Going with the Flow
## Contents

**Chapter 1:** Lessons from *Chevys*  
1

**Chapter 2:** A Look at Reading: Developing Competence and Providing Control  
19

**Chapter 3:** Teaching So It Matters: Where Should We Be Going and How Can We Get There?  
54

**Chapter 4:** Making Literacy Visible and Social  
80

**Chapter 5:** A Look at Writing: Getting to the Heart of the Matter  
116

**Chapter 6:** Present Possibilities  
154

Appendix: Method  
173

Works Cited  
175

Index  
180
In Chapter 1 we explored the notion of flow experience and how our research convinced us that the characteristics of flow explain why our boys rejected various literate activities (including most of school literacy) in which those conditions were lacking, and why they embraced other literate experiences (including, for every boy, many home and life literacies) in which these features of flow were present. The characteristics of flow also helped us to understand the contexts and types of situated assistance that help students to learn new kinds of strategic competence, as explored in Chapter 2. By attending to the features of flow in our teaching, we can teach more effectively.

Despite our focus on the conditions of flow, when we talk about our work, we’re always confronted with questions about what titles we’d recommend for boys to read. Unfortunately, our research doesn’t provide a clear answer. To be sure, our boys tended to like texts that are storied, visual, novel, and funny. They enjoyed texts that they could easily bring into conversation and that sustained their engagement over a period of time. Many of the boys liked reading about certain subjects. (Professional wrestling was a particular favorite.) But no single text or kind of text appealed to all of the young men in our study. And we worry that choosing texts that appeal to most boys reinforces what some theorists call hegemonic masculinity, the idea that there’s just one appropriate way to be a man.

In contrast, the features of flow were appealing to all of the young men in our study. So we’re moved to answer the question of what texts boys like to
read by saying, “It’s not the text, but the context!” In other words, what engages boys and helps them to learn are the contextual features of flow. We found that our boys would read and enjoy and learn from almost any kind of text if the conditions of flow were met in the context of instruction. And our experience as teachers suggests that this would be true for girls as well.

In this chapter we will consider how to achieve the characteristics of flow experience by organizing curriculum conceptually around inquiry questions. Although we’ll address all five of the themes we discussed in Chapter 1, we’ll focus especially on how inquiry units provide clear goals and immediate feedback and how they engage students in meaningful learning in the here and now. We’ll also demonstrate how inquiry units can provide a meaningful context for deep learning of foundational concepts and for learning the kinds of interpretive literacy processes that are needed to become accomplished readers, writers, speakers, listeners, and designers of knowledge who not only understand but can use and share their understandings. We’ll again focus on planning a particular unit in some detail, highlighting throughout how the design principles we use can be applied to develop other kinds of inquiry units.

Making It Matter

In Chapter 2 we shared a quote from Rev that haunts us to this day: “English is about NOTHING!” His pointed assertion was echoed in various ways by many of the boys about almost all of their school activity. They just did not see the purpose or importance of what they were being asked to learn. When Jeff interviewed his informants about the purposes of various assignments, not one student could tell him a single reason for a single assignment. What they said was: “The teacher told me to do it,” or “My mom will ground me if I don’t do homework.” These are not real-world reasons; they are entirely schoolish.

We’re haunted by Rev’s statement because teaching English is our life work and because his assertion contradicts the experiences we’ve had as readers and writers. Books have been absolutely crucial to our development. Jeff remembers using Hermann Hesse’s *Narcissus and Goldmund* to think and negotiate his way through several relationships. Michael looks upon his father’s gift of
Claude Brown, Jr.’s, *Manchild in the Promised Land* as one of the touchstones in becoming the man he is.

But our boys clearly did not share our experience. Our data is rife with the boys’ disenchantment about this disconnect between the schoolish and the toolish, between school and their lived experience in the world. Fortunately, our data also point us in the direction of a powerful solution. Organizing the teaching of English—or any other subject—around the notion of inquiry makes Rev’s statement false. Inquiry makes English about *something*, and in so doing it transforms the skills and strategies and terms we teach into important tools for understanding a big idea or expressing new knowledge and personal insights about that important issue. Making what we teach matter through inquiry addresses the boys’ desire for a focus on the immediate experience. Making it matter means making what we do compelling in the here and now instead of casting it merely as preparation for the future.

