5 Metacognitive Questions For Students Learning New Material

By Paige Tutt
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Confronting new material is an almost daily occurrence in classrooms but figuring out how new learning connects to what's already been covered isn't always clear to students—or even something they know is important to think about. For many kids, when new lessons are taught in class, it can feel like just another disembodied idea or concept to add to the mix, another thing to grapple with or memorize for a test or explain in a writing assignment.

But grasping the larger framework of how ideas and knowledge build upon each other, how they form an intentional continuum that stretches through units and grade levels and connects to existing background knowledge, helps build deeper, more durable learning. It's also a critical part of students taking ownership of their own learning.

Many teachers focus on instilling in kids the metacognitive habits to actively reflect on their learning process with the goal of developing self-sufficient learners. But teaching students how to grapple with new material so they see how it fits into the puzzle of what they already know, how it solidifies concepts, or reveals gaps in their knowledge, is just as important.

Here are five questions—inspired by a tweet from TeachThought as well as by the work of several Edutopia contributors—to help students build the metacognitive habits to evaluate new materials and make sense of them, helping them grow as competent, independent learners.

1. What stands out to me? What makes me wonder?

When students encounter new information in Ann Young's math class at King Middle School in Portland, Maine, she asks them to do an "I notice, I wonder" exercise. They begin by simply spending a few minutes examining the material and noting what stands out to them. "It helps them slow down and really focus on what's in front of them," says Young. "They write about what they noticed and then turn and talk to a neighbor to enhance and draw attention to things that they maybe had missed." By giving students time to think for themselves and ask questions about the new material, Young is intentionally empowering them to engage critically with it. She wraps up the exercise by asking students what they wonder, creating a window for Young to see where students might need further instruction and getting them to reflect on their own knowledge gaps.

Getting kids to ask themselves this type of question is key here. When teachers ask the class "What stands out?," rather than letting students do the asking, it can inadvertently send the signal that there is "something you've already noticed, as a teacher, and you want to know if they see it too," writes educator Terry Heick. This can send the message that "if they do see it, they're smart, and if not, they can continue to guess what you're thinking," he explains. "This not only de-centers the student but the content as well, devolving the process into a distracting game of cat and mouse."

2. Which parts or terms are new to me and which parts do I recognize?

What students think they know and what they actually know don't always overlap; research shows they frequently overestimate how well they understand content and how prepared they are for tests or exams. But active reflection as they encounter new material can help—they should be looking for gaps in their knowledge, poking at their assumptions about a subject, and contemplating how their thinking syncs with new information.

To help scaffold learning new vocabulary terms and build student agency, Rebecca Alber, an instructor at UCLA's Graduate School of Education, has each student in her classroom create a chart where they write down key terms or concepts from a new unit and rank them as "know it," "sort of know it," or "don't know it at all." On the same paper, students then attempt to define the terms they identified as ones they know or kind of know, giving Alber a roadmap for areas to focus her instruction and giving students a clearer picture of where more work is needed.

3. How does this connect with what I already know?

The beginning of a unit is an excellent opportunity for students to think more deeply about how what they're learning may be tethered to previous knowledge, strengthening both the new knowledge and providing a review of older material. This is sense-making and students should regularly be pausing to contemplate and ask themselves questions about how what they're learning fits into their existing knowledge framework.

One way to do this is by sketching out a concept map, says educational consultant Kripa Sundar. Concept maps—visual diagrams that show the relationships between ideas and information—can help students organize and structure what they know and prompt the creation of deeper, richer connections. "A student learning about bacteria can create a concept map that includes any relevant ideas—such as specific types of bacteria ("Helicobacter pylori") or ways to describe them ("single-celled organism")," Sundar writes. "This layout allows learners to identify what they know and where the gaps are, in addition to the relationships between concepts."

