



# Bloom membagi kemampuan kognisi manusia ke dalam 6 tingkatan.

## 1. Tingkat Pengetahuan (Knowledge Level)

Berisikan kemampuan untuk mengenali dan mengingat peristilahan, definisi, fakta-fakta, gagasan, pola, urutan, metodologi, prinsip dasar, dsb. Sebagai contoh, ketika diminta menjelaskan manajemen kualitas (quality management), orang yg berada di level ini bisa menguraikan dengan baik definisi dari kualitas, karakteristik produk yg berkualitas, standar kualitas minimum untuk produk, dsb.

## 2. Tingkat Pemahaman (Comprehension Level)

Dikenali dari kemampuan untuk membaca dan memahami gambaran, laporan, tabel, diagram, arahan, peraturan, dsb. Sebagai contoh, orang di level ini bisa memahami apa yg diuraikan dalam fish bone diagram, pareto chart, dsb.

## 3. Tingkat Aplikasi (Application Level)

Di tingkat ini, seseorang memiliki kemampuan untuk menerapkan gagasan, prosedur, metode, rumus, teori, dsb di dalam kondisi kerja. Sebagai contoh, ketika diberi informasi tentang penyebab meningkatnya reject di produksi, seseorang yg berada di tingkat aplikasi akan mampu merangkum dan menggambarkan penyebab turunnya kualitas dalam bentuk fish bone diagram atau pareto chart.

## 4. Tingkat Analisis (Analytical Level)

Di tingkat analisis, seseorang akan mampu menganalisa informasi yang masuk dan membagi-bagi atau menstrukturkan informasi ke dalam bagian yang lebih kecil untuk mengenali pola atau hubungannya, dan mampu mengenali serta membedakan faktor penyebab dan akibat dari sebuah skenario yg rumit. Sebagai contoh, di level ini seseorang akan mampu memilah-milah penyebab meningkatnya reject, membanding-bandingkan tingkat keparahan dari setiap penyebab, dan menggolongkan setiap penyebab ke dalam tingkat keparahan yg ditimbulkan.

## 5. Tingkat Sintesa (Synthesis Level)

Satu tingkat di atas analisa, seseorang di tingkat sintesa akan mampu menjelaskan struktur atau pola dari sebuah skenario yang sebelumnya tidak terlihat, dan mampu mengenali data atau informasi yang harus didapat untuk menghasilkan solusi yg dibutuhkan. Sebagai contoh, di tingkat ini seorang manajer kualitas mampu memberikan solusi untuk menurunkan tingkat reject di produksi berdasarkan pengamatannya terhadap semua penyebab turunnya kualitas produk.



## 6. Tingkat Evaluasi (Evaluation Level)

Dikenali dari kemampuan untuk memberikan penilaian terhadap solusi, gagasan, metodologi, dsb dengan menggunakan kriteria yang cocok atau standar yg ada untuk memastikan nilai efektivitas atau manfaatnya. Sebagai contoh, di tingkat ini seorang manajer kualitas harus mampu menilai alternatif solusi yg sesuai untuk dijalankan berdasarkan efektivitas, urgensi, nilai manfaat, nilai ekonomis, dsb

Diperoleh dari "[http://id.wikipedia.org/wiki/Taksonomi Bloom](http://id.wikipedia.org/wiki/Taksonomi_Bloom)"

# Taxonomy of Educational Objectives

---



Categories in the cognitive domain of Bloom's Taxonomy (Anderson & Krathwohl, 2001)

The **Taxonomy of Educational Objectives**, often called **Bloom's Taxonomy**, is a classification of the different objectives and skills that [educators](#) set for students. The taxonomy was proposed in [1956](#) by [Benjamin Bloom](#), an [educational psychologist](#) at the University of Chicago. Bloom's Taxonomy divides educational objectives into three "domains:" Affective, Psychomotor, and Cognitive. Within each domain are different levels of learning, with higher levels considered more complex and closer to complete mastery of the subject matter. A goal of Bloom's Taxonomy is to motivate educators to focus on all three domains, creating a more [holistic](#) form of education.

## Affective

Skills in the **affective domain** describe the way people react emotionally and their ability to feel another living thing's pain or joy. Affective objectives typically target the awareness and growth in attitudes, emotion, and feelings.



There are five levels in the affective domain moving through the lowest order processes to the highest:

- Receiving - The lowest level; the student passively pays attention. Without this level no learning can occur.
- Responding - The student actively participates in the learning process, not only attends to a stimulus, the student also reacts in some way.
- Valuing - The student attaches a value to an object, phenomenon, or piece of information.
- Organizing - Students can put together different values, information, and ideas and accommodate them within their own schema; comparing, relating and elaborating on what has been learnt.
- Characterizing - The student has held a particular value or belief that now exerts influence on their behaviour so that it becomes a characteristic.

## **Psychomotor**

Skills in the **psychomotor domain** describe the ability to physically manipulate a tool or instrument like a hand or a hammer. Psychomotor objectives usually focus on change and/or development in behaviour and/or skills.

Bloom and his colleagues never created subcategories for skills in the psychomotor domain, but since then other educators have created their own psychomotor taxonomies

## **Cognitive**

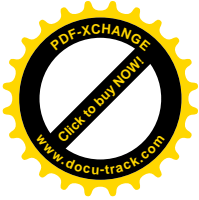
Skills in the **cognitive domain** revolve around knowledge, comprehension, and "thinking through" a particular topic. Traditional education tends to emphasize the skills in this domain, particularly the lower-order objectives.

