

SECOND EDITION

THE ART OF
INQUIRY

Questioning Strategies
for K-6 Classrooms


Nancy Lee Cecil • Jeanne Pfeifer



PORTAGE & MAIN PRESS

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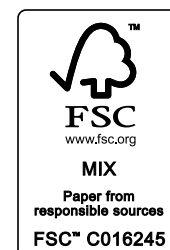
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*To Landon and Katrina, who inspire me with
their incessant questions and curiosity.*

– NLC

*To my parents, who encourage curiosity and
questions – with compassion and integrity.*

– JP

CONTENTS

Preface to the Second Edition	ix
Acknowledgments	x
INTRODUCTION TO <i>THE ART OF INQUIRY</i>	1
How to Use This Book	2
Who This Book Is For	2
PART I: THE IMPORTANCE OF GOOD QUESTIONS	3
What Are the Right Questions?	4
The Limitations of Factual Questions	5
CHAPTER 1: THE QUESTION OF QUESTIONS	7
Purpose of Questions	8
Types of Questions	8
The Cognitive Domain	8
Beyond Bloom's Taxonomy	10
Critical Thinking and Thinking Processes	11
The Affective Domain	11
Other Types of Questions	13
The Pervasive Initiate-Respond-Evaluate	14
Using the Taxonomy of Questions	14
An Exercise for Identifying Types and Levels of Questions	17

CHAPTER 2: THE IDEAL CLIMATE FOR QUESTIONING	19
Removing Blocks to Critical Thinking	20
Knowledge	20
Habits	20
Attitudes	21
Facilitating the Free Flow of Production	22
Careful Planning of Questions	22
Matching Questions With Their Purposes	22
Wait Time	23
Student Responses	24
Conducting “Grand Conversations”	24
Student-Directed Discussions	25
Equality in the Classroom	25
Appropriate Use of Praise	26
Continually Encouraging Inquiry	26
Admitting Lack of Knowledge	28
A Checklist for Classroom Climate	28
PART I SUMMARY	29
PART II: QUESTIONING STRATEGIES	31
Some Guidelines for Using Questioning Strategies	33
CHAPTER 3: TEACHER QUESTIONING STRATEGIES FOR PRIMARY GRADES	35
Knowledge Chart	35
Response Heuristic	39
Concept Formation	41
Polar Opposites	43
Point of View and Observation	44
Multiple Response	46
Reciprocal Teaching	48
Probable Passages	51
CHAPTER 4: TEACHER QUESTIONING STRATEGIES FOR INTERMEDIATE GRADES	55
Think Aloud	55
Inductive Reasoning	58
Question-Eliciting Questions	61
Metacognition	62
Experience-Text Relationship	64
SCAMPERing	67

Fictional Role-Plays	70
Prompting	72
CHAPTER 5: STUDENT QUESTIONING STRATEGIES FOR PRIMARY GRADES	75
Self-Instruction	75
Question-Answer Relationships	77
Interviewing/Surveying	79
Basal Reader Prediction	84
Sequencing	86
Schema-General Questions	88
Visual (Digital) Literacy	91
CHAPTER 6: STUDENT QUESTIONING STRATEGIES FOR INTERMEDIATE GRADES	95
Dyad Reading	95
Wondering Notebooks	97
I-Search	99
Question Generating	101
Cognitive Strategy Instruction in Writing	103
Metacognitive Reading	104
Survey, Question, Read, Recite, and Review	107
CHAPTER 7: QUESTIONS ACROSS THE CURRICULUM	109
Questioning in Mathematics	109
Vignette 1, Grade 4 Integration: Math/Oral Language	110
Vignette 2, Grade 5 Integration: Math/Oral Language/Listening	111
Vignette 3, Grade K Integration: Math/Oral Language	111
Vignette 4, Grade 1 Integration: Math/Oral Language	112
Vignette 5, Grade 6 Integration: Math/Oral Language	112
Questioning in Science	113
Vignette 6, Grade 2 Integration: Science/Math (Measuring)/Oral Language/Writing	113
Vignette 7, Grade 1 Integration: Science/Ecology/Reading/Social Studies	115
Vignette 8, Grade 6 Integration: Science/Ecology/Social Studies/Reading	117

Vignette 9, Grade 4 Integration: Science/Social Studies	118
Vignette 10, Grade 5 Integration: Math/Oral Language	120
Questioning in Social Studies	121
Vignette 11, Grade 3 Integration: Social Studies/Science/Art	121
Vignette 12, Grade 1 Integration: Citizenship/Role-Playing/Oral Language	122
Vignette 13, Grade 6 Integration: Global Awareness/Math/Writing	124
Vignette 14, Grade 5 Integration: Historical and Geographical Knowledge/ Oral Language/Writing	125
Vignette 15, Grade 2 Integration: Historical Timelines/Geography/Oral Language/Art	126
Questioning in Art and Music	128
Vignette 16, Grade 6 Integration: Art/Social Studies/Writing	129
Vignette 17, Grade 4 Integration: Art Appreciation/Math/Social Studies	130
Vignette 18, Grade 2 Integration: Music/Writing	131
PART II SUMMARY	133
CONCLUSION	135
APPENDIX: BLACKLINE MASTERS	137
REFERENCES	153
RESOURCES CITED	159
SUGGESTED READING	161

PREFACE TO THE SECOND EDITION

Since the publication of *The Art of Inquiry* in 1995, educators have refined and elaborated on many of the questioning and inquiry strategies included in the book. In this edition, we have updated these strategies to reflect the changes. For example, some models recommended for narrative text have been adapted for information text. Some strategies include additional steps or new examples to help teachers and students better understand the purpose of an activity. Some strategies that were originally introduced at intermediate levels have been expanded and applied to primary grades.