### Designing Inquiry Units

Although inquiry units help students develop complex understandings, the process of designing them can be summarized simply:

1. Start with a big, essential question that is debated in the world and is used by practitioners of the discipline being studied (historians, ethicists, et al.) to organize their own work and conversations.
2. Identify a real-world task that involves “meaningful making,” a constructed response to the question, that is, a knowledge artifact or social action that will “do work” to explore and address the problem at hand.
3. Plan backwards from the “meaningful making” by figuring out what activities will help students develop the conceptual understandings and abilities essential to address the question and create a meaningful response to it. Create a sequence of such instructional activities that start with students’ current needs, interests, and abilities and build from there to develop the needed expertise.

Of course, the devil’s in the details, so let’s take each of these principles in turn.
Asking the Big Questions

Jeff recently heard the famed Harvard biologist and Pulitzer Prize winner E. O. Wilson speak, and he ended by chiding teachers for our current practices of delivering information to students: “Most people teach biology by starting with the molecule!” he exclaimed. “This is exactly the wrong way to go. No one cares about the molecule. I don’t care about the molecule. Unless I have a reason to care—that is, a problem that I am working on that requires understanding molecules to address.”

Wilson went on to say that biology, like all disciplines, is organized around questions: Why do organisms die? Is sex necessary (biologically speaking)? How are humans like bacteria? What are the effects of genetically altering an organism? What are the effects of changing the environment in some way? Wilson emphasized that students need to have a sense of these foundational questions that biology (or literature, or algebra, or any other subject) was designed to address. They need to understand how knowledge has been created to solve past problems so they will know the story behind the facts and the uses and justifications behind the methods and concepts that the discipline has created. He ended by saying, “If students don’t go out and get their knees dirty, if they don’t work on the problems of biology as novice biologists using the tools of biology, then we can hardly say that we have taught them biology or that they have learned anything approaching biological understanding. To say that we have is a grand delusion.” In essence, Wilson argued that American schools teach disconnected bits of information, ask students to play “guess what the teacher already knows,” and do not teach transferable concepts and procedures that are important in life, communities of disciplinary practice, or the world. In other words, he echoed the concerns and complaints of our boys: School is totally separated from life. What we learn in school is not in service of real-world activity.

Echoing Wilson’s ideas, the late MIT physicist Jerrold Zaccharias once defined education as “the raising of questions worth arguing about.” The boys in our study would concur: They did not want to play “guess what the teacher already knows.” They wanted to solve problems, debate, and argue in ways through which they could stake their identity and develop both ideas and functional tools that they could immediately use and share with others. They wanted to develop the competence and capacities of experts. They wanted to be readied to do real work in the world, not just “do school.”
A powerful way to achieve a problem orientation toward learning and to encourage students to be involved in constructing meanings they can use in their lives is to organize the curriculum around essential questions or guiding questions. Any curricular unit you may teach in any subject involves different kinds of established knowledge: artifacts like arguments, artwork, literary and nonfiction texts, and strategic tools that were developed to address particular questions or problems. To take Zaccharias’s advice, we must consider why the conceptual material and tools we are teaching were created, what issues they were meant to address, and what work this knowledge can do.

The Example of The Incredible Journey

For years, Jeff began his seventh-grade classes with a reading of *The Incredible Journey*. The text was a required part of the curriculum and was read by students across the district. Over the course of several years, Jeff developed a lot of interesting activities to help his students engage with the text, discuss it, and reflect upon it. He enjoyed reading the book, and so did most of his students. But after several years, he still felt that something was lacking. He felt like he was just teaching the text, or the shallow what of the curriculum. After the unit, when he asked students to write about what they had learned of importance, they summarized the plot, a few facts about Canada, and at best, an insight or two about relationships. In short, Jeff wasn’t very pleased when he gave his unit the Sarducci test.

