The ability to question lies at the heart of human curiosity and is a necessary component of cognition. Noam Chomsky, the noted generative linguist, has posited that the ability to form questions is an integral part of Universal Grammar (1975, 29), by which he means that forming questions is part of a blueprint for language hardwired into human brains. More recently, linguists like Ewa Dabrowska (2004, 75–76) have argued that language and grammar are built on preexisting cognitive structures inherent in the human brain, rather than on any evolutionary development of Universal Grammar. Whether you agree with Chomsky’s generative linguistics or Dabrowska, it is clear that forming questions is essential to human thought and communication. As such, forming questions is a foundational process that cuts across curricular areas and is embedded in content standards across the nation, including our own. Clearly, it is our professional responsibility to understand the complexities of the questioning process as deeply as possible.

Looking at Content Standards
When the school library media specialists in Cecil County (MD) looked to content standards for guidance, however, we were struck by how little light they shed on the process of question formation or how questions work. Faced with scoring students’ questions on a system-wide benchmark test of information literacy skills, we turned first to our own library curriculum. Eight years ago, it stated:

"1. Students will access information to address personal or curricular information needs.
2. Form questions based on identified information needs.

Basic: Distinguish between open and closed questions and articulate at least one appropriate question.

Proficient: Formulate and revise broad and specific questions related to the identified information need.

Exemplary: Develop and refine research questions appropriate to the changing needs of the information problem" (CCPS 1999).

Students were expected to be at the basic level by the end of third grade.
reach the proficient level by the end of fifth grade, and become exemplary by the end of tenth grade. These stages were restatements of the proficiency levels listed for the first "Information Literacy Standard for Student Learning" (AASL 1998, 10): "The student who is information literate accesses information efficiently and effectively by formulating questions based on information needs," and the ages the skills were to be mastered were rough estimates of children's abilities. Clearly, our library media curriculum and standards did not provide enough guidance to delineate by grade level the skills embedded in the formation of effective questions.

Next, we turned to national and state content standards in core subject areas to help clarify what was going wrong with our students' questions. As you can see from Maryland's Voluntary State Curriculum for fifth grade shown in figure 1, these standards provided no better insight into how to help students form effective questions. The standards assumed that students already knew enough about questions to be able to tailor them to a particular subject area and information need. While this might be true for some students, our test showed that it was not true for all. We still needed to understand the basic functions of questions so that we could teach every child to use questions to reason more precisely.

Although the school library media specialists in Cecil County are highly proficient in the use of the English language and can form questions correctly targeted to specific needs, for us, as for our students, language and grammar are just a shorthand code for a series of highly complex thought processes about which the thinker, listener, or speaker rarely reflects. As cognitive linguist Gilles Fauconnier describes the complex relationship between language and cognitive structures:

"We are not conscious of performing these operations when we speak, think and listen. Everything takes place very fast and only the words themselves and the global emergence of meaning are accessible to consciousness. At other levels of thought, such as science, poetry or rhetoric, there may be more awareness of some of the operations; we may consciously perceive an analogy, a metaphor..."
FIGURE 1 - Forming Questions within Maryland’s Voluntary State Curriculum for Grade 5

Standard 7.0 Processes of Mathematics
Students demonstrate the processes of mathematics by making connections and applying reasoning to solve problems and to communicate their findings.

**TOPIC A. Problem Solving**
Indicator 1. Apply a variety of concepts, processes, and skills to solve problems
- Objective a. Identify the question in the problem.

**TOPIC C. Communication**
Indicator 1. Present mathematical ideas using words, symbols, visual displays, or technology.
- Objective g. Ask questions about mathematical ideas or problems.

Standard 1.0 Skills and Processes of Science
Students will demonstrate the thinking and acting inherent in the practice of science.

**TOPIC A. Constructing Knowledge**
Indicator 1. Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.

**TOPIC C. Communicating Scientific Information**
Indicator 1. Recognize that clear communication is an essential part of doing science because it enables scientists to inform others about their work, expose their ideas to criticism by other scientists, and stay informed about scientific discoveries around the world.
- Objective c. Submit work to the critique of others which involves discussing findings, posing questions, and challenging statements to clarify ideas.
- Objective d. Construct and share reasonable explanations for questions asked.