This second edition also features several new strategies – including concept formation, concept attainment, and inductive reasoning. These strategies are intended to help students learn how to analyze data that lead to problem solving and decision making. We have also added new vignettes across the curriculum.

Many of the classroom examples in this edition take students beyond reading – to a place where they can reflect not only on structured activities but on their reading experiences.

Throughout this second edition, we have tried to differentiate between higher-level cognitive questioning and critical thinking. Higher-level cognitive questions help students think at more complex levels. Critical thinking encourages students to question what they are thinking so that they can improve the quality of their thinking.

We think you will agree that the changes and additions we have made to *The Art of Inquiry* reflect today's best practices in education.

ACKNOWLEDGMENTS

This book maintains that the art of questioning is a very exciting form of social interaction. In many ways, so too is writing a book about questioning. We must acknowledge the valuable interactions of the many colleagues and students who have shared their ideas and experiences with us during our years at California State University. These people are too numerous to mention by name, but their voices, spirit – even their work samples – are reflected throughout the book.

We would like to thank our editor, Leigh Hambly, for her considerable skill in bringing this book to print, for handling all the details, and for actually caring about the book as much as we do.

INTRODUCTION

to *The Art of Inquiry*

Why do people choose to become teachers? Having read, through the years, the professional goal statements of hundreds of eager students entering the field of education, we are amazed at how many mention “the excitement of seeing a light bulb go on inside a little head when the child suddenly understands a concept or an idea.” Most present and future teachers, it seems, are attracted to the profession by the promise of those blissful moments when a child under their tutelage appears to have *learned*. Often, it is children’s answers to questions about what they are reading or studying that are taken as the evidence that this learning has, indeed, taken place.

And that is the premise of this book: Asking elementary-age children just the right kinds of questions is directly related to these heady instances of sudden understanding. Throughout this second edition of *The Art of Inquiry*, pre-service and practicing teachers will discover numerous ideas about how to model provocative, open-ended questions and how to help young students learn to ask their own critical questions about content.

Our world has changed considerably since *The Art of Inquiry* was first published in 1995. Back then, students acquired most of their information from television, radio, and books. Students still get information from those media. Today, however, students are much more inclined to use computers, iPods, and cell phones to access the seemingly endless stream of information available on the Internet. Unfortunately, not all electronic information is valid, reliable, or even correct. Students must be able to evaluate the reliability of information they acquire.

The average life expectancy in North America in 1900 was just over 47 years. By 2010, the average life expectancy was beyond 80 years. Most of today’s students are expected to live more than 60 years beyond the time they graduate from high school. Teachers, however, cannot teach their students everything they will need

to know during their first 18 years. Nor do students learn everything they are taught in school. Beyond their school years, they will continue to learn. It is important, then, that students be taught inquiry and questioning strategies they can use for a lifetime of learning.

HOW TO USE THIS BOOK

We have divided this book into two sections. In Part I, we describe the taxonomy of questions, their uses, and the environmental factors necessary for the free flow of questions and answers in the classroom. We explore the types of questions that teachers can ask, and we present a definition, description, and an example of each type. A self-check is also included so that teachers can determine their own ability to identify the various levels of questions and, perhaps, begin asking more questions of a critical or open-ended nature.

Then, we focus on how to create the ideal environment for questioning – a classroom climate in which young learners feel free to ask and answer questions, where they feel competent to ask about topics that interest them, and where they can work with one another to investigate issues. We also include caveats about common practices that tend to squelch creative and critical thinking, thereby thwarting question asking and answering.

In Part II, we address specific questioning strategies that teachers can use to ask more thought-provoking questions, thus enhancing their students' construction of meaning from text and critical thinking. Next, we give suggestions and provide strategies that teachers can use to enable their students to generate their *own* questions. Then, we show how questioning strategies can be integrated across the entire curriculum, and we examine strategies particularly appropriate for math, science, social studies, and art appreciation.

Finally, for those teachers who are interested in reading more about questioning techniques and critical thinking, we have included an extensive bibliography of books, articles, and papers on these topics.

WHO THIS BOOK IS FOR

This book is for teachers of grades K–6 who are already convinced magic can occur when they ask just the right kinds of questions. Such teachers want to develop their questioning skills to a level where their students are noticeably more involved in the learning process. This book is also for all pre-service teachers who still fantasize about the joy they will experience when they see *the light bulb go on*. When teachers ask the right questions of their students, they stimulate in-depth thinking and invite sudden connections and insights. It is in the classrooms of such teachers that light bulbs can be observed going on in young heads – all day long.

