School as Inquiry

Telling our students to sit quietly and listen will not turn them into lifelong learners or engaged citizens, Mr. Wolk reminds us. He argues that inquiry-based teaching can transform our classrooms and spark a love for learning.

BY STEVEN WOLK

SOME students were milling about Sara's 7th-grade classroom; others were sitting on the couch and beanbags in the library area. The space was abuzz with activity. I asked Sara what her kids were working on, and she told me the 7th- and 8th-grade teachers had created an interdisciplinary inquiry unit on sugar.

Most people would not put "sugar" near the top of their list for school subjects. But Sara and her

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colleagues at Augustus Burley School, a Chicago public school, are transforming their curriculum into what they call "inquiry explorations." The topic of sugar was suggested by Dennis, the math teacher, who had read *Sweetness and Power: The Place of Sugar in Modern History*.[1] From that idea, a nine-week investigation of sugar was born.

Teachers started by asking students, "What comes to your mind when you hear the word 'sugar'?" The students gave the expected replies of candy and cake. Then the teachers showed the film, "Sugar Cane Alley," about the oppressive sugar industry in the French colony of Martinique in the 1930s.[2] This filled the students with totally different thoughts about sugar. Suddenly, those little packets on every restaurant table had an entirely new meaning. From there, Todd, the science teacher, explored sugar from a scientific perspective, Dennis had students look at the economic and commodity dimensions of sugar, and Sara — teaching both language arts and social studies — helped the kids to investigate today's sugar industry and, in particular, life in the Dominican Republic sugar-worker settlements, known as "bateyes."

This sugar "exploration" is a good example of teaching through inquiry. In my previous *Kappan* article, "Why Go to School?" (May 2007), I argued that most people believe our schools' primary purpose is to prepare children for their future as workers, rather than to educate them as complete human beings. This narrow aim of preparing children for employment means that our schools do not teach a love for learning, caring and empathy, moral consciousness, media literacy, social responsibility, ecological literacy, peace and nonviolence, creativity and imagination, intellectual curiosity, and global awareness. Rethinking curricula as inquiry is one of the best ways we can teach this essential knowledge and make content and skills infinitely more meaningful.

WONDERING ABOUT THE WORLD

Most children are not going to be an Einstein or a Thoreau, but they can live like them, in awe of our existence, filled with questions, and excited to observe and understand the world. Thoreau and Einstein followed two very different paths, but their inquiry about the world required common habits of mind. To them, the world was something to study, to explore, to wonder about. They had passion; their inquiry was not pulled by a test, it was pushed from within. That passion and wonder is what sent Shakespeare to the stage, Darwin to the Galapagos, and Jane Goodall to the chimpanzees. And it should be what drives our schools.

So, I have a question. Imagine your students graduating. They know all of the facts and skills taught to them over the years. All of them have learned fractions and earth science. They can read a great novel and write a perfect persuasive essay. Let's even say — remember we're pretending — that all of your students have terrific standardized test scores. However, they have no passion, no wonder about life and the human condition. They care little for the world. They are indifferent to nature and the environment. They have no intellectual curiosity. They don't like to read, so they hardly ever pick up a book or a newspaper. They rarely vote, they have little knowledge of what is happening in the country and the world, and they fill their days largely with working, watching TV, surfing the Internet, and shopping. So, here is my question: As an educator, have you succeeded?

> If my great-grandma walked into a classroom today, she would know exactly what to do: sit down, be quiet, listen to the teacher.

To me, the answer is obvious. Schools have not succeeded. Schools have been successful in creating contestants for "Jeopardy," receptacles for inert facts and skills, what David Perkins calls "couch potato knowledge."[3] Schools help create workers and consumers, but what are these students going to *do* with that content? Not much. This means that even if our schools "succeed" — based on our current definition of success — in reality they fail because we did little more than give children the technical skills to pass through the education system in order to get a job. Can we call that an education?