Standard 6.0 Social Studies Skills and Processes
Students shall use reading, writing, and thinking processes and skills to gain knowledge and understanding of political, historical, and current events using chronological and spatial thinking, economic reasoning, and historical interpretation, by framing and evaluating questions from primary and secondary sources.

**TOPIC A. Read to Learn and Construct Meaning about Social Studies**
Indicator 2. Use strategies to prepare for reading (before reading)
- Objective d. Ask questions and make predictions about the text.

**TOPIC C. Ask Social Studies Questions**
Indicator 1. Identify a topic that requires further study
- Objective b. Pose questions the about the topic
- Objective c. Formulate research questions

Indicator 2. Identify a problem/situation that requires further study
- Objective b. Pose questions about the problem/situation from a variety of perspectives

Objective d. Pose questions that elicit higher order thinking responses
- Objective e. Formulate simple research questions

Standard 4.0 Language Arts - Writing
Students will compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose.

**TOPIC A. Writing**
Indicator 1. Compose texts using the prewriting and drafting strategies of effective writers and speakers
- Objective b. Select and use appropriate organizational structures such as narrative, chronological or sequential order, description, main idea and detail, problem/solution, question/answer, comparison and contrast, cause and effect

Indicator 4. Identify how language choices in writing and speaking affect thoughts and feelings
- Objective a. Select words appropriate for audience, situation, or purpose.

**TOPIC E. General Reading Comprehension**
Indicator 2. Use strategies to prepare for reading (before reading)
- Objective c. Make predictions and ask questions about the text.

**TOPIC C. Ask Social Studies Questions**
Indicator 1. Identify a topic that requires further study
- Objective d. Ask questions and make predictions about the text.

**TOPIC C. Ask Social Studies Questions**
Indicator 1. Identify a topic that requires further study
- Objective b. Pose questions the about the topic
- Objective c. Formulate research questions

Indicator 2. Identify a problem/situation that requires further study
- Objective b. Pose questions about the problem/situation from a variety of perspectives

Objective d. Pose questions that elicit higher order thinking responses
- Objective e. Formulate simple research questions

**TOPIC C. Ask Social Studies Questions**
Indicator 1. Identify a topic that requires further study
- Objective d. Pose questions that elicit higher order thinking responses
- Objective e. Formulate simple research questions
or a metonymy. Yet, typically, even then, most of the efficient cognitive processes are hidden from view, and their overall structure is seldom directly apprehended” (1997, 180).

Without explicit teaching, it is little wonder that so many of our students were confused about how to form an effective question. Faced with the necessity of helping students learn to form effective research questions, the school library media specialists saw three challenges:

1) We had to force into consciousness the complex thought processes that operate behind the veil of language;

2) Then we could work on a scope and sequence that would allow us to share any newfound understanding with our students, and, finally,

3) We would be able to translate that scope and sequence into a meaningful progression of instructional activities designed to build our students’ understanding and proficiency with questions.

Investigating Questions

Elementary, middle, and high school media specialists in Cecil County spent two years researching questioning. We began by examining and analyzing the actual questions that students formed on the fifth-grade benchmark test. We grouped these questions into two categories—audience and purpose—concepts familiar to us from the writing process. While the audience for questions paralleled the audience for writing neatly, the purposes for questions seemed different, indeed far more complex, than purposes for writing. We decided to use the category “purpose for questions” as an advance organizer for every book chapter, published article, and webpage we read that talked about questioning. We discussed, analyzed, and argued about the purposes behind open and closed questions, essential and supporting questions, and teacher-formed and student-formed questions.

