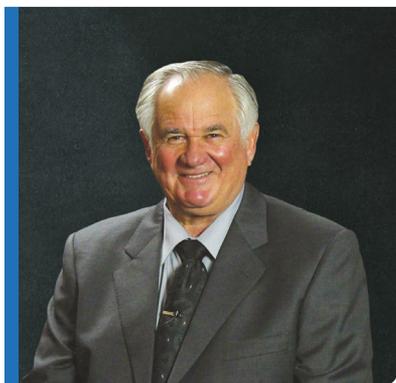


# Thinking Skills



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Educators worldwide increasingly recognize that we must revise our educational objectives if we are to prepare students for life in the 21st century. One dimension of primary concern is thinking skills. Thinking skills are an essential, if not the single most important element of a good 21st century curriculum.

A century ago, most people lived in rural areas and were employed in agriculture. The teacher had a good idea of what information and skills students would need for a lifetime. The teacher could prepare the student for a life in a predictable and relatively constant world. Today, we as teachers have the unprecedented challenge of preparing students for a world we can only dimly imagine. The change rate itself accelerates exponentially as new technology produces even newer technology. We take for granted picture phones, television watches, personal digital assistants, video conferencing, and GPS tracking devices that keep us updated in real time on traffic conditions—all of which were things of science fiction but a few decades ago. Think for a moment of all the things we have today that were not invented just a decade ago. We can no longer imagine with confidence what our lives will include a decade from now, never mind the myriad changes that will occur over the entire course of the lives of our students.

Preparation for accelerating change must include development of a full range of

thinking skills. Change means adapting, and adapting means problem solving, predicting, questioning, applying old skills to new situations, and analyzing and evaluating options. We don't know the situations to which our students will have to adapt, but we do know they will need a range of thinking skills if they are to be successful.

We can predict with certainty also that our students will need information skills. The majority of all scientists who have ever lived are alive today, busy making new discoveries. Advanced computers are answering questions not yet formulated by humans; the sum of stored human information doubles each year and the doubling rate itself is doubling so, during the lives of our students, the time it takes for human information to double will be measured in months, not years. In the face of the accelerating information explosion, having the student memorize one more fact is of little value compared to having the student learn how to categorize, analyze, synthesize, summarize, and apply information. Information memorized today will be outdated before our students graduate from high school; skills will be replaced many times over the course of a student's life. Improving the ability to generate new information is more important than trying to improve the human brain's capacity to store information—something even a handheld computer does far better.

## The Information Processing Approach to Thinking

An increasing percentage of people are employed in the information segment of the economy, and it is the fastest growing segment. In the information age, we earn our living by generating, analyzing, categorizing, evaluating, and communicating information. An information processing approach to thinking skills aligns well with preparation of students for 21st century life. The approach to teaching thinking skills that I developed and that Kagan Professional Development teaches is based on an information processing approach to thinking. This approach divides thinking skills into three types: understanding information, manipulating information, and generating information. In each of the three categories are specific skills. For example, recall is related to understanding information; deduction is related to manipulating information; and brainstorming is related to generating information. This division of skills into three sets of five is not perfect (for example, questioning is related to understanding, manipulating, and generating); nevertheless, it is quite useful. See “The 15 Fundamental Types of Thinking” sidebar.



## The Curricular Approach vs. the Instructional Approach to Developing Thinking Skills

To distinguish the curricular approach from the instructional approach, let's imagine we want to develop students' ability to summarize information. If we take a curricular approach, we would design some lessons on summarizing. We might spend some time developing summarizing worksheets. For example, the worksheet might include a paragraph and then, below, a place for the student to write a summary sentence. Or it might show a picture and have a place for the student to summarize what is going on in the picture using no more than 30 words.

In contrast, if we take the instructional approach, we would use our existing academic content, but teach that content using structures that foster summarizing skills. For example, as part of our lesson on the Great Depression, we might pair students up, one student role-playing the part of a business executive who is just learning about the stock market crash, and another student role-playing the part of a widow who is unable to make mortgage payments and, so, has just lost her farm. While students do this role-play, they use the Paraphrase Passport structure. When this structure is used, before a student may speak, he or she must first paraphrase the person who spoke before him or her. Paraphrasing is a form of summary, so students are acquiring summarizing skills without taking time away from the existing curriculum.

In the Kagan Structural Approach, we have identified 15 fundamental types of thinking, and many structures to develop each.