When Jeff decided he wanted to do something more, he asked himself a fundamental question: Why exactly do I teach this book? Well, the easy answer was “because it’s required.” But he knew that there was more to it than that. He knew, in fact, that he would always choose to teach the book if given the option. So he asked again: Why do I teach this book? And this time his answer was more generative: Because it speaks to something that is of importance to humanity, something that we care about, something that is of great significance in our lives. As he continued to probe his responses, he realized that from his perspective the power of *The Incredible Journey* resides in its exploration of relationships and in how relationships help us survive daunting and precarious circumstances. He then asked how he could teach the book in a way that would highlight these ideas and enable students to think with, transfer, and use them as tools.

Inspired by folks like Wilson and Zaccharias, Jeff fiddled around with an essential question to frame the unit. He began to think about other texts his students read, not only in language arts, but also in science, social studies,
health, and even math. He knew that in science the kids studied extinction; in
math, rates of decay; in health, healthy teen living. In social studies they studied the rise and fall of various movements and cultures. Jeff tried to incorporate these various ideas as he drafted questions like, Why is extinction bad? What causes creatures, cultures, and ideas to become extinct? But these questions didn’t really capture what he was interested in. And they didn’t seem provocative enough to sustain ongoing classroom conversations. He finally settled on, Who will survive?

He was pleased with the question. It was compelling and interesting. It invited engagement, real audiences, and social action. And it would provide a reason and a focus for learning particular concepts and strategies that Jeff wanted his students to own and carry away. And most of all, he didn’t know the answer to the question. The kids could hardly play “guess what the teacher already knows.” He would be acting as a guide, helping the students develop strategies and conceptual tools they could apply to build their own understandings and stake their own position on this issue.

Framing the unit with this question led to some very powerful effects. First of all, Jeff’s lesson, unit, and even yearly planning became easier and much more coherent. Instead of teaching a list of texts, he was able to link various texts he read with students throughout the year into a single unit. He saw that “Republic of Cockroaches” by David Quammen would fit the survival theme. So would Ray Bradbury’s “A Sound of Thunder,” Jack London’s “To Build a Fire,” and various nonfiction selections about rescues. He was able to talk with other members of his teaching team about how to integrate their teaching of ideas that would help students understand survival.

Soon everywhere Jeff looked he began to see cartoons, articles, photographs, picture books, movies, and a variety of other materials that commented directly on various kinds of survival. He was teaching what he was required to teach, but in a way that made more sense to him, that integrated instruction so it would make more sense to his students (instead of being a bunch of disconnected facts), and that he knew would lead to greater and more transferable learning.

Suddenly, he was planning his teaching strategically, chunking materials and activities together in ways that would complement each other and lead to deeper understanding. In his journal, he wrote excitedly:

Somehow I’ve lost sight of teaching purposefully. I’ve just been assigning stuff and letting the curriculum or anthology be my guide. Asking the essential question moves me from teaching a bunch of texts to using a
variety of materials to consider and really explore an exciting and im-
portant issue!

After beginning the unit, he wrote:

Asking a big question immediately makes the unit a social project of ex-
ploration. I mean, it makes it clear we are doing something important
together. It shows the kids how they can contribute and invites them to
bring in stories and material of their own about hunting and fishing lim-
its, and letting fields lie fallow and all kinds of other things.

Jeff told his students that they would not only be inquiring into “Who will
survive?” through shared readings and activities (what we might call a project
of topical inquiry), but that at the end of the unit small groups would choose a
subtopic of survival they had encountered and research it more thoroughly to
create a proposal, a social action project, or new data for the conversation
about survival. In other words, the students would be asked to do indepen-
dent critical inquiry, to use the concepts and procedures they would be learn-
ing to do something new.

The effect was absolutely energizing. Jeff wrote:

By telling the kids at the outset that they were going to eventually do
small group inquiry, they were immediately looking for connections to
their own lived experience and the world. We’ve been keeping a chart
on the wall of topics and ideas and issues regarding survival that we’d
like to know more about. It’s amazing how the list is growing: the Amaz-
on rain forest, the disappearing Abenaki language, Atlantic salmon, the
lobster.

