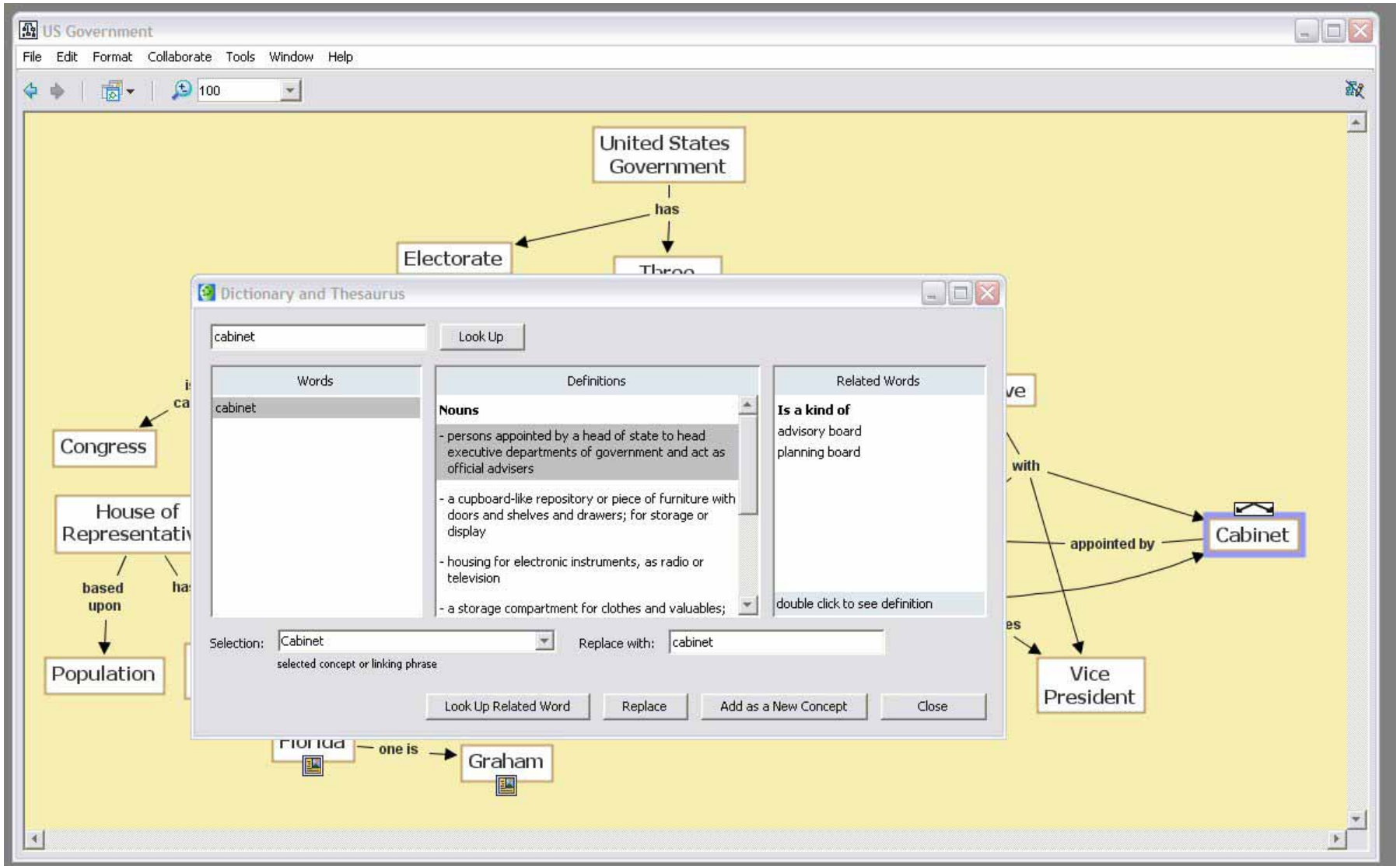
Selection:   Replace with:

selected concept or linking phrase

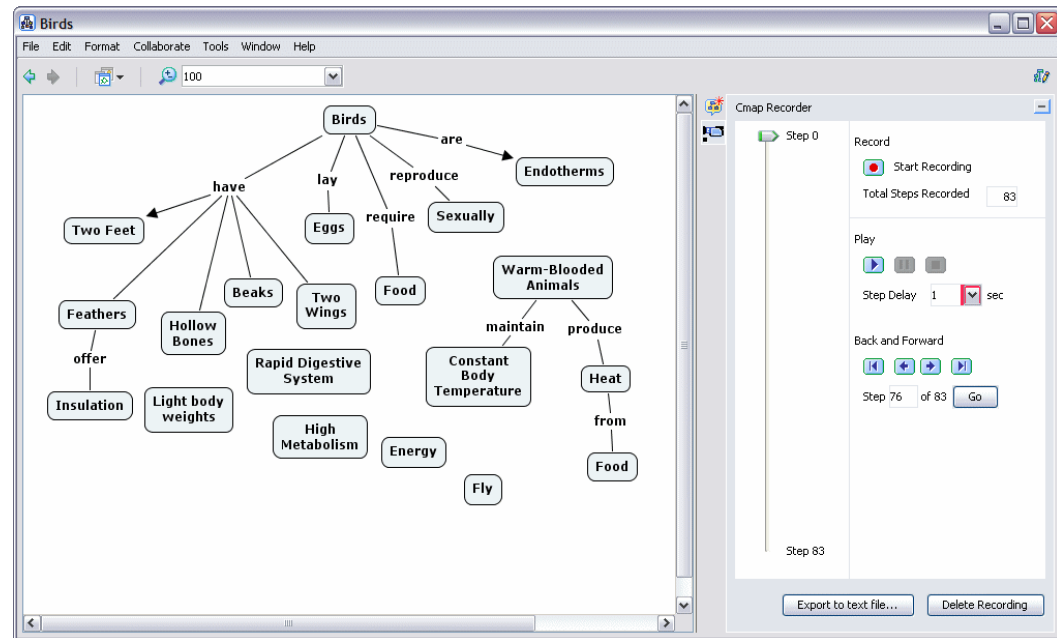
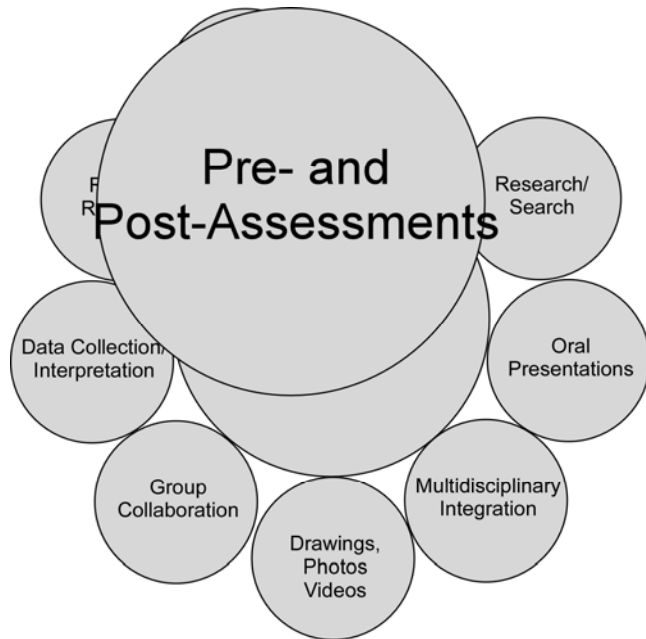