There are six levels in the taxonomy, moving through the lowest order processes to the highest:

### **Knowledge**

Exhibit memory of previously-learned materials by recalling facts, terms, basic concepts and answers

- Knowledge of specifics - terminology, specific facts
- Knowledge of ways and means of dealing with specifics - conventions, trends and sequences, classifications and categories, criteria, methodology
- Knowledge of the universals and abstractions in a field - principles and generalizations, theories and structures



### Comprehension

Demonstrative understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas

- Translation
- Interpretation
- Extrapolation

### Application

Using new knowledge. Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way

### Analysis

Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations

- Analysis of elements
- Analysis of relationships
- Analysis of organizational principles

### Synthesis

Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions

- Production of a unique communication
- Production of a plan, or proposed set of operations
- Derivation of a set of abstract relations

### Evaluation

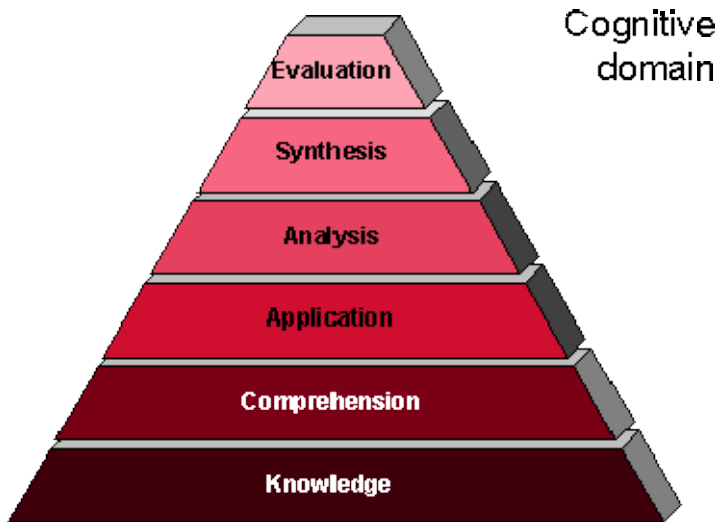
Present and defend opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria

- Judgments in terms of internal evidence
- Judgments in terms of external criteria

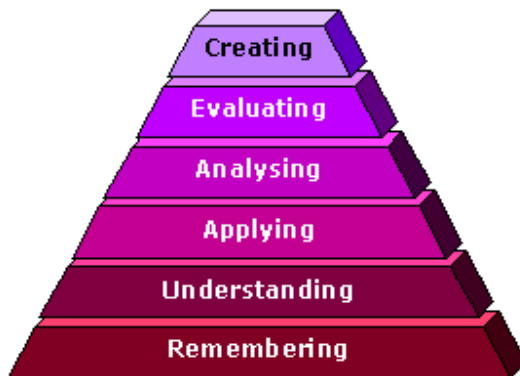
## Bloom Taxonomy

Taxonomy • simply means classification • so the well-known taxonomy of learning objectives is an attempt (within the [behavioural](#) paradigm) to classify forms and levels of learning. It identifies three Domains • of learning (see below), each of which is organised as a series of levels or pre-requisites. It is suggested that one cannot effectively • or ought not try to • address higher levels until those below them have been covered (it is thus effectively serial in structure). As well as providing a basic sequential model for dealing with topics in the curriculum, it also suggests a way of categorising levels of learning, in terms of the expected ceiling for a given programme. Thus in the Cognitive domain, training for technicians may cover *knowledge*, *comprehension* and *application*, but not concern itself with *analysis* and above, whereas full professional training may be expected to include this and *synthesis* and *evaluation* as well.

Cognitive: the most-used of the domains, refers to knowledge structures (although sheer knowing the facts is its bottom level). It can be viewed as a sequence of progressive contextualisation of the material. (Based on [Bloom,1956](#))



The model above is included because it is still common currency, but [Anderson and Krathwohl \(2001\)](#) have made some apparently minor but actually significant modifications, to come up with:



*Revised taxonomy of the cognitive domain following Anderson and Krathwohl (2001)*

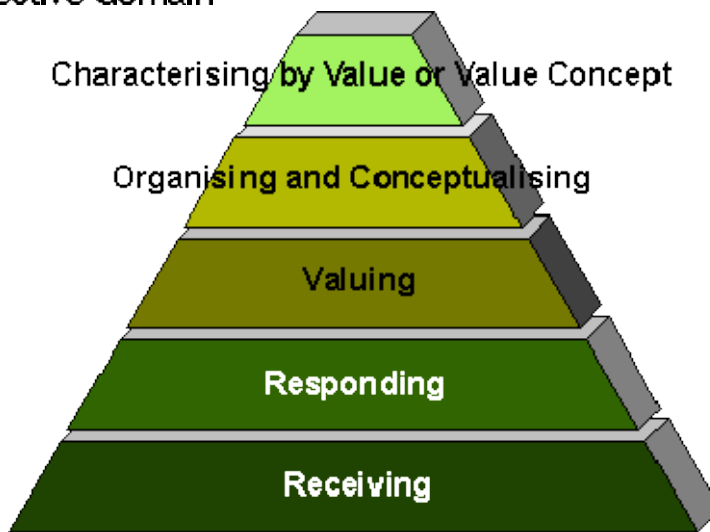
Note the new top category, which is about being able to create new knowledge within the domain, and the move from nouns to verbs.

In higher education, "understand" is still in my view problematic in its positioning. There is a higher, contextualised level of "understanding" which comes only with attempting to evaluate ideas and to try them out in new ways, or to "create" with them. It is what I expect at [Master's level](#). The taxonomy is an epistemological rather than psychological hierarchy, but it also has a basic

chronological element: you achieve certain levels before others. This higher, [Gestalt](#), level of understanding comes last, in my experience: my principal evidence is in the use of research methods. The "real", intuitive, contextualised, critical, strategic understanding only happens when you have tried to be creative within the field... Argue with me (use the "comments welcome" link below).

