Writing Objectives Using Bloom's Taxonomy

Various researchers have summarized how to use Bloom's Taxonomy. Following are four interpretations that you can use as guides in helping to write objectives using Bloom's Taxonomy.

Bloom's Taxonomy divides the way people learn into three domains. One of these is the cognitive domain, which emphasizes intellectual outcomes. This domain is further divided into categories or levels. The key words used and the type of questions asked may aid in the establishment and encouragement of critical thinking, especially in the higher levels.

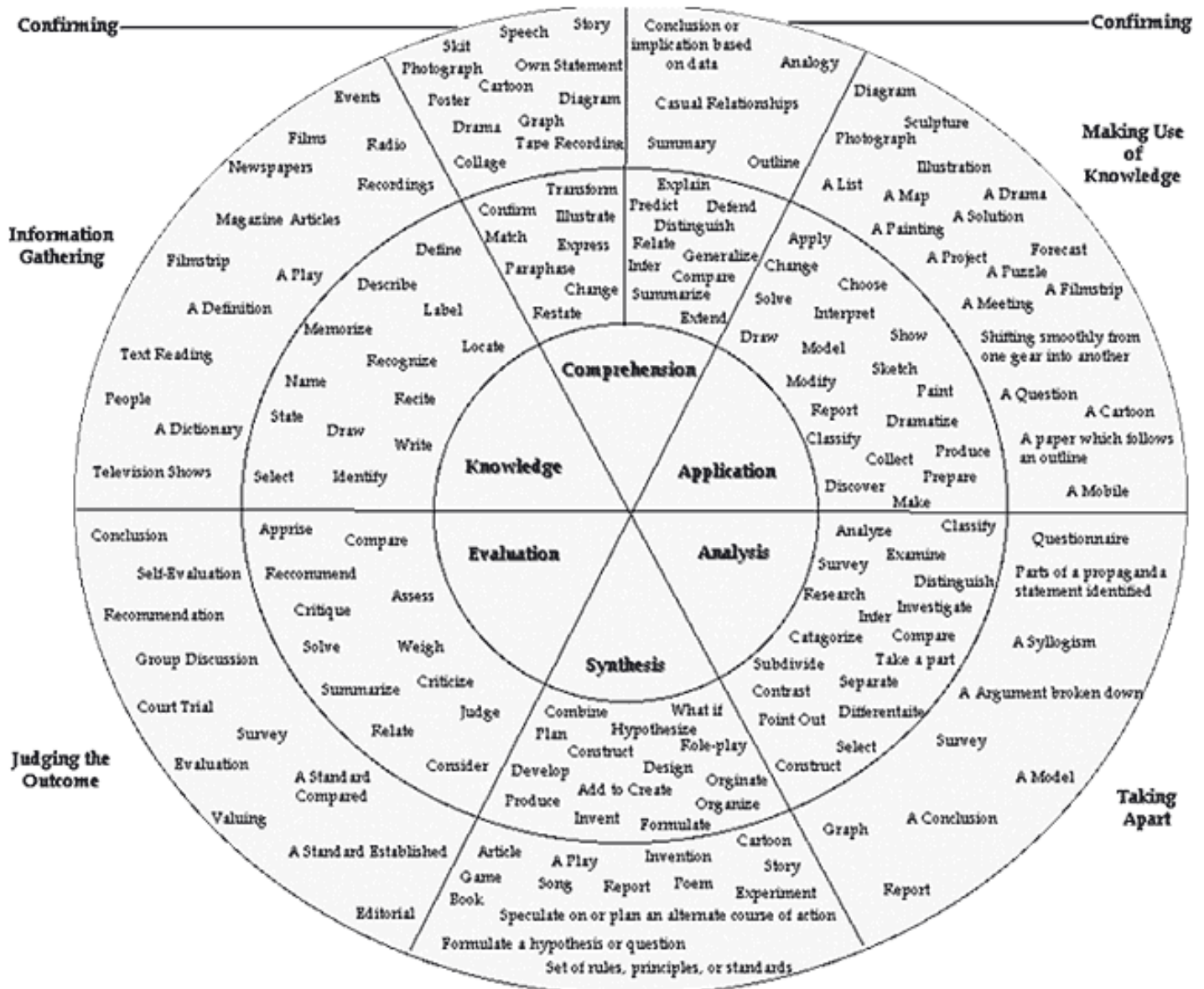| LEVEL	LEVEL ATTRIBUTES	KEYWORDS	QUESTIONS
1: Knowledge	Exhibits previously learned material by recalling facts, terms, basic concepts and answers.	who, what, why, when, omit, where, which, choose, find, how, define, label, show, spell, list, match, name, relate, tell, recall, select	What is ...? How is ...? Where is ...? When did _____ happen? How did _____ happen? How would you explain ...? Why did ...? How would you describe ...? When did ...? Can you recall ...? How would you show ...? Can you select ...? Who were the main ...? Can you list three ...? Which one ...? Who was ...?
2: Comprehension	Demonstrating understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas.	compare, contrast, demonstrate, interpret, explain, extend, illustrate, infer, outline, relate, rephrase, translate, summarize, show, classify	How would you classify the type of ...? How would you compare ...? contrast ...? Will you state or interpret in your own words ...? How would you rephrase the meaning ...? What facts or ideas show ...? What is the main idea of ...? Which statements support ...? Can you explain what is happening . . . what is meant . . .? What can you say about ...? Which is the best answer ...? How would you summarize ...?
3: Application	Solving problems by applying acquired knowledge, facts, techniques and rules in a different way.	apply, build, choose, construct, develop, interview, make use of, organize, experiment with, plan, select, solve, utilize, model, identify	How would you use ...? What examples can you find to ...? How would you solve _____ using what you have learned ...? How would you organize _____ to show ...? How would you show your understanding of ...? What approach would you use to ...? How would you apply what you learned to develop ...? What other way would you plan to ...? What would result if ...? Can you make use of the facts to ...? What elements would you choose to change ...? What facts would you select to show ...? What questions would you ask in an interview with ...?
4: Analysis	Examining and breaking information into parts by identifying motives or causes;	analyze, categorize, classify, compare, contrast, discover, dissect, divide, examine,	What are the parts or features of ...? How is _____ related to ...? Why do you think ...? What is the theme ...? What motive is there ...? Can you list the parts ...?