Of course, schooling is not an either-or proposition. We do not have to choose between students knowing important content, being prepared for college and employment, developing empathy and moral identity, having intellectual curiosity, and being involved in their communities. We can aim for all of these and more. And teaching through inquiry can help us succeed. But make no mistake: Inquiry-based teaching is a profound change from business as usu-

al. Inquiry-based teaching transforms the aims of school from short-term memorization of facts into disciplined questioning and investigating. Teaching through inquiry cannot be taken lightly or planned quickly. And inquiry-based schools at their very best do not just practice inquiry with their students, they also invite — even expect — teachers and administrators to use inquiry to improve their practice. In this sense, inquiry becomes far more than a pedagogical theory or a teaching method; it becomes a way of life inside school.

TRANSMISSION TEACHING AND THE ILLUSION OF LEARNING

Have you ever talked with students about what they have learned? I don't mean just asking them what they're studying in math or English, but asking them about the specific topics they were taught. I do this often. The results are not surprising, but they are shocking. I don't ask them about recent topics in school; those are too fresh in their minds. I ask them about topics they studied months and years ago. After all, if they really learned that content, they should still know at least a significant amount of it, right?

Teaching through inquiry considers our work a failure if students do not leave school filled with *questions* and the yearning to explore them.

But when I ask what they studied in science or social studies earlier in the year or during the previous year, there is a long silence as they dig through their brains to remember the topics they were taught. And then I'll either hear one sentence, "I don't remember," or I'll get bits and pieces of information that add up to very little. Some researchers have done this as well. They've sat down and interviewed students about their learning (or their not-learning) in school. In one study, they interviewed 8th graders after the students had an extensive unit on Colonial American history. Here is a description of the typical results:

Following a lengthy unit on British colonization, the interviewer says to an 8th-grade student, "Tell me about the Jamestown Colony." The student, Randy, replies, "Jamestown, I think it was, like, the colony that. . . I remember it was the colony. . . I don't really remember much. I just think, um. . . I don't really remember much about the Jamestown Colony."[4]

Randy was not the exception in this classroom. The researchers said that most of the students could not articulate what they were just taught at length. Rather than a solid understanding of Colonial history, they had what the researchers called a "factual stew" of knowledge.

My graduate students do similar interviews and get the same results. Students almost *never* talk about the content in any articulate or enlightened or passionate way. When students *can* talk about a topic with at least a modicum of coherence, it happens to be a subject they love, which makes perfect sense. If you love science, you'll learn more of it, even from a textbook. I also have my students ask them about their outside-of-school learning. The same children who are lost for words when asked about their in-school learning can hardly be quiet when talking about learning how to skateboard or dance or play the guitar. I have to be careful with this assignment because this happens so often that my students can become disillusioned.

Why are students not learning most of what they are taught in school? Primarily because of the 19th-century model of transmission teaching that still dominates our schools and curricula. The signs and symptoms of transmission teaching are obvious: students sitting in their desks for most of the school day, teachers doing most of the talking, textbooks and worksheets as the primary resources, assessment focused on tests and quizzes. Contrary to popular belief, this model has changed little in the past century.[5] If my great-grandma walked into a classroom today, she would know exactly what to do: sit down, be quiet, listen to the teacher.

When students sit at their desks as teachers talk, are they really hearing what the teacher is saying? Are they intellectually engaged? Mihaly Csikszentmihalyi gave high school teachers pagers that beeped randomly during school. When the pager went off, the teacher and students completed a questionnaire with such questions as, What are you doing right now? and What are you thinking about right now? What were these students thinking about? The upcoming weekend, what they watched on TV the night before, and lunch.[6]

If we want students to care about learning and the world, then we need to make school, their learning, and the world *interesting* and *purposeful.* To do that, we must toss the transmission model of teaching in-

to the bin of obsolete educational practices and make our classrooms bloom with the intellectual and creative buzz of inquiry.

WHAT IS INQUIRY-BASED TEACHING?