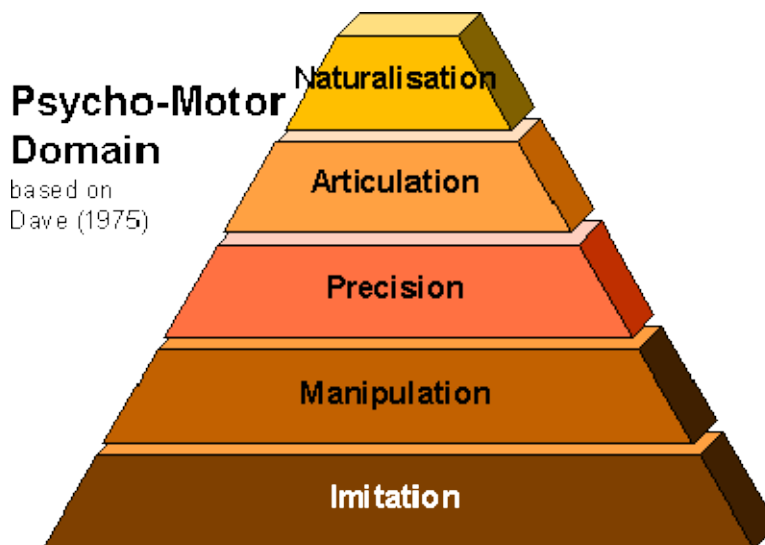
Affective: the Affective domain has received less attention, and is less intuitive than the Cognitive. It is concerned with values, or more precisely perhaps with perception of value issues, and ranges from mere awareness (Receiving), through to being able to distinguish implicit values through analysis. ([Kratwohl, Bloom and Masia \(1964\)](#))

### Affective domain



26/1/2019

Psycho-Motor: Bloom never completed work on this domain, and there have been several attempts to complete it. One of the simplest versions has been suggested by [Dave \(1975\)](#): it fits with the [model of developing skill](#) put forward by Reynolds (1965), and it also draws attention to the fundamental role of [imitation](#) in skill acquisition.



26/1/2019



## Bloom's Taxonomy \*

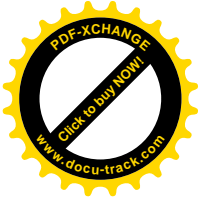
Benjamin Bloom created this taxonomy for categorizing level of abstraction of questions that commonly occur in educational settings. The taxonomy provides a useful structure in which to categorize test questions, since professors will characteristically ask questions within particular levels, and if you can determine the levels of questions that will appear on your exams, you will be able to study using appropriate strategies.

Competence	Skills Demonstrated
<b>Knowledge</b>	<ul style="list-style-type: none"><li>• observation and recall of information</li><li>• knowledge of dates, events, places</li><li>• knowledge of major ideas</li><li>• mastery of subject matter</li><li>• <i>Question Cues:</i> list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.</li></ul>
<b>Comprehension</b>	<ul style="list-style-type: none"><li>• understanding information</li><li>• grasp meaning</li><li>• translate knowledge into new context</li><li>• interpret facts, compare, contrast</li><li>• order, group, infer causes</li><li>• predict consequences</li><li>• <i>Question Cues:</i> summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend</li></ul>
<b>Application</b>	<ul style="list-style-type: none"><li>• use information</li><li>• use methods, concepts, theories in new situations</li><li>• solve problems using required skills or knowledge</li><li>• <i>Questions Cues:</i> apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover</li></ul>
<b>Analysis</b>	<ul style="list-style-type: none"><li>• seeing patterns</li><li>• organization of parts</li><li>• recognition of hidden meanings</li><li>• identification of components</li></ul>



	<ul style="list-style-type: none"><li>• <i>Question Cues:</i> analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer</li></ul>
<b>Synthesis</b>	<ul style="list-style-type: none"><li>• use old ideas to create new ones</li><li>• generalize from given facts</li><li>• relate knowledge from several areas</li><li>• predict, draw conclusions</li><li>• <i>Question Cues:</i> combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite</li></ul>
<b>Evaluation</b>	<ul style="list-style-type: none"><li>• compare and discriminate between ideas</li><li>• assess value of theories, presentations</li><li>• make choices based on reasoned argument</li><li>• verify value of evidence</li><li>• recognize subjectivity</li><li>• <i>Question Cues</i> assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize</li></ul>

- From Benjamin S. Bloom *Taxonomy of educational objectives*.  
Published by Allyn and Bacon, Boston, MA. Copyright (c) 1984 by Pearson Education.  
Adapted by permission of the publisher.



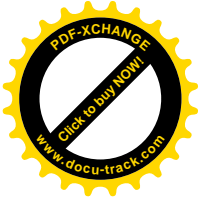
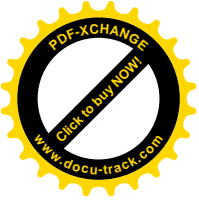
# BLOOM'S TAXONOMY



In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. Bloom found that over 95 % of the test questions students encounter require them to think only at the lowest possible level...the recall of information.

Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation. Verb examples that represent intellectual activity on each level are listed here.

1. **Knowledge:** arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
2. **Comprehension:** classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate,
3. **Application:** apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
4. **Analysis:** analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
5. **Synthesis:** arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
6. **Evaluation:** appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support, value, evaluate.



# Learning Domains or Bloom's Taxonomy

## The Three Types of Learning

There is more than one type of [learning](#). A committee of colleges, led by Benjamin Bloom, identified three domains of educational activities:

- **Cognitive:** mental skills (*Knowledge*)
- **Affective:** growth in feelings or emotional areas (*Attitude*)
- **Psychomotor:** manual or physical skills (*Skills*)

Since the work was produced by higher education, the words tend to be a little bigger than we normally use. Domains can be thought of as categories. Trainers often refer to these three domains as KSA (Knowledge, Skills, and Attitude). This taxonomy of learning behaviors can be thought of as "the goals of the training process." That is, after the training session, the learner should have acquired new skills, knowledge, and/or attitudes.

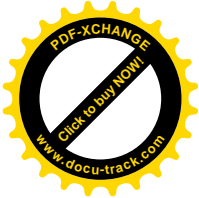
The committee also produced an elaborate compilation for the cognitive and affective domains, but none for the psychomotor domain. Their explanation for this oversight was that they have little experience in teaching manual skills within the college level (I guess they never thought to check with their sports or drama department).