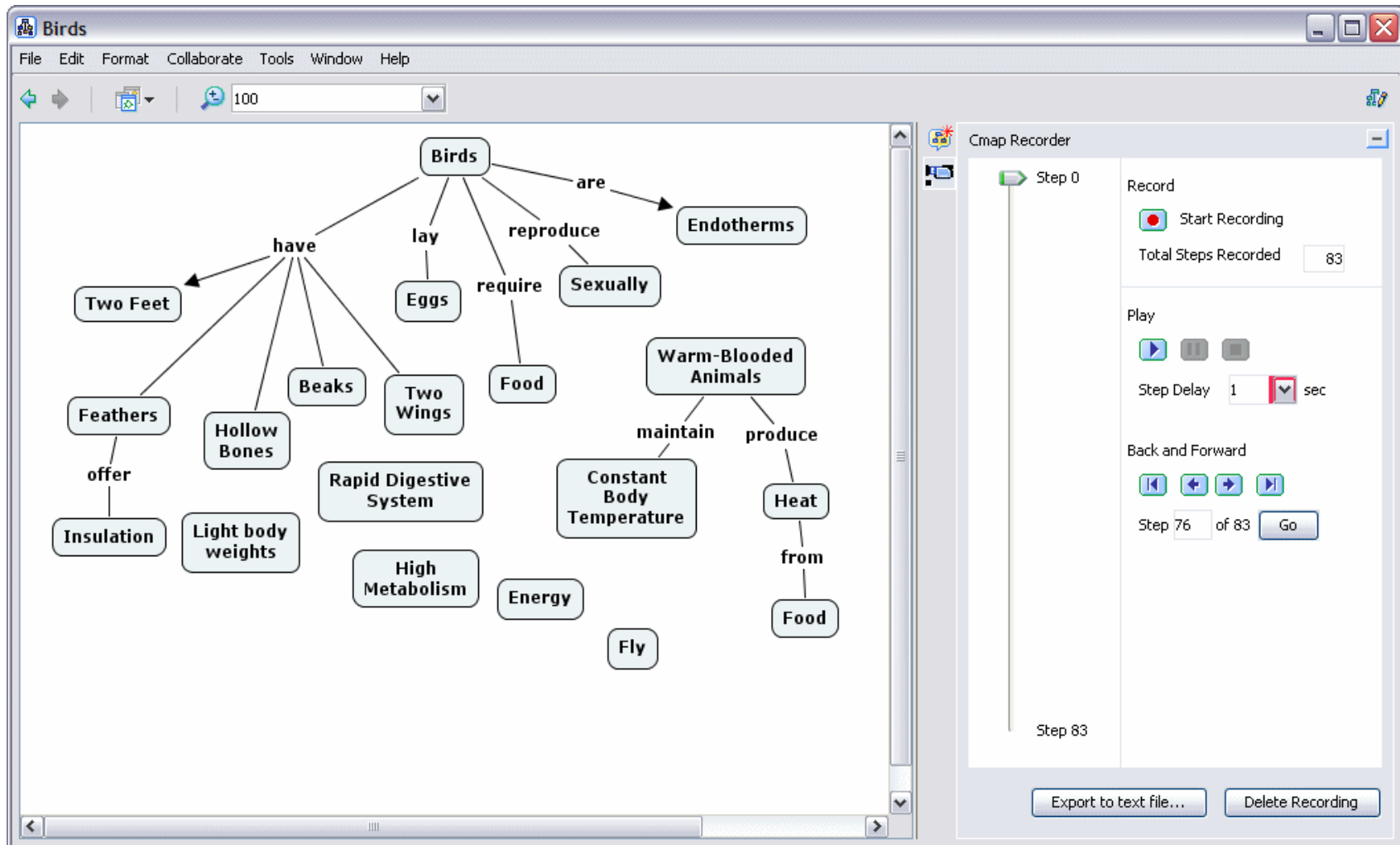




# A Concept Map-Centered Model



# A Concept Map-Centered Model



**Cmap Recorder**

Step 0

Record

Total Steps Recorded: 83

Play

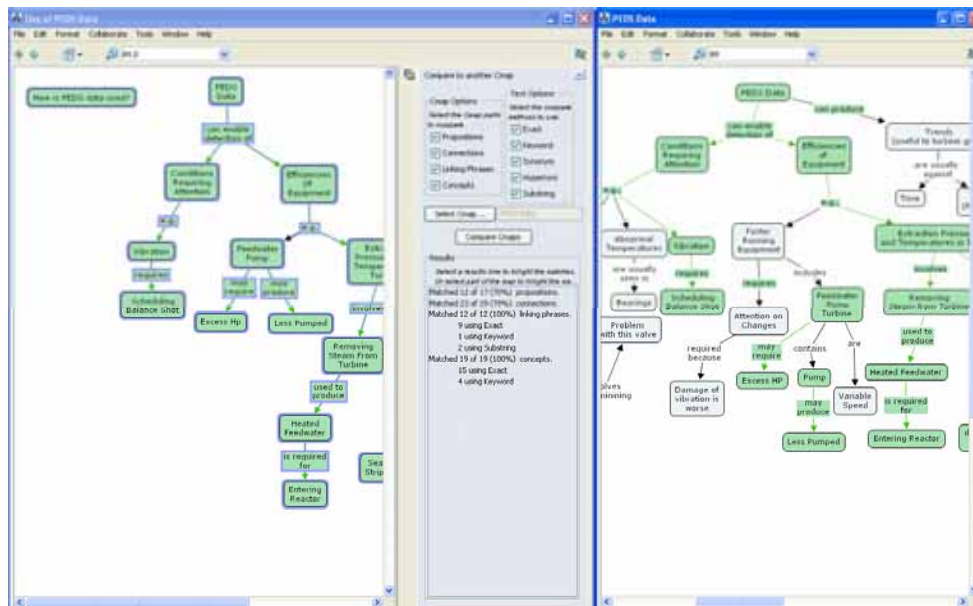
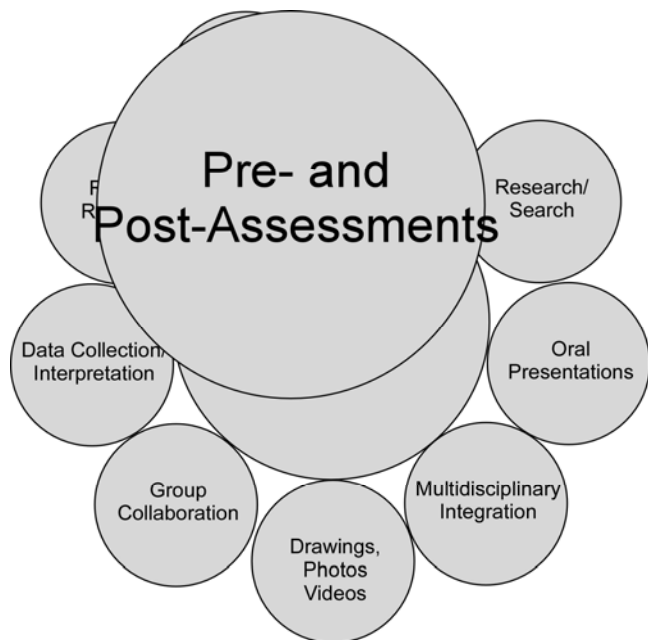
Step Delay: 1 sec

