COGNITIVE DOMAIN

(Bloom B. S. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain.* New York: David McKay Co Inc.)

Level	***Example and Key Words***
Knowledge (Low) Recall data or information.	**Examples**: Recite a policy. Quote prices from memory to a customer. Knows the safety rules. **Key Words**: arrange, define, describe, identify, label, list, match, memorize, name, outline, recall, recognize, relate, repeat, reproduce, select, state, underline
Comprehension (Low) Understand the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.	**Examples**: 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. **Key Words**: choose, classify, comprehend, convert, critique, defend, distinguish, estimate, express, explain, extend, generalize, give example, identify, infer, interpret, paraphrase, report, respond, rewrite, tell, translate
Application (Middle) 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.	**Examples**: Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test. **Key Words**: apply, change, compute, construct, demonstrate, discover, dramatize, employ, execute, illustrate, implement, initiate, manage, manipulate, modify, operate, practice, predict, prepare, produce, react, relate, respond, role-play, show, solve, use
Analysis (High) Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences.	**Examples**: 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. **Key Words**: analyze, appraise, break down, calculate, compare, contrast, conclude, correlate, diagram, deconstruct, diagnose, differentiate, discriminate, distinguish, extrapolate, identify, illustrate, infer, outline, quantify, relate, select, separate, test
Synthesis (High) Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	**Examples**: 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. **Key Words**: arrange, assemble, build, categorize, combine, compile, compose, create, devise, design, explain, generate, modify, organize, plan, propose, rearrange, reconstruct, relate, reorganize, revise, rewrite, synthesize, summarize, tell, write
Evaluation (High) Make judgments about the value of ideas or materials.	**Examples**: Select the most effective solution. Hire the most qualified candidate. Explain and justify a new budget. **Key Words**: appraise, argue, assess, compare, conclude, contrast, criticize, critique, defend, describe, discriminate, evaluate, explain, interpret, investigate, justify, relate, report on, review, summarize, support

THE TAXONOMY OF EDUCATIONAL OBJECTIVES
http://www.humboldt.edu/~tha1/bloomtax.html

This is a revised version of Benjamin Bloom's work with the addition of the Psychomotor Domain as developed by Anita Harrow [1972]. Dr. Bloom's intent was to develop a classification framework for writing educational objectives. The questions and examples were added by Tom Allen to make the Taxonomy more useful for beginning teachers as a tool to facilitate appropriate questioning.

Cognitive Domain (Bloom)
From: itc.utk.edu/~jklittle/edsmrt521/cognitive.html

- Knowledge - Recognize or recall information.
- Comprehension - Ability to grasp the meaning of material.
- Application - Ability to use learned material in new and concrete situations.
- Analysis - Ability to break down materials into its component parts so that its structure may be understood.
- Synthesis - The ability to put parts together to form a new whole.
- Evaluation - Ability to judge value.

COGNITIVE DOMAIN of Educational Objectives:

1. **Knowledge:** recognize or recall information.
   Q: What is the capital of Maine? Who wrote "Hamlet?"
   Words typically used: define, recall, recognize, remember, who, what, where, when.
2. **Comprehension:** demonstrate that the student has sufficient understanding to organize and arrange material mentally.
   Q: What do you think Hamlet meant when he said, "to be or not to be, that is the question?"
   (Rosenshine, among others, would argue that one of the best ways to teach is to teach pupils how to ask their own questions about the topic under consideration.)
   Words typically used: describe, compare, contrast, rephrase, put in your own words, explain the main idea.
3. **Application:** a question that asks a student to apply previously learned information to reach an answer. Solving math word problems is an example.
   Q: According to our definition of socialism, which of the following nations would be considered to be socialist?
   Words typically used: apply, classify, use, choose, employ, write and example, solve, how many, which, what is.
4. **Analysis:** higher order questions that require students to think critically and in depth. [Unless students can be brought to the higher levels of analysis, synthesis, and evaluation, it is unlikely that transfer will take place, i.e., this is stuff I can use rather than this is just more dumb school stuff that I can forget after I take the test. If teachers don't ask higher level questions, it is unlikely that most students will transfer school work to real life. They may not even be able to apply it to school situations other than the one in which it was "learned." E.g., we "know" that students know more than scores on the CAP Test or SAT would suggest.] In analysis questions, students are asked to engage in three kinds of cognitive processes:
   a. identify the motives, reasons, and/or causes for a specific occurrence (Q: Why was Israel selected as the site for the Jewish nation?),
   b. consider and analyze available information to reach a conclusion, inference, or generalization based on this information (Q: After studying the French, American, and Russian revolutions, what can you conclude about the causes of a revolution?), or
   c. Words typically used: identify motives/causes, draw conclusions, determine evidence, support, analyze, why.
5. **Synthesis:** higher order question that asks the student to perform original and creative thinking. Synthesis questions ask students to:
   a. produce original communications. (Q: What's a good name for this invention? Write a letter to the editor on a social issue of concern to you. Make a collage of pictures and words that represents your beliefs and feelings about the issue.)