LEVEL	LEVEL ATTRIBUTES	KEYWORDS	QUESTIONS
5: Synthesis	making inferences and finding evidence to support generalizations.	inspect, simplify, survey, take part in, test for, distinguish, list, distinction, theme, relationships, function, motive, inference, assumption, conclusion	What inference can you make ...? What conclusions can you draw ...? How would you classify ...? How would you categorize ...? Can you identify the difference parts ...? What evidence can you find ...? What is the relationship between ...? Can you make a distinction between ...? What is the function of ...? What ideas justify ...?
	Compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions.	build, choose, combine, compile, compose, construct, create, design, develop, estimate, formulate, imagine, invent, make up, originate, plan, predict, propose, solve, solution, suppose, discuss, modify, change, original, improve, adapt, minimize, maximize, delete, theorize, elaborate, test, improve, happen, change	What changes would you make to solve ...? How would you improve ...? What would happen if ...? Can you elaborate on the reason ...? Can you propose an alternative ...? Can you invent ...? How would you adapt _____ to create a different ...? How could you change (modify) the plot (plan) ...? What could be done to minimize (maximize) ...? What way would you design ...? What could be combined to improve (change) ...? Suppose you could _____ what would you do ...? How would you test ...? Can you formulate a theory for ...? Can you predict the outcome if ...? How would you estimate the results for ...? What facts can you compile ...? Can you construct a model that would change ...? Can you think of an original way for the ...?
6: Evaluation	Presenting and defending opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria.	award, choose, conclude, criticize, decide, defend, determine, dispute, evaluate, judge, justify, measure, compare, mark, rate, recommend, rule on, select, agree, interpret, explain, appraise, prioritize, opinion, ,support, importance, criteria, prove, disprove, assess, influence, perceive, value, estimate, influence, deduct	Do you agree with the actions ...? with the outcomes ...? What is your opinion of ...? How would you prove ...? disprove ...? Can you assess the value or importance of ...? Would it be better if ...? Why did they (the character) choose ...? What would you recommend ...? How would you rate the ...? What would you cite to defend the actions ...? How would you evaluate ...? How could you determine ...? What choice would you have made ...? What would you select ...? How would you prioritize ...? What judgment would you make about ...? Based on what you know, how would you explain ...? What information would you use to support the view ...? How would you justify ...? What data was used to make the conclusion ...? Why was it better that ...? How would you prioritize the facts ...? How would you compare the ideas ...? people ...?