Inquiry is the opposite of transmission. Walk into a classroom about inquiry and you will not see students sitting passively. You would see an active environment, a true community of learners. Students' minds are engaged. The classroom is filled with the voices of children taking an active role in their own education.

The very idea of curriculum is redefined through inquiry. Curriculum is not just the facts and skills we teach, but the knowledge we *create* together and the understandings and connections that each learner makes from that knowledge. Today, we consider our schools great successes if children graduate with all the answers. Teaching through inquiry considers our work a failure if students do not leave school filled with *questions* and the yearning to explore them.

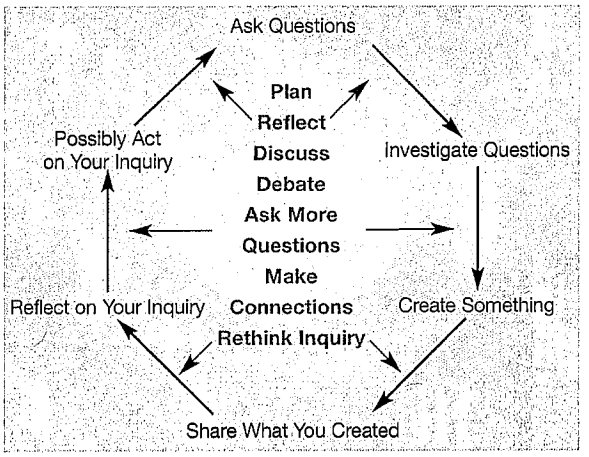
Science is the one subject that almost everyone agrees should be inquiry-based. That is because inquiry is an inherent part of doing science. I can't imagine anyone advocating science education that did not involve students spending the majority of their time asking questions, mixing chemicals, dissecting flowers, observing ants, and forming hypotheses before they try them out. Four major science and education organizations — the National Science Foundation, the American Association for the Advancement of Science, the National Research Council, and the Northwest Regional Educational Laboratory — have lengthy publications specifically on teaching science as inquiry.[7] These organizations know the best way to teach science to children and young adults is to have them actually experience the scientific process — as much as possible — like real scientists. Unfortunately, too many people believe that using the same methods in other subjects is controversial or "progressive," rather than just good teaching.

If you do a Google search on the phrase "inquiry cycle" and then click on "images," up pop diagrams showing somewhat different, but similar, processes. Most include these basic steps:

Ask questions.
Investigate the questions.
Create something to show what you found.
Share what you created.
Reflect on your work.
Possibly act on your inquiry.
Ask more questions.

While I like the minimalism of this, it also oversimplifies the process. Doing inquiry in any discipline (including science) is not strictly linear. Inquiry is a messy process and at times idiosyncratic. If I were to diagram the process of inquiry it would look something like Figure 1.

FIG. 1
The Process of Inquiry



It's a common mistake that only the "investigation" part is the inquiry. That is what most people equate with "research." But it is the entire experience that is the inquiry. The teacher facilitates the work of students as they work their way through the outer ring of the cycle. Most, if not all, of the investigation and creation phases are done by students in the classroom (not at home) where the teachers can help them through every step. Teachers make sure the elements on the inside of the cycle — reflection, discussion, rethinking — are an essential part of the inquiry experience.

Even my own diagram oversimplifies the process because it ignores the planning teachers must do before they even mention an inquiry question to their students. Having questions that guide inquiry is key, but behind the questions must be what Selma Wassermann calls the "big ideas."[8] The big ideas are the critical knowledge about the topic — written as explicit statements — that the teacher believes must be understood for students to have a truly educational experience. For example, if a class is investigating what we should eat, some of the big ideas I would include are:

• Statistically, the United States is the fattest coun-

try in the world, suffering from an obesity epidemic. Nearly two-thirds of Americans are overweight or obese.

• What we choose to eat — and our obesity — are leading causes for heart disease, cancer, diabetes, and high blood pressure.

• What we eat and obesity are related to socioeconomic status, with people in poverty eating lower quality food, having a higher concentration of fast-food restaurants in their neighborhoods, and having less access to quality health care.