Eventually, we selected the Shared Inquiry model (Whitfield 2006) as a basic framework for our investigation. Shared Inquiry breaks questions into three purposes: factual, interpretive, and evaluative. We modified this structure by changing “interpretive” to “analytical” and adding a category for yes/no questions that elicit agreement or disagreement, rather than facts. Then we brainstormed more specific purposes for asking questions and placed these purposes within our broad framework. We noticed that specific question words, such as is, was, who, what, where, why, how, would, should, and could, matched up with the different purposes that we had listed. We saw that questions beginning with who, what, when, or where elicited factual responses, while those that included should, would, or could required some form of judgment in the response.

Even when the purpose did not call forth a specific question word, there were terms that acted as cues to the cognitive process involved. For example, while most analysis questions began with how or why, the presence of the word similar or different ensured that a question was asking for comparison or contrast. Similarly, the presence of a term such as order indicated that sequencing was required. Adding the question words and the cues to our frame, we eventually arrived at the chart in figure 2. We reasoned that, if we could teach students to analyze the purpose for a question and then choose the corresponding question term and/or cue word, we would enable all students to form research questions effectively.

![Chart to aid students analyze the purpose for a question and then formulate the question appropriately.](image-url)
### Skills and Essential Questions

<table>
<thead>
<tr>
<th>Grade: 2</th>
<th>Essential Question(s)</th>
<th>Enduring Understanding(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSIFY</td>
<td>Why do we ask questions?</td>
<td>We ask questions to find information.</td>
</tr>
<tr>
<td>FORM</td>
<td>How do we signal that we are asking a question?</td>
<td>We use special words to ask questions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade: 3</th>
<th>Essential Question(s)</th>
<th>Enduring Understanding(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSIFY</td>
<td>Why are there different kinds of questions?</td>
<td>We ask different questions for different purposes.</td>
</tr>
<tr>
<td>FORM</td>
<td>Why do we use different question words?</td>
<td>We use different question words to signal different purposes for questions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade: 4</th>
<th>Essential Question(s)</th>
<th>Enduring Understanding(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSIFY</td>
<td>How are different forms of questions related?</td>
<td>Questions can be classified by purpose.</td>
</tr>
<tr>
<td>FORM</td>
<td>Why is it important to phrase questions carefully?</td>
<td>The question you ask determines the answer you get.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade: 5</th>
<th>Essential Question(s)</th>
<th>Enduring Understanding(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSIFY</td>
<td>What is the relationship between questions asked to find facts and questions asked to make sense?</td>
<td>Facts provide the support that helps us to answer higher-level questions.</td>
</tr>
<tr>
<td>FORM</td>
<td>Why is it important to phrase questions carefully?</td>
<td>The question you ask determines the answer you get.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grades: 6-8</th>
<th>Essential Question(s)</th>
<th>Enduring Understanding(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSIFY</td>
<td>How do questions help us to form judgments?</td>
<td>Information must be gathered and analyzed before judgments can be formed.</td>
</tr>
<tr>
<td>FORM</td>
<td>How can I ensure that the questions I ask get the answers I need?</td>
<td>Identifying the purpose and choosing the corresponding question word or cue leads to the formation of effective questions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grades: 9-12</th>
<th>Essential Question(s)</th>
<th>Enduring Understanding(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSIFY</td>
<td>How does classifying the purposes for questions help us to use questions more effectively?</td>
<td>Classifying questions by purpose helps us to understand the interrelationships among different forms of questions.</td>
</tr>
<tr>
<td>FORM</td>
<td>How can I ensure that the questions I ask get the answers I need?</td>
<td>Understanding the similarities and differences in the way questions are used in each discipline refines our ability to use questions effectively.</td>
</tr>
</tbody>
</table>

### Revising Curriculum

After devising this taxonomy for forming questions based on our understanding of how purpose and form connect, our next step was to revise our library media curriculum. Our revised library media curriculum establishes a coherent articulation of two distinct sub-skills (1) the different purposes for questions and (2) the associated forms these questions take.

The new expectations for recognizing purposes for questions are:

- By second grade: "All students will distinguish between questions and statements, and be able to differentiate between yes/no and factual questions."
- By fifth grade: "All students will sort questions by purpose using a basic form of the question taxonomy."
- By seventh grade: "All students will classify questions by purpose using the advanced question taxonomy."
- By tenth grade: "All students will compare and contrast the cognitive processes used to guide questioning across the disciplines."