PART I

The Importance of Good Questions

Just how important are questions in the academic life of a child? According to Rubin (2009), well-fashioned, intentional questions give students opportunities to connect different aspects of content and, thus, develop deep understandings that they can transfer across content. Sigel and Saunders (1979) say that questioning is critical, because it requires children to distance themselves in time and space from the present. Sigel (1982, 50) defines distancing as the “psychological separation of [the student] from the immediate, ongoing present.” When responding to questions about past or future events, the child shifts from the present to another, distant, mode of thought, rather than simply responding to current observable events. Thinking about past or future events requires an abstract mental representation of what has happened or of what may soon happen. The ability to abstract calls for a higher plane of thinking that results, ultimately, in increased learning (Rosenshine, Meister, and Chapan 1996).

Asking questions also appears to be an effective way to direct and develop reading comprehension in children, especially when the teacher models good questions and shows children how to ask their own questions. Asking one’s own questions is a form of making predictions and is essential to comprehension – it forces one to construct meaning rather than passively accept text as it is encountered. Children who are good predictors – and, therefore, good self-questioners – are also good comprehenders of text (Kestler 1992; Ouzts 1998; Jones and Leahy 2006).

Finally, imagination can be enhanced only when children are given the opportunity to play with ideas, to discover relationships, and, most important, to ask questions. Educators who show children that their ideas have value and their questions will be carefully considered add a rich source of fuel to children’s motivation for learning. Children who are encouraged to ask and answer carefully crafted questions are being given opportunities to explore with their minds, to gain meaning for themselves, and to relate new data to old ideas. And when

children seek to ask or answer questions about things or events for which there is no one right answer (or for which there are many potentially correct answers), they begin to develop an attitude of appreciation for the immensity and complexity of the natural world (Barell 2003). This is when true learning begins to take place within and beyond the classroom doors!

WHAT ARE THE RIGHT QUESTIONS?

Most teachers believe that asking students questions facilitates the learning and cognitive development of learners. It is not surprising, therefore, that over 50 percent of adult verbal interactions with young children are composed of adult questions (Blank and Allen 1976). Studies involving elementary-school teachers reveal that they ask their students about 3.5 questions per minute, with teachers asking approximately 27 questions for every student question (Floyd 1960). To improve the quality of the questions teachers ask, it helps to examine the types of questions asked, their impact on students' learning, and the teacher's role in facilitating that learning. From this information, helpful strategies and techniques for asking questions can be developed.

Research on questioning suggests that teachers are not asking enough of the kinds of open-ended questions that enhance a child's imagination and facilitate critical thinking. Bromley (1992, 139) draws the following conclusions:

- Seventy-five percent of the questions teachers ask are of a factual or a literal nature.
- Over 50 percent of the questions contained in the basal readers, still pervasively used in elementary schools, are of a factual or a literal nature.
- Teachers ask an average of 70 factual or literal questions in an average 30-minute lesson.

Over the last few years, the importance of reading and math as separate subjects has been emphasized. This emphasis is often to the exclusion of social studies, science, the arts, physical education, and to the integration of these subject areas. Children do not normally encounter situations in life from a single discipline area. To successfully solve problems, students must be able to call upon multiple areas of study. One major purpose of inquiry and problem-based learning involves students in real-world problems, asking authentic questions, gathering data leading to decision making, problem solving, logical thinking, or creative thinking (Preseisen 2001).

Costa (2001) reminds us that children have a universal, inquisitive nature, and that they are continually asking questions to learn or to challenge ideas. However, he argues, without the open-ended *why* questions, the *whats* and the *hows* that generally precede factual questions will not really matter very much to children. Neither the question nor the answer will draw the child in, or engage his or her mind in a meaningful way. The *why* questions, Costa (2001, 246) avows, are critical because they jump to "...the core of our curriculum [to] focus on such processes as learning to learn, knowledge production, metacognition, transference, decision making, creativity and group problem solving."

THE LIMITATIONS OF FACTUAL QUESTIONS

Why do most teachers ask so many factual questions? Teachers may believe that factual questions are easier to answer, because only small amounts of specific information are needed to answer them. But this is not so. A child with good critical-thinking skills may know all about Columbus's difficulties securing support for his explorations from Italian, Spanish, and Portuguese royalty, but be unable to remember the exact year Columbus sailed to America. Teachers may also believe there are fewer possible answers to dispute with factual questions than there are with interpretive or evaluative questions (which often involve background knowledge or personal opinion). But by responding only to factual questions, students miss out on the critical – and creative – thinking benefits that derive from rigorous discussion. Some teachers believe that students must know a certain number of facts before they can think critically. The problem with this assumption is that students may never know enough facts, so the teacher and students never get around to critical thinking. Critical thinking can occur while students are learning facts and new content and may even direct them toward new information. Finally, some teachers may emphasize factual questions, because such questions require concise answers. Teachers may think that classroom behavior can be more easily controlled when many students are involved in fast-paced questioning and answering. If this is the case, the teacher is inviting students to become superficially involved in an *inquisition*, but never actively engaged in *inquiry*.

What subtle messages do teachers who ask mainly factual questions give their students? Children may get the impression that facts and details are more important than personal interpretations or evaluations of events and ideas. They may feel they are not intelligent if they happen to have short-term memories and ignore names and dates in favor of, for example, more global, schematic impressions. Moreover, in classrooms where factual answers are emphasized, children often get little opportunity to use oral language to elaborate their ideas or to talk in-depth about meaningful content. Instead, they too often spend their time answering factual questions in monosyllables, or filling in blanks on worksheets in the same, uninspired manner. Students are less likely to remember facts when they do not use the information in meaningful ways. Students who engage in problem-based learning use higher-order questions; they acquire not only factual information but also information-processing skills.