• Most food sold in traditional grocery stores is highly processed.[9]

A culture of inquiry happens when teachers breathe inquiry as a part of their lives.

Without the big ideas, an inquiry becomes little more than a friendly version of reading a textbook or a "fun activity." With big ideas, a teacher can challenge students to think far beyond the sanitized content of a textbook. Wasserman writes, "A teacher skilled in the use of provocative and probing questions and guided by big ideas will lead students to dig for the gold within the experience, putting the big ideas under the lens of critical examination."[10]

But more than merely engaging students in authentic inquiry investigations, we want to immerse them in a *culture* of inquiry. I can't reduce this essence of inquiry to a recipe. A culture of inquiry happens when teachers breathe inquiry as a part of their lives. As Connelly and Clandinin point out, "The kind of teacher that we are reflects the kind of life that we lead."[11] The best teachers I know aren't good just because of what they do in their classrooms for six hours a day, they're good teachers because of how they live their lives 24 hours a day. These teachers live a life filled with learning, thinking, reading, and debating. Because inquiry is an important part of their lives, inquiry becomes an essential part of their classroom.

WHAT INQUIRY IS NOT

One of the most abused phrases in education is "hands-on." While I agree that "hands-on" teaching isn't as boring as sitting and listening to a teacher talk for most of the day, hands-on teaching is not synonymous with inquiry-based teaching. In fact, an essential part of inquiry — engaging in discussion and debate — would not be seen as "hands-on." And most hands-on teaching is not about inquiry because it is not framed around questions, does not explore "big ideas," is driven primarily by the short-term memorization of facts, and rarely involves analyzing multiple perspectives. Having students make a diorama of an ocean may be "hands-on," but that alone will do nothing to help them investigate the inquiry question, "How are humans affecting our oceans?"

Inquiry is also not "discovery learning." It is not a free-for-all, and it is not about letting students study whatever they want. Rather, inquiry-based teaching is collaborative, investigative, and deeply intellectual. The teacher has a responsibility to make the inquiry experience purposeful and highly thoughtful. Teachers are the primary architects of the learning experience.

Teaching through inquiry does not mean that a teacher never lectures or never does whole-class instruction. There are certainly times for both. However, the inquiry process does not silence or disregard students' interests. There must be time for students to pursue or discuss their own questions and ideas (with the teachers' guidance) and to make some of the decisions regarding their learning. So the process requires the teacher to find the just-right equilibrium between control and explicit curricular objectives on one end and student interest and autonomy on the other.

COMMONALITIES OF INQUIRY

Inquiry takes different forms depending on the discipline or the questions you're investigating. Inquiry looks different in science classes and reading classes. But there are universal features in all inquiry-based teaching.

Authenticity. All inquiry learning is *real* — or as real as it can be in the context of a school. Learning outside school is so successful — and often seems effortless —because it is real learning done within real contexts and for real purposes.[12] Outside school, everything has real purposes. In school, there is little immediate internal or mindful purpose from the learner's perspective. Learning that is purposeless is like a ship without a rudder; it will stay afloat and look like a mode of transportation, but it gets us nowhere.

The Work Space. A space that is about open investigations does not look like a traditional classroom. Outside school, many spaces are designed specifically for inquiry-type activities: workshops, laboratories,

My friend Chuck Cole taught middle school science for more than 30 years. When his 7th graders studied "atoms," he also had them read John Hersey's classic nonfiction book, *Hiroshima*, about the dropping of the atomic bomb. Here is some of Chuck's reasoning, including some of his "big ideas" for using the book:

> On one level [reading *Hiroshima*] was an attempt to illustrate and explain a science concept. But then I realized that there was also a total disconnect in my students between hearing about the atomic bomb being dropped and an awareness of what that actually meant in real lives. I saw enormous teaching opportunities and possibilities in it. They just jumped out of every page — the scientific and the social, but also all sorts of other connections. There's vocabulary, history, geography, the math (what does 20 kilotons mean?). But underneath it all, emerged the unimaginable horror of the event.
>
> The kids always wanted to know if dropping the bomb could have been avoided. And that allowed me to help them discover a bit of the nature of political leadership, and what awesome responsibility leaders really have — that they're people just like us in some ways, who have to make huge decisions. Someone had to give the O.K. to drop that bomb. All of the goals and reasons for reading it in class couldn't have been clear and obvious from the start. I had to discover them too, although I knew there was a lot of potential for examining the politics and ethics of the event. Reading that book was like jumping into another universe.

ateliers, book clubs, think tanks, colloquiums, roundtables, children's museums, studios. In all of these spaces, the people are active; they are busy doing things and engaged in purposeful pursuits.

Asking Questions. Questions fuel the inquiry (along with big ideas and goals). Usually an inquiry unit will be framed by one or more questions. These are often called "essential questions" or "guiding questions."[13] Rethinking curriculum as questions is a profound change.

Investigations. Once we have a question or set of questions (and the teacher has determined the big ideas), we want to investigate that question. The exact nature of an investigation would differ depending on the question and the discipline. Students can do typical library and Internet research, conduct surveys, interview people, write to e-pals in other countries, watch films, listen to music, and read short texts (newspapers, poetry, speeches, letters, short stories, etc.). And teaching with literature is a powerful way to inquire in all disciplines.

Real-World Resources. Imagine you want to learn about the Vietnam War. I'll give you two options: You can use any real resources you can find in the world, including books and articles about the war, interviewing people who lived through the war, and watching movies and documentaries about the war. Or you can read Unit 9, Chapter 30, Lessons 1, 2, and 3 in *Creating America: A History of the United States*, published by McDougal Littell. Remember, we're assuming you want to learn about the war, not just get it done quickly. Which would you choose, the world or the textbook?

Chances are you'd choose the world, and I don't blame you. Why? Because it's a lot more interesting! If that is true for an adult, then it should also be true for an 8th grader. In life outside of school, we would never read a textbook, we would read real texts that are absorbing, focused, well-written, provocative, and emotional.

Multiple Perspectives and Multiple Answers. Stimulating arguments are a by-product of an inquiry classroom because an inquiry-based classroom challenges students to see an issue from multiple perspectives and to answer questions that do not have one correct answer — and both are habits of mind that are vital in a democracy.

Dialogue and Discussion. Inquiry learning cannot happen in an academic culture of silence. Roger Simon wrote, "An education that creates silence is not an education."[14] Talk and inquiry are deeply symbiotic. The process of inquiry nurtures good talk, and that

good talk furthers the inquiry. This discourse must not be limited to classes in the social sciences and humanities. Math and the sciences also are rich with possibilities for discussion.

Creating. Inquiry-based classrooms are busy with learners writing stories, newspapers, magazines, and speeches; creating web sites and PowerPoint presentations; drawing artwork; performing plays; building models; painting murals; producing films; and designing posters, lab reports, and brochures. The act of creating something is vital because students are shaping an idea into an artifact. That act of creation teaches students to value and appreciate the thought and discipline required to produce excellence and to feel the pride that comes with making something with their own hands and minds.

Agency. Jerome Bruner defines "agency" as "taking more control of your own mental activity."[15] Nurturing agency in children involves honoring their unique construction of knowledge, integrating choices and ownership into the curriculum, and teaching students to be metacognitive, that is, to help them to consciously think about their thinking and learning. As teachers, we want children fully engaged in learning and in deciding the direction and substance of their learning.

Discovery. While I have written that inquiry is not "discovery" learning, there should still be a sense of discovery. One of the tragic facts about most schools today is their distressing lack of playfulness. Sadly, there isn't nearly enough tinkering going on in our schools. The only place kids can "officially" tinker is kindergarten. Along with discovery, playfulness, and tinkering, inquiry benefits from another void in our classrooms: spontaneity. Unfortunately, in our zeal to control every aspect of the school day, students lose out on the possibilities that can emerge from the unexpected and the uncertain.

