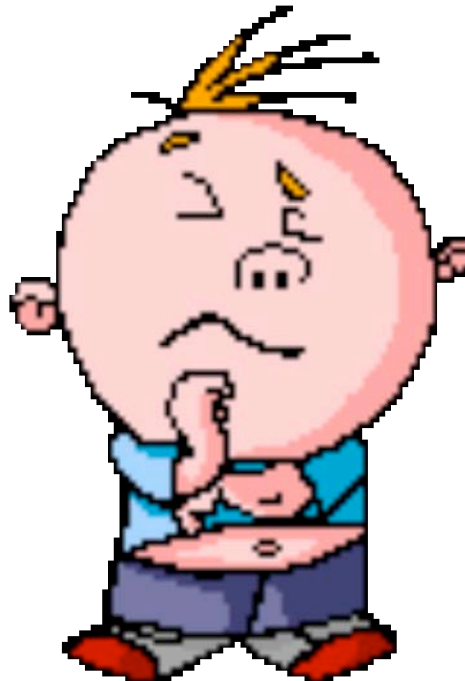
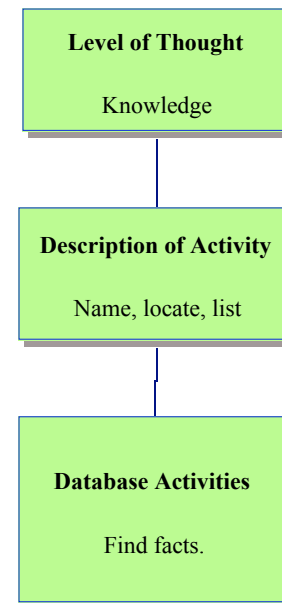


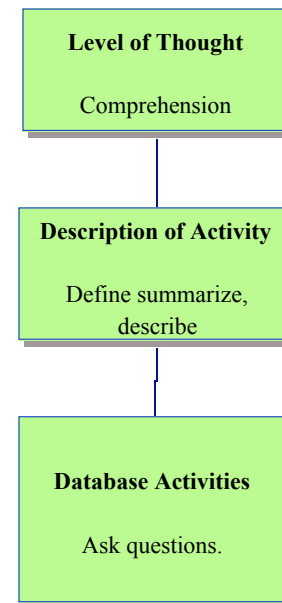
Databases and their Development of Critical Thinking Skills



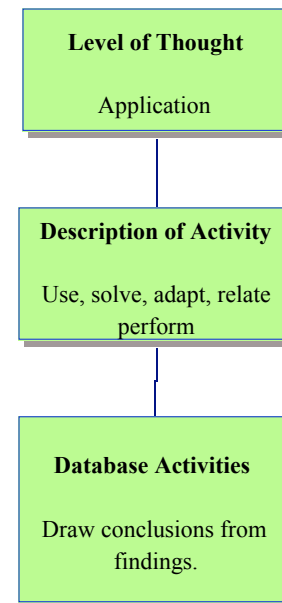
- Students generally are encouraged to explore databases as a means of retrieval of facts



- They also are encouraged in their research based learning to question and describe what they have found.



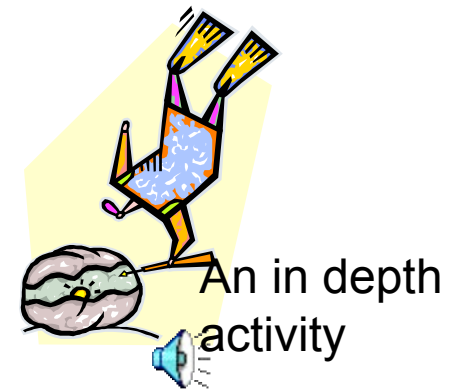
- Students will also be involved in drawing conclusions from the information they have found



- Bloom's higher order thinkings skills of
- Analysis,
- Synthesis
- Evaluation

suit in depth activities students can do with databases and database design.

These levels of thought are the natural progression of skills when using databases as a teaching tool.



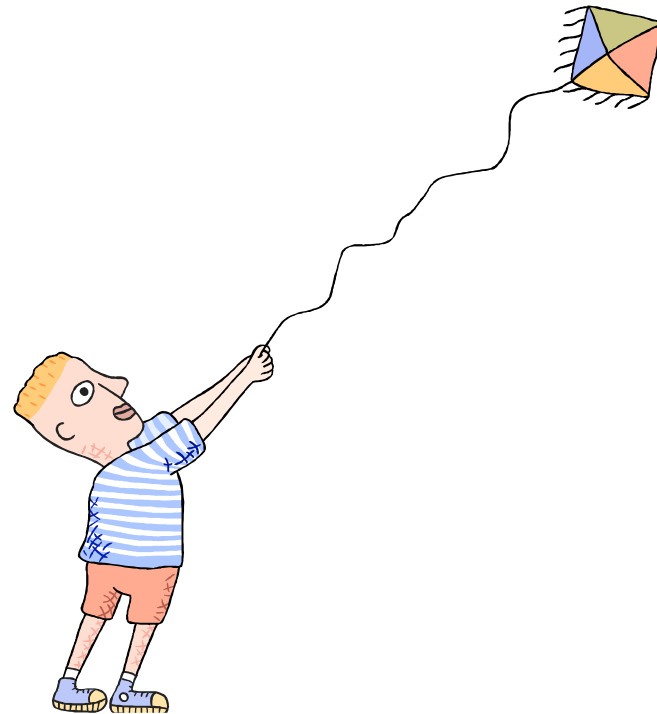
Level of thought	Description fo Activity	Database Activity
Analysis	Compare, classify examine	Build a final product based on conclusions drawn from the database
Synthesis	Create, develop, build design	Design a database
Evaluation	Assess, crtically analyse	Assess if successful based on hypotheses / verifying the prediction

Room 17 Activity

- As part of their daily routine, students were expected to report on current news items.
- Several items about childhood obesity caught the student's attention.