CHAPTER 1

The Question of Questions

Most educators agree that one of the major goals of teaching is to help children learn to make reasoned decisions in life. To do so, children must be taught to actively solve problems, to think critically and creatively, and to feel good about themselves. Trilling and Fadel (2009) list these as essential skills for the 21st century. Children acquire these necessary thinking skills by learning to form and respond to critical questions. Teachers may help children accomplish these goals within a required curriculum of knowledge acquisition, or, in sharp contrast, they may simply fill the minds of children with a series of unrelated facts as if their minds were empty vessels.

Learning to ask appropriate questions is a sophisticated art form, but it is an area that receives short shrift in most teacher-education programs. This is unfortunate. Research indicates that teachers specifically trained to ask high-quality questions show significant improvement in constructing and using such questions in the classroom (Angletti 1991; Blanchard, Southerland, and Grandger 2008) and so become more adept at stimulating the human potential of their students. As well, being aware of the classification of questions and their myriad forms helps teachers determine just how well they are doing at engaging their students in critical and creative thinking levels.

Questioning is effective for so many purposes that teachers must be skilled in its use. They need to know the many ways of asking, and how to adapt the type and form of each question to the purpose for which it is asked. Because questioning is so important, this entire chapter is devoted to helping the teacher become familiar with the different levels of questions in both the cognitive and the affective domains.

PURPOSE OF QUESTIONS

Teachers use questions in the classroom for many different purposes (see figure 1.1). Often, these purposes work simultaneously. For instance, a teacher might ask a question to test students' understandings of a specific concept while, at the same time, ask students to use the concept to make a decision or solve a problem. The teacher may also ask the question to elicit an attitude or feeling about a topic.

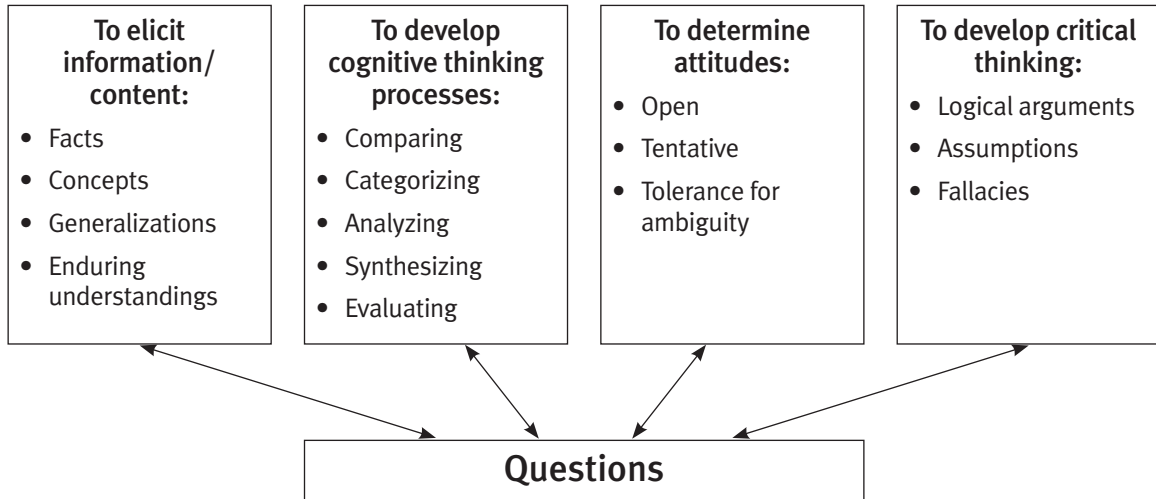


Figure 1.1 This chart shows the multiple purposes of questions.

TYPES OF QUESTIONS

The Cognitive Domain

The basic framework for the types of questions used in most classrooms comes from the work of Bloom. In his book *Taxonomy of Educational Objectives*, Bloom (1984) presents six major cognitive – or thinking – operations: knowledge, comprehension, application, analysis, synthesis, and evaluation.

Bloom's six types of questions can be grouped into three larger categories according to the level of processing that is required of students who are answering them (see figure 1.2). Level I questions – knowledge and comprehension – are lower-level questions. They require children to gather and recall data, but call for minimal complex thinking. Level I questions are designed mainly to solicit from students concepts, information, feelings, or experiences that have been gathered in the past and stored in the memory. Level II questions – application and analysis – ask the students to begin to process data and to integrate new content with their own experiences. Level III questions – synthesis and evaluation – are called higher-level questions. They require a high level of mental operation. To answer, students must engage in more abstract and sophisticated thinking that requires them to evaluate data in an entirely new situation, or to predict future events. At this level, questions are designed to encourage students to think intuitively, creatively, and hypothetically, to use their imaginations, to reveal their value systems, or to make judgments.