In the interest of full disclosure, Jeff admits that the first time he taught this
unit with a guiding question, he started fairly small. His students read The In-
credible Journey as they had in the past, and then a few articles and sections
from the science text. They compared what contributed to the animals’ sur-
vival in the book to the conditions and capacities that contributed to or
threatened the survivability of the other people and creatures they read about.
Jeff asked the students to interpret the patterns of details among the various
readings to come up with their own theory of survivability. The unit was only
three weeks long, but it was a powerful example of transforming topical cov-
erage (information transmission) into topical research (inquiry guided by an
essential question). Jeff has expanded the unit each time he has taught it until
it has become a wide-ranging integrated unit.
Other Examples

Jeff’s experience is not unique. Many teachers across the country have also experienced the power of framing instruction with an essential question. Many of these teachers have shared their experience with us. For example, Jeff has spent the last five years as in-service director for a national demonstration site in content literacy. In the Maine-based demonstration site and several resulting dissemination sites across the country, he works with teachers in all subject areas in grades K–12 (although most teachers are from middle and high schools). In his work with over five hundred teachers, he has yet to find a curricular unit in any subject at any grade level that cannot be reframed into a question. This is because the content we teach really does matter; it was originally the result of inquiry that addressed human problems, and can serve future inquiry if students are encouraged in this direction. Unfortunately, we often lose the original purpose and use of the content we teach when it is transmitted as information. Reframing our instruction as inquiry gets us back to the essential vitality of knowledge and its application.

The results of this reframing have proven to be powerful for teachers and students alike. As one Utah teacher, Dallas Smith, explained:

Asking a guiding question changes everything. Once you’ve asked an inquiry question, you can’t just teach facts anymore. You have to help your students question, explore, and uncover understandings. You have to teach them concepts and strategic tools and how to use them. The motivation is much better for me and for them. It’s like setting off on a journey with them. The learning is so much greater. And things sure are a lot more exciting, energetic, and fun!

The teachers that Jeff has been working with have posed a wide variety of inquiry questions. Some teachers used guiding questions to reframe their instruction in literature. Many of these questions focused on major themes that so much writing addresses: What makes a great friend? What does it mean to grow up? What can we do about human evil/selfishness and so on? What is the most effective response to a threat to civil rights? What makes a good relationship? What is courage? Other questions were asked about a single text or experience: Is Holden Caulfield (from The Catcher in the Rye) a typical or pathological adolescent?

Some teachers taught both literature and social studies themselves or worked as part of an interdisciplinary team. These teachers came up with
broad interdisciplinary questions like the following: In what ways do present cultures relate to their past and future? What are the costs and benefits of how culture shapes us? What makes an influential historical figure? Is war ever necessary? Can liberty and security be balanced? Is the history of the United States a history of progress?

By working with science teachers Jeff discovered that essential questions in the teaching of science might also work for the teaching of literature: What is our proper relationship to nature? What are the costs and benefits of cloning/stem-cell research? Is progress always good?

**Tips for Composing Guiding Questions**

When composing an essential question, it is important to consider what issues are worth exploring and understanding. In our *Chevys* study, we found that the boys wanted to learn something significant, and that they craved purpose, clear goals, and immediate feedback from the very start of learning. They wanted to work toward functionality, to actually use what they learned. Therefore, the first problem for curriculum designers and teachers to consider is what is worth understanding. In other words, what understandings will matter and “do work” in the real world.

One of the problems with school curricula, exemplified by textbooks, is that information is presented densely and in a nondifferentiated fashion, as if all the information were of equal value. There is a headlong push for coverage. This causes great problems for students who cannot possibly learn all the details presented. With no guiding purpose or overarching framework, these kids do not know which details to study or discard, or how to link, organize, and use the details they “learn.” The information is presented like the news report that announces: “A battle rages in Iraq, and a Middleton woman rescues a cat from a tree.”

Wiggins and McTighe (1998) offer four useful criteria for considering appropriate inquiry topics for focusing student learning. What’s worth understanding is

1. Engaging—it offers potential for intriguing students and motivating student learning.
2. Enduring—it leads to learning big ideas that have value beyond the classroom.
3. At the heart of a discipline—it is used by practitioners to do the subject, and to solve problems and create knowledge in that subject area.
4. In need of “uncoverage”—that is, it involves a background of foundational principles, rich concepts, theories, and procedures that require unpacking.

Reframing a required text or topic. One way to develop a guiding question that meets these four criteria is to begin with a text that’s currently in your curriculum and then do the kind of thinking Jeff did as he reformed his teaching of The Incredible Journey. Ask yourself, Why do I care about this text? Why should kids care about reading it? What human problems/issues/questions does the text address? If you have trouble answering, you might ask, What other texts seem to speak to this one? and then try to articulate the differences in perspective.