This compilation divides the three domains into subdivisions, starting from the simplest behavior to the most complex. The divisions outlined are not absolutes and there are other systems or hierarchies that have been devised in the educational and training world. However, Bloom's taxonomy is easily understood and is probably the most widely applied one in use today.

## Cognitive <sup>(1)</sup>

The cognitive domain involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. There are six major categories, which are listed in order below, starting from the simplest behavior to the most complex. The categories can be thought of as degrees of difficulties. That is, the first one must be mastered before the next one can take place.

Category	Example and Key Words
<b>Knowledge:</b> Recall data or information.	<b>Examples:</b> Recite a policy. Quote prices from memory to a customer. Knows the safety rules.  <b>Key Words:</b> defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls,



	recognizes, reproduces, selects, states.
<b>Comprehension:</b> Understand the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.	<b>Examples:</b> Rewrites the principles of test writing. Explain in one's own words the steps for performing a complex task. Translates an equation into a computer spreadsheet. <b>Key Words:</b> comprehends, converts, defends, distinguishes, estimates, explains, extends, generalizes, gives <b>Examples</b> , infers, interprets, paraphrases, predicts, rewrites, summarizes, translates.
<b>Application:</b> Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the work place.	<b>Examples:</b> Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test. <b>Key Words:</b> applies, changes, computes, constructs, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses.
<b>Analysis:</b> Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences.	<b>Examples:</b> Troubleshoot a piece of equipment by using logical deduction. Recognize logical fallacies in reasoning. Gathers information from a department and selects the required tasks for training. <b>Key Words:</b> analyzes, breaks down, compares, contrasts, diagrams, deconstructs, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, relates, selects, separates.
<b>Synthesis:</b> Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	<b>Examples:</b> Write a company operations or process manual. Design a machine to perform a specific task. Integrates training from several sources to solve a problem. Revises and process to improve the outcome. <b>Key Words:</b> categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes.
<b>Evaluation:</b> Make judgments	<b>Examples:</b> Select the most effective solution. Hire the

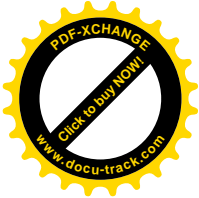


about the value of ideas or materials.	most qualified candidate. Explain and justify a new budget.  <b>Key Words:</b> appraises, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates, explains, interprets, justifies, relates, summarizes, supports.
--	--

## Affective <sup>(2)</sup>

This domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes. The five major categories are listed from the simplest behavior to the most complex:

Category	Example and Key Words
<b>Receiving Phenomena:</b> Awareness, willingness to hear, selected attention.	<b>Examples:</b> Listen to others with respect. Listen for and remember the name of newly introduced people.  <b>Key Words:</b> asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits, erects, replies, uses.
<b>Responding to Phenomena:</b> Active participation on the part of the learners. Attends and reacts to a particular phenomenon. Learning outcomes may emphasize compliance in responding, willingness to respond, or satisfaction in responding (motivation).	<b>Examples:</b> Participates in class discussions. Gives a presentation. Questions new ideals, concepts, models, etc. in order to fully understand them. Know the safety rules and practices them.  <b>Key Words:</b> answers, assists, aids, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes.
<b>Valuing:</b> The worth or value a person attaches to a particular object, phenomenon, or behavior. This ranges from simple acceptance to the more complex state of commitment. Valuing is based on the internalization of a set	<b>Examples:</b> Demonstrates belief in the democratic process. Is sensitive towards individual and cultural differences (value diversity). Shows the ability to solve problems. Proposes a plan to social improvement and follows through with commitment. Informs management on matters that one feels strongly about.  <b>Key Words:</b> completes, demonstrates, differentiates,



<p>of specified values, while clues to these values are expressed in the learner's overt behavior and are often identifiable.</p>	<p>explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works.</p>
<p><b>Organization:</b> Organizes values into priorities by contrasting different values, resolving conflicts between them, and creating an unique value system. The emphasis is on comparing, relating, and synthesizing values.</p>	<p><b>Examples:</b> Recognizes the need for balance between freedom and responsible behavior. Accepts responsibility for one's behavior. Explains the role of systematic planning in solving problems. Accepts professional ethical standards. Creates a life plan in harmony with abilities, interests, and beliefs. Prioritizes time effectively to meet the needs of the organization, family, and self.</p> <p><b>Key Words:</b> adheres, alters, arranges, combines, compares, completes, defends, explains, formulates, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes.</p>
<p><b>Internalizing values</b> (characterization): Has a value system that controls their behavior. The behavior is pervasive, consistent, predictable, and most importantly, characteristic of the learner. Instructional objectives are concerned with the student's general patterns of adjustment (personal, social, emotional).</p>	<p><b>Examples:</b> Shows self-reliance when working independently. Cooperates in group activities (displays teamwork). Uses an objective approach in problem solving. Displays a professional commitment to ethical practice on a daily basis. Revises judgments and changes behavior in light of new evidence. Values people for what they are, not how they look.</p> <p><b>Key Words:</b> acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, verifies.</p>

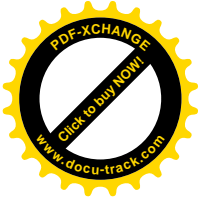
## Psychomotor <sup>(3)</sup>

The psychomotor domain includes physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution. The seven major categories are listed from the simplest behavior to the most complex:

Category	Example and Key Words
<p><b>Perception:</b> The ability to use</p>	<p><b>Examples:</b> Detects non-verbal communication cues.</p>