The new expectations for question forms are:

- By second grade: "All students will use scaffolds such as question wheels or cubes to form questions with assistance."
- By fourth grade: "All students will independently generate factual questions."
- By sixth grade: "All students will independently generate questions for multiple purposes."
- By tenth grade: "All students will create essential questions and analyze them into their subsidiary parts."

All statements are direct quotes of indicators from the Cecil County Public Schools "Information Literacy Curriculum" (2006).
From Curriculum to Pedagogy
Curricular outcomes and indicators provide clear targets for student performance while an effective instructional design model provides the delivery system that ensures that students will achieve mastery of those targets. Following the Understanding by Design model (Wiggins and McTighe 1998), we developed a scope and sequence of essential questions and enduring understandings for questioning (see figure 3) that form the framework for our lesson planning. We introduce the essential question at the beginning of a lesson as a frame for that particular skill and then return to it at the end to ascertain understanding. For example, in fifth grade media specialists begin a lesson on questioning by asking, “How are questions asked to find facts and questions asked to make sense related?” The media specialists return to the same question at the end of the lesson, and, if the learning activities have been successful, students are able to answer the teacher-librarian’s question by articulating the enduring understanding (factual questions provide the support that helps to answer higher-level questions) in their own words.

Putting Pedagogy into Action
Our curriculum is delivered through a fixed schedule at the elementary level and flexibly at the secondary. In elementary school students refine their questioning skills through a series of learning activities that are integral parts of media research units designed to support or extend classroom learning. At the secondary level the school library media specialist and the classroom teacher collaboratively design and implement research projects, with the school library media specialist assuming responsibility for information literacy skills such as questioning.

In the primary grades students sort questions into two categories (1) those that can be answered “yes” or “no” and (2) those that lead to information. As part of their first research project, kindergarten students are given a set of prepared questions, and the school library media specialist models this skill of sorting questions. In subsequent units throughout the primary grades students will master this skill as they practice sorting questions they have been given, and eventually they will generate their own factual questions for a research project. Each time they are exposed to the target skill, students subsequently listen to, view, or locate and read information to find the answers to the factual questions they have identified—they always experience questioning in the context of the research process.

At the intermediate level students are introduced to the basic question chart (see figure 4), which uses the metaphor of a house to emphasize the purposes and appropriate forms for different types of questions. All the elementary media specialists in the county and some classroom teachers have begun to display and refer to posters of this chart, developed by Connie Seibert, a National Board Certified elementary library media specialist in Cecil County. By fifth grade students are generating research questions, sorting them, first by topic and then within topics by purpose, to ensure that their research will extend beyond factual reports.

In practice, students frequently use pronouns rather than specific terms or ramble around a thought rather than express it succinctly in a question. To help students learn to create clear and precise questions, we ask them to group similar questions and discuss the different versions, looking for the strengths and weaknesses of each. Then, in small groups, students are asked to select and justify the most effective, orally or in writing. Since this process is analogous to peer editing during writing, we make the interdisciplinary connection overt to encourage the transfer (or generalization) of this important evaluative skill.
In secondary school, the library media specialists use a graphic organizer to help students identify, define, and modify the keywords in an essential question; connect definitions to background knowledge; and then use the understandings gleaned to develop factual or analytical questions. For examples, see the sidebar.

**Content Area Integration**

We are still in the process of collecting data on the different ways in which the content areas approach questioning, a necessary precursor to our ability to create effective lessons around our high school outcomes. As a district supervisor, I have shared our research question chart with other content supervisors and instructional support teachers. At the individual school level, media specialists introduce it and brainstorm with classroom teachers how this approach could be integrated with thinking skills in their disciplines. Because our current high school students went through elementary and middle schools before our curriculum was revised and so have not benefited from our improved focus on questioning, high school media specialists are sharing with high school students the learning activities designed for earlier grades. In the future we will be creating high school lessons that enable students to analyze subtle differences in the way each discipline approaches questioning.