Joy. How did joy become the enemy of education? I get a clear sense from many critics of progressive education that children are not supposed to enjoy school, that school is supposed to be work. They believe that if students are enjoying school, then our teaching is not "rigorous" enough. But can't our schools have both academic integrity and joy in learning?

The Skills and Tools of Inquiry. One of the most important purposes for inquiry-based teaching is to teach the skills of inquiry. While this includes proficiency in finding resources and doing "library" type research, inquiry also includes collecting and analyzing data, developing observation skills, interviewing and surveying, technical and creative writing skills, creating purposeful questions and hypotheses, computer skills, reading for information, aesthetic abilities, and skills in discourse and argument. Learning the skills of inquiry also means learning that inquiry requires self-discipline along with a sense of playfulness and joy.

STUDENT-INITIATED INQUIRY

Although inquiry is not entirely student-generated, students still need some choice in what they learn. Imagine you're teaching 4th grade and one of your students says, "I'd like to learn about frogs." If you're in a typical 4th-grade classroom, you'd say something like, "That's nice" or "You should go to the library after school and check out a book on frogs." But that's about it. End of frogs. And perhaps the end of that student's interest in frogs.

But now imagine that your school has created a daily one-hour class period called Exploratory. During that hour, students work on topics and questions that interest them. These student-initiated projects are shaped — with the teacher's help — into purposeful investigations. So, now when that student says, "I'd like to learn about frogs," you can answer, "Wonderful! How about studying frogs for your new Exploratory project?"

I often hear educators say that they want their students to be "lifelong learners," but do they really mean

that? Is it possible to nurture that love for learning and disciplined inquiry in children if teachers always tell them what to learn, when to learn, and how to learn? Giving children time in school to inquire into topics and questions that they initiate may be the most important way to arouse wonder and passion in children and the will to pursue a life of learning.

WHAT ABOUT CONTENT? STANDARDS? TEST SCORES?

Too often, learning through inquiry and learning content are seen as being mutually exclusive. This is a false dichotomy; it is not how inquiry happens outside of school in either the disciplines or in our lives. Someone who wants to answer the question, "How can I turn my backyard into a thriving garden?" can spend all of their time doing "hands-on" gardening, digging up their yard, planting flowers and vegetables; but without the needed, factual knowledge, their garden won't thrive.

Students who learn through inquiry are immersed in content knowledge. Teachers make specific academic knowledge a fundamental part of an inquiry experience. Students may not be studying graphing out of a textbook, but they're learning that same content by graphing real data from a real survey they researched, created, and analyzed.

State standards don't say, "Teach students geology from a textbook" or "Have kids learn about the American Revolution through a lecture." Standards list what kids should learn. They don't describe how they should learn. An advocate of inquiry-based teaching should not fear standards. On the contrary, the standards can support and justify teaching through inquiry. In addition, one long, well-planned, integrative inquiry unit will satisfy dozens of learning standards.

GETTING STARTED, MOVING FORWARD

The first step in moving from transmission teaching to inquiry teaching begins inside teachers' heads. We must help teachers (and schools) to stop seeing themselves as curriculum *deliverers* and start seeing themselves as curriculum *creators*. Once we begin to see that textbooks should be just one resource — used sparingly as a reference book — we can start to rethink what curricula could be. The success of inquiry-based teaching depends on teachers who have the vision, intellect, and ability to create these dynamic inquiry experiences.

We have a choice. We can choose to stay the same and continue a philosophy of schooling that perpetuates intellectual superficiality, civic illiteracy, the illusion of meaningful learning, and the destruction of children's innate curiosity about the world. Or we can work for change and transform our schools into spaces of genuine wonder and critical inquiry.

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13. Jeffery D. Wilhelm, *Engaging Readers & Writers with Inquiry* (New York: Scholastic, 2007); and A. Vincent Ciardiello, "'To Wander and Wonder': Pathways to Literacy and Inquiry Through Question-Finding," *Journal of Adolescent and Adult Literacy*, November 2003, pp. 228-39.