<p>sensory cues to guide motor activity. This ranges from sensory stimulation, through cue selection, to translation.</p>	<p>Estimate where a ball will land after it is thrown and then moving to the correct location to catch the ball. Adjusts heat of stove to correct temperature by smell and taste of food. Adjusts the height of the forks on a forklift by comparing where the forks are in relation to the pallet.</p> <p><b>Key Words:</b> chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects.</p>
<p><b>Set:</b> Readiness to act. It includes mental, physical, and emotional sets. These three sets are dispositions that predetermine a person's response to different situations (sometimes called mindsets).</p>	<p><b>Examples:</b> Knows and acts upon a sequence of steps in a manufacturing process. Recognize one's abilities and limitations. Shows desire to learn a new process (motivation). NOTE: This subdivision of Psychomotor is closely related with the "Responding to phenomena" subdivision of the Affective domain.</p> <p><b>Key Words:</b> begins, displays, explains, moves, proceeds, reacts, shows, states, volunteers.</p>
<p><b>Guided Response:</b> The early stages in learning a complex skill that includes imitation and trial and error. Adequacy of performance is achieved by practicing.</p>	<p><b>Examples:</b> Performs a mathematical equation as demonstrated. Follows instructions to build a model. Responds hand-signals of instructor while learning to operate a forklift.</p> <p><b>Key Words:</b> copies, traces, follows, react, reproduce, responds</p>
<p><b>Mechanism:</b> This is the intermediate stage in learning a complex skill. Learned responses have become habitual and the movements can be performed with some confidence and proficiency.</p>	<p><b>Examples:</b> Use a personal computer. Repair a leaking faucet. Drive a car.</p> <p><b>Key Words:</b> assembles, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches.</p>
<p><b>Complex Overt Response:</b> The skillful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, accurate,</p>	<p><b>Examples:</b> Maneuvers a car into a tight parallel parking spot. Operates a computer quickly and accurately. Displays competence while playing the piano.</p> <p><b>Key Words:</b> assembles, builds, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats,</p>



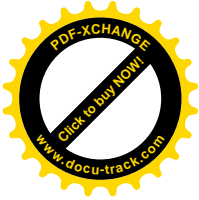
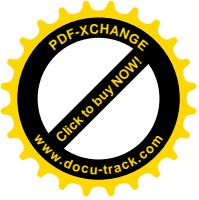
<p>and highly coordinated performance, requiring a minimum of energy. This category includes performing without hesitation, and automatic performance. For example, players are often utter sounds of satisfaction or expletives as soon as they hit a tennis ball or throw a football, because they can tell by the feel of the act what the result will produce.</p>	<p>manipulates, measures, mends, mixes, organizes, sketches.</p> <p>NOTE: The Key Words are the same as Mechanism, but will have adverbs or adjectives that indicate that the performance is quicker, better, more accurate, etc.</p>
<p><b>Adaptation:</b> Skills are well developed and the individual can modify movement patterns to fit special requirements.</p>	<p><b>Examples:</b> Responds effectively to unexpected experiences. Modifies instruction to meet the needs of the learners. Perform a task with a machine that it was not originally intended to do (machine is not damaged and there is no danger in performing the new task).</p> <p><b>Key Words:</b> adapts, alters, changes, rearranges, reorganizes, revises, varies.</p>
<p><b>Origination:</b> Creating new movement patterns to fit a particular situation or specific problem. Learning outcomes emphasize creativity based upon highly developed skills.</p>	<p><b>Examples:</b> Constructs a new theory. Develops a new and comprehensive training programming. Creates a new gymnastic routine.</p> <p><b>Key Words:</b> arranges, builds, combines, composes, constructs, creates, designs, initiate, makes, originates.</p>

## Other Psychomotor Domains

As mentioned earlier, the committee did not produce a compilation for the psychomotor domain model, but others have. The one discussed above is by Simpson (1972). There are two other popular versions:

Dave's:<sup>(4)</sup>

- **Imitation:** Observing and patterning behavior after someone else. Performance may be of low quality. Example: Copying a work of art.
- **Manipulation:** Being able to perform certain actions by following instructions and practicing. Example: Creating work on one's own, after taking lessons, or reading about it.
- **Precision:** Refining, becoming more exact. Few errors are apparent. Example: Working and reworking something, so it will be "just right."



- **Articulation:** Coordinating a series of actions, achieving harmony and internal consistency. Example: Producing a video that involves music, drama, color, sound, etc.
- **Naturalization:** Having high level performance become natural, without needing to think much about it. **Examples:** Michael Jordan playing basketball, Nancy Lopez hitting a golf ball, etc.

#### Harrow's:<sup>(5)</sup>

- **Reflex movements** - Reactions that are not learned.
- **Fundamental movements** - Basic movements such as walking, or grasping.
- **Perception** - Response to stimuli such as visual, auditory, kinesthetic, or tactile discrimination.
- **Physical abilities** - Stamina that must be developed for further development such as strength and agility.
- **Skilled movements** - Advanced learned movements as one would find in sports or acting.
- **No discursive communication** - Effective body language, such as gestures and facial expressions.

## Bloom's Taxonomy: Original and Revised

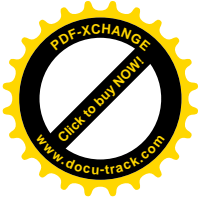
by  
**Mary Forehand**

### Introduction

One of the basic questions facing educators has always been "Where do we begin in seeking to improve human thinking?" (Houghton, 2004). Fortunately we do not have to begin from scratch in searching for answers to this complicated question. The Communities Resolving Our Problems ([C.R.O.P.](#)) website recommends, "One place to begin is in defining the nature of thinking. Before we can make it better, we need to know more of what it is" (Houghton, 2004).

Benjamin S. Bloom extensively contemplated the nature of thinking, eventually authoring or co-authoring 18 books. According to a biography of Bloom, written by former student Elliot W. Eisner, "it was clear that he was in love with the process of finding out, and finding out is what I think he did best. One of Bloom's great talents was having a nose for what is significant" (2002).

Although it received little attention when first published, Bloom's Taxonomy has since been translated into 22 languages and is one of the most widely applied and most often cited references in education. (Anderson & Sosniak, 1994, preface), (Houghton, 2004), ( Krathwohl, 2002), ( oz-TeacherNet, 2001). As of this writing, three other chapters in this ebook make reference to Bloom's Taxonomy, yet another testament to its relevance.



