

# From Subject-Based Education To Cognition-Based Education:

**What cognitive science tells us about what we  
*really* need to learn.**

By Roger Schank

The premise of this book is very simple. We have all gone to school. We all know that school is organized around academic subjects like math, English, history and science. This book asks *why?*

It is not easy to question something that everyone takes for granted. It is especially not easy when the very source of all our concerns in education can be easily traced to this one decision: *to organize school around academic subjects*. How else might school be organized? There is an easy answer to this: *organize school around thought processes*. In 1892, when the American high school was designed, we didn't know much about thought processes. Now we do. It is time to re-think school.

School, at every age, needs to be designed around these processes, since it is through these processes that everyone learns. Academic subjects are irrelevant to real learning. They are not irrelevant to the education of academics of course. But, how many people really want to need to become experts in the academic fields?

Here is a list of the sixteen critical thinking processes. These processes are as old as the human race itself. The better one is at doing them the better one survives:

The Sixteen Cognitive Processes that Underlie All Learning

## Conscious Processes

1. Prediction: determining what will happen next
2. Judgment: deciding between choices
3. Modeling: figuring out how things work
4. Experimentation: coming to conclusions after trying things out
5. Describing: communicating one's thoughts and what has just happened to others
6. Managing: organizing people to work together towards a goal

## Subconscious processes

1. Step by Step: knowing how to perform a complex action
2. Artistry: knowing what you like
3. Values: deciding between things you care about

## Analytic Processes

1. Diagnosis: determining what happened from the evidence
2. Planning: determining a course of action
3. Causation: understanding why something happened

## Mixed processes

1. Influence: figuring out how to get someone else to do something that you want them to do
2. Teamwork: getting along with others when working towards a common goal
3. Negotiation: trading with others and completing successful deals
4. Goal Conflict: managing conflict in such a way as to come out with what you want

All of these processes are part of a small child's life as well as a high function adult's life. Education should mean helping people get more sophisticated about doing these things through the acquisition of a

case base of experience. Teaching should mean helping people think about their experiences and how to handle these processes better. Unfortunately education and teaching rarely means either of these things in today's world.