Bloom's Ranking of Thinking Skills

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
List, Name, Identify, Show, Define, Recognize, Recall, State, Visualize	Summarize, Explain, Interpret, Describe, Compare, Paraphrase, Differentiate, Demonstrate, Classify	Solve, Illustrate, Calculate, Use, Interpret, Relate, Manipulate, Apply, Modify	Analyze, Organize, Deduce, Contrast, Compare, Distinguish, Discuss, Plan, Devise	Design, Hypothesize, Support, Schematize, Write, Report, Justify	Evaluate, Choose, Estimate, Judge, Defend, Criticize

From: Stewards

Task Oriented Question Construction Wheel Based on Bloom's Taxonomy

Confirming — Confirming

Making Use of Knowledge

Information Gathering

Judging the Outcome

Taking Apart

Knowledge · **Comprehension** · **Application** · **Analysis** · **Synthesis** · **Evaluation**

(central wheel labels and surrounding terms: Speech, Story, Conclusion or implication based on data, Analogy, Skit, Own Statement, Photograph, Cartoon, Diagram, Casual Relationships, Sculpture, Events, Poster, Graph, Summary, Photograph, Illustration, Films, Radio, Drama, Tape Recording, Outline, A List, A Map, A Drama, Newspapers, Collage, Explain, A Solution, Recordings, Transform, Predict, Defend, A Painting, Forecast, Magazine Articles, Confirm, Illustrate, Distinguish, Apply, A Project, A Puzzle, Filmstrip, Define, Match, Express, Relate, Generalize, Change, Choose, A Filmstrip, A Play, Describe, Paraphrase, Infer, Compare, Solve, A Meeting, A Definition, Label, Change, Summarize, Interpret, Memorize, Restate, Extend, Draw, Model, Show, Shifting smoothly from one gear into another, Text Reading, Locate, Modify, Sketch, People, Recognize, Recite, Paint, A Question, Name, Report, Dramatize, A Cartoon, State, Draw, Classify, A paper which follows an outline, A Dictionary, Write, Collect, Produce, Television Shows, Select, Identify, Discover, Prepare, A Mobile, Make, Conclusion, Apprise, Compare, Analyze, Classify, Questionnaire, Self-Evaluation, Reccomend, Survey, Examine, Parts of a propaganda statement identified, Assess, Research, Distinguish, Recommendation, Critique, Infer, Investigate, Group Discussion, Solve, Weigh, Catagorize, Compare, A Syllogism, Court Trial, Summarize, Criticize, Subdivide, Take a part, Survey, Relate, Judge, Contrast, Separate, A Argument broken down, Evaluation, Combine, What if, Point Out, Differentaite, A Standard Compared, Consider, Develop, Plan, Hypothesize, Role-play, Select, Construct, Survey, Valuing, Produce, Construct, Design, Orginate, A Model, Add to Create, Organize, Graph, A Conclusion, Invent, Formulate, Cartoon, A Standard Established, Article, A Play, Invention, Story, Report, Game, Song, Report, Poem, Experiment, Book, Speculate on or plan an alternate course of action, Editorial, Formulate a hypothesis or question, Set of rules, principles, or standards)