Level	Question Type	Response Behaviors	Eliciting Question Starters
I	Knowledge	Recalling facts or observations. Recalling definitions.	1. Who...? 2. What...? 3. Where...? 4. When...? 5. Define (the word <i>prosper</i>).
	Comprehension	Giving descriptions.	1. Describe (what happened when the third goat went over the bridge). 2. What is the main idea (in this paragraph)? 3. How are (these two fruits alike)?
II	Application	Applying techniques.	1. If...then.... 2. What (is the perimeter of your living room)?
	Analysis	Identifying motives or causes. Making inferences. Finding evidence to support generalizations.	1. Why (did Old Yeller die)? 2. Now that we have studied whales, what can we conclude about zoos? (assumptions) 3. What evidence can you find to support (the point of view that students should not receive grades)?
III	Synthesis	Solving problems. Making predictions. Producing original communications.	1. Can you think of (a way to test this)? 2. How can we solve (this problem)? 3. How can we improve (our research)? 4. What will happen (now that we have found a cure for cancer)? 5. What do you predict would happen (if we all looked the same)?
	Evaluation	Giving opinions about issues. Judging the validity of ideas. Judging the merit of problem solutions. Judging the quality of art and other products. Judging opinions and ideas.	1. Do you agree (with José)? 2. Do you believe (that this is the best way to proceed)? Why? 3. Do you think (that it is right to judge criminals)? Why? 4. What is your opinion (on this matter)? Why? 5. Would it be better (to do it this way)? Why? 6. Which (video) did you like? Why?

Figure 1.2 This chart shows the types of questions in the cognitive domain.

Beyond Bloom's Taxonomy

Bloom's Taxonomy of cognitive objectives was published in the 1950s and has had an important influence on educators. Since that time, his work has been looked at through multiple lenses and elaborated upon by many. Not only have cognitive psychologists used the taxonomy to describe complex thinking but so too have philosophers, educators, and others in disciplines such as the sciences, social sciences, and the arts. A study group of teachers and university professors examined the thinking processes from a variety of fields and over several years evolved the following graphic organizer (see figure 1.3). This elaborate chart helps to pinpoint some of the steps that are necessary to engage students in problem solving or decision making. The chart helps to describe different purposes for complex processing of information. *Input* refers to the different types of knowledge. *Comparing, categorizing, sequencing, and point of view* elaborate on comprehension and application. *Problem solving, decision making, logical thinking, and creative thinking* expand on why we engage in analysis, synthesis, and evaluation.

When students are asked to research information, they need a place to organize it. The thinking processes they have used will not be meaningful if they are not aware of the purpose or questions they are pursuing.

Students become engaged in higher-order thinking for different purposes. They may need to solve a problem, make a decision, or find a solution to a logical dilemma usually too complex and messy without apparent answers at the beginning. Students must have some way of organizing and sorting the raw data, to be able to "make sense" of information and apply it to some end purpose.

THINKING PROCESSES			
Purpose or Question			
Input	Elaboration		Output
Primary Sources (first person): <ul style="list-style-type: none"> • Documents • Interviews • Surveys • Experimentation 	Comparing Categorizing Hypothesizing	Analysis (whole to parts) Synthesis (parts creating a new whole)	Problem Solving Decision Making
Secondary Sources (someone else's interpretations): <ul style="list-style-type: none"> • Documents • Interviews • Surveys • Experimentation 	Sequencing Point of View	Evaluation (criteria applied to examples)	Logical Thinking Creative Thinking
Facts			

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Figure 1.3 This chart, useful for data collection and analysis, elaborates on Bloom's Taxonomy.

CRITICAL THINKING APPLIED TO THINKING PROCESSES		
SIMPLE		COMPLEX
Input	Elaboration	
Output		
Data/facts/resources: <ul style="list-style-type: none"> • Are they credible? • Does the person have the expertise? • Do the sources fit the problem/dilemma/situation? • Are the sources valid? • Are the sources representative of the population? • To whom might the data be generalized? • Are the data sufficient? • Is there bias? 	Are <i>comparisons</i> complete, including necessary elements? Are <i>categories</i> complete? Have all relevant <i>points of view</i> been considered? Do patterns fit sparse data for <i>hypotheses</i> ? Will more data be collected to confirm or deny hypotheses? Does language indicate tentativeness of <i>interpretation</i> ? Does the order of <i>sequences</i> have support?	Analysis: Are all of the parts accounted for and explain or relate to the whole? Are relationships explained and credible? Synthesis: How has creativity been determined? Beyond odd, unusual? Evaluation: Are criteria evident? Relevant to the example(s)? Complete sets of criteria? Match the complexity of the task?
		Problem Solving: Are objective criteria evident? Multiple alternatives considered? Generalizable? Decision Making: Major and sufficient alternatives considered? Values clear? Pros and cons consistent with values? Logical: Clear premises? Logical connections between premises? Avoid fallacies? Creativity: New, fresh, unique aspects? Combines things to create new outcomes?

Figure 1.4 The sample questions illustrate moving beyond thinking processes that lead to critical thinking.

Critical Thinking and Thinking Processes

Although critical thinking and thinking processes are similar to each other, they are not exactly the same. Bloom and his colleagues described a hierarchy of cognitive thinking processes; how the human mind processes information to remember, apply, and invent new information. Critical thinking is thinking about one’s thinking to improve thinking (Paul and Elder 2006, 87). Critical thinking involves the *quality* of thinking. Students are asked to apply nine standards of thinking to their own claims as well as to the claims of others. These standards include the consideration of clarity, accuracy, precision, relevance, depth, breadth, logicalness, significance, and fairness. As students collect information there are a number of questions they can ask themselves (see figure 1.4).

As teachers design lessons to engage students in inquiry, they must pay attention to not only the cognitive (brain) processes, but also to how attitudes, values, beliefs, and feelings impact ideas – the affective domain.