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5.1 The Cognitive Process Dimension

Categories & Cognitive Processes	Alternative Names	Definitions and Examples
1. Remember—Retrieve relevant knowledge from long-term memory		
1.1 Recognizing	Identifying	Locating knowledge in long-term memory that is consistent with presented material (e.g., Recognize the dates of important events in U.S. history)
1.2 Recalling	Retrieving	Retrieving relevant knowledge from long-term memory (e.g., Recall the dates of important events in U.S. history)
2. Understand—Construct meaning from instructional messages, including oral, written, and graphic communication		
2.1 Interpreting	Clarifying, paraphrasing, representing, translating	Changing from one form of representation (e.g., numerical) to another (e.g., verbal) (e.g., Paraphrase important speeches and documents)
2.2 Exemplifying	Illustrating, instantiating	Finding a specific example or illustration of a concept or principle (e.g., Give examples of various artistic painting styles)
2.3 Classifying	Categorizing, subsuming	Determining that something belongs to a category (e.g., concept or principle) (e.g., Classify observed or described cases of mental disorders)
2.4 Summarizing	Abstracting, generalizing	Abstracting a general theme or major point(s) (e.g., Write a short summary of the events portrayed on a videotape)
2.5 Inferring	Concluding, extrapolating, interpolating, predicting	Drawing a logical conclusion from presented information (e.g., In learning a foreign language, infer grammatical principles from examples)
2.6 Comparing	Contrasting, mapping, matching	Detecting correspondences between two ideas, objects, and the like (e.g., Compare historical events to contemporary situations)
2.7 Explaining	Constructing models	Constructing a cause-and-effect model of a system (e.g., Explain the causes of important 18th-century events in France)
3. Apply—Carry out or use a procedure in a given situation		
3.1 Executing	Carrying out	Applying a procedure to a familiar task (e.g., Divide one whole number by another whole number, both with multiple digits)
3.2 Implementing	Using	Applying a procedure to an unfamiliar task (e.g., Use Newton's Second Law in situations in which it is appropriate)

5.1 THE COGNITIVE PROCESS DIMENSION (CONTINUED)

CATEGORIES & COGNITIVE PROCESSES	ALTERNATIVE NAMES	DEFINITIONS AND EXAMPLES
4. ANALYZE—Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose		
4.1 DIFFERENTIATING	Discriminating, distinguishing, focusing, selecting	Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material (e.g., Distinguish between relevant and irrelevant numbers in a mathematical word problem)
4.2 ORGANIZING	Finding coherence, intergrating, outlining, parsing, structuring	Determining how elements fit or function within a structure (e.g., Structure evidence in a historical description into evidence for and against a particular historical explanation)
4.3 ATTRIBUTING	Deconstructing	Determine a point of view, bias, values, or intent underlying presented material (e.g., Determine the point of view of the author of an essay in terms of his or her political perspective)
5. EVALUATE—Make judgments based on criteria and standards		
5.1 CHECKING	Coordinating, detecting, monitoring, testing	Detecting inconsistencies or fallacies within a process or product; determining whether a process or product has internal consistency; detecting the effectiveness of a procedure as it is being implemented (e.g., Determine if a scientist's conclusions follow from observed data)
5.2 CRITIQUING	Judging	Detecting inconsistencies between a product and external criteria, determining whether a product has external consistency; detecting the appropriateness of a procedure for a given problem (e.g., Judge which of two methods is the best way to solve a given problem)
6. CREATE—Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure		
6.1 GENERATING	Hypothesizing	Coming up with alternative hypotheses based on criteria (e.g., Generate hypotheses to account for an observed phenomenon)
6.2 PLANNING	Designing	Devising a procedure for accomplishing some task (e.g., Plan a research paper on a given historical topic)
6.3 PRODUCING	Constructing	Inventing a product (e.g., Build habitats for a specific purpose)