Back and Forward

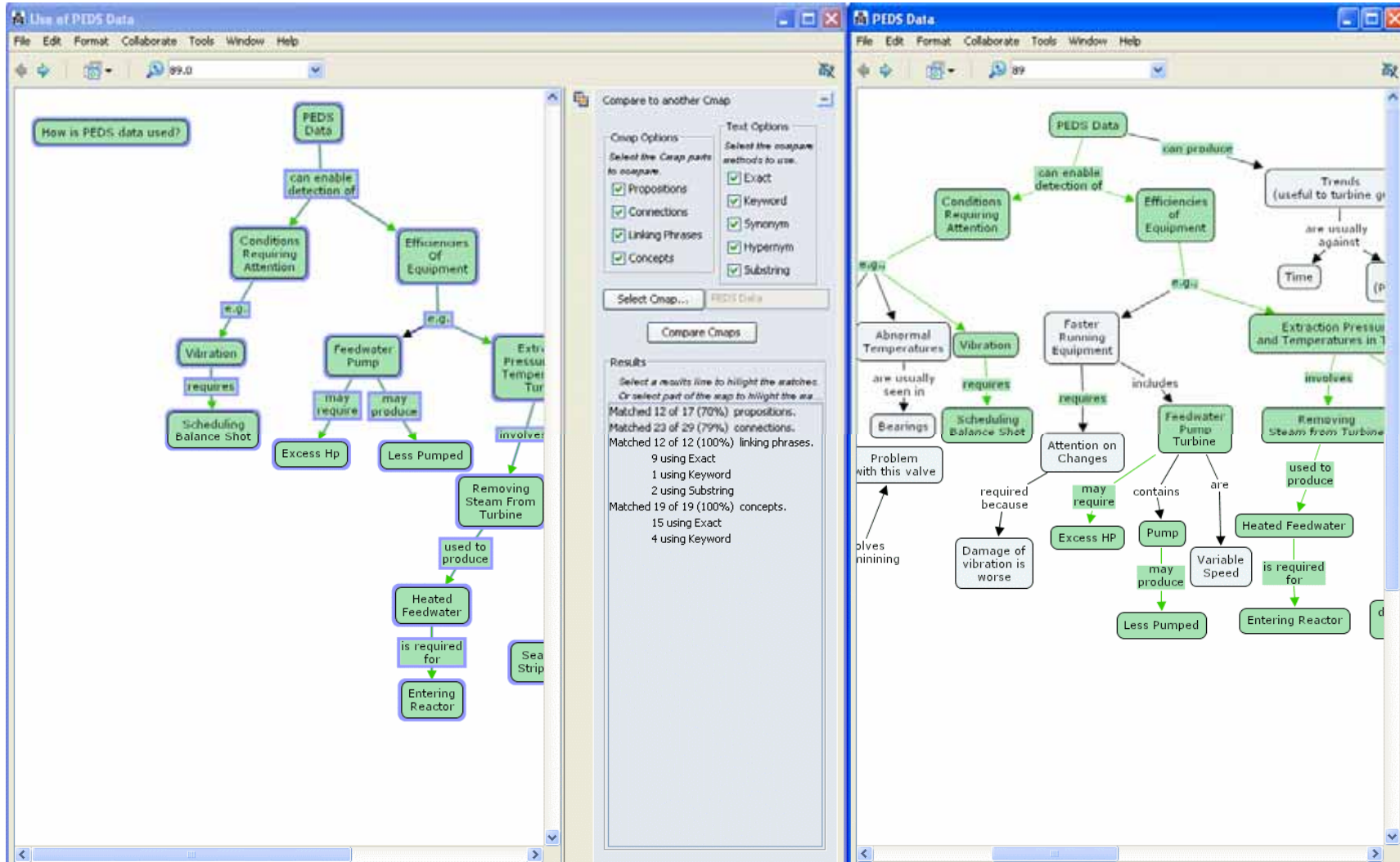
Step 76 of 83

Step 83

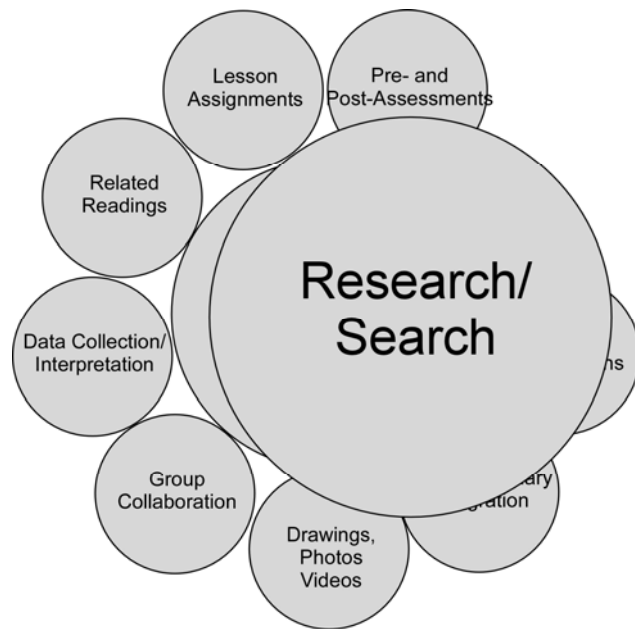
# A Concept Map-Centered Model



# A Concept Map-Centered Model



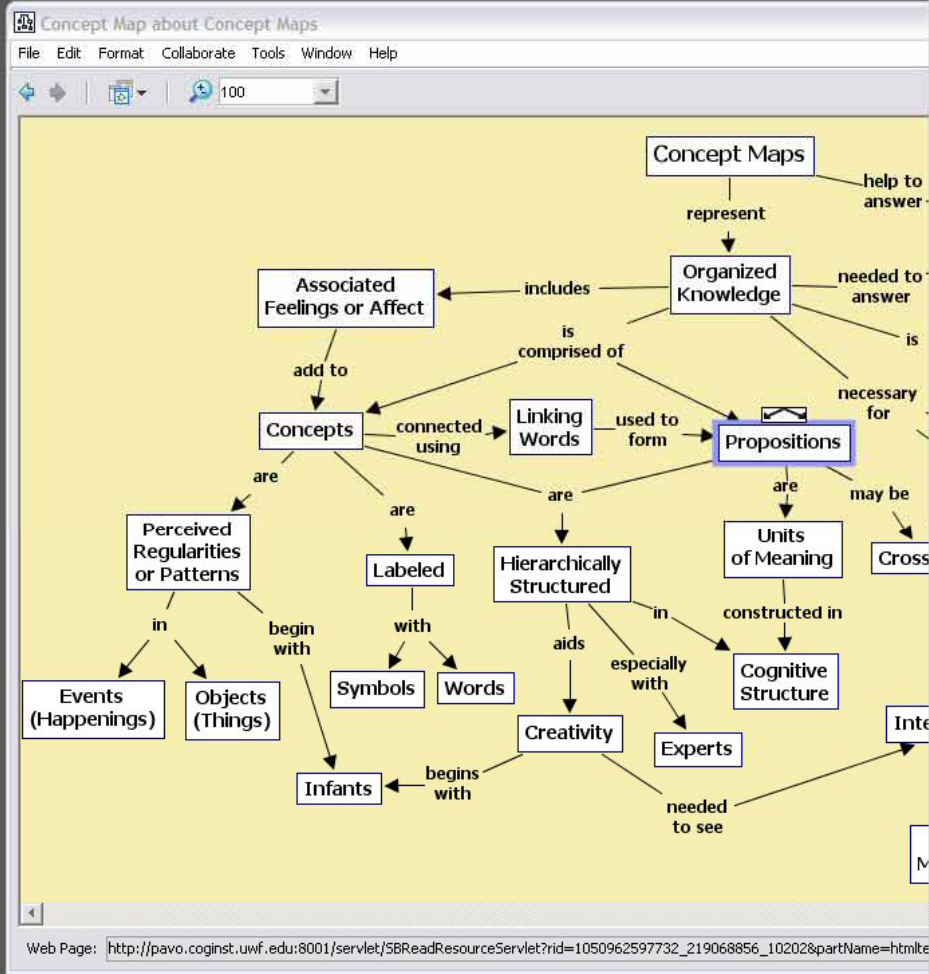
# A Concept Map-Centered Model



The screenshot shows a web browser displaying a concept map about concept maps. The map is a hierarchical structure of concepts and their relationships. The central concept is "Concept Maps", which "represent" "Organized Knowledge". "Organized Knowledge" "includes" "Associated Feelings or Affect" and "is composed of" "Concepts". "Concepts" are "connected using" "Linking Words" and "used to form" "Propositions". "Propositions" are "necessary for" "Units of Meaning" and "may be" "Cross". "Concepts" are "Perceived Regularities or Patterns" and "are" "Labeled". "Perceived Regularities or Patterns" are "in" "Events (Happenings)" and "begin with" "Objects (Things)". "Objects (Things)" are "begin with" "Symbols" and "Words". "Symbols" and "Words" are "begin with" "Infants". "Words" are "ask" "Creativity" and "especially with" "Experts". "Creativity" "needs to see" "Experts". "Creativity" is "constructed in" "Cognitive Structure". "Cognitive Structure" is "constructed in" "Units of Meaning". "Units of Meaning" are "Cross".

On the right side of the browser, there is a search window titled "What to Search" with the search term "Propositions". The search results show several items related to "Propositions", including "Propositions", "propositions and cross-links", "concept maps - knowledge scope", "Concept Tools - Knowledge Scope", "concept maps - importing scope", "Concept Maps", "Concept Tools - Importing Scope", "concept\_scope", and "research/teams".





Search

What to Search:

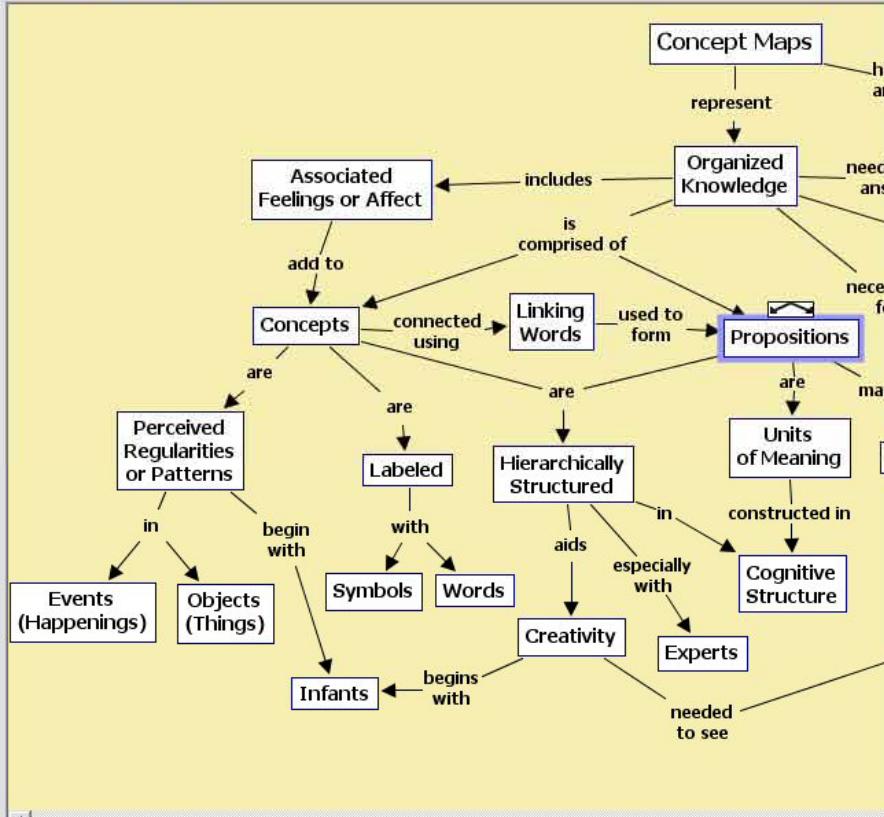
"Propositions" Search

Searching in My Cmaps, and Places

Results: My Cmaps: 1 Places:53

- Propositions**  
propositions  
IHMC Public Cmaps\CNET Workshops - All\CNET Workshop August 13-14 2002\DTs\Propositions
- propositions and cross-links**  
propositions and cross-links  
IHMC Public Cmaps\CNET Workshops - All\CNET Workshop August 13-14 2002\DTs\Propositions and cross-links
- cmaptools - knowledge soups**  
description of knowledge soups in cmaptools  
CMAP USB\CmapTools Website\Cmaps\CmapTools - Knowledge Soups
- CmapTools - Knowledge Soups**  
description of knowledge soups in cmaptools  
IHMC Public Cmaps\maryjo\CmapTools v3 Website\CmapTools Website\Cmaps\CmapTools - Knowledge Soups
- cmaptools - importing cmaps**  
what formats can cmaps be imported from?  
CMAP USB\CmapTools Website\Cmaps\CmapTools - Importing Cmaps
- Concept Maps**  
shows key ideas from the theory of knowledge and theory of learning as they relate to the structure of concept maps  
IHMC Public Cmaps>About Top Maps\otros\Concept Maps
- CmapTools - Importing Cmaps**  
what formats can cmaps be imported from?  
IHMC Public Cmaps\maryjo\CmapTools v3 Website\CmapTools Website\Cmaps\CmapTools - Importing Cmaps
- concept\_maps**  
no description  
IHMC Public Cmaps\SemanticWeb\Scargle\Concept\_Mapping\concept\_maps
- rmanahrman**  
Double click an entry to view, and/or drag and drop to target