According to Benjamin Bloom, and his colleagues, there are six levels of cognition:

1. Knowledge: rote memorization, recognition, or recall of facts
2. Comprehension: understanding what the facts mean
3. Application: correct use of the facts, rules, or ideas
4. Analysis: breaking down information into component parts
5. Synthesis: combination of facts, ideas, or information to make a new whole
6. Evaluation: judging or forming an opinion about the information or situation

Ideally, each of these levels should be covered in each course and, thus, at least one objective should be written for each level. Depending on the nature of the course, a few of these levels may need to be given more emphasis than the others.

Below are examples of objectives written for each level of Bloom's Taxonomy and activities and assessment tools based on those objectives. Common key verbs used in drafting objectives are also listed for each level.

LEVEL	LEVEL ATTRIBUTES	KEYWORDS	EXAMPLE OBJECTIVE	EXAMPLE ACTIVITY	EXAMPLE ASSESSMENT
1: Knowledge	Rote memorization, recognition, or recall of facts.	list, recite, define, name, match, quote, recall, identify, label, recognize	"By the end of this course, the student will be able to recite Newton's three laws of motion."	Have students group up and perform simple experiments to the class showing how one of the laws of motion works.	Use the following question on an exam or homework. "Recite Newton's three laws of motion."
2: Comprehension	Understanding what the facts mean.	describe, explain, paraphrase, restate, give original examples of, summarize, interpret, discuss	"By the end of this course, the student will be able to explain Newton's three laws of motion in his/her own words."	Group students into pairs and have each pair think of words that describe motion. After a few minutes, ask pairs to volunteer some of their descriptions and write these descriptions on the board.	Assign the students to write a simple essay that explains what Newton's laws of motion mean in his/her own words.
3: Application	Correct use of the facts, rules, or ideas.	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model	"By the end of this course, the student will be able to calculate the kinetic energy of a projectile."	After presenting the kinetic energy equation in class, have the students pair off for just a few minutes and practice using it so that they feel comfortable with it before being assessed .	On a test, define a projectile and ask the students to "Calculate the kinetic energy of the projectile."
4: Analysis	Breaking down information into component parts.	classify, outline, break down, categorize, analyze, diagram, illustrate	"By the end of this course, the student will be able to differentiate between potential and kinetic	Present the students with different situations involving energy and ask the students to	Give the students an assignment that asks them outline the basic principles of kinetic and potential energy. Ask them to point out the differences between the

LEVEL	LEVEL ATTRIBUTES	KEYWORDS	EXAMPLE OBJECTIVE	EXAMPLE ACTIVITY	EXAMPLE ASSESSMENT
			energy."	categorize the energy as either kinetic or potential then have them explain in detail why they categorized it the way they did, thus breaking down what exactly makes up kinetic and potential energy.	two as well as how they are related.
5: Synthesis	Combining parts to make a new whole.	design, formulate, build, invent, create, compose, generate, derive, modify, develop	By the end of this section of the course, the student will be able to design an original homework problem dealing with the principle of conservation of energy."	Tie each lecture or discussion to the previous lectures or discussions before it, thus helping the students assemble all the discreet classroom sessions into a unified topic or theory.	Give the students a project in which they must design an original homework problem dealing with the principle of conservation of energy.
6: Evaluation	Judging the value or worth of information or ideas.	choose, support, relate, determine, defend, judge, grade, compare, contrast, argue, justify, support, convince, select, evaluate	"By the end of the course, the student will be able to determine whether using conservation of energy or conservation of momentum would be more appropriate for solving a dynamics problem."	Have different groups of students solve the same problem using different methods, then have each group present the pros and cons of the method they chose.	On a test, describe a dynamic system and ask the students which method they would use to solve the problem and why.