The Affective Domain

Bloom also considered questions in the affective domain – questions that deal mainly with feelings and emotions. In reality, the cognitive and affective domains cannot be separated, for it is almost impossible for children, or for anyone else, to process information without some emotional response. Nor can they actually

value an issue without having thought about it. It seems that both domains tend to blend and flow concurrently. However, certain questions may be more relevant to one domain than to the other.

The five types of questions in the affective domain are: receiving, responding, valuing, organizing, and characterizing. These can be grouped according to the level of processing required (see figure 1.5), as are the cognitive domain questions. Receiving and responding are considered Level I, or lower-level questions. While both require that a child be somewhat involved in the activity or idea, there is little real commitment in his or her answer. Level II questions – valuing – require students to “think harder” and, thus, to commit themselves to the degree that the resulting behavior is consistent and stable enough to be called a belief or an attitude. Level III questions, or higher-level questions, involve organizing and

Level	Question Type	Response Behaviors	Eliciting Question Starters
I	Receiving (attending)	Awareness of environment. Willingness to receive.	1. Which would you prefer...? 2. Identify the person who... 3. Listen to this song by... 4. Are you aware that...?
	Responding	Acquiescence in responding. Willingness to respond. Satisfaction in response.	1. Do you like to sing? 2. Did you observe the difference between the two pieces? 3. Are you willing to go to the ballet?
II	Valuing	Acceptance of a value. Preference for a value. Commitment.	1. Defend your stance (on gun control). 2. Do you feel (responsible for the homeless)? 3. Rank order your preferences... 4. Do you agree or disagree that...?
III	Organization	Conceptualization of a value. Organization of a value system.	1. In your opinion (is this money well spent)? 2. As you view (the war, should we have entered the conflict)? 3. In your own words, explain the issue. 4. Have you weighed the alternatives (for not using animal research)?
	Characterization	Generalized set. A philosophy of life. Values are internalized.	1. What will you do (about pollution)? 2. Are you willing to (give up lunch one day a week for the homeless)? 3. What is your philosophy (on mercy killings)? 4. Which of the following beliefs would you say is the most important in your life?

Figure 1.5 This chart shows the types of questions in the affective domain.

characterizing. Such questions are successful when they provoke the students to internalize their values, act upon those values, or organize them into a consistent value system that they are willing to defend.

Affective-type questions that represent all levels should be present in all class discussions, although not all levels need to be used in every lesson. The skilled teacher devises cognitive questions to stimulate students to process information with the final goal of analyzing data and evaluating it. That same teacher uses affective questions to elicit feeling-laden responses from students, and invites them to develop a value system that will become part of their daily lives.

Many educators suggest that certain dispositions, attitudes, values, and feelings enhance a learner's opportunities to solve problems, make decisions, and think critically. These include, for example, being open minded, respecting others' points of view, respecting evidence, being a risk taker, being objective, being a perfectionist, having the ability to stay focused on the main issue, having perseverance, and having healthy skepticism (questioning).

Other Types of Questions

Higher-order questions elicit multiple, high-level responses. If, however, students provide partial or narrow responses, the teacher may ask questions that invite students to think about the question in different ways. In addition to Bloom's two taxonomies, Costa (1991, 2001) identifies several other ways of looking at the questions teachers ask in classrooms to elicit desired responses: clarifying, cuing, focusing, and probing.

- Clarifying questions. When the teacher does not understand what the student is saying or hopes to get the student to elaborate, clarifying questions can be asked. Examples include: Are you saying that gang members provide the same function as parents? Would you tell us more about why you think that is so, and give an example of what you are thinking?
- Cuing questions. Often a teacher asks a leading question to launch a lesson – only to be greeted by total silence, because the students lack the background information to answer the question. In these instances, the teacher provides hints in the form of questions. For example, the teacher might initially ask: Why do you think so many people went westward in the pioneer days? When greeted with silence, the teacher tries cuing, What effect did the discovery of gold in California have on the settlers' decision to go west? or What discovery in California caused great excitement?
- Focusing questions. A teacher asks a focusing question when directing the learners' attention to a particular issue or topic. A teacher might ask, for example: Should there be a leash law in Sacramento? Then, the teacher can begin to elicit opinions and draw the whole class into a discussion on the pros and cons of the issue.
- Probing questions. Without the follow-up of probing questions, many important questions receive simple responses. For example, the teacher asks: Should we have sent troops to Afghanistan? A student answers, Absolutely not! The teacher has an answer to the critical question, but no reasoned

decision. The teacher may ask for an elaboration, more information, a reason, or a description of what the student is thinking: Why do you think that? By asking a probing question, the teacher can discover the depth of the student's thinking on the subject.

The Pervasive Initiate-Respond-Evaluate

A final word about questions concerns not the design of the questions themselves, but how the responses are evaluated by the questioner. For critical and creative thinking to flourish in a classroom, students must be free to respond to questions from their own trajectory of experiences, attitudes, and values. Unfortunately, in most classrooms, discussions follow the time-honored Initiate-Respond-Evaluate (IRE) pattern of question and answer (Roller 1989).

