

## WHY SOME STUDENTS ARE POOR TEST-TAKERS

### **The Five Forms of Higher Level Thinking** **A Summary of findings identified in A Mind at a Time, by Dr. Mel Levine**

Not infrequently, parents report that their high school students do well on daily assignments and even quizzes, but bomb their exams.

Most parents I talk to are clueless about why. They shouldn't feel remiss, however, at least not according to Dr. Mel Levine, director of The University of North Carolina's Center for Clinical Study of Development and Learning. Even thorough testing does not always reveal how a student is thinking and learning, Levine suggests in his new best selling book, A Mind at a Time. In his book he identifies eight neuro-developmental systems that define how the mind functions. One of these systems is "higher thinking." (Chapter 8) Higher thinking, according to Levine, involves five primary processes.

Students having difficulty taking tests could have a deficiency in one or more of the following:

- Forming concepts
- Problem solving
- Remembering and applying rules
- Critical thinking
- Creative thinking

Parents need to ask the following questions.

**CONCEPT FORMATION:** Do students memorize processes and content without understanding the concepts that underlie and define that information? Concepts are accumulations of common features that form new ideas and categories. For example, orange juice is a liquid made from squeezing oranges that people usually drink for breakfast and is an excellent source of Vitamin C. That is a concrete concept. As students progress in school they begin to deal more and more with abstract concepts. Failing to form abstract concepts adequately makes learning almost meaningless because concepts build on previously acquired concepts. Students who have difficulty forming concepts rely on memorizing which works to some degrees in subjects such as history and literature, but not at all with subjects such as math and science that build on previously acquired concepts.

**PROBLEM SOLVING:** Are students aware that there is a problem, perhaps in the way they study or in their final preparations for taking a test? Do they know how to preview outcomes, assess feasibility (cost/benefit), mobilize resources, consider different strategies, and think logically?

**REMEMBERING AND APPLYING RULES:** Are students able to do well on an algebra assignment and even a quiz, but then flunk the final? Can they write a good essay, but fail to spell and use appropriate grammar? They probably have difficulty remembering and applying rules that govern mathematical processes and English mechanics.

**CRITICAL THINKING:** Do students take things at face value, or do they examine the facts, determine the author's point of view, consider their own biases, look for errors and exaggerations, identify reliable sources of evidence and then make their conclusions?

**CREATIVITY:** When students are given a project to complete for school, do they prefer broad guidelines that give room for their own input, or do they prefer step-by-step directives? Are they not afraid of making mistakes, or do they want to find what is considered the "right" answer? Do they interject their own perspective and applications, or do they want to find the answers found in their text? Are they risk takers, willing to try or say something that may not be considered "cool" by their peers?

### **APPLICATION OF THESE FIVE FORMS OF HIGHER LEVEL THINKING**

**CONCEPT FORMATION:** Concepts build on previously learned concepts. One of the most important lessons in Biology has to do with DNA and the replication of cells. **DNA** is a **polymer**, a large compound made of **monomers** (a small compound), and a **compound** is a grouping of two or more bonded **elements** (elements are made up of only one atom of which there are only just over 100 that compose all matter).

Pick out five or six key concepts from a chapter that your student has covered and ask her to explain the significance of these concepts. If she is able to explain what these concepts mean in her own words, then your student is forming concepts adequately.

**PROBLEM SOLVING:** In taking a test, **previewing an outcome** of a word problem before trying to solve the problem is helpful. If you divide a dividend by a whole number you will get a smaller amount; divide by a fraction and you get a larger amount.

**Assessing feasibility** enables students to pace themselves through tests (if the benefit of getting one answer correct takes too long, better skip that question until later).

**Mobilizing resources** enables students to think through several formulas and processes they have learned to solve a multi-step problem in a math test. An essay question may ask students to compare and contrast the American and French Revolutions. Here students would think through several ways (**strategies**) of approaching the question and organizing the response (Show all the similarities first and then the contrast, or compare and contrast each item one-by-one. Or, use a grid to visually display the similarities and differences.)

**REMEMBERING AND APPLYING RULES:** For math and English your student should create summary sheets that identify critical rules. They should be able to recite a list of these rules from memory, state them in their own words, and provide examples of how these rules work in actual sentences and problems:

1. RULES:
  - a. I before e, except after c and in words like neigh and sleigh.
  - b. A semi-colon separates two independent clauses.
2. THEIR OWN WORDS:
  - a. When subtracting negative integers, I must change the sign of the second integer and then add.
  - b. Whatever I do to one side of an equation I must do to the other, just as in a balanced teeter-totter.
3. EXAMPLES:
  - a. Bill worked hard; however, he still had time to go out with his friends.
  - b. If I multiply one side of an equation by the reciprocal of a number, I should multiply the other side by the same reciprocal.

These lists of rules, stated in their own words, with examples should be kept in a folder that can be added to as your student moves through each chapter of their math and English texts (Since English grammar is not emphasized on a yearly basis, you may need to acquire a good English grammar source for your student's own use.)

**CRITICAL THINKING:** Ask your student to tell you what topics they have discussed at school that have international, national, and local import. Then choose one and ask them to discuss the pros and cons of each. Examples: Should the U.S. go to war with Iraq? Should the death penalty be eliminated? Are the "No cruising" restrictions fair to teenagers?

**CREATIVE THINKING:** Creative students are less likely to resort to memorizing information that doesn't make sense to them. They want to understand the author's point of view so that they can add their perspective and apply the topic they are studying to issues from their own lives. Creative people are often not detail-oriented, so they need help in making sure they address the facts that support the author's point-of-view and their own conclusions.

### **THE FIVE FACETS OF HIGHER LEVEL THINKING AND THE ACT/SAT**

**If you are interested in a copy of an article that discusses how each of these higher levels of thinking impact the taking of the ACT and the SAT and how we help students use these thinking process in taking these tests, please call and we will send you a copy.**