## History

In 1780, Abigail Adams stated, "Learning is not attained by chance; it must be sought for with ardor and attended to with diligence" ( [quotationspage.com](http://quotationspage.com), 2005). Learning, teaching, identifying educational goals, and thinking are all complicated concepts interwoven in an intricate web. Bloom was arduous, diligent, and patient while seeking to demystify these concepts and untangle this web. He made "the improvement of student learning" (Bloom 1971, Preface) the central focus of his life's work.

Discussions during the 1948 Convention of the American Psychological Association led Bloom to spearhead a group of educators who eventually undertook the ambitious task of classifying educational goals and objectives. Their intent was to develop a method of classification for thinking behaviors that were believed to be important in the processes of learning. Eventually, this framework became a taxonomy of three domains:

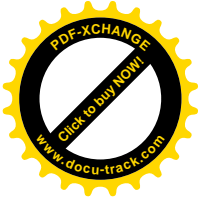
- **The cognitive** - knowledge based domain, consisting of six levels
- **The affective** - attitudinal based domain, consisting of five levels, and
- **The psychomotor** - skills based domain, consisting of six levels.

In 1956, eight years after the group first began, work on the cognitive domain was completed and a handbook commonly referred to as "Bloom's Taxonomy" was published. This chapter focuses its attention on the cognitive domain.

While Bloom pushed for the use of the term "taxonomy," others in the group resisted because of the unfamiliarity of the term within educational circles. Eventually Bloom prevailed, forever linking his name and the term. The small volume intended for university examiners "has been transformed into a basic reference for all educators worldwide. Unexpectedly, it has been used by curriculum planners, administrators, researchers, and classroom teachers at all levels of education" (Anderson & Sosniak, 1994, p. 1). While it should be noted that other educational taxonomies and hierarchical systems have been developed, it is Bloom's Taxonomy which remains, even after nearly fifty years, the de facto standard.

## What is Bloom's Taxonomy?

Understanding that "taxonomy" and "classification" are synonymous helps dispel uneasiness with the term. Bloom's Taxonomy is a multi-tiered model of classifying thinking according to six cognitive levels of complexity. Throughout the years, the levels have often been depicted as a stairway, leading many teachers to encourage their students to "climb to a higher (level of) thought." The lowest three levels are: knowledge, comprehension, and application. The highest three levels are: analysis, synthesis, and evaluation. "The taxonomy is hierarchical; [in that] each level is subsumed by the higher levels. In other words,



a student functioning at the 'application' level has also mastered the material at the 'knowledge' and 'comprehension' levels." ([UW Teaching Academy](#), 2003). One can easily see how this arrangement led to natural divisions of lower and higher level thinking.

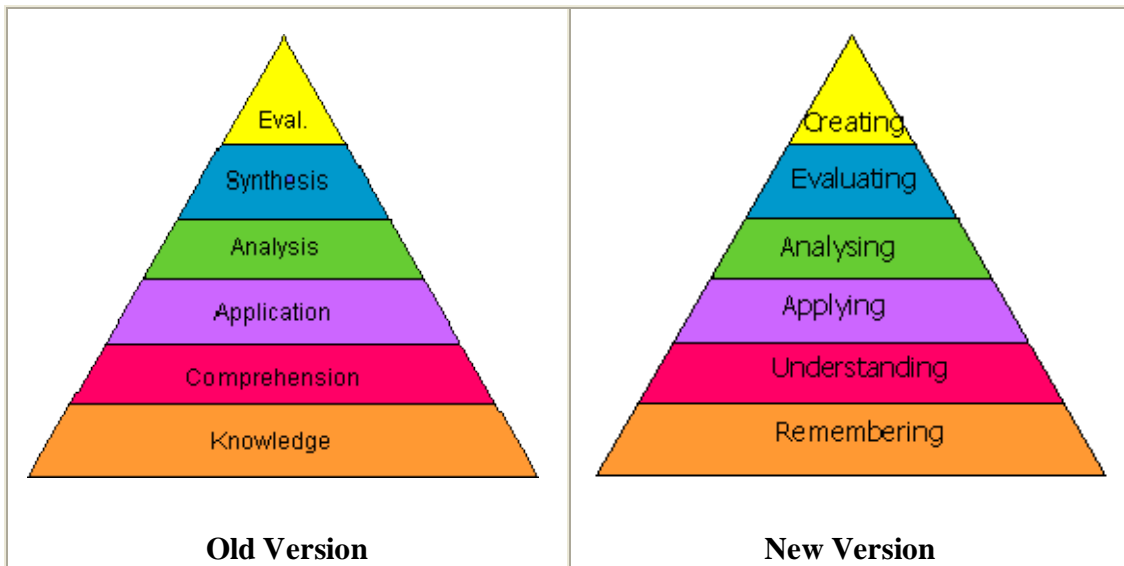
Clearly, Bloom's Taxonomy has stood the test of time. Due to its long history and popularity, it has been condensed, expanded, and reinterpreted in a variety of ways. Research findings have led to the discovery of a veritable smorgasbord of interpretations and applications falling on a continuum ranging from tight overviews to expanded explanations. Nonetheless, one recent revision (designed by one of the co-editors of the original taxonomy along with a former Bloom student) merits particular attention.

### **Revised Bloom's Taxonomy (RBT)**

During the 1990's, a former student of Bloom's, Lorin Anderson, led a new assembly which met for the purpose of updating the taxonomy, hoping to add relevance for 21st century students and teachers. This time "representatives of three groups [were present]: cognitive psychologists, curriculum theorists and instructional researchers, and testing and assessment specialists" (Anderson, & Krathwohl, 2001, p. xxviii). Like the original group, they were also arduous and diligent in their pursuit of learning, spending six years to finalize their work. Published in 2001, the revision includes several seemingly minor yet actually quite significant changes. Several excellent sources are available which detail the revisions and reasons for the changes. A more concise summary appears here. The changes occur in three broad categories: terminology, structure, and emphasis.

### **Terminology Changes**

Changes in terminology between the two versions are perhaps the most obvious differences and can also cause the most confusion. Basically, Bloom's six major categories were changed from noun to verb forms. Additionally, the lowest level of the original, knowledge was renamed and became remembering. Finally, comprehension and synthesis were retitled to understanding and creating. In an effort to minimize the confusion, comparison images appear below.



Source: [http://web.odu.edu/educ/lischult/blooms\\_taxonomy.htm](http://web.odu.edu/educ/lischult/blooms_taxonomy.htm)

Caption: "The graphic is a representation of the NEW verbage associated with the long familiar Bloom's Taxonomy. Note the change from Nouns to Verbs [e.g., Application to Applying] to describe the different levels of the taxonomy. Note that the top two levels are essentially exchanged from the Old to the New version." (Schultz, 2005) (Evaluation moved from the top to Evaluating in the second from the top, Synthesis moved from second on top to the top as Creating.)

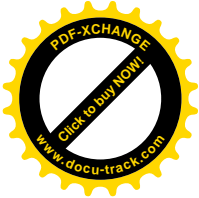
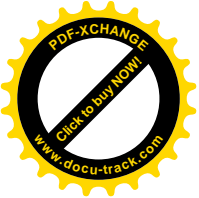
The new terms are defined as:

- **Remembering:** Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
- **Understanding:** Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- **Applying:** Carrying out or using a procedure through executing, or implementing.
- **Analyzing:** Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
- **Evaluating:** Making judgments based on criteria and standards through checking and critiquing.
- **Creating:** Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

(Anderson & Krathwohl, 2001, pp. 67-68).

### Structural changes

Structural changes seem dramatic at first, yet are quite logical when closely examined. Bloom's original cognitive taxonomy was a one-dimensional form.



With the addition of products, the Revised Bloom's Taxonomy takes the form of a two-dimensional table. One of the dimensions identifies The Knowledge Dimension (or the kind of knowledge to be learned) while the second identifies The Cognitive Process Dimension (or the process used to learn). As represented on the grid below, the intersection of the knowledge and cognitive process categories form twenty-four separate cells as represented on the "Taxonomy Table" below.

The Knowledge Dimension on the left side is comprised of four levels that are defined as Factual, Conceptual, Procedural, and Meta-Cognitive. The Cognitive Process Dimension across the top of the grid consists of six levels that are defined as Remember, Understand, Apply, Analyze, Evaluate, and Create. Each level of both dimensions of the table is subdivided.

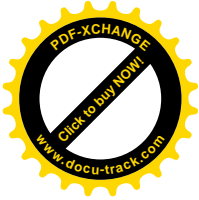
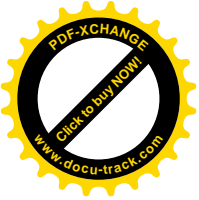
Each of the four Knowledge Dimension levels is subdivided into either three or four categories (e.g. Factual is divided into Factual, Knowledge of Terminology, and Knowledge of Specific Details and Elements). The Cognitive Process Dimension levels are also subdivided with the number of sectors in each level ranging from a low of three to a high of eight categories. For example, Remember is subdivided into the three categories of Remember, Recognizing, and Recalling while the Understanding level is divided into eight separate categories. The resulting grid, containing 19 subcategories is most helpful to teachers in both writing objectives and aligning standards with curricular. The "Why" and "How" sections of this chapter further discuss use of the Taxonomy Table as well as provide specific examples of applications.

### Bloom's Taxonomy

The Knowledge Dimension	The Cognitive Process Dimension					
	<a href="#">Remember</a>	<a href="#">Understand</a>	<a href="#">Apply</a>	<a href="#">Analyze</a>	<a href="#">Evaluate</a>	<a href="#">Create</a>
<a href="#">Factual Knowledge</a>	<a href="#">List</a>	<a href="#">Summarize</a>	<a href="#">Classify</a>	<a href="#">Order</a>	<a href="#">Rank</a>	<a href="#">Combine</a>
<a href="#">Conceptual Knowledge</a>	<a href="#">Describe</a>	<a href="#">Interpret</a>	<a href="#">Experiment</a>	<a href="#">Explain</a>	<a href="#">Assess</a>	<a href="#">Plan</a>
<a href="#">Procedural Knowledge</a>	<a href="#">Tabulate</a>	<a href="#">Predict</a>	<a href="#">Calculate</a>	<a href="#">Differentiate</a>	<a href="#">Conclude</a>	<a href="#">Compose</a>
<a href="#">Meta-Cognitive Knowledge</a>	<a href="#">Appropriate Use</a>	<a href="#">Execute</a>	<a href="#">Construct</a>	<a href="#">Achieve</a>	<a href="#">Action</a>	<a href="#">Actualize</a>

**Copyright (c) 2005 Extended Campus -- Oregon State University**  
<http://ecampus.oregonstate.edu/> Designer/Developer - Dianna Fisher

Caption: As one can see from the Oregon State chart above, the intersection of the six Cognitive Process defined dimensions (Remember, Understand, Apply, Analyze, Evaluate, and Create) with the four Knowledge Dimensions (defined as Factual, Conceptual, Procedural, and Meta-Cognitive) forms a grid with twenty-four separate cells as represented. Each of the cells contains a hyperlinked verb that launches a pop-up window containing definitions and examples.



## Changes in Emphasis

Emphasis is the third and final category of changes. As noted earlier, Bloom himself recognized that the taxonomy was being "unexpectedly" used by countless groups never considered an audience for the original publication. The revised version of the taxonomy is intended for a much broader audience. Emphasis is placed upon its use as a "more authentic tool for curriculum planning, instructional delivery and assessment" ([oz-TeacherNet](#), 2001).