Using the IRE pattern, the teacher asks a question designed to get students ready to interact with what they are about to read. The teacher tries to connect what the students already know about a subject so that they will be more likely to assimilate new information easily. For example, prior to reading a story about a youngster who has won a prestigious award, the teacher initiates discussion by asking if anyone in the class has ever won an award. A student says her father once won an award in a refugee camp, for touching his nose with his tongue. Very quickly, almost subconsciously, the teacher evaluates and decides the response does not meet her expectation; it is not the academic-type award she has in mind. The child who answered the question has been unintentionally rebuked. From this, she learns she must try to figure out the answer that the teacher has in mind. Or, perhaps, she learns that it is safer to not respond at all (Cecil 1990).

Teachers who use IRE have a hidden agenda in asking the question. They control the interchange, subtly, by insisting all learners match their level of language, experience, and values. These teachers may continue to ask students for responses to a particular question until they get the answer they want. The questioning patterns used usually focus on fact/recall questions, the lowest levels of Bloom's Taxonomy. Such questions may limit students' use and application of information.

USING THE TAXONOMY OF QUESTIONS

The taxonomy of the types of questions just explored offers a variety of interesting possibilities related to teaching and learning. These possibilities are presented in random order, as individual differences in teachers and classrooms of students have a significant influence on the usability and success of a particular approach to questioning techniques. The following are ways in which awareness of types of questions could impact various curricular components:

- Building questions from reading material. Knowing the breadth of possibilities in both the cognitive and affective domains helps teachers create questions that build on one another hierarchically. Also, awareness of several models, descriptions, and verb delineations helps teachers develop questions that focus on particular cognitive skills or affective responses (see figure 1.6).

- Providing opportunities for students to collect and interpret data. While it is important for students to become proficient readers, they also need opportunities to obtain information through a multitude of sources, and to solve real problems and experience “mucking around” as they sort through information and make sense of it. These opportunities often involve

Name: <u>Theo</u> Date: <u>April 3</u>																																																	
Theme: <u>Martin Luther King, Jr.: The Life of a Great Man</u>																																																	
<p>Question Type 1. Choose from the following verbs:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px 10px;">define</td> <td style="padding: 2px 10px;">describe</td> <td style="padding: 2px 10px;">observe</td> </tr> <tr> <td style="padding: 2px 10px;">list</td> <td style="padding: 2px 10px;">match</td> <td style="padding: 2px 10px;">notice</td> </tr> <tr> <td style="padding: 2px 10px;">identify</td> <td style="padding: 2px 10px;">locate</td> <td></td> </tr> </table> <p>Student: <i>I will describe the early life of Martin Luther King, Jr.</i></p> <p>Question Type 2. Choose from the following verbs:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px 10px;">explain</td> <td style="padding: 2px 10px;">rewrite</td> <td style="padding: 2px 10px;">summarize</td> </tr> <tr> <td style="padding: 2px 10px;">convert</td> <td style="padding: 2px 10px;">interpret</td> <td style="padding: 2px 10px;">give examples</td> </tr> <tr> <td style="padding: 2px 10px;">paraphrase</td> <td style="padding: 2px 10px;">respond</td> <td></td> </tr> </table> <p>Student: <i>I will paraphrase Martin Luther King, Jr.'s "I Have a Dream" speech.</i></p> <p>Question Type 3. Choose from the following verbs:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px 10px;">demonstrate</td> <td style="padding: 2px 10px;">show</td> <td style="padding: 2px 10px;">support an opinion</td> </tr> <tr> <td style="padding: 2px 10px;">construct</td> <td style="padding: 2px 10px;">operate</td> <td style="padding: 2px 10px;">apply</td> </tr> </table> <p>Student: <i>I will support my opinion that Dr. King was a "Great Man" by showing the many ways he changed life for Black Americans.</i></p> <p>Question Type 4. Choose from the following verbs:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px 10px;">organize</td> <td style="padding: 2px 10px;">deduct</td> <td style="padding: 2px 10px;">value</td> </tr> <tr> <td style="padding: 2px 10px;">infer</td> <td style="padding: 2px 10px;">compare</td> <td style="padding: 2px 10px;">analyze</td> </tr> <tr> <td style="padding: 2px 10px;">contrast</td> <td style="padding: 2px 10px;">categorize</td> <td style="padding: 2px 10px;">distinguish</td> </tr> </table> <p>Student: <i>I will compare the life of Dr. Martin Luther King, Jr. to that of Mahatma Gandhi.</i></p> <p>Question Type 5. Choose from the following verbs:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px 10px;">create</td> <td style="padding: 2px 10px;">design</td> <td style="padding: 2px 10px;">suppose</td> <td style="padding: 2px 10px;">compose</td> </tr> <tr> <td style="padding: 2px 10px;">support</td> <td style="padding: 2px 10px;">rearrange</td> <td style="padding: 2px 10px;">combine</td> <td></td> </tr> </table> <p>Student: <i>I will create my own "I Have a Dream" speech, including all the goals Dr. King had that have not yet been realized.</i></p> <p>Question Type 6. Choose from the following verbs:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px 10px;">judge</td> <td style="padding: 2px 10px;">debate</td> <td style="padding: 2px 10px;">characterize</td> <td style="padding: 2px 10px;">support</td> </tr> <tr> <td style="padding: 2px 10px;">appraise</td> <td style="padding: 2px 10px;">criticize</td> <td style="padding: 2px 10px;">evaluate</td> <td></td> </tr> </table> <p>Student: <i>I will write an essay in support of passive resistance and how it could end the violence in North American cities.</i></p>	define	describe	observe	list	match	notice	identify	locate		explain	rewrite	summarize	convert	interpret	give examples	paraphrase	respond		demonstrate	show	support an opinion	construct	operate	apply	organize	deduct	value	infer	compare	analyze	contrast	categorize	distinguish	create	design	suppose	compose	support	rearrange	combine		judge	debate	characterize	support	appraise	criticize	evaluate	
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appraise	criticize	evaluate																																															

Figure 1.6 Students can be taught to use the taxonomy.

