

# Bloom's Taxonomy

# What is It?

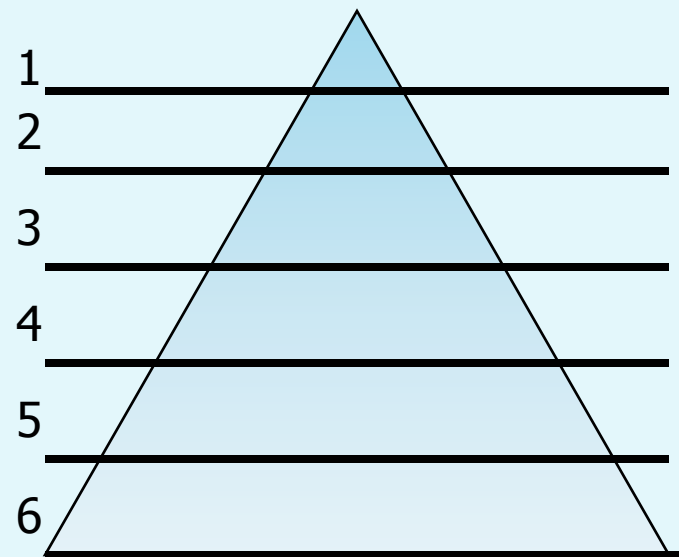
- ▶ In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. Bloom found that over 95 % of the test questions students encounter require them to think only at the lowest possible level...the recall of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

- ▶ Bloom's Taxonomy is more accurately referred to as the "Taxonomy of Learning Objectives".

- ▶ Bloom's Taxonomy is hierarchical, which means that learning at the higher levels is dependent on having attained prerequisite knowledge and skills at lower levels.

- ▶ This means that the taxonomy is like a pyramid, with the lower levels acting as building blocks to allow the learner to attain the higher levels of educational functioning.

- ▶ Each “domain” of the taxonomy therefore can be symbolized by a schematic pyramid with the higher functions of education resting and depending on the strengths of the lower levels.



# Domains

- ▶ Bloom and his group identified three “domains” of educational objectives:
- ▶ Cognitive;
- ▶ Affective;
- ▶ Psychomotor.

# Cognitive Domain

- ▶ 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.



# Levels of Cognitive Domain

- ▶ Evaluation
- ▶ Synthesis
- ▶ Analysis
- ▶ Application
- ▶ Comprehension
- ▶ Knowledge



# Knowledge

- ▶ Recall or recognition of facts and specifics
- ▶ Verb examples:
- ▶ Name, define, label, recall, recognize, state, list
- ▶ “What is \_\_\_\_\_?”

# Comprehension

- ▶ Understanding of facts and ideas
- ▶ Verb examples:
- ▶ Describe, classify, explain, select, paraphrase, identify, express

# Application

- ▶ Apply acquired knowledge, facts, techniques and rules
- ▶ Verb examples:
- ▶ Apply, solve, use, demonstrate, illustrate, organize

# Analysis

- ▶ Examine and break information into parts
- ▶ Differentiate ideas, motives, information
- ▶ Understand by placing into component pieces
- ▶ Verb examples:
  - ▶ analyze, compare, contrast, diagram, differentiate, discriminate, distinguish, outline, separate

# Synthesis

- ▶ Combining or organizing information in a different way into a new pattern or solution
- ▶ Verb examples:
- ▶ Arrange, assemble, create, organize, design, develop, compose, manage, plan

# Evaluation

- ▶ Judgment making about work, ideas, or information; the highest level
- ▶ Verb examples:
- ▶ Appraise, compare, defend, rate, evaluate, judge, support, critique