+ Show Refine Search Close



What to Search:

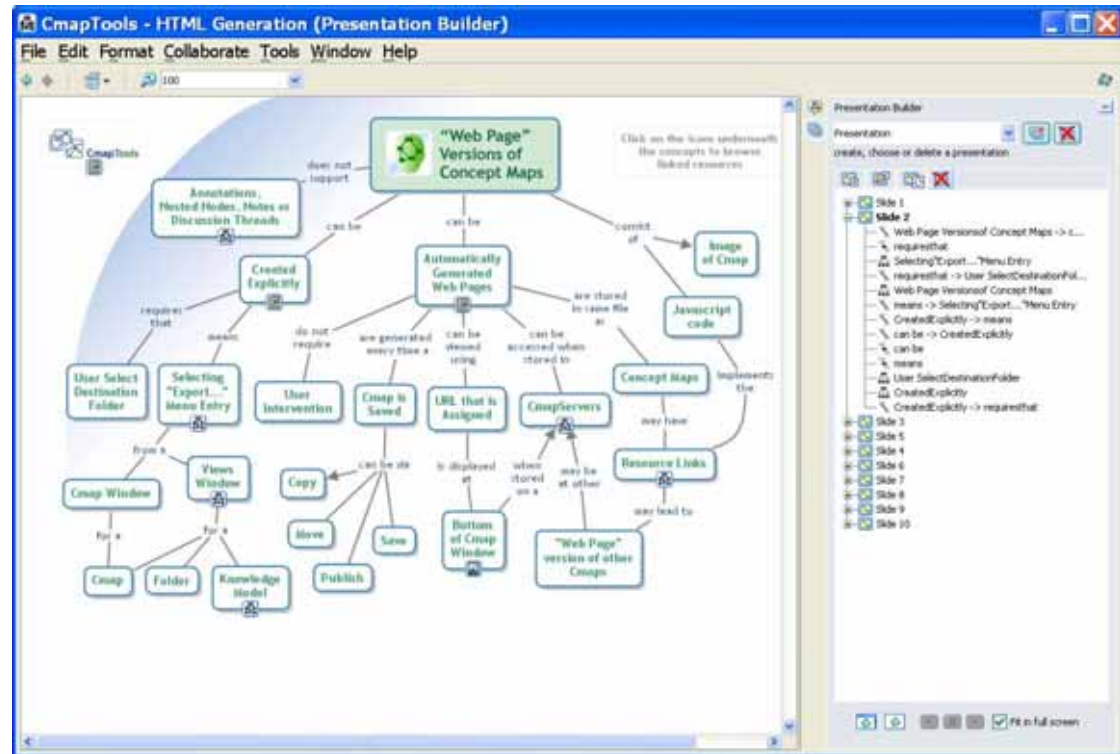
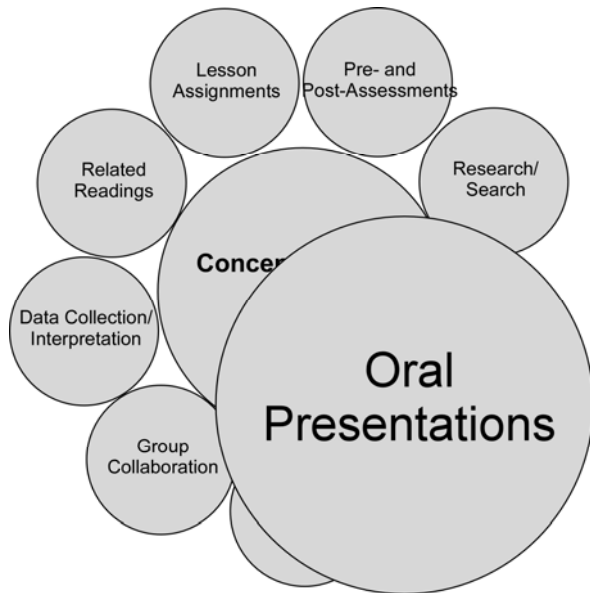
Searching Web for pages related to "Propositions" in the context of this map.