For example, if the curriculum required a novel like Roll of Thunder, Hear My Cry, you might develop questions like the following: What are civil rights, and how can we best promote and protect them? How should individuals respond when their rights are threatened? If you thought about textual conversations you had experienced as a reader, you might ask, Who offers a more compelling vision of how to achieve civil rights—is it Timothy Tyson in Blood Done Signed My Name, who says civil rights must be fought for with force, or Harper Lee in To Kill a Mockingbird, who argues for an incremental approach?

Reframing a standard. Another way to develop a guiding question is to reframe a standard. For example, one of the NCTE IRA (1996) standards says that students “should develop an understanding of and respect for diversity of language use.” That standard could be reframed into a question: To what extent is language a determiner of one’s social mobility and what should schools do as a consequence? Those of you who are working on interdisciplinary teams might see this social studies standard: Students will understand the notion of “balance of powers.” That standard can easily be reframed for exploration in an English language arts classroom through questions like these: What are the effects of power and how can individuals/marginalized groups be protected from abuses of power? How can we balance our needs for freedom and security (in our country/town/school/family)? How do we balance our needs with those of others? What happens when one group imposes its beliefs on another?

—David Perkins

cognitive scientist, Harvard University

Understanding is the ability to think and act flexibly with what one knows...a flexible performance capability as opposed to rote recall or plugging in of answers.
**Looking around the community.** Another way to develop guiding questions is to consider issues and concerns from your community that are on people’s minds or in the news and then think about how these issues relate to required curricular topics or could become new curricular topics for your class. One of the reasons Jeff hit upon the question “Who will survive?” was that issues relating to survival were being vigorously debated in Maine. The students had heard about these issues and were personally affected by their resolution. For example, salmon farming and transgenic salmon were vitally important in Jeff’s community. His question allowed his students to take a close look at pro arguments for food production efficiency and job creation, and con arguments about how farming increases disease and genetic alterations that threaten the survival of wild salmon. They were able to visit a local salmon farm and to interview the managers and workers. The questions allowed them to look at economic effects and interests and use these to make predictions about future practices and legislation. They were able to debate whether the direction currently taken was a good one, and what they could do to promote or resist the status quo on a personal, social, and legislative level. Although looking around the immediate community has clear benefits, you can also consider issues of a more national scope as a way to tap existing knowledge and interest. For example, the Terry Schiavo case raised many possibilities for guiding questions, such as, Who has the right to interfere in the life of another?

**Identifying Meaningful Making**

Guiding questions give rise to inquiry. But where exactly does inquiry lead? Asking an essential question implies what we have been calling “knowledge design” or “meaningful making”; it requires coming up with some kind of answer, staking some kind of tentative claims about the issue or problem, developing tools and experiments that further our study, creating and sharing knowledge artifacts, and/or implementing solutions through social action. Any of these results can be shared and used. Inquiry implies finding or progressing toward a functional solution; it demands exploration and progress; it requires the making and doing of something.

Once Jeff framed his unit in terms of a question that could be answered in multiple ways, he realized that he needed to provide an opportunity for students to share their answers. He told the class that their culminating projects would be (1) to write an argument about their position on a survival issue that came up during the unit, and (2) to create a PSA (public service announcement) about something of social significance that other people would
need to understand. This PSA could be in the form of a brochure, a museum exhibit, or a short informational video documentary. This PSA would be the result of a critical inquiry into a subtopic of survival that they would pursue in small groups after the whole class had completed topical research on survival.

During the critical inquiry phase, different groups studied threats to lobster survival; environmental hazards at the school and their possible effects; climate change and how it might affect maple trees and maple syrup production in Maine; whether man will survive the twenty-first century; the effects of deforestation in the Amazon; accounting for the failure and success of various Mount Everest expeditions (e.g., Into Thin Air) and other journeys, such as the Shackleton expedition to Antarctica; and many other topics of interest to them.