A teacher who regularly uses a range of structures develops in students a rich repertoire of thinking skills. Thinking in many ways is simply part of the ongoing process in a classroom that regularly uses Kagan Structures. The Kagan Structural Approach, along with many Kagan Structures.<sup>1</sup>

## The 15 Fundamental Types of Thinking



### Understanding Information

Recalling  
Summarizing  
Symbolizing  
Categorizing  
Role-taking



### Manipulating Information

Analyzing  
Applying  
Inducing  
Deducing  
Problem-solving



### Generating Information

Brainstorming  
Synthesizing  
Predicting  
Evaluating  
Questioning

The Kagan approach to thinking skills, and the 15 types of thinking have been described in detail.<sup>2</sup> Kagan Publishing has produced many resources to facilitate the use of Kagan Structures across the curriculum.<sup>3</sup>

### Advantages to the Kagan Instructional Approach

There are a number of advantages to this instructional approach to thinking skills.

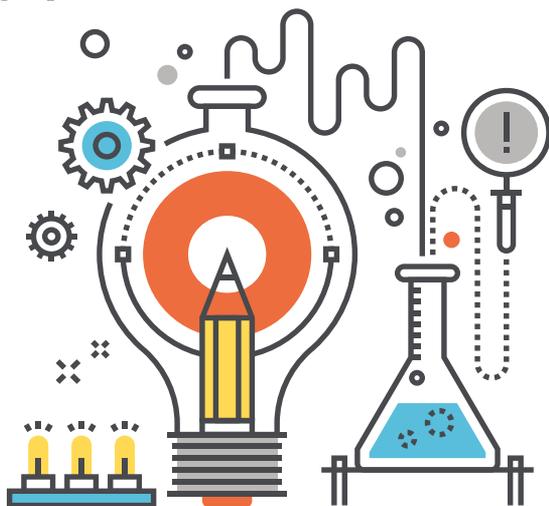
**Not a Competing Curriculum.** The instructional approach does not attempt to fit new lessons into an already overcrowded day; it is not something new to teach, but better way to teach. When thinking skills are a competing curriculum, they get dropped when there's pressure to cover existing curriculum and to prepare students for high-stakes tests. In contrast, with the instructional approach, students acquire the skills while covering content or preparing for the test. In effect, the instructional approach permits more learning from each valuable minute of class time. At the same time the teacher is covering academic content, the teacher is also fostering thinking skills. Thinking skills represent an embedded curriculum—a curriculum embedded into the way the teacher teaches.

**Less Preparation.** A curricular approach demands the teacher prepare special worksheets or lessons. In the worst case it demands the teacher spend the day teaching—and the night designing lessons. In contrast, the instructional approach demands no special preparation time. Once the structures are learned, they become part of how the teacher teaches on a daily basis.

**Authentic Transfer.** Special lessons on thinking skills create a transfer gap; the instructional approach sidesteps the transfer gap. In real life we do not fill in blanks on a worksheet. We do, though, interact with others, sometimes paraphrasing them. Because the instructional approach teaches the thinking skills in an authentic context, similar to how thinking is used in real life, it avoids the transfer gap. A transfer gap is created anytime the situation of acquisition is dissimilar to the situation of performance. The classic transfer gap was created in foreign language classes where students had to memorize lists of vocabulary and conjugations of verbs. Even students who did quite well on vocabulary and verb tests failed to become fluent in the language because the situation of acquisition was too dissimilar to the situation

of performance. Thinking is not something we want students to do when faced with an inauthentic worksheet; it is something we want them to do in the full range of life's situations. Structures provide a broad range of authentic situations to promote thinking.

**Rich in Redundancy.** If we teach separate lessons on thinking skills, we are likely to teach each skill one time, then move on to the next. Learning, however, occurs via repetition. One worksheet on summarizing will never add up to enduring summarizing skills. If, however, students use Paraphrase Passport (and other summarizing structures) all school year, they will become better at the skill. The same holds true for each of the thinking skills: the redundancy created by repeated use of the structures ensures students don't just learn about the skill but rather acquire the skill. The curricular approach has students glimpse the skill; the instructional approach has students grasp the skill.



## Conclusion

By making thinking skills an integral part of every lesson, we create thinking skills as habits of mind. Rather than learning about thinking skills, students acquire thinking skills while engaged in their regular academic lessons.

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