### Essential Question

**How can we prevent another Holocaust?**

<table>
<thead>
<tr>
<th>Keyword(s) and Definition(s)</th>
<th>Holocaust: The slaughter of Jewish people in German concentration camps during World War II.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym(s) and Definitions(s)</td>
<td>Final Solution: The Nazi program of killing Jewish people during the Third Reich.</td>
</tr>
<tr>
<td>Broader term(s) and definition(s)</td>
<td>Genocide: The deliberate extermination of a group of people. Extermination: To get rid of by destroying.</td>
</tr>
<tr>
<td>Narrower term(s) and definition(s)</td>
<td>Concentration camp: A camp set up by the Nazis to imprison and persecute people. Ghetto: A section of a city in which Jewish people were required to stay. Discrimination: Treating people differently based on their ethnic background, religion, gender, etc.</td>
</tr>
<tr>
<td>Related term(s) and definition(s)</td>
<td>Nazis, Third Reich &amp; Minorities</td>
</tr>
<tr>
<td>Factual questions and answers based on term(s)</td>
<td>What was the Holocaust? Who was involved? What is genocide? Which events preceded the Holocaust? Where were the concentration camps?</td>
</tr>
<tr>
<td>Analytical questions and answers based on term(s)</td>
<td>How were the Jewish people like the Germans? How were they different? Why did the German people support the Nazi’s program of discrimination?</td>
</tr>
<tr>
<td>Enduring Understanding</td>
<td>Societies must have safeguards in place to ensure that a minority group does not become a scapegoat for the majority.</td>
</tr>
</tbody>
</table>

### Spiraling Curriculum

Our instructional design model is not unique. Many schools across the country use Understanding by Design or a similar model as a framework to ensure that all students reach a deep understanding of content. Nor are our instructional activities unusual. The salient difference with our approach is the clear, consistent focus that our curriculum places on the cognitive skills that blend together in the formation of questions. These processes remain consistent from kindergarten through high school, differing in complexity rather than in kind as students mature. Therefore, our learning activities follow a similar pattern at each grade level.

- We model sorting questions by grade-level-appropriate purposes, allow students guided practice, and then encourage independence.
- We provide scaffolds, such as question cubes, in early grades to assist students in forming different types of questions.
- We demonstrate the connection between specific question words and purposes.
- We introduce scaffolds, such as the question house and the question chart, that replace the randomness of the question cubes with a connection to purpose and then encourage students to form questions independently for each purpose.

At all times our emphasis is on breaking down complex cognitive processes into simple steps that all students can master, highlighting the important connection between clear purpose and clear expression, and then encouraging students to generalize the skills they have developed by exploring the ways in which questions are used in multiple contexts and content areas.
Measuring Our Success
Our investigation of questioning began with student performances on our fifth-grade library media benchmark assessment. Therefore, that is the logical place to look for evidence that our efforts to improve our understanding and instructional efficacy have resulted in measurable gains in our students' ability to form effective questions. The results of our fifth-grade benchmark test have been showing slow, deliberate improvement. In the past five years, as we have been clarifying our own understanding of questions and the focus of our instruction, the county average score for forming questions has improved from 0.99 on a 3-point scale to 1.31. While this still leaves much room for continued growth, it nevertheless demonstrates the impact that thoughtful, targeted instruction in the school library media center can have on students' cognitive skills. As we continue to share with classroom teachers the insights we have gained, and they integrate them into their daily instruction, the impact on our students' ability to think and express themselves clearly will deepen.

Looking to the Future
We started this process before AASL introduced the new Standards for the 21st-Century Learner. However, the language on questioning in the new standards parallels the direction we have taken and provides additional support as we continue our efforts to enlist other content areas in this mission (see figure 5). Working together, we can help all students learn to use language effectively, tailoring the questions they form to whatever information need they face.

Tish Stafford is program facilitator for media in the Cecil County (MD) Public Schools. She serves on the steering committee for the MDK12 Digital Library Project.

Works Cited:


