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When Readers Ask Questions: Inquiry-Based Reading Instruction

Molly Ness

What happens in classrooms when teachers carve out space and time for student-generated questions? In this article, two teachers use familiar comprehension activities to elicit powerful questions from students. The result is literacy instruction driven by student questions.

"What conditions would be necessary for dinosaurs to come back to Earth?"

"Why are airplanes faster than helicopters?"

"If Humpty Dumpty were an egg, which is fragile and breakable, why would he sit somewhere high up, like a wall?"

These questions hang on chart paper in the third- and fourth-grade urban classrooms where I conduct biweekly observations. I am a teacher educator at a graduate school of education; these classes were taught by my former students, who—after graduation—invited me to observe, provide feedback, and mentor them at the start of their careers. When I asked the teachers to explain how these questions emerged, they tell me that the questions came from students during their literacy block. Williams (2010) might call these *heavyweight* questions, which move toward higher levels of critical thinking, in contrast to *lightweight* questions, which address literal thinking and recount basic information.

In the classrooms where these questions emerged, the teachers emphasized question generation as an instructional priority, much like the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). As readers rise in grade level, the questions that they are expected to ask become increasingly complex. Second graders are expected to ask journalistic-type questions (*who*, *what*, *where*, *when*, *why*, and *how*) about explicit information in a text. By the end of fourth grade, students are expected to ask both closed-ended and open-ended questions, requiring both inference skills and critical thinking.

The purpose of this article is to showcase literacy instruction driven by student questions. I feature two teachers who modified two familiar reading activities into meaningful opportunities for students to generate their own questions. As they support their readers in generating questions, these teachers also encourage their students to seek out their answers in supplemental texts.

The Instructional Benefits of Question Generation

Children are naturally curious and come to our elementary classrooms well versed in posing questions to their parents and caregivers. On an average day, children ages 2–10 typically ask their mothers an average of 288 questions (Frazier, Gelman, & Wellman, 2009). According to Chouinard, Harris, and Maratsos (2007), children ask between 400 and 1,200 questions each week. Yet, as children begin formal schooling, their questions often taper off as instruction today provides little room for student-generated questions (Dillon, 1988; Graesser & Person, 1994; Van der Meij, 1988). Furthermore, the questions that kids do ask are mostly factual questions (Chin & Osborne, 2008). It is likely that students don't ask more questions because of teacher-dominated classroom discourse (Cazden, 2001) and the limited time of classroom instruction. In classrooms today, students do far more question answering than question asking; the typical schoolchild answers an "interminable number of low-level literal questions" (Allington, 2014, p. 18),

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with teachers posing 300–400 questions each day (Leven & Long, 1981).

The terms *question generation* and *self-questioning*—meaning the process in which students stop periodically to ask themselves questions related to the text—both appear in research from literacy journals, though they are growing increasingly outdated. Key studies point out that proficient readers ask questions and that asking questions is a favorable strategy to enhance reading comprehension (Chin, Brown, & Bruce, 2002; Davey & McBride, 1986; King & Rosenshine, 1993; Nolte & Singer, 1985; Rosenshine, Meister, & Chapman, 1996; Taboada & Guthrie, 2006; Taylor, Alber, & Walker, 2002; Therrien & Hughes, 2008; Wong & Jones, 1982). As explained by Harvey and Goudvis (2000), questioning pushes readers forward in their understanding of text. In their meta-analysis of question generation, Therrien and Hughes reported 13 studies highlighting significant gains in reading comprehension scores with the use of question generation. Taboada and Guthrie noted that question generation contributes to the active reading comprehension process by helping students initiate cognitive processes, concluding that "when asking questions, students are involved in multiple processes requiring deeper interactions with text" (p. 4). As they pose questions, students become focused readers with stronger understanding of the written text (Chin et al., 2002).

Question generation benefits children in other cognitive and motivational capacities. Posing questions builds children's critical thinking skills and activates higher level thinking skills. Children learn to not accept information at face value but instead to extend their learning in a self-directed manner. More recent research from various disciplines shows that question generation improves students' retention of math content (Teodoro, Donders, Kemp-Davidson, Robertson, & Schuyler, 2011), explanations of their thinking processes (Gillies, Nicols, Burgh, & Haynes, 2014), engagement in science (Hung et al., 2014), and oral and written responses to literature (Peterson & Taylor, 2012). A 2014 research team from the University of California, Davis (Singh, 2014), monitored brain activity to measure how engaged learners were in reading questions and their answers. When learners' curiosity was piqued by questions and their answers, the parts of the brain associated with pleasure, reward, and creation of memory underwent an increase in activity.

Student-generated questions are at the heart of inquiry-based classrooms, which are student-centered and teacher-guided (Wilhelm, 2007). In inquiry-based classrooms, students' questions and curiosities, rather than a teacher-directed curriculum, drive learning. Inquiry-based classrooms focus on questions in an attempt to address real-world questions. The benefits of inquiry-based instruction are well documented; students hold more ownership and control of their learning (Short et al., 1996), engage in collaborative learning (Myers & Beach, 2001), develop their metacognitive skills (Wells, 1999), and are more motivated and engaged in learning tasks (Wilhelm, 2007).

PAUSE AND PONDER

- How often do you ask your students to pose their own questions?
- What do you do to address the questions that your students have generated?
- If young children are so naturally curious, why isn't there more time in elementary classrooms for their questions?
- What are the benefits of allowing students to generate questions?

Inside Two Teachers' Classrooms

As a teacher educator, I teach literacy methods courses to preservice and inservice teachers. One element of these courses is to explore how student-generated questions create engaged and purposeful readers, promote retention of content knowledge, and build comprehension skills (Ness, 2015). With reading comprehension instruction as a significant focus of the course, we read and discuss Yopp and Yopp's (2001) text about literature-based reading activities. In the next sections, I document what I witnessed when two of my former students carved out time for inquiry-based instruction within their language arts instruction.

Mr. Patterson's Fourth-Grade Classroom: Using Book Bits to Generate Questions

In a unit on historical fiction, Mr. Patterson (all names are pseudonyms) has selected the picture book *Mighty Jackie: The Strike-Out Queen* (Moss, 2004). *Mighty Jackie* tells the true story of Jackie Mitchell, a 17-year-old girl whose dream was to be a pitcher for a Major League Baseball team. The book focuses on a 1931 exhibition game between the New York Yankees and the minor-league Chattanooga Lookouts. Jackie, who was raised by a father who reassured her that girls could do anything, practices tirelessly. Unfazed

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by a crowd snickering at the sight of a woman pitching in Major League Baseball, she strikes out baseball legends Babe Ruth and Lou Gehrig.

To begin his read-aloud, Mr. Patterson modifies a prereading activity from Yopp and Yopp (2001). In the Book Bits activity, the teacher shares short phrases from the text. These phrases are significant to the text, providing hints about the characters, setting, plot, resolution, and narrative structure. The Book Bits strategy supports young readers in several ways: (a) by hooking them and piquing their curiosity about the upcoming book, (b) by stimulating their background knowledge, (c) by helping them generate predictions, and (d) by setting a purpose for reading.

Mr. Patterson alerts his students that he will not tell them the title of the book nor show them the cover so as to not influence their background knowledge. Each student receives an index card on which Mr. Patterson has transcribed a short phrase taken directly from the text. He directs students to silently read their book bits to themselves, and he circulates to whisper read to a handful of his struggling readers. Each child sees only one of the book bits shown in Table 1.

He tells students to jot down a quick prediction, guided with the questions "What does your book bit tell you about the book?" and "What might we be reading about?" After 3 minutes, he directs students to mingle with three different people, sharing out only their book bit. Students push their chairs aside and eagerly search out classmates to share book bits. Once back in their original seats, they add to and revise their initial predictions. Mr. Patterson leads a whole-class conversation about their predictions based on the book bits. The classroom consensus is that the story is about a baseball player named Jackie, and perhaps that is Jackie Robinson.

To extend this activity into a question generation opportunity, Mr. Patterson shows the class the entire list of book bits and models using the sentence starters *who*, *what*, *where*, *when*, *why*, and *how* to jump-start question generation:

> I recognize some of these names—I know that Babe Ruth and Lou Gehrig were famous baseball players, but I'm not familiar with the name Tony Lazzeri. So, that's a question that I hope the book answers for me. I will write down "Who is Tony Lazzeri?"

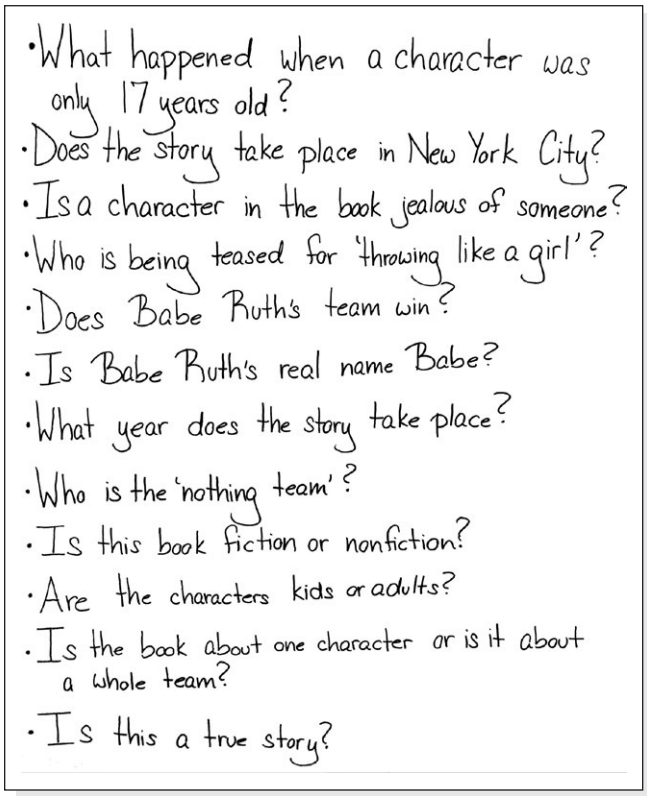
As students set to work, their teacher peers over their shoulders and provides feedback like "How could you rewrite that prediction into a question?" Students share out their questions. Mr. Patterson acts as a scribe, recording all of these questions on chart paper, as shown in Figure 1.

He directs them, "Every time you think you hear something in the text that answers one of the questions we've asked, put your thumb up. We will pause and discuss both the question and how the book

Table 1
Book Bits Selected From *Mighty Jackie: The Strike-Out Queen* by Marissa Moss

- Mighty Jackie
- April 2, 1931
- Chattanooga Lookouts
- New York Yankees
- A nothing team
- Babe Ruth, Lou Gehrig, and Tony Lazzeri
- Only 17 years old
- A mighty good pitcher
- "You throw like a girl!"
- Fingers were callused
- Hooting and jeering
- Strike three!
- A crowd of 4,000 had come to see
- The Babe was striking out

Figure 1
Students' Questions Prior to Reading *Mighty Jackie: The Strike-Out Queen* by Marissa Moss



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provides an answer." As these questions provide a purposeful reason for students to read the text, they listen attentively as the true story of Jackie Mitchell unfolds. Thumbs shoot into the air as the text addresses each question. When the text tells how Jackie Mitchell was teased for "throwing like a girl," Mr. Patterson notices William's wiggling thumb and calls on him. William explains the following:

> Our question "Who is being teased for 'throwing like a girl'?" makes it sound like it's bad to throw like a girl—like girls are weaker or not as good. But it sounds like the author is telling us that throwing like Jackie Mitchell—a girl who practiced and practiced and struck out famous baseball players—is a good thing.

This response shows that asking and answering questions builds students' ability to engage in close reading, or reading to uncover layers of meaning to aid comprehension (Boyles, 2012).

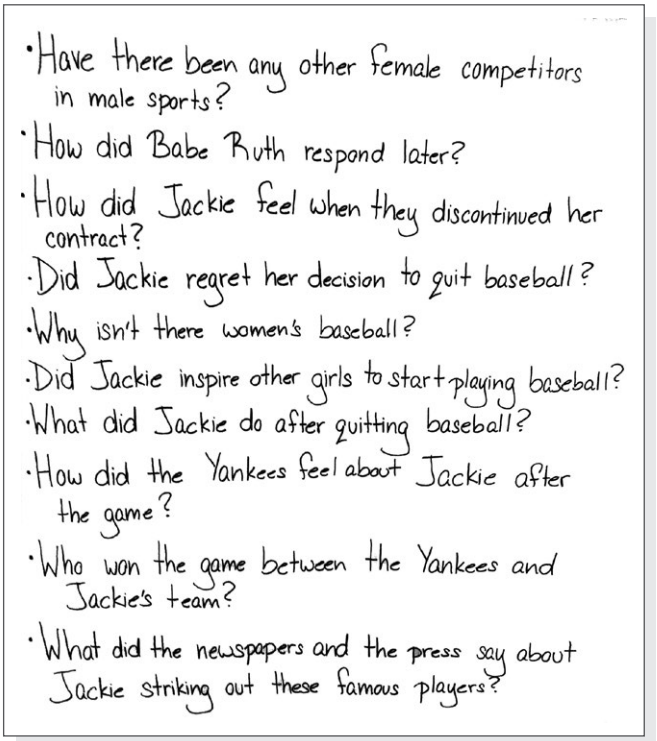
Mr. Patterson extends question generation into an after-reading strategy by explaining the following:

> We started off asking lots of questions, which mostly were answered by this book. But good readers continue to ask questions even after finishing the text. This book left me with questions that go beyond the text. I might not be able to answer the question just with the book alone—I might need to do outside research or look for other books or even just have a conversation with other readers about possible answers to these questions. For example, after reading *Mighty Jackie,* I wonder how baseball today might be different if women were able to play.

He directs students to talk with partners about some of the questions they have that were either unanswered by the book or were outside the scope of the text. Eventually, Mr. Patterson records the group's questions, as shown in Figure 2.

On subsequent days, students work in small groups to discuss the questions they've generated. During their literacy block, they conduct Internet searches about women in sports and Jackie Mitchell. They learn that Jackie continued to play with another minor-league team, House of David (where she often sported a fake beard!), and quit baseball eventually to work in her father's office. They come across a website featuring "20 Inspirational Females Who Won in a Males' Sport." Their research leads them to newsreel footage of the actual game, newspaper interviews, and resources from the National Women's History Museum, the Baseball Hall of Fame, the Smithsonian Institute, and a 1987 obituary from the *St. Petersburg Times*. Mr. Patterson brings in portions of a magazine article (Doster, 2013) to use with his highest guided reading group. Here, students find the answer to their question about the score of the game highlighted in *Mighty Jackie*: New York Yankees 14, Chattanooga Lookouts 4. They learn that Jackie received a standing ovation from the crowd on that fateful day. They debate whether Babe Ruth was potentially disgusted by a poor call from the umpire on the third pitch or by being struck out by a girl.

Figure 2
Students' Questions After Reading *Mighty Jackie: The Strike-Out Queen* by Marissa Moss



The Book Bits strategy shows that powerful questions can come from small tidbits of text; the activity helps students see that questions can be generated both prior to and after reading a book. Generating questions prior to reading helps students become purposeful and focused as they approach the text. As they generate questions after reading, they learn that proficient readers use multiple sources to answer questions, gather data, and formulate opinions. Thus, generating questions builds these students' abilities to read closely.

Ms. Farrin's Third-Grade Classroom: Using Concrete Experiences to Generate Questions

In her classroom, Ms. Farrin modifies Yopp and Yopp's (2001) Concrete Experiences activity, in which

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a teacher selects three to five concrete objects that relate to a text. Before reading, the teacher places these small objects in a box and then reveals them one by one to have readers make predictions about how the objects relate to the text. These objects challenge students to activate their background knowledge, to generate vocabulary, and to make inferences about the events or theme of a book prior to reading. These concrete experiences have many benefits, such as activating background knowledge and building intrinsic motivation (Guthrie & Ozgungor, 2002) and supporting English learners through meaning making with tangible objects (Peregoy & Boyle, 2009). Yopp and Yopp wrote that "a second cognitive benefit of concrete experiences is that they prompt students to ask questions" (p. 44).

Ms. Farrin most frequently incorporates concrete experiences into her science instruction, using everyday objects that spark her students' curiosity, evoke their wonderings, and help them generate questions. She has shared seashells, volcanic rocks, seedpods from trees, and bits of coral. On a spring morning, she brings in half of a robin's egg that she has discovered in the school courtyard. Her discovery is opportune, as her students are just about to begin a thematic unit on the adaptations of living things. To pique her students' curiosity, Ms. Farrin places magnifying glasses and the mystery object in a shadow box at the classroom writing center. She also includes a poster of sentence starters to jump-start students' thinking: "I wonder if…," "I'd like to know…," and *who*, *what*, *where*, *when*, *why*, and *how*.

During their writing center time, students eagerly examine the object and generate lists of questions. All of Ms. Farrin's students understand that the object came from a bird; she assists them in organizing their questions according to their structure. When she probes for students who generated wonderings using the "I wonder if…" and "I'd like to know…" prompts, students share out the questions and wonderings shown in Figure 3.

She then leads students in sharing out questions according to their question stems (see Table 2). Students also piggyback additional questions onto those posed by their peers. When one student alludes to a question about bird migration, several students build off that question, though these were not questions originally posed in their journal writing.

To address students' questions about bird migration, Ms. Farrin reads aloud from an informational text, *How Do Birds Find Their Way?* (Gans, 1996). Periodically while reading, she directs students to turn and talk about the ways in which this text answers their questions. One student explains,

> I knew that birds didn't have maps. They definitely don't have a GPS system like in my car! This book made me realize that it's still a mystery to scientists how birds know exactly when to fly to warmer places. It might be that they know when to go because of colder temperatures or because they have a harder time finding food. But scientists aren't really sure—which makes me wonder, How will scientists ever be able to really know the answer to the question "How do birds know when to fly south?"

On subsequent days, Ms. Farrin uses differentiated texts with each guided reading group to address students' lingering questions. From Sill's (2013) book, students answer their question about why some birds do not fly: Birds such as penguins have a denser bone structure that enables them to swim but prevents them from flying. From Boring's (1998) book, students address their question about the composition of bird eggs: The protein structure of the shell is porous to allow air to pass through.

Figure 3
Students' Questions and Wonderings

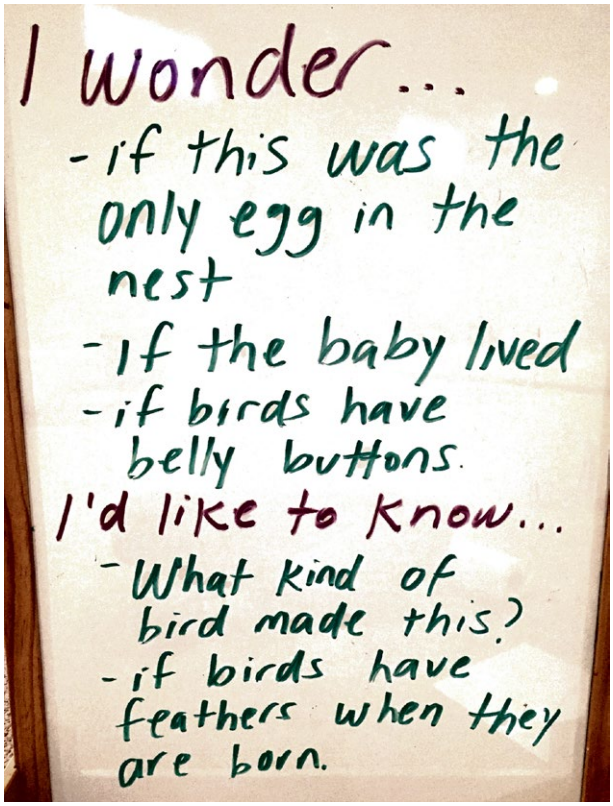

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Table 2
Questions Generated Using Sentence Starters

Who?	■ Whose egg is this? ■ Who came out of this egg? ■ Who is the mom of this egg? Who is the dad?
What?	■ What kind of bird made this egg? ■ What is an egg made of? ■ What did birds evolve from? ■ What happens when a baby doesn't learn to fly? ■ What makes the egg such a bright blue color? ■ What are birds' predators? ■ What do birds eat? ■ What does a baby bird look like?
Where?	■ Where is this baby now? ■ Where would a baby bird go if it fell out of its nest? ■ Where do birds nest? ■ Where do birds sleep when they fly over big oceans?
When?	■ When dinosaurs and birds lived together, did they get along? Or were they enemies? ■ When they sit on electric wires, why don't birds get shocked?
Why?	■ Why is this egg cracked? Did it fall out of the nest? ■ Why don't all birds fly? Why can't a penguin fly? Why can't an ostrich fly? ■ Why are birds colorful? ■ Why do birds peck on telephone poles? ■ Why do birds peck on glass windows and doors?
How?	■ How can you tell male and female birds apart? ■ How do birds fly such a long way in the fall? ■ How do birds know which direction to fly? ■ How does the bird know how to get out of the egg? ■ How did the bird get out of the egg? ■ How does a bird lay an egg? ■ How do birds fly? ■ How do birds sing? ■ How do baby birds learn to sing? Does their mom teach them? ■ How fast do birds fly? ■ How do babies catch their food? ■ How long does a baby bird live with its mother?

They read *City Hawk: The Story of Pale Male* (McCarthy, 2007), which tells of the red-shouldered hawks living on Fifth Avenue skyscrapers in New York City.

To build their question generation capabilities and to harness their interest in the topic, Ms. Farrin gives students the responsibility to interview an expert in the field. One student's grandmother is a bird enthusiast and volunteers at a local nature center. The students sort through their unanswered questions and refine the lightweight questions until they are more sophisticated. Knowing that they might not be able to have all of their questions answered, students rank their questions in terms of importance and interest level. In a 20-minute Skype interview, the expert is able to address students' questions about birds' migratory patterns, nesting habits, and mating rituals.

With the simple move of bringing in this concrete object, this teacher has piqued her students' curiosity and increased their motivation to learn. A concrete object evokes questions; these questions aid students' comprehension of the text. They search for answers in multiple texts, questions lead to more questions, and the culminating experience is an authentic literacy endeavor.

Concluding Thoughts

The preceding vignettes showcase classrooms where "the teacher's job becomes one of facilitating the skill of questioning for each student" (Williams, 2010, p. 281). As students generate heavyweight and lightweight questions within and beyond the texts they encounter, their comprehension improves and they become focused, purposeful readers.

Elementary school is a pivotal time for students; their abilities to generate, address, and explain the answers to questions are developed between the ages of 3 and 9 (Chouinard et al., 2007; Loukusa, Ryder, & Leinonen, 2008). Logically, instruction must focus on meaningful ways to encourage and honor the questions that children naturally ask. When teachers create time and space for children's questions, powerful learning and interactions occur. Legare, Mills, Souza, Plummer, and Yasskin (2013) indicated that when teachers model how to generate questions, children's question generation abilities improve. As evidenced in Mr. Patterson's and Ms. Farrin's classrooms, the process of generating questions has a snowball effect. As children become more proficient in generating questions, they eagerly ask more questions. The cyclical process of generating questions and approaching texts to answer their

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TAKE ACTION!

1. For Book Bits, select eight to 10 short phrases or words from a text. Model how to use a small portion of the text to generate a question. Distribute the book bits to students. Ask them to write predictions from their bit. Allow students to share out their bits with classmates and revisit or revise their predictions. Encourage them to generate questions on their own, using sentence starters like *who, what, where, when, why,* and *how* to prompt their thinking. At the conclusion of the book, revisit the questions to generate more queries that are beyond the scope of the text or unanswered by the text.
2. For Concrete Experiences, bring in a tangible object related to the theme or content of a related text. Allow students to explore the object on their own, and ask them to brainstorm questions related to the object. Provide them with sentence starters like *who, what, where, when, why,* and *how* to scaffold their questions.

questions achieves "the best close readings…that leave students with a lot of questions that they still want to answer" (Fisher & Frey, 2015, p. 10).

This article encourages educators to not allow our students' questions to fade away in the confines of structured educational environments, cramped school days, and narrow curricula. The opportunities for student-generated questions are abundant. When teachers incorporate and adapt simple reading activities, our students reap the benefits inherent in question generation.

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MORE TO EXPLORE

- "Writing Higher Order Questions" by the Teaching Channel: https://www.teachingchannel.org/videos/developing-better-questions
- "A Questioning Toolkit" from *From Now On*: www.questioning.org/Q7/toolkit.html
- "Questioning Mini-Lessons and Practice Activities" by Annemarie: www.teacher2teacherhelp.com/reading-strategies/questioning-mini-lessons-and-practice-activities/
- "How Can We Teach Kids to Question?" by Warren Berger: amorebeautifulquestion.com/can-teach-kids-question/
- Rothstein, D., & Santana, L. (2014). The right questions. *Educational Leadership*, 72(2). Retrieved from www.ascd.org/publications/educational-leadership/oct14/vol72/num02/The-Right-Questions.aspx
- "Questioning: A Comprehension Strategy for Small-Group Guided Reading" by John Young: www.readwritethink.org/classroom-resources/lesson-plans/questioning-comprehension-strategy-small-408.html

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