Searching the Web

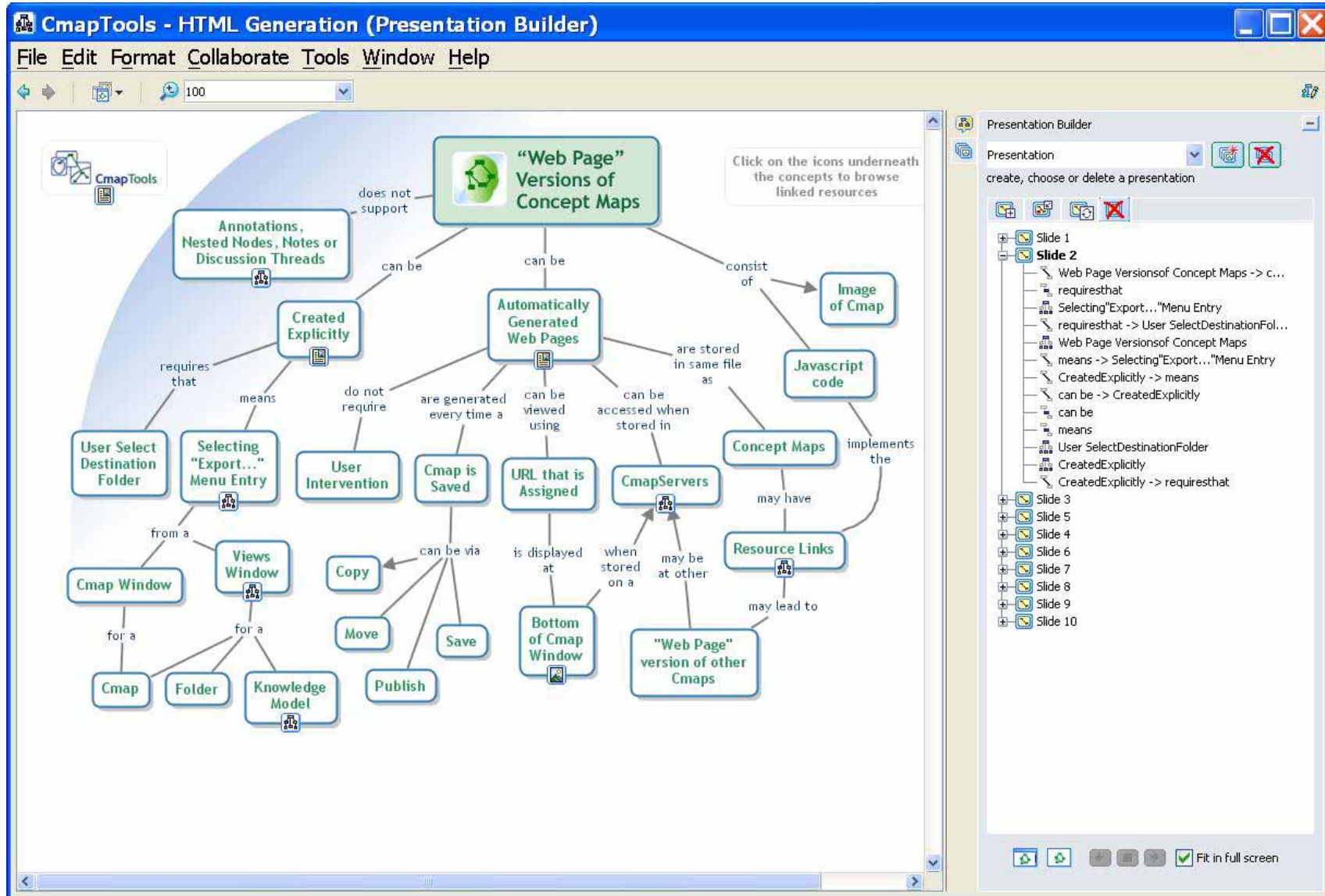
Results: Web: 11

- AERA99\_1**  
... in the framework of propositions (Novak & ... Concept maps have been shown to promote problem ... to knowledge structure because organized knowledge structures are at ...  
[http://www.bath.ac.uk/dacs/cdnt/ConceptMaps/x-url/validation\\_of\\_concept\\_ma.html](http://www.bath.ac.uk/dacs/cdnt/ConceptMaps/x-url/validation_of_concept_ma.html)
- Concept Map-Based Assessment in Science: Two Exploratory Studies ...**  
... It may be that reliability depends on the scoring criteria (eg, validity of the propositions) and the number of concept maps used. Page 11. ...  
<http://www.cse.ucla.edu/CRE55T/Reports/TECH436.pdf>
- Assessing Expert Knowledge Representations of Introductory ...**  
... These connections reflect an organized knowledge base that ... training package for constructing concept maps prior to ... ie, nodes, links, propositions, cross-links ...  
<http://www.cse.ucla.edu/reports/TR600.pdf>
- Cell Biology Education**  
... Note the enormous growth of organized knowledge and the ... revealed by the interviews as concept maps, with concepts and propositions organized into a ...  
<http://www.cellbioed.org/articles/vol2no2/article.cfm?articleID=59>
- ANDERSON 26\_8 for PDF**  
... approach, making concepts and propositions visible enables ... Building an organized knowledge-base: Concept mapping and ... Concept maps as a heuristic for science ...  
<http://dercenter.gallaudet.edu/TecEds/training/summer-2003/articles/mapping.pdf>
- Concept Mapping as a Tool for Curriculum Development and Student ...**  
... a map with two central propositions: "purpose guides ... The theory underlying concept maps and how to ... Building an organized knowledge base: Concept mapping and ...  
[http://www.vanrh.org/docs/010\\_2002.pdf](http://www.vanrh.org/docs/010_2002.pdf)
- IHMC Concept Map Software**  
... and the role played by concepts and propositions. ... Building an organized knowledge base: Concept ... Concept maps are used as representations of the structural ...  
<http://cmap.coginst.uwf.edu/refs.html>
- ITD Journal**  
... fish&quot; examples would become propositions requiring further ... Concept maps consistently provide excellent opportunities for ... build an organized knowledge base in a ...  
<http://www.rit.edu/~easi/itd/itdv05n1-2/article2.html>

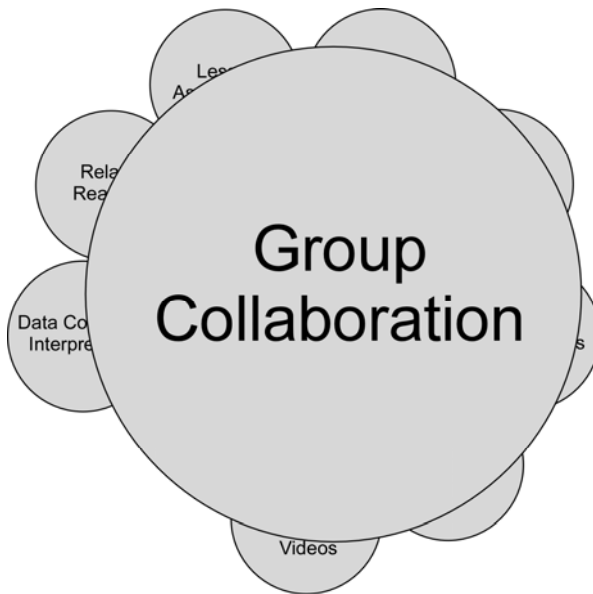
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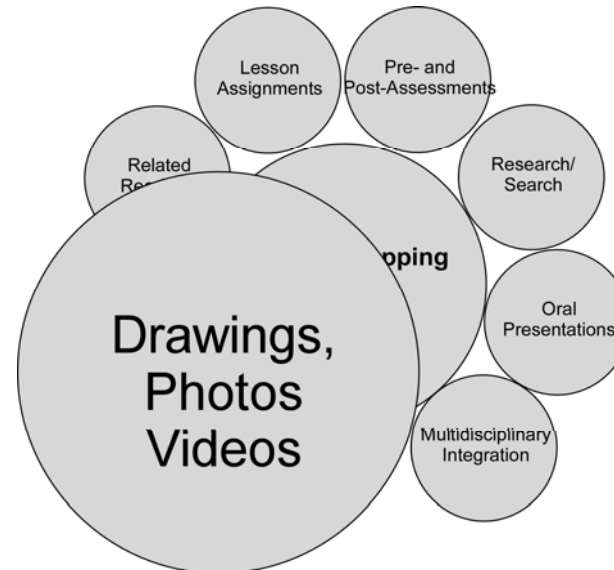
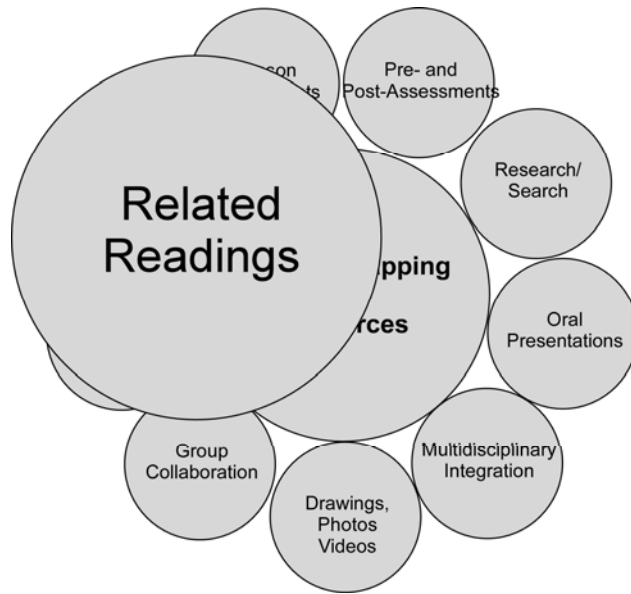
## A Concept Map-Centered Model



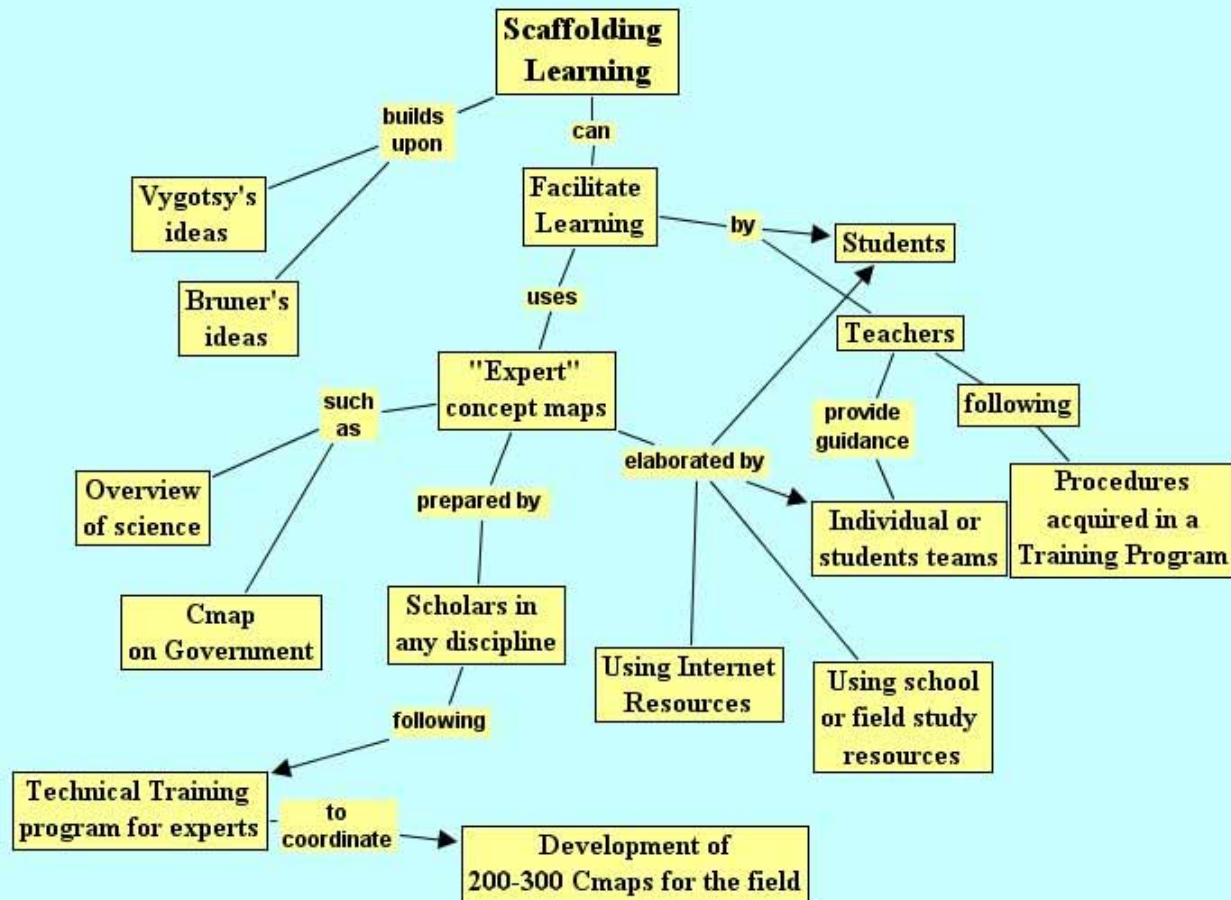
Sharing in servers  
Synchronous collaboration  
Asynchronous collaboration  
Discussion threads  
Annotations  
Knowledge Soups

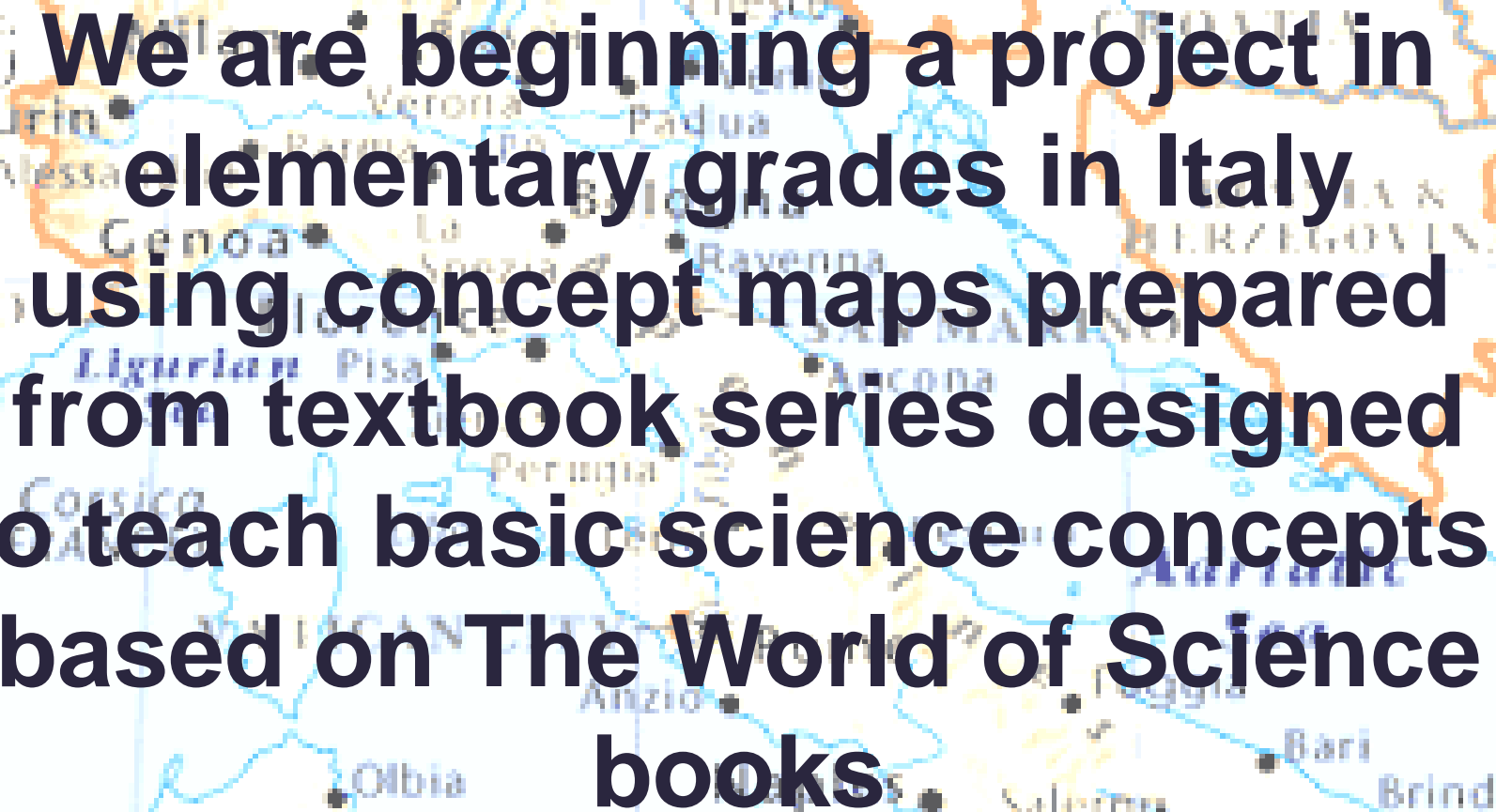
.....

# A Concept Map-Centered Model



# Scaffolding / Expert Maps

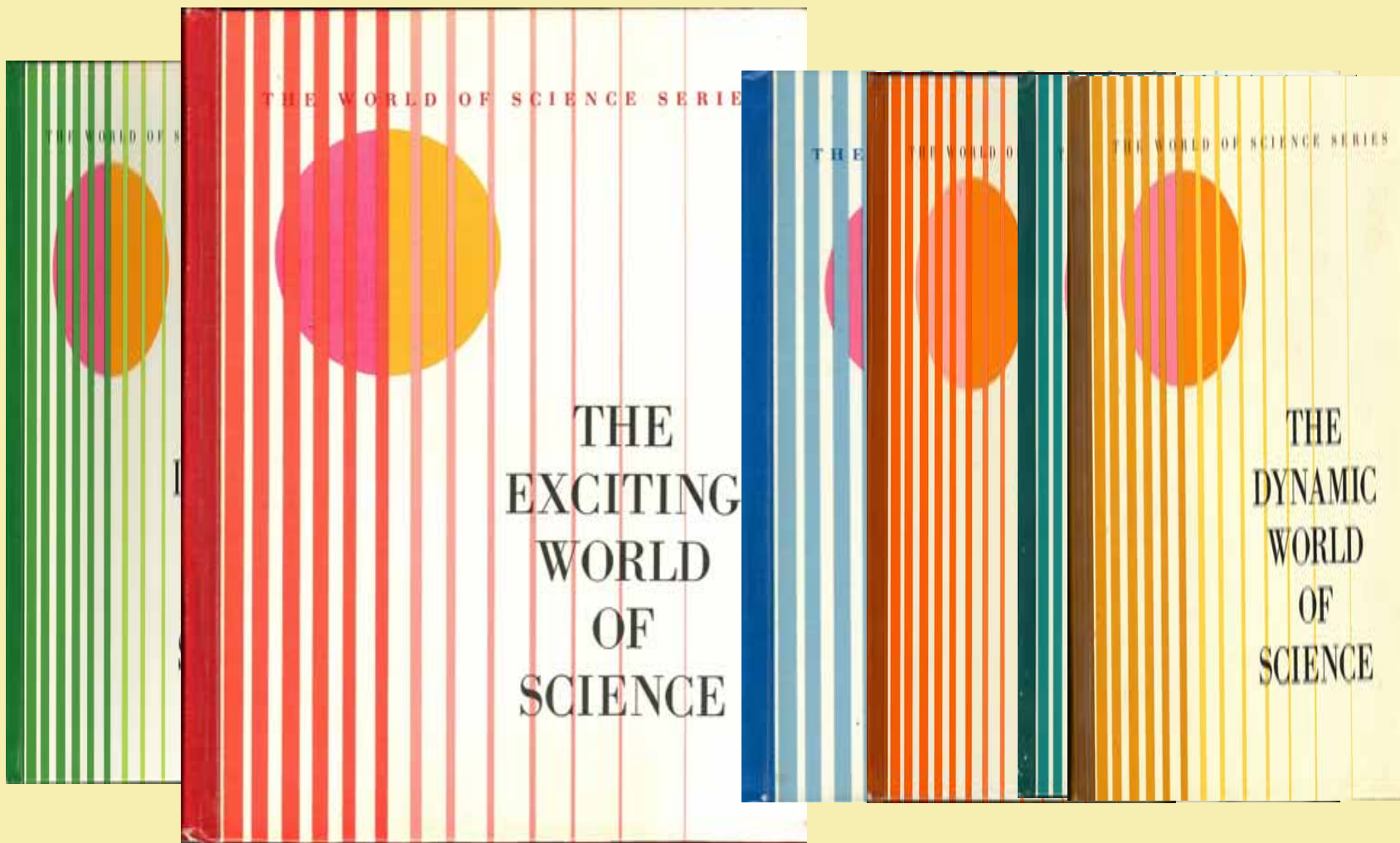


A map of Italy with various cities and regions labeled. The map is overlaid with a large, bold, black text block. The text reads: "We are beginning a project in elementary grades in Italy using concept maps prepared from textbook series designed to teach basic science concepts, based on The World of Science books".

**We are beginning a project in elementary grades in Italy using concept maps prepared from textbook series designed to teach basic science concepts, based on The World of Science books**



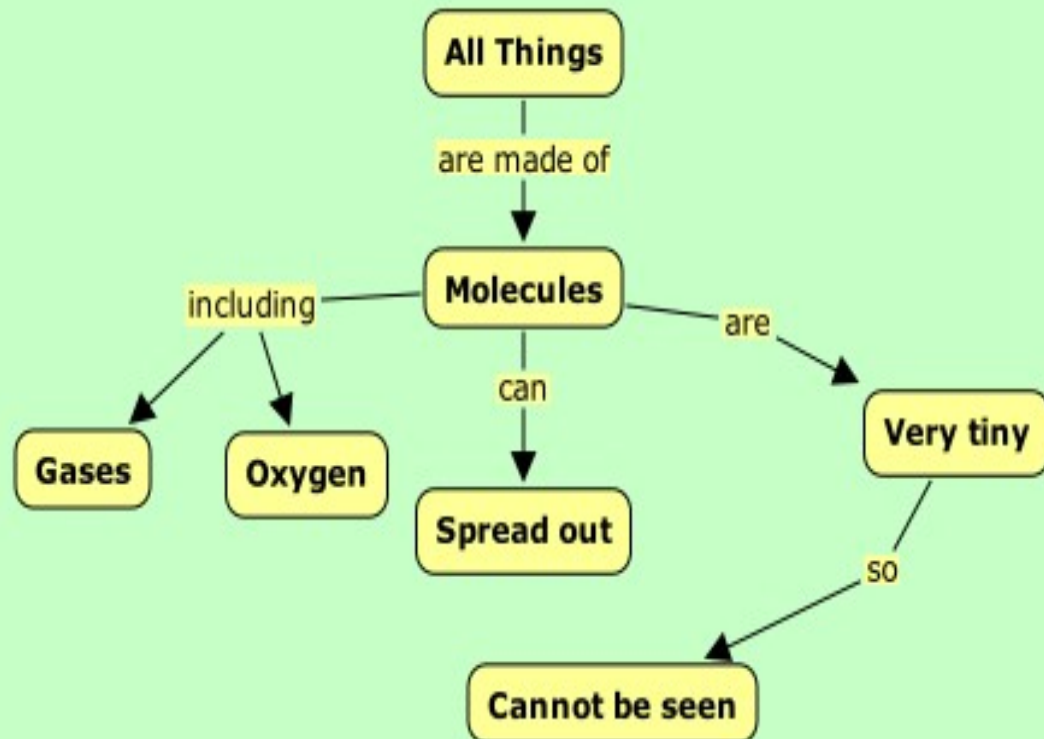
# The World of Science Series Books 1 to 6



# Expert “Skeleton” concept maps provide a starting point for students and teachers

From: The World of Science  
Grade 2, PP 12-17  
A beginning  
"skeleton" concept map

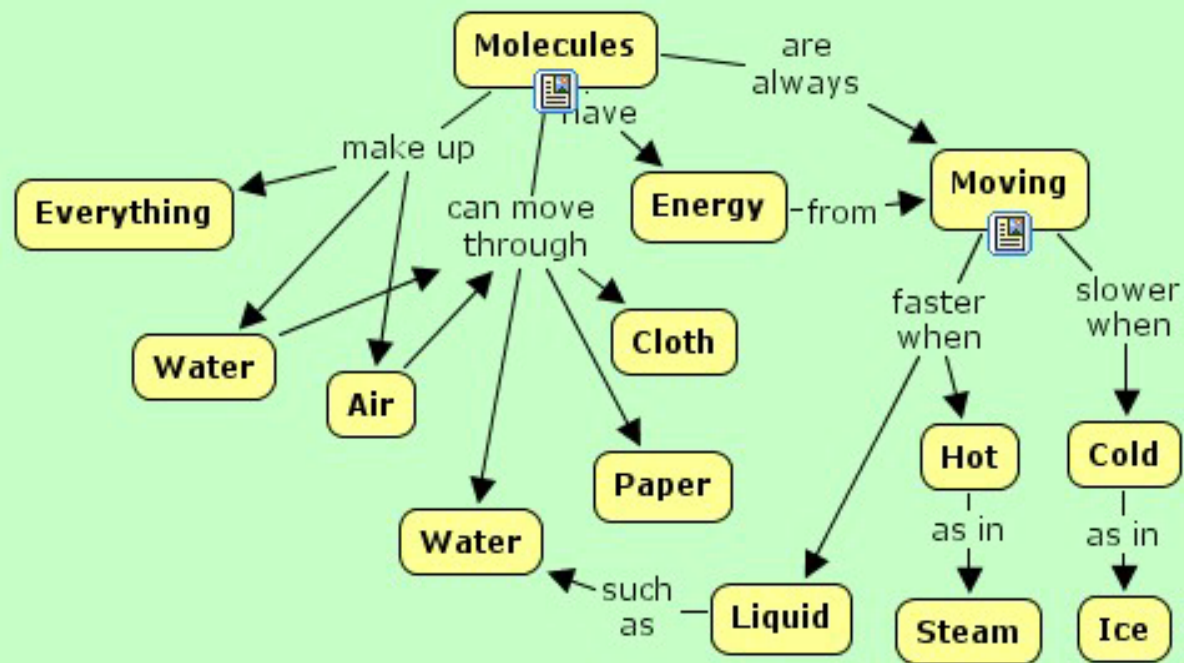
Focus Question: What are things made of?



Based on The World of Science books, concept maps have been prepared to serve as a starting point for building conceptual understanding

The World of Science  
Grade 2, PP168-181

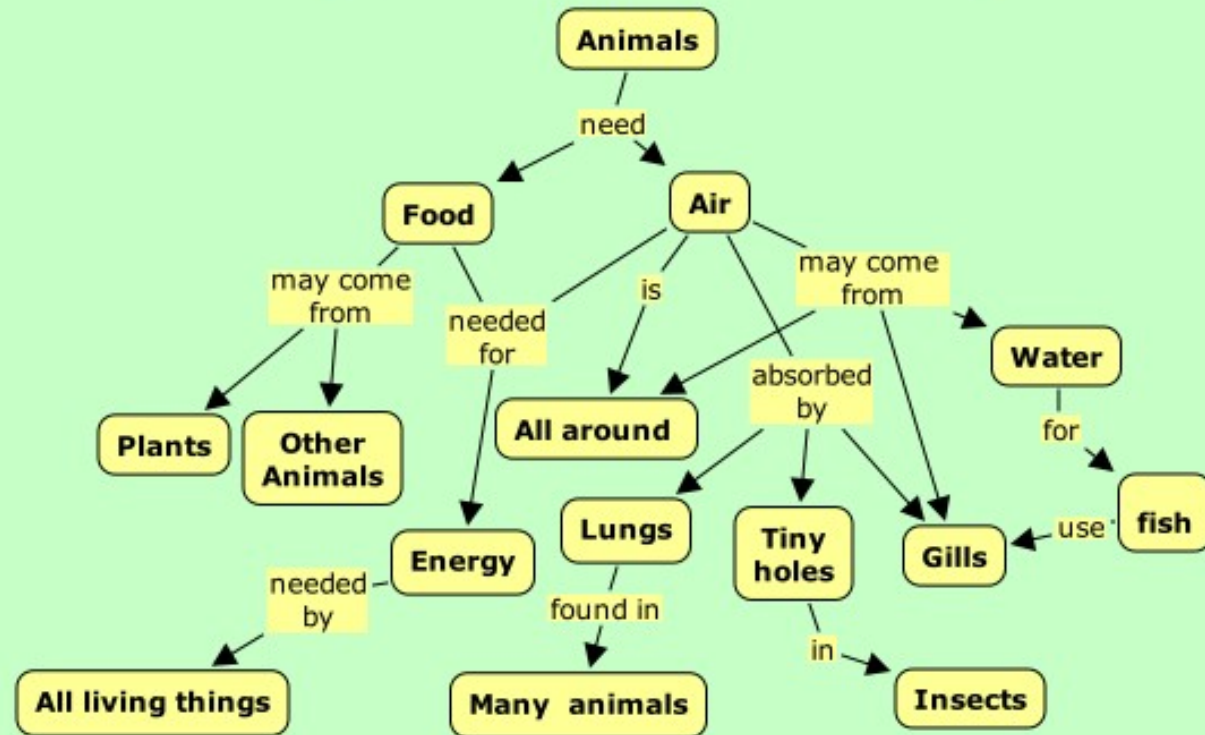
Focus Question: How do changes affect molecules?



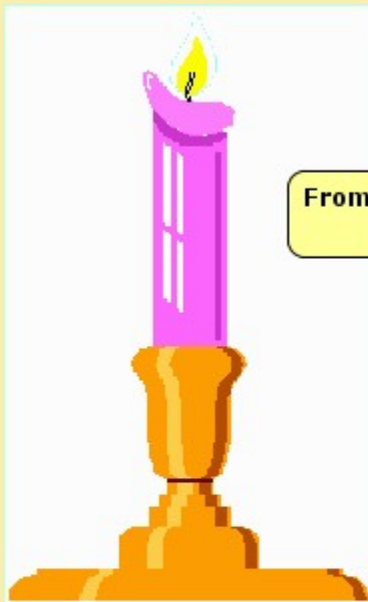
As students gain skills, more elaborate “expert” concept maps can be used as a starting point

From: The World of Science  
Grade 2, PP 40-50

Focus Question: What do animals need?