- Students were interested to see what may have contributed to this.
- We decided to conduct an investigation into their parents and grandparents
- **types of activities** after school
- **main meals** eaten
- compare the results with the student's activities and diet.



Level of thought	Description of activity	Database Activity
Knowledge	Collecting data from students, parents and grandparents and listing activities and diet.	Collating the data and collecting statistics.
Comprehension	Sorting and summarizing the activities and to determine frequency.	Building questions about the data and looking for patterns
Application	Use the data to compare activities and diet from the different generations	Predicting consequences explaining and hypothesizing
Analysis	<ul style="list-style-type: none"> • Compare, classify activities as active or passive, • examine ingredients in meals prepared as prepackaged or home cooked and the implications of this. 	Consider what fields would be required for database design. What information would be useful if sorted What data could be compared and would that tell us something. Number of passive activities as opposed to active activities. Etc.
Synthesis	Create and design database forms to generate information about the research.	Design database
Evaluation	Judge, rate conclude, verify the predictions	Examine results and show data to support and explain predictions and hypotheses or reject .

What is Higher-Order Thinking and Critical/Creative/Constructive Thinking?

- **Knowledge** statements ask the student to recall the diet and activities.
- List activities and diet by yourself, parent and grandparents

- **Comprehension** statements ask the student to explain the meaning of words contained in the examples.
- “What type of activity was it? Passive or active? What type of food?”

- **Application** statements ask the student to apply understandings.
- What implications can be drawn from the findings?

- **Analysis** statements ask the student to interpret word meanings in relation to context.
- “What is the meaning of the results. Why is this the case?”

- **Synthesis** statements ask the student to apply concepts in a new setting.
- Example: “What might be the implications for future generations?”

- **Evaluation** statements ask the student to judge the relative merits of the content and concepts contained in the subject.

“How can we use this information to change what we do and what we eat?”

Types of Questioning

Knowledge

Identification and recall of information

- Who, what, when, where, how?
- Describe _____.

Comprehension

Organization and selection of facts and ideas

- Retell _____ in your own words.
- What is the main idea of _____?

Application

Use of facts, rules, principles

- How is _____ and example of _____?
- How is _____ related to _____?
- Why is _____ significant?

Analysis

Separation of the whole into component parts

- What are the parts or features of _____?
- Classify _____ according to _____.
- Outline/diagram/web _____.
- How does _____ compare/contrast with _____?
- What evidence can you list for _____?

Synthesis

Combination of ideas to form a new whole

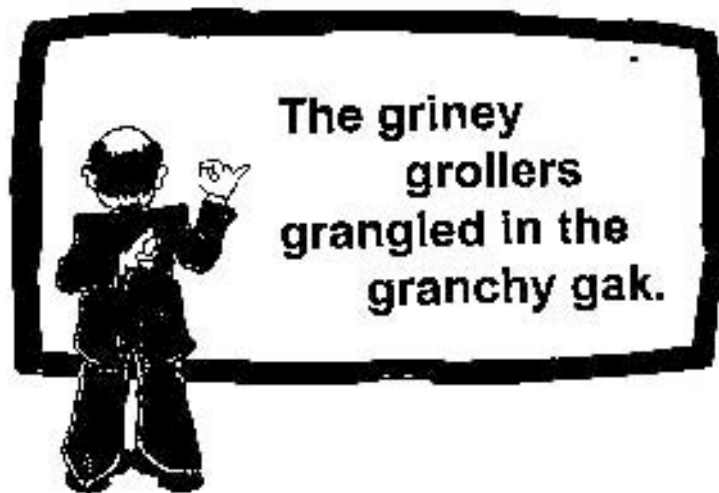
- What would you predict/infer from
_____?
- What ideas can you add to
_____?
- How would you create/design a new
_____?
- What might happen if you combine
_____ with _____?
- What solutions would you suggest for
_____?

Evaluation

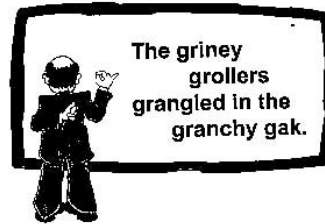
Development of opinions, judgments, or decisions

- Do you agree with _____?
- What do you think about _____?
- What is the most important _____?
- Prioritize _____.
- How would you decide about _____?
- What criteria would you use to assess _____?


The Griney Grollers Thinking Skills Test



The griney
grollers
grangled in the
granchy gak.



- 1. What kind of grollers were they?
- 2. What did the grollers do?
- 3. Where did they do it?
- 4. In what kind of gak did they grangle?
- 5. Place one line under the subject and two lines under the verb.
- 6. In one sentence, explain why-the grollers were grangling in the granchy gak. Be prepared to justify your answer with facts.
- 7. If you had to grangle in a granchy gak, what one item would you choose to have with you and why?



The griney grollers
grangled in the
granchy gak.
?????

- **Moral:**
Students can answer low-level questions without thinking.
- **Students enter/exit classrooms with no more understanding of what they've learned than "The Griney Groller" taught you!**

Any Topic?

The Possibilities are Endless!

- *Beverley Hunter states that teacher and students use databases to:*
- **Discover commonalities and differences among groups of events or things**
- **Analysing of relationships**
- **Looking for trends**
- **Testing and refining hypotheses**
- **Organising and sharing information**
- **Keeping lists up to date**
- **Arranging information in more useful ways**

Take a ride on the wild side



"We had a thinking drill—just in case
our computers break down."