

Questioning Frameworks

From Doughty, K.J. & Hockett, J.A. (2015). *Differentiation in Middle and High School: Strategies to Engage All Learners*. Alexandria, VA: ASCD.

Structures for Composing Questions

Numerous methods for organizing and classifying questions exist. Perhaps most familiar of these is Benjamin Bloom's Taxonomy (Anderson & Krathwohl, 2001). In truth, Bloom's taxonomy undergirds most other arrangements. Bloom arranged his thinking domains from lowest (remembering) to highest (creating) with the aim of encouraging varied levels of thinking in the classroom.

- Remembering – Recalling or recognizing information (e.g., *define, name, recall, repeat, state*)
- Understanding – Comprehending or grasping prior learning (e.g., *describe, discuss, explain, paraphrase, summarize*). **Not to be confused with overarching understandings as discussed in chapter 3**
- Applying – Using information to solve a problem or complete a task (e.g., *demonstrate, illustrate, interpret, solve, use*)
- Analyzing – Breaking down material, examining organizational structure, finding patterns in, or relating ideas (e.g., *categorize, compare, contrast, discriminate, distinguish*)
- Evaluating – Appraising or critiquing based on specific standards or criteria (e.g., *appraise, defend, judge, justify, support*)
- Creating – Combining and integrating ideas and information into new schematics, products, plans, patterns, structures (e.g., *construct, design, develop, formulate, propose*)

It is important to note that Bloom did **not**, designate this taxonomy to dictate the **order** in which these kinds of thinking should occur (Bransford, et al, 2000). Many teachers structure questions based on the erroneous impression that students must remember in order to accomplish anything else; as a result the majority of instructional questions remain on the memory and comprehension levels. Bloom's intention, however, was to ensure that students wrestled with a *variety* of cognitive demands. He recognized that only in grappling with material would students truly comprehend that material. In other words, as Ritchhart, Church and Morrison (2011) explain, "understanding is not a *precursor* to application, analysis, evaluating, and creating but a *result* of it" (p.7, *emphasis added*).

Therefore, teachers using Bloom's Taxonomy – or any of the organizational structures featured in this chapter – should keep in mind the following principles:

- Guiding Principle 1: One level of thinking is not a barrier to the next; therefore questions need not always build from lowest to highest
- Guiding Principle 2: Use a variety of levels of questions throughout the course of a lesson; avoid overreliance on any one level (low level or high level)
- Guiding Principle 3: In order to ensure a variety of questions – especially those that are higher-order – plan questions in advance. Without advance planning, lessons will mostly like devolve into a battery of low-order questions, as they are the easiest to generate "on the fly." The time spent planning questions in advance will increase the level of cognitive discourse in the classroom, involving all students in worthwhile discussion and exploration of content.

The three questioning frameworks featured below can serve as tools for teachers planning questions for use in discussions, investigations, tasks, and assessments. Each framework provides a different lens through which to structure questions with the goal of ensuring students apply, analyze, evaluate, and create throughout the course of a lesson. Teachers may feel more comfortable using one framework rather than the others, or they may prefer to draw from all three. Either approach is warranted, as either approach will help teachers provide ways for students to truly crunch on ideas during instruction.

1. **Inferential and Analytical Questions** – In their 2012 summary of the research regarding cues and questions, Dean, et al discuss the important role that *learning goals* play in regards to questioning. Their top recommendation - to “focus on what’s important” in questions – stresses the danger of focusing on tangential questions in service of making learning “engaging”. Rather, in order to ensure *cognitive* engagement, questions should focus on the essence of the upper range of articulated learning goals. By planning *inferential and analytical questions* centered on predetermined, higher-order learning goals, teachers can help students fill in gaps from a lesson, generate their own questions, and synthesize prior knowledge with new information.

Question Type	Nature of Question Type/ Overlap with Bloom’s	Sample Questions
Inferential - Regarding things/people, events, actions, states of being	Students must use prior knowledge to explain or interpret a situation, phenomenon, or set of circumstances; utilizes thinking associated with Bloom’s <i>Applying</i>	<ul style="list-style-type: none"> ○ <u>Things and People</u>: What is the nature of the relationship between Nick and Gatsby? ○ <u>Events</u>: Why did this conflict begin at this point in history? ○ <u>Actions</u>: How is the area of the triangle changed by doubling the length of the hypotenuse? ○ <u>States of Being</u>: Why does an individual sweat when exposed to extreme heat? Explain the body’s effort to maintain homeostasis in this situation.
Analytical - Analyzing Errors	Students must find and address errors in reasoning, problem solving, etc.; calls for thinking associated with Bloom’s <i>Analyzing</i> and <i>Evaluating</i>	<ul style="list-style-type: none"> ○ How would you correct this flawed sentence structure? ○ Which amendment from the Bill of Rights is improperly represented in this speech? ○ What are the errors in this solution to the problem? ○ What misunderstanding is exhibited in this solution? ○ How could the weaknesses in this experiment’s design be improved?
Analytical - Constructing Support	Students must provide data, evidence, examples, etc. to construct or strengthen an argument; thinking aligned to Bloom’s <i>Analyzing</i> , <i>Evaluating</i> , and <i>Creating</i>	<ul style="list-style-type: none"> ○ What evidence would you add to this argument to make it stronger? ○ What counter-claims might you introduce to strengthen this argument? ○ Is there another way that we could write the same equation to see if it would still work? (Thunder, 2012)
Analytical - Analyzing Perspective	Students must assume a perspective other than the one presented/their own and provide insight into that perspective using data, evidence, and reasoning; utilizes Bloom’s <i>Analyzing</i> , <i>Evaluating</i> , and <i>Creating</i>	<ul style="list-style-type: none"> ○ Why were some colonists opposed to the tactics of the Sons of Liberty? ○ Why might someone disagree with this amendment and how would they defend their stance? ○ What is another way to solve this problem and why might that method be preferable to some people (Thunder, 2012)? ○ By whom might this environmental danger be accepted or encouraged? Why?

2. **Depth of Knowledge (Webb, 2005)** – Norman Webb designed his framework as a tool for examining the alignment between the cognitive demand of standards and the cognitive demand of assessments measuring them. His framework can also be used to examine the match between learning objectives and the questions posed to unpack those targets. For example, if a teacher’s be-able-to-do goal is written at the evaluation level, he would be remiss in asking questions that merely asked students to recall or to analyze the content. Webb’s framework can help teachers insure that the depth of their classroom questions – whether posed in discussion or in tasks and activities – is consistent with the depth of their instructional objectives.

Webb’s Level	Overlap with Bloom’s	Key Verbs	Sample Questions
<u>Level One:</u> Recall <i>Who, What, When, Where, Why</i>	Remembering/ Understanding	Arrange, Calculate, Define, Identify, List, Measure Recognize, Recall, Repeat, State, Use	<ul style="list-style-type: none"> ○ How would you explain the difference between internal and external conflict? ○ Where were the majority of the battles in this war fought? Why? ○ Find the equation of the straight line that has slope $m=2$ and passes through the line, $(-1, -4)$. ○ What is meant by “negative” feedback and “positive” feedback in regard to maintaining homeostasis?
<u>Level Two:</u> Skill/Concept <i>Beyond recall; requires processing</i>	Applying	Categorize, Estimate, Identify Patterns, If/Then, Organize, Predict, Separate, Summarize	<ul style="list-style-type: none"> ○ What ideas show which type of conflict – internal or external – is at work in this passage? ○ What inference can you make about what was lost on both sides (in addition to soldiers’ lives) in these battles? ○ Examine the 3 different slopes represented in graphs of 3 different lines. Predict the order of the lines’ slopes from least to greatest. ○ Summarize the body’s negative feedback system in maintaining homeostasis regarding body temperature when exposed to extreme cold.
<u>Level Three:</u> Strategic Thinking <i>Requires mental processing at a higher level</i>	Analyzing/ Evaluating	Apprise, Assess, Compare, Critique, Formulate, Hypothesize, Investigate, Revise	<ul style="list-style-type: none"> ○ Assess this character’s response to conflict thus far. How has she been changed by conflict and how has she changed in her response to conflict? ○ How might have the strategy on each side of the battle been adjusted to minimize losses? ○ Using what you’ve learned from our exploration of finding slope by examining the relationship between the increase in x and the increase in y, how would you generalize a formula for finding slope? ○ Compare the positive feedback system that occurs in women’s bodies during childbirth to one of the positive feedback systems discussed regarding climate change.
<u>Level Four:</u> Extended Thinking <i>Requires planning and developing; therefore, extended time is necessary</i>	Evaluating/ Creating	Apply Concepts to, Connect, Create, Critique (more factors), Design, Prove, Synthesize	<ul style="list-style-type: none"> ○ What character from _____ might you point to as someone for this character to emulate in terms of handling future conflicts, and how should the character follow suit? ○ Taking multiple, consecutive battles into account, what could have been done to maximize resources and minimize risks? ○ “Conduct an investigation, from specifying a problem to designing and carrying out an experiment, to analyzing its data and forming conclusions” (Webb, et al., 2005, p.59) ○ “Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis” (NGSS-HS-LS1-3).

3. **Six Facets of Understanding (Wiggins and McTighe, 2006)** – The *Understanding by Design* framework operates on the principle that “understanding is revealed when students autonomously make sense of and transfer their learning through authentic performance” (Wiggins & McTighe, 2006, p.?). The six facets of understanding provide teachers with six avenues through which students can both tunnel into big ideas and reveal how deeply they have grasped those understandings. By posing questions that ask students to grapple with material in the following manner, teachers can have a better sense of where students are in their journey and what they might need to continue to move forward.

Facet	Nature of Question Type/ Overlap with Bloom's	Sample Questions
Explain	Put information, ideas, principles, and processes into own words and explaining thinking; requires thinking akin to Bloom's <i>Understanding</i> [i.e., <i>Comprehending</i>]	<ul style="list-style-type: none"> ○ Demonstrate two different ways in which authors show readers what their characters are like? ○ Describe your view of the three most powerful factors contributing to the Civil War in the United States? ○ How would you describe the difference between what is meant by the Mean and the Median of a number set? ○ Explain what causes the different phases of the moon.
Interpret	Make sense of ideas, principles, processes by creating comparisons, analogies, stories; requires thinking aligned with Bloom's <i>Analyzing</i> and <i>Creating</i>	<ul style="list-style-type: none"> ○ The reader's process of characterization is like what process in science? Math? History? Art? Explain. ○ Describe President Lincoln's thought process as he debated whether or not to let the Southern states secede. ○ How might the Mean and the Median be compared to a) siblings in a large family, b) candy in a Halloween bag, or c) fish in a pond? Explain your comparison. ○ How would you describe the appearance of the moon during each phase of a lunar eclipse using NEW terms (other than waxing, waning, gibbous, crescent, etc.)?
Apply	Use information, ideas, principles, and processes in new contexts and situations; moves beyond Bloom's <i>Applying</i> and into <i>Creating</i>	<ul style="list-style-type: none"> ○ How would you characterize a family member or friend if you used the same techniques Shakespeare did in this scene? ○ What issue in the modern day United States has - or might one day have - the power to divide the United States government as in the time of the Civil War? Why? ○ What patterns do you see in the comparisons of Means and Medians across these sets of neighborhood housing prices? Which measure better reveals what a buyer should expect to pay? ○ How would you illustrate the relative positions of the moon, earth, and sun during each of the lunar phases in a way that elementary students would understand?
Demonstrate Perspective	Recognize and articulate the many possible different viewpoints regarding a situation; requires thought that moves from Bloom's <i>Analyzing</i> into <i>Evaluating</i>	<ul style="list-style-type: none"> ○ Describe how three different characters perceive Hamlet? How does Shakespeare communicate these different perceptions? ○ How would you justify or condemn the issue of slavery from the perspective of four different people with different occupations living in different areas of the country at the time of the Civil War? ○ How might different parties (ad agency, concerned parent group, a teenager) view this data set on cell phone usage in terms of the communication power of Mean and Median? ○ What other titles have been given to the US "Civil War" and what ideology does each title represent? ○ What misconceptions might people have about what causes lunar phases and why might they carry those misconceptions?

Display Empathy	Take on the viewpoint, concerns, opinions of another and argue from this perspective; applies thought aligned to Bloom's <i>Evaluating</i> and <i>Creating</i>	<ul style="list-style-type: none"> ○ Is Hamlet a hero or a coward? Choose one character and argue convincingly from his or her perspective. ○ How would you explain the perspective on the justification or condemnation of the Civil War that you believe to be least understood by the American public? ○ Create an argument from the voice of Mean and Median arguing about which is used the most, which should be used the most, and why. ○ How would you explain the differences between the lunar phases and lunar eclipses to someone who is confused about their causes and/or believes they are the same?
Self-Reflect	Reflect on one's own connection to, use of, strengths and weaknesses with the ideas and processes; draws on Bloom's <i>Analyzing</i> and <i>Evaluating</i> in terms of fusing metacognition with content and skills	<ul style="list-style-type: none"> ○ How are your strengths and weaknesses like Hamlet's? Describe specific examples from the play and your life. ○ Where in your life do you see your personal perspective limiting your consideration or understanding of others' perspectives? ○ How might you use Mean and Median to make decisions in your life? Explain potential contexts, whether you rely more heavily on one measure than the other, and the merits/shortfalls of this tendency. ○ How have you grown in your grasp of the lunar phases? What was the most complicated aspect for you to fully understand?

Regardless of the framework used, good questions should form the heart of classroom instruction. Teachers need to plan questions in advance, whether they are to guide full-class discussion during an **Interactive Lecture** (see page??), to serve as thinking prompts in processing activities such as **Think Dots** (see page ??), or to promote investigation during small group inquiries such as **Analytical Role Cards** (see page ??). No matter how they will be used, questions should be rich enough to invite investigation, targeted enough to require students to grapple with content, and complex enough to make thinking and learning visible to both the teacher and the students.

References

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