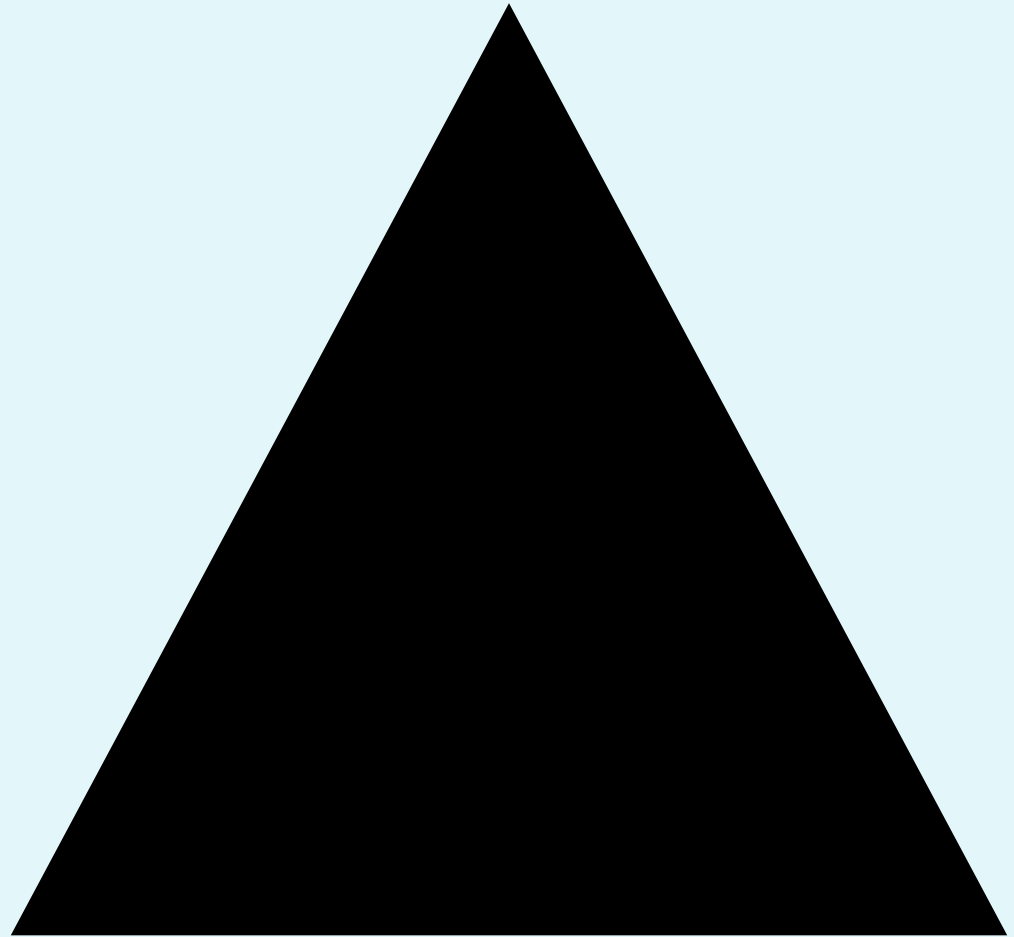
# Affective Domain

- ▶ Deals with how one deals with or reacts emotionally with things or information
- ▶ Enthusiasm, appreciation, motivation, attitudes, personal development
- ▶ Qualities of lifelong learners
- ▶ Five levels in this domain



# Affective Pyramid

- ▶ Characterizing  
(Value Complex)
- ▶ Organizing
- ▶ Valuing
- ▶ Responding
- ▶ Receiving



# Receiving

- ▶ Lowest level of affective domain
- ▶ Passively paying attention–
- ▶ But foundation of learning
- ▶ Verb examples:
- ▶ Listen, follow, pay attention, hear

# Responding

- ▶ Active participation
- ▶ Willing and satisfied to respond
- ▶ Verb examples:
  - ▶ answer, discuss, help, perform, practice, present, read, recite, report, select, tell, write

# Valuing

- ▶ Attaches worth to the subject or information
- ▶ Acceptance of subject or information
- ▶ Verb examples:
- ▶ Internalize, explain, justify, follow, propose

# Organizing

- ▶ Putting together different ideas, information, values
- ▶ Resolving conflicts
- ▶ Verb examples:
- ▶ Compare, contrast, organize, defend, explain, modify, resolve, relate

# Characterizing (Value Complex)

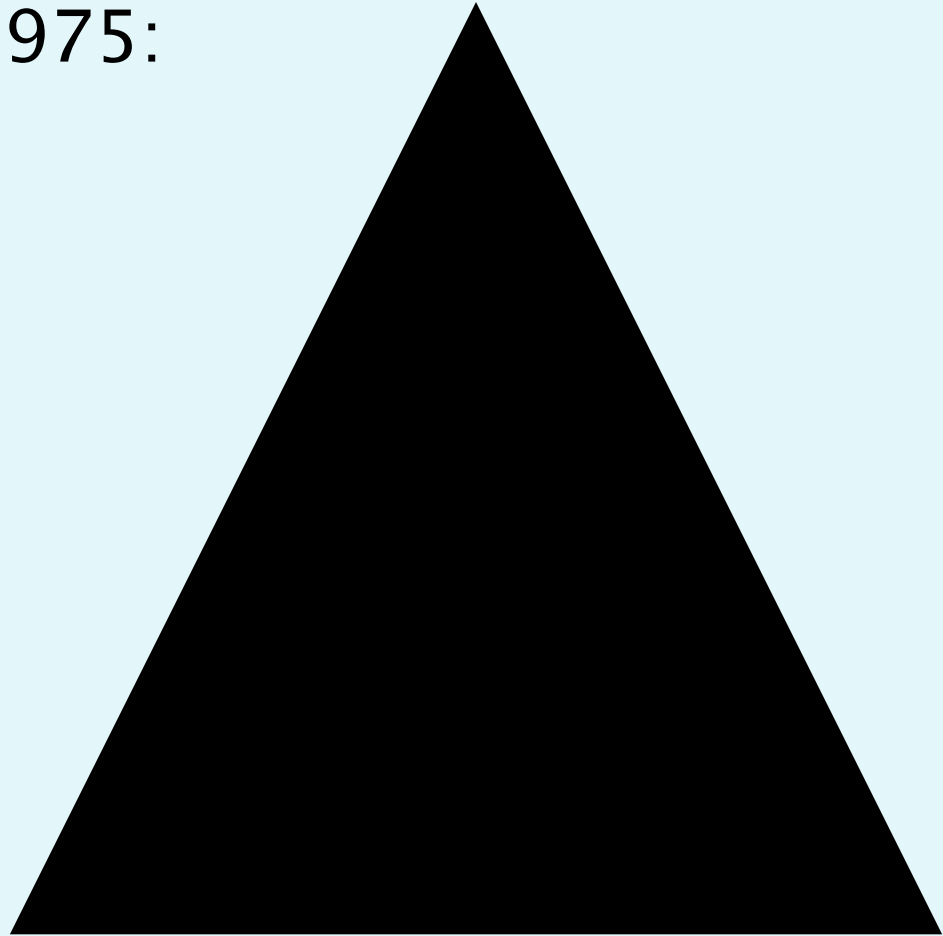
- ▶ Development of a value system that influences their behavior
- ▶ Consistent, predictable, characteristic qualities displayed by learner
- ▶ Verb examples:
- ▶ Believe, cooperate, solve, practice, influence, display, value