## Why use Bloom's Taxonomy?

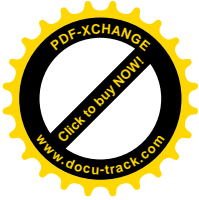
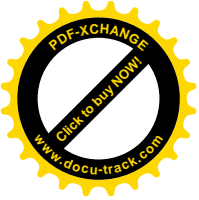
As history has shown, this well known, widely applied scheme filled a void and provided educators with one of the first systematic classifications of the processes of thinking and learning. The cumulative hierarchical framework consisting of six categories each requiring achievement of the prior skill or ability before the next, more complex, one, remains easy to understand. Out of necessity, teachers must measure their students' ability. Accurately doing so requires a classification of levels of intellectual behavior important in learning. Bloom's Taxonomy provided the measurement tool for thinking.

With the dramatic changes in society over the last five decades, the Revised Bloom's Taxonomy provides an even more powerful tool to fit today's teachers' needs. The structure of the Revised Taxonomy Table matrix "provides a clear, concise visual representation" (Krathwohl, 2002) of the alignment between standards and educational goals, objectives, products, and activities.

Today's teachers must make tough decisions about how to spend their classroom time. Clear alignment of educational objectives with local, state, and national standards is a necessity. Like pieces of a huge puzzle, everything must fit properly. The Revised Bloom's Taxonomy Table clarifies the fit of each lesson plan's purpose, "essential question," goal or objective. The twenty-four-cell grid from Oregon State University that is shown above along with the "[Printable Taxonomy Table Examples](#)" can easily be used in conjunction with a chart available in [MSWord](#) that can be downloaded from the [South Carolina Department of Education](#). When used in this manner the "Essential Question" or lesson objective becomes clearly defined.

## How can Bloom's Taxonomy Be Used?

A search of the World Wide Web will yield clear evidence that Bloom's Taxonomy has been applied to a variety of situations. Current results include a broad spectrum of applications represented by articles and websites describing everything from corrosion training to medical preparation. In almost all circumstances when an instructor desires to move a group of students through a learning process utilizing an organized framework, Bloom's Taxonomy can prove



helpful. Yet the educational setting (K-graduate) remains the most often used application. A brief explanation of one example is described below.

The educational journal *Theory into Practice* published an entire issue on the Revised Bloom's Taxonomy. Included is an article entitled, "*Using the Revised Taxonomy to Plan and Deliver Team-Taught, Integrated, Thematic Units*" (Ferguson, 2002).

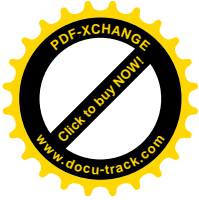
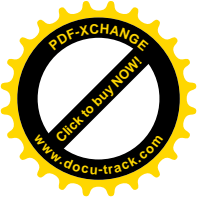
The writer describes the use of the revised Bloom's Taxonomy to plan and deliver an integrated English and history course entitled "Western Culture." The taxonomy provided the team-teachers with a common language with which to translate and discuss state standards from two different subject areas. Moreover, it helped them to understand how their subjects overlapped and how they could develop conceptual and procedural knowledge concurrently. Furthermore, the taxonomy table in the revised taxonomy provided the history and English teachers with a new outlook on assessment and enabled them to create assignments and projects that required students to operate at more complex levels of thinking (Abstract, Ferguson, 2002).

Additionally, "[The Encyclopedia of Educational Technology](#)" website contains an excellent and extensive description of the use of the Revised Taxonomy Table in writing, examining and revising objectives to insure the alignment of the objectives with both the standards and the assessments. Three charts can be found on the site one of which compares "Unclear objectives" with "Revised Objectives".

Bloom's group initially met hoping to reduce the duplication of effort by faculty at various universities. In the beginning, the scope of their purpose was limited to facilitating the exchange of test items measuring the same educational objectives. Intending the Taxonomy "as a method of classifying educational objectives, educational experiences, learning processes, and evaluation questions and problems" (Paul, 1985 p. 39), numerous examples of test items (mostly multiple choice) were included. This led to a natural linkage of specific verbs and products with each level of the taxonomy. Thus, when designing effective lesson plans, teachers often look to Bloom's Taxonomy for guidance.

Likewise the Revised Taxonomy includes specific verb and product linkage with each of the levels of the Cognitive Process Dimension. However, due to its 19 subcategories and two-dimensional organization, there is more clarity and less confusion about the fit of a specific verb or product to a given level. Thus the Revised Taxonomy offers teachers an even more powerful tool to help design their lesson plans.

As touched upon earlier, through the years, Bloom's Taxonomy has given rise to educational concepts including terms such as high and low level thinking. It has also been closely linked with multiple intelligences (Noble, 2004) problem solving



skills, creative and critical thinking, and more recently, technology integration. For example, currently, the [State of Georgia K-12 Technology Plan](#) has included in its website an excellent graphic depicting technology alignment using Bloom's Taxonomy with learning through the two axes of instructional approach and authenticity.

Using the Revised Taxonomy in an adaptation from the [Omaha Public Schools Teacher's Corner](#), a lesson objective based upon the story of *Goldilocks and the Three Bears* is presented for each of the six levels of the Cognitive Process as shown on the Revised Taxonomy Table.

**Remember:** Describe where Goldilocks lived.

**Understand:** Summarize what the Goldilocks story was about.

**Apply:** Construct a theory as to why Goldilocks went into the house.

**Analyze:** Differentiate between how Goldilocks reacted and how you would react in each story event.

**Evaluate:** Assess whether or not you think this really happened to Goldilocks.

**Create:** Compose a song, skit, poem, or rap to convey the Goldilocks story in a new form.

Although this is a very simple example of the application of Bloom's taxonomy the author is hopeful that it will demonstrate both the ease and the usefulness of the Revised Taxonomy Table.

## Summary

Countless people know, love and are comfortable with the original Bloom's Taxonomy and are understandably hesitant to change. After all, change is difficult for most people. The original Bloom's Taxonomy was and is a superb tool for educators. Yet, even "the original group always considered the [Taxonomy] framework a work in progress, neither finished nor final" (Anderson & Krathwohl 2001 p. xxvii). The new century has brought us the Revised Bloom's Taxonomy which really is new and improved. Try it out; this author thinks you will like it better than cake.