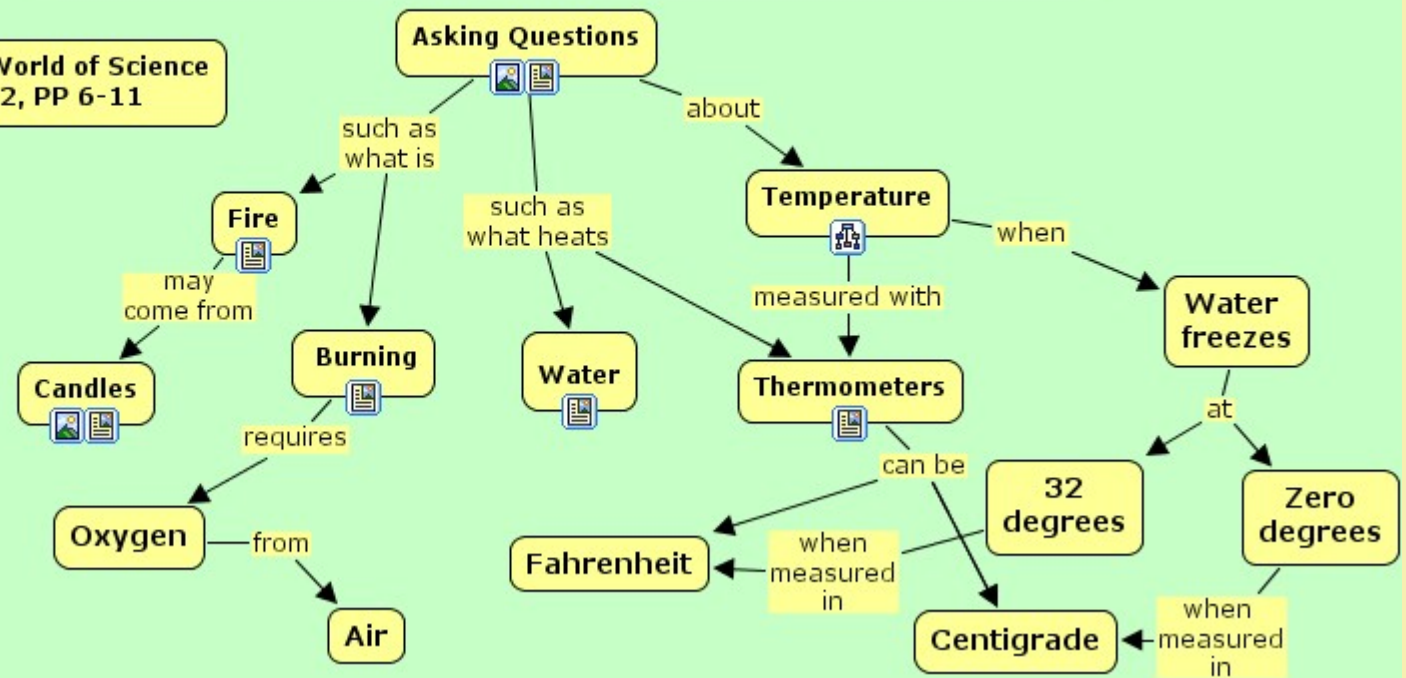


# A concept map for an early section of The World Of Science, Grade 2 showing some added concepts and resources



From: The World of Science  
Grade 2, PP 6-11

Focus Question: How do we find answers to questions in science?



# A concept map showing some attached resources

The image shows a composite screenshot of a web browser. On the left, a news article titled "U.S. Senator Bob Graham, Florida Recent News" is displayed, dated February 5, 2003. The article text includes: "WASHINGTON (February 5, 2003) - Senator Bob Graham, D-Florida Intelligence, issued the following statement today in response to Secretary Powell's statement to the United Nations Security Council: 'I applaud Secretary Powell for finally making available to the world... will base its actions against Iraq. In my judgement, the most significant... between the shadowy networks of international terrorists and Saddam Hussein.' 'Since October, the American intelligence community has been warning... verge of being toppled, he will be the most dangerous, including strikes... and abroad.' 'In my opinion, this linkage of Saddam Hussein's weapons of mass... Hezbollah - with a substantial number of trained terrorist operatives... greatest danger to our people. I am outraged that four months have passed... increase the security of our people.' 'I continue to urge the president, in the relatively few days left before... measure to protect Americans by dismantling these international terrorist... Note: Senator Graham remains at the National Naval Medical Center'".

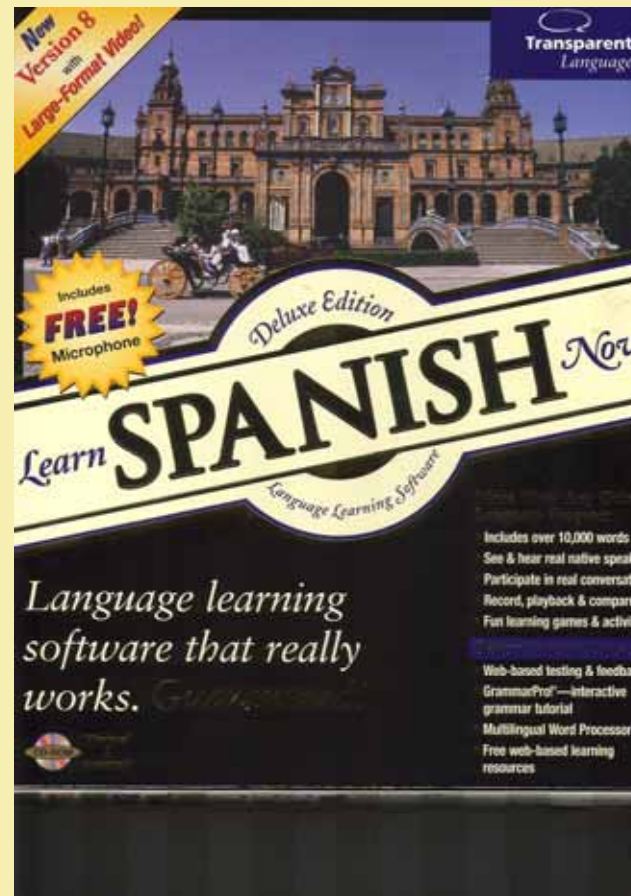
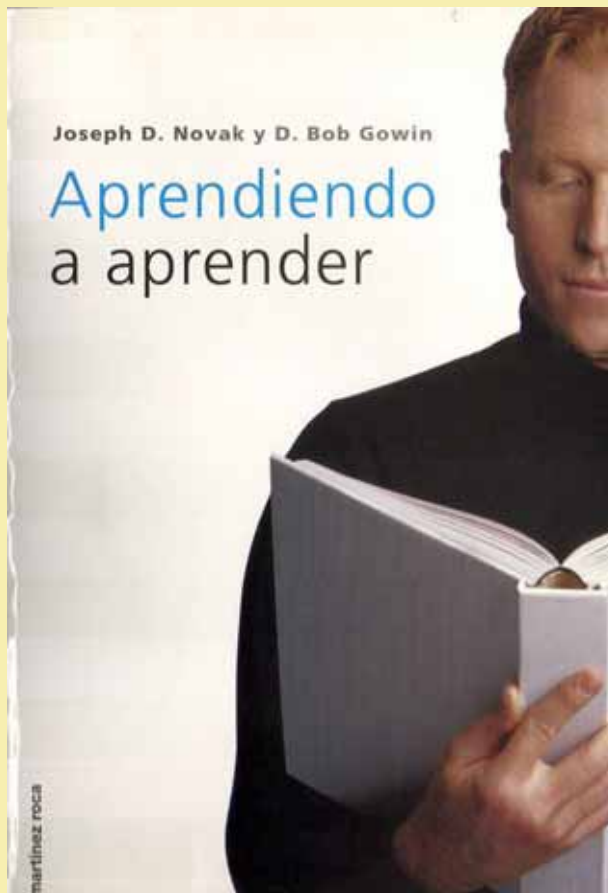
In the center, a concept map titled "United States Government" is shown. The map illustrates the relationships between various branches and entities:

- United States Government** has **Electorate** and **Three branches**.
- Electorate** elects **Legislative** and **Executive**.
- Three branches** are **Legislative**, **Judicial**, and **Executive**.
- Legislative** is called **Congress** and has **House of Representatives** and **Senate**.
- House of Representatives** is based upon **Population** and has **435 members**.
- Senate** has **2 per state** (e.g., **Florida**) and **Appointed for life**.
- Judicial** has **Supreme Court** and **Federal Courts**.
- Executive** has **President** and **Cabinet**.
- President** appoints **Cabinet** and chooses **Vice President**.
- President** nominates members of **Federal Courts**.
- Supreme Court** and **Federal Courts** have **93 District courts**.
- Florida** (one is) **Graham**.

On the right, a window titled "President Bush in Oval Office" shows a photograph of President George W. Bush sitting at his desk in the Oval Office.

At the bottom of the browser window, the address bar shows the URL: [http://pavo.coginst.uwf.edu:8001/servlet/SBRReadResourceServlet?rid=1051821110487\\_1737259746\\_22638partName=htmltext](http://pavo.coginst.uwf.edu:8001/servlet/SBRReadResourceServlet?rid=1051821110487_1737259746_22638partName=htmltext)

# Any syllabus or curriculum can serve as the foundation in this New Model of Learning



## Hands on experimentation should proceed together with concept mapping

As you know, you must use force to move anything. To use a lever, you must push or pull on one end. The lever turns on the fulcrum, lifting the weight at the other end.



What happens if you put the fulcrum in other places? You may experiment to find out.



## The teacher plays a crucial role in planning science activities and guiding students



At what temperature does ice melt?  
You may experiment to find out.  
Put some ice into a pan. What is  
the temperature of the ice?  
Now slowly heat the ice.  
What is the temperature of the water  
when most of the ice has melted?

**The challenge and the future  
belong to you!**