b. make predictions. (Q: How would the U.S.A. be different if the South had won the Civil War? What would happen if school attendance was made optional? What is the next likely development in popular music?)
c. solve problems--although analysis questions may also ask students to solve problems, synthesis questions differ because they don't require a single correct answer but, instead allow a variety of creative answers. (How could we determine the number of pennies in a jar without counting them? How can we raise money for our ecology project?

   Words typically used in synthesis questions: predict, produce, write, design, develop, synthesize, construct, how can we improve, what would happen if, can you devise, how can we solve.

6. **Evaluation:** a higher level question that does not have a single correct answer. It requires the student to judge the merit of an idea, a solution to a problem, or an aesthetic work. The student may also be asked to offer an opinion on an issue. (Q: Do you think schools are too easy? Is busing an appropriate remedy for desegregating schools? Do you think it is true that "Americans never had it so good?" Which U.S. senator is the most effective? To answer evaluation questions objective criteria or personal values must be applied. Some standard must be used. differing standards are quite acceptable and they naturally result in different answers. This type of question frequently is used to surface values or to cause students to realize that not everyone sees things the same way. It can be used to start a class discussion. It can also precede a follow-up analysis or synthesis question like, "Why?"

AFFECTIVE DOMAIN

(Krathwohl, D. R., Bloom, B. S., & Bertram, B. M. (1973). *Taxonomy of Educational Objectives, the Classification of Educational Goals. Handbook II: Affective Domain.* New York: David McKay Co., Inc.)

Level	***Example and Key Words***
Receiving Phenomena (Low) Awareness, willingness to hear, selected attention.	**Examples**: Listen to others with respect. Listen for and remember the name of newly introduced people. **Key Words**: acknowledge, ask, concentrate, describe, erect, follow, give, hold, identify, locate, name, point to, select, sits, reply, use
Responding to Phenomena (Low) 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).	**Examples**: 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. **Key Words**: answer, assist, aid, comply, conform, contribute, discuss, greet, help, label, perform, practice, present, read, recite, report, select, tell, write
Valuing (Middle) 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 of specified values, while clues to these values are expressed in the learner's overt behavior and are often identifiable.	**Examples**: 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. **Key Words**: argue, challenge, complete, demonstrate, differentiate, explain, follow, form, initiate, invite, join, justify, propose, read, report, select, share, study, work
Organization (Middle) 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.	**Examples**: 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. **Key Words**: adhere, alter, arrange, combine, compares, complete, defend, explain, formulate, generalize, identify, integrate, modify, order, organize, prepare, relate, synthesize
Internalizing values (characterization) **(High)** 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).	**Examples**: 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. **Key Words**: act, discriminate, display, influence, listen, modify, perform, practice, propose, qualify, question, revise, serve, solve, verify

Affective Domain (Krathwohl)
From : http://itc.utk.edu/~jklittle/edsmrt521/affective.html

- Receiving - Student's willingness to attend to classroom activity; getting, holding, and directing students' attention.
- Responding - Active participation on the part of the student.
- Valuing - The worth or value a student attaches to a particular object or behavior.
- Organization - Bringing together different values, resolving conflict between them and beginning the building of a consistent value system.
- Internalizing values - The individual has a value system that has controlled his or her behavior for a sufficiently long time for him or her to have developed a "life style."

AFFECTIVE DOMAIN of Educational Objectives:

The Affective Domain addresses interests, attitudes, opinions, appreciations, values, and emotional sets. The original purpose of the **Taxonomy of Educational Objectives** was to provide a tool for classifying instructional objectives. The Taxonomy is hierarchical (levels increase in difficulty/sophistication) and cumulative (each level builds on and subsumes the ones below). The levels, in addition to clarifying instructional objectives, may be used to provide a basis for questioning that ensures that students progress to the highest level of understanding. If the teaching purpose is to change attitudes/behavior rather than to transmit/process information, then the instruction should be structured to progress through the levels of the **Affective Domain**:

1. **Receiving.** The student passively attends to particular phenomena or stimuli [classroom activities, textbook, music, etc. The teacher's concern is that the student's attention is focused. Intended outcomes include the pupil's awareness that a thing exists. Sample objectives: listens attentively, shows sensitivity to social problems. Behavioral terms: asks, chooses, identifies, locates, points to, sits erect, etc.
2. **Responding.** The student actively participates. The pupil not only attends to the stimulus but reacts in some way. Objectives: completes homework, obeys rules, participates in class discussion, shows interest in subject, enjoys helping others, etc. Terms: answers, assists, complies, discusses, helps, performs, practices, presents, reads, reports, writes, etc.
3. **Valuing.** The worth a student attaches to a particular object, phenomenon, or behavior. Ranges from acceptance to commitment (e.g., assumes responsibility for the functioning of a group). Attitudes and appreciation. Objectives: demonstrates belief in democratic processes, appreciates the role of science in daily life, shows concern for others' welfare, demonstrates a problem-solving approach, etc. Terms: differentiates, explains, initiates, justifies, proposes, shares, etc.
4. **Organization.** Bringing together different values, resolving conflicts among them, and starting to build an internally consistent value system--comparing, relating and synthesizing values and developing a philosophy of life. Objectives: recognizes the need for balance between freedom and responsibility in a democracy, understands the role of systematic planning in solving problems, accepts responsibility for own behavior, etc. Terms: Arranges, combines, compares, generalizes, integrates, modifies, organizes, synthesizes, etc.
5. **Characterization by a Value or Value Complex.** At this level, the person has held a value system that has controlled his behavior for a sufficiently long time that a characteristic "life style" has been developed. Behavior is pervasive, consistent and predictable. Objectives are concerned with personal, social, and emotional adjustment: displays self reliance in working independently, cooperates in group activities, maintains good health habits, etc. Terms:

HARROW'S PSYCHOMOTOR DOMAIN

http://www.businessballs.com/bloomstaxonomyoflearningdomains.htm#bloom's%20psychomotor%20domain

Level	Example and Key Words
Reflex Movement (Low) Involuntary reaction	**Example:** Respond physically instinctively **Key Words:** react, respond
Basic Fundamental Movements (Low) Basic simple movement	**Example:** Alter position, move, perform simple action **Key Words:** grasp, walk, stand, throw
Perceptual Abilities (Middle) Basic response	**Example:** Use more than one ability in response to different sensory perceptions **Key Words:** catch, write, explore, distinguish using senses
Physical Abilities (Middle) Fitness	**Example:** Develop strength, endurance, agility, control **Key Words:** endure, maintain, repeat, increase, improve, exceed
Skilled Movements (High) Complex operations	**Example:** Execute and adapt advanced, integrated movements **Key Words:** drive, build, juggle, play a musical instrument, craft
Non-discursive Communication (High) Meaningfully expressive activity or output	**Example:** Activity expresses meaningful interpretation **Key Words:** express and convey feeling and meaning through movement and actions

Psychomotor Domain (Harrow)
From itc.utk.edu/~jklittle/edsmrt521/psychomotor.html

- Reflex Movements
- Basic Fundamental Movements
- Perceptual Abilities
- Physical Abilities
- Skilled Movements
- Non-discursive Communication

PSYCHOMOTOR DOMAIN of Educational Objectives:

Instructional objectives and derived questions/tasks typically have cognitive/affective elements, but the focus is on motor skill development. The suggested areas for use are speech development, reading readiness, handwriting, and physical education. Other areas include manipulative skills required in business training [e.g., keyboarding], industrial technology, and performance areas in science, art and music. American education has tended to emphasize cognitive development at the expense of affective and psychomotor development. The well-rounded and fully functioning person needs development in all three domains. In the psychomotor domain, performance may take the place of questioning strategies in many cases.

1. **Reflex movements.** Segmental, intersegmental, and suprasegmental reflexes.
2. **Basic-fundamental movements.** Locomotor movements, nonlocomotor movements, manipulative movements.
3. **Perceptual abilities.** Kinesthetic, visual, auditory and tactile discrimination and coordinated abilities.
4. **Physical abilities.** Endurance, strength, flexibility, and agility.
5. **Skilled movements.** Simple, compound, and complex adaptive skills.
6. **Non-discursive communication.** Expressive and interpretive movement.

Sample general objectives: writes smoothly and legibly; accurately reproduces a picture, map, etc.; operates a [machine] skillfully; plays the piano skillfully; demonstrates correct swimming form; drives an automobile skillfully; creates a new way of performing [creative dance]; etc.

Behavioral terms: assembles, builds, composes, fastens, grips, hammers, makes, manipulates, paints, sharpens, sketches, uses, etc. [See Anita Harrow, 1972, for more detail on the psychomotor domain.]