“hands-on learning.” Teachers need to ensure that hands-on learning is also minds-on learning.

- Selecting curricula. When selecting different learning activities across the curricula, the overall objectives can be tied to reinforcing particular thinking skills or affective responses. This criterion for selection allows the teacher, as key decision maker, to choose activities with clear, broad-based instructional goals.
- Purchasing instructional materials. The taxonomy of questions can be used as a guideline for evaluating whether or not instructional materials tap the full range of thinking and valuing levels, as opposed to specific content matter. Materials may include primary sources, supplemental text materials, and visual aids such as software and Internet sources.
- Teaching the taxonomy to students. Students can be taught to use the taxonomy by having them select from a series of options that cover the entire range of thinking processes. To do this, have students choose an issue, theme, or problem. Then, using question types, they select verbs from each level of the taxonomy as a way to explore the topic (see figure 1.6). Finally, from the top rung of either the cognitive or affective taxonomy, they select a means for displaying a product of their exploration. In the affective domain, for example, an exploration of capital punishment might lead to a final product of a letter to the government representative stating the student’s argument for or against. In the cognitive domain, an essay might be the vehicle through which the student evaluates the relative validity of passive resistance by exploring the life of Mahatma Gandhi or Martin Luther King, Jr.
- Independent study. Many teachers are uncomfortable with student independent study, because they must evaluate an “orphan” product – that is, they cannot measure it against the work of other students to help establish a norm. But in independent study, higher-level thinking skills are experienced by the learner in a natural way. Using the taxonomy as a criterion, the teacher can analyze the range of thinking (or valuing) within the student’s activities.
- Small-group study. When students work together, they learn important social skills; they are also motivated by what and by how other students think. Additionally, responses to some questions are so long that a student does not have enough time to answer them. In small groups, students can divide such questions into parts, with each student being responsible for one part. The group can then teach the rest of the class what each student learned.
- Assessing verbal interactions. Teachers know intuitively that classroom discussions provide students with meaningful forums for oral-language development, intellectual experiences, and discovering values. However, in this age of accountability, evaluating these discussions may be difficult. At various times throughout the school year, the use of portfolios and authentic assessments enables teachers to keep informal anecdotal records of the quality and types of questions initiated by each student during discussions.

The above suggestions represent several possible uses for the cognitive and affective questioning taxonomies. While their usefulness will vary according to different teaching styles and situations, they do provide structure and a viable rationale for the curriculum selection process. If used appropriately and integrated throughout the curriculum, the taxonomies and other types of questions can offer

welcome guidelines for teachers wishing to boost the level of cognitive and affective functioning in their classrooms.

AN EXERCISE FOR IDENTIFYING TYPES AND LEVELS OF QUESTIONS

The exercise in figure 1.7 assesses your recognition and understanding of the types (cognitive or affective) and levels (I, II, or III) of questions that we have discussed in this chapter. Mark each question with a letter (C for cognitive or A for affective) and a number corresponding to the level (I, II, or III). In many cases, a question can contain elements of both domains or, depending on the actual response, straddle two different levels. For this exercise, however, mark the type and level that best fits the question.

IDENTIFYING TYPES AND LEVELS OF QUESTIONS	
_____	1. Do you recall the difference between a camel and a dromedary?
_____	2. What is your reaction to the position Mr. Potter has taken regarding the leash law in Sacramento?
_____	3. Explain how the habitats of the two turtles are similar. How are they different?
_____	4. Which of the poems do you think was the most interesting?
_____	5. If you were offered a trip to China this summer, how would you react?
_____	6. Compose an essay that would tell about your outlook on school.
_____	7. What is the capital of Illinois?
_____	8. Indicate your reaction to the man who says he loves nature but who goes deer hunting.
_____	9. How do you feel about reading?
_____	10. How might these geometric shapes be grouped?
_____	11. What do you think will happen when Jud finds out the boy has Shiloh?
_____	12. How does life today differ from life in the times of the pioneers?
_____	13. Write a short essay relating how you interpret the role of government with regard to providing housing for the homeless.
_____	14. Indicate philosophically how you feel about the death penalty.
_____	15. What do you think transportation will be like in the year 2525?
_____	16. What do you think will be the long-term effect of pollution if nothing is done to stop it?
_____	17. What do you think caused Jesse to change his mind about Leslie?
_____	18. Do all trees have leaves?
_____	19. Is there any type of activity you would like to try over any other?
Answers:	1. C, I 2. A, II 3. C, I 4. A, I 5. A, II 6. C, III 7. C, I 8. A, I 9. A, II 10. C, II 11. C, III 12. C, II 13. C, II 14. A, III 15. C, III 16. C, III 17. C, II 18. C, II 19. A, II

Figure 1.7 Assessment exercise