4. What follow-up questions do I have?

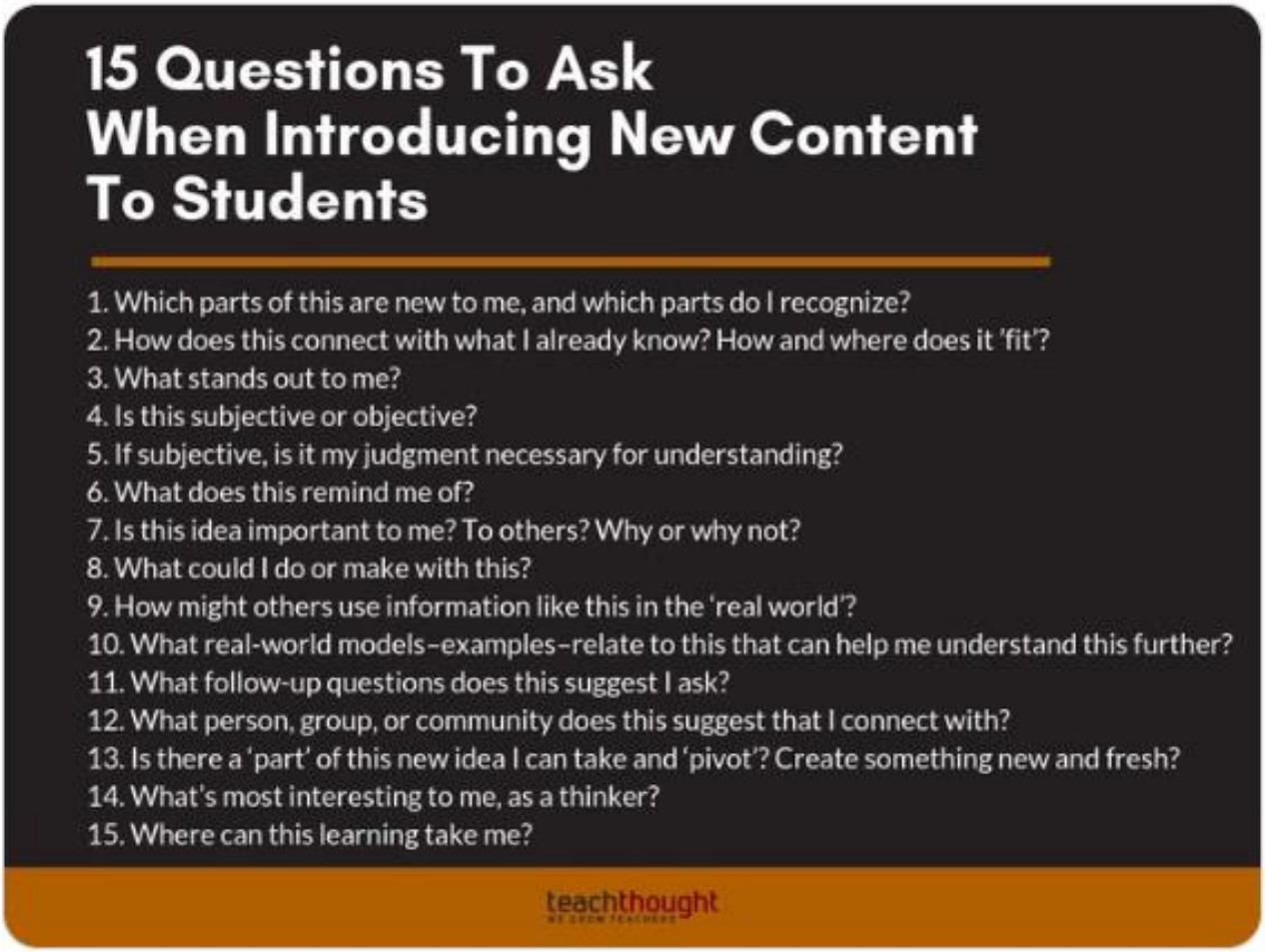
Many students are hesitant to ask questions, or don't connect their feelings of confusion to a need for more information. To get her students to "identify what they are confused about and then embrace, work on, and wrestle with that confusion as they participate in the learning activities" Kimberly D. Tanner, a professor of biology at Baylor University, regularly asks her students to fill out index cards answering the prompt: "What was most confusing to me about the material being explored in class today?" Examining the "muddiest point" in this way—the place where things got confusing or complicated for students—or doing a quick misconception check, can be powerful tools for students to identify where they lack clarity.

"For many students, it is an unusual experience for an instructor to invite them to share confusions aloud," writes Tanner. "Regular use of the Muddiest Point in classrooms sets a tone that confusion is a part of learning and that articulating confusions is not done solely to inform the instructor, but also to inform students themselves; students can use identified confusions to drive their independent learning or to generate dialogue in review sessions."

5. Why is this idea important?

When teachers routinely encourage students to think about why a new concept or skill is important to learn, or how it links to the real world, it helps students find their own connections to the material and "add their own spin" in ways that clarify for them why they're engaging with the work, writes eighth-grade English teacher Cathleen Beachboard. "Taking the time to look for and add intrinsic motivation ensures that student engagement is built into the learning process. The best part? Focusing on intrinsic motivators will give students desire, discipline, and dedication to learn."

Students can answer this question via a simple journal jot or a quick classroom discussion. Graphic organizers can also be helpful, says Alber, providing a scaffold to "guide and shape students' thinking" and allowing them to pull out and organize important information from new content. "Some students can dive right into discussing, or writing an essay, or synthesizing several different hypotheses, without using a graphic organizer of some sort," Alber writes. "But many of our students benefit from using one with a difficult reading, or challenging new information."



The Difference Between A Good Question And A Bad Question

'Good' Questions

Use clear, concise language

Use 'low levels of thinking' (e.g., recall) to lead to higher levels (e.g., evaluation)

Promote long-term retention of content

Encourage ongoing inquiry

Accessible to student (in terms of cultural allusions, language, background knowledge, etc.)

Related to a specific goal, learning objective, or psychological effect

Encourages reflection after being answered

May have more than one correct (or quality' response)

'Bad' Questions

Use unclear language

Unrelated to goal/objective

Outside student of ZPD ★

Unnecessarily complex

Deter thinking

Based on faulty premises

Loaded with bias/logical fallacies

Center opinion and beliefs over reason and knowledge

Is open-ended when it should've been closed (or vice-versa)

★ ZPD = Zone of Proximal Development