# Psychomotor Domain

- ▶ Focus on ability to manipulate tools or devices
- ▶ From beginning to mastery of skills
- ▶ Bloom and colleagues never categorized this domain
- ▶ Other researchers have made categories

# Psychomotor Domain Category Example

- ▶ From R.H. Dave, 1975:
- ▶ Naturalization
- ▶ Articulation
- ▶ Precision
- ▶ Manipulation
- ▶ Imitation





# Of What Practical Value is This?

- ▶ The value of the taxonomy, especially the cognitive domain in Anesthesiology education is in self-evaluation.
- ▶ At what level are you learning, thinking, and performing?

# Cognitive Domain

- ▶ Memorizing facts, such as the MAC of Desflurane, is important, but–
- ▶ As you see, it is the lowest level of knowledge.
- ▶ It is what you do with that knowledge–how you comprehend, apply, analyze, and then use that knowledge to synthesize and evaluate the best anesthetic plan or the latest journal article that is of importance.

# Comprehension

- ▶ If you know the MAC for Desflurane, what can you do with that knowledge?
- ▶ Remember the next step on the pyramid, which is Comprehension.
- ▶ You should be able to understand what the MAC of Desflurane is—remember the verb examples.

# Application

- ▶ After Knowledge and Comprehension, can you apply what you have learned about Desflurane?
- ▶ Remember some of the verb examples for Application—such as use, apply, and demonstrate.

# Analysis

- ▶ If you know the MAC of Desflurane, what else can you learn about the agent by analyzing the information?
- ▶ Remember, Analysis involves examining and breaking information into parts;
- ▶ Understanding by placing into component pieces;
- ▶ Verb examples– analyze, compare, contrast, differentiate;
- ▶ Using these skills and other facts, can you analyze, compare, contrast or differentiate Des compared to other agents?

# Synthesis

- ▶ With what you know about Desflurane, can you combine or organize information into a plan for an anesthetic using Des or defend why a different way might be better?
- ▶ Verb examples—arrange, create, plan

# Evaluation

- ▶ Judge why your choice of Des is or is not a good choice;
- ▶ Compare other agents you could use;
- ▶ Defend or support your choice;
- ▶ Critique the outcome.

- ▶ Thinking at the higher levels of the cognitive pyramid will be of value to you as you prepare for oral board exams.
- ▶ When you study or plan an anesthetic, think about at what level of the cognitive domain you are functioning.



- ▶ Consistent functioning at the higher levels of the cognitive domain along with the understanding of knowledge allowed by the lower levels is the hallmark of the Consultant in Anesthesiology.

# Affective Domain

- ▶ Understanding of the affective domain is important in the development of good study habits that will make you a lifelong learner.
- ▶ Think about an attending that you admire. Chances are that the attending in question exhibits qualities of a lifelong learner.

# Receiving

- ▶ What would be an example of receiving?
- ▶ You see how Dr. X tapes an ET tube.
- ▶ Dr. X says “This is the best way to tape an ETT!”

# Responding

- ▶ You ask why this is the best way.
- ▶ You nod your head in understanding.
- ▶ You accept his/her teaching effort.

# Valuing

- ▶ You have, however, seen many ways to tape an ETT.
- ▶ You begin to internalize and develop ideas of your own.

# Organization

- ▶ You begin to put together different ideas and formulate what you think is the best way to tape an ETT.

# Value Complex

- ▶ This way that you have chosen becomes the way that you always tape an ETT in the future.
- ▶ This has become a consistent, predictable, characteristic quality displayed by you.
- ▶ This is your *Value Complex* for taping an ETT.

# Conclusion

- ▶ Do not live by these domains, or walk around asking yourself at what level you are performing. But every now and then, evaluate yourself as to what level in which you tend to function.
- ▶ Make an effort to function at the higher levels after mastering the knowledge.
- ▶ Begin to think as a Consultant in Anesthesiology would think.