The resulting projects were beyond anything Jeff had hoped for. Some students created a videotaped talk show (e.g., with Shackleton and Krakauer as
their guests on the topic of survival) or a newsmagazine show to display what they had learned. One group created a museum exhibit about the Tasmanian tiger’s extinction and what humans should learn from this. (See even more examples in Figure 3.1.)

As a class, the students decided on the social action project of purchasing rain forest acreage for protection under a program offered by the Wilderness Society. Some students became interested in a local effort to bar the draining of a swamp so that a Wal-Mart could be built; still others worked to protect a local lake from milfoil infestation. They made bumper stickers and wrote letters to the editor and school newspaper articles. A few students volunteered at a local rehabilitation center for injured animals.

These projects demonstrated student understanding of conditions and capacities that lead to survival or threaten it. They also demonstrated that the students could ask questions, interpret connections among the things they had learned, and represent what they had learned to others. (This sharing addressed the social component of flow, which we will explore more fully in the next chapter.)

In Jeff’s national demonstration site work, teachers have undertaken various permutations of the projects cited in Figure 3.1. Upon completion of these knowledge artifacts or projects, the teachers and students identify how they meet state learning standards. Teachers help students to code their own work to these standards and to explain how their work shows that they have met the standards. This is a valuable exercise in and of itself. But it also offers an alternative to traditional testing and standardized measures. This is real performance-based assessment in which the students’ meaningful work and actual accomplishment are tied to standards. An alternative to standardized testing and its inability to measure true understanding is therefore achieved. Teachers and students alike are excited by this project because they understand that we will be stuck with less appropriate measures of student learning until we can provide more appropriate ones.

**Backwards Planning from Meaningful Making**

Once Jeff determined the range of ways his students were choosing to answer the guiding question, he recognized that they were going to need deeper understandings of the material than they had needed to do well on a test or a conventional paper. How can a teacher help students develop deep understandings? Grant Wiggins and Jay McTighe have thought as hard as anyone
about this issue. They are prominent experts in assessment, and their book *Understanding by Design* (1998) is a classic exploration of how inquiry and design environments can promote deep understanding.

Wiggins and McTighe offer a thorough critique of the information-transmission theories and models of learning that dominate American schools. They posit that most instruction is teaching by mentioning and argue that we must instead teach for understanding. This means providing assessment opportunities that require students to demonstrate understanding in the varied ways that expert practitioners do (versus single measures like multiple-choice tests). This means providing opportunities for students to deal with curricular materials and activities that will help them develop expertise and understanding over time. It means offering whatever assistance is necessary for the students to achieve success with their final projects—that is, their meaningful making and doing.

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**FIGURE 3.1**

<table>
<thead>
<tr>
<th>Written</th>
<th>Multimedia Design</th>
<th>Social Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arguments</td>
<td>Websites</td>
<td>School-based projects</td>
</tr>
<tr>
<td>Extended definitions</td>
<td>Hypermedia documentaries</td>
<td>Community-based projects</td>
</tr>
<tr>
<td>Classifications</td>
<td>Dramas</td>
<td>Informational campaigns</td>
</tr>
<tr>
<td>PSAs</td>
<td>Museum exhibits</td>
<td>Service projects (e.g., lake cleanup)</td>
</tr>
<tr>
<td>Informational brochures</td>
<td>Living history museum</td>
<td>Rain forest purchase</td>
</tr>
<tr>
<td>Op-ed pieces</td>
<td>Video documentaries</td>
<td>Soup kitchen</td>
</tr>
<tr>
<td>Letters to the editor</td>
<td>Video PSAs, advertisements</td>
<td>Senior citizen help days</td>
</tr>
<tr>
<td>Letters to others</td>
<td>Instructional videos</td>
<td>Listening friend project</td>
</tr>
<tr>
<td>Children’s book</td>
<td>Graphic novels/picture</td>
<td>Hotline</td>
</tr>
<tr>
<td>Transformations of the material</td>
<td>books/how-to versions of the material</td>
<td>Recycling</td>
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<tr>
<td>Class newspaper issue</td>
<td>Displays/poster sessions</td>
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<tr>
<td>Fact sheet/study guide</td>
<td>Children’s book version</td>
<td>Waste-free school project</td>
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<tr>
<td>Reviews</td>
<td></td>
<td></td>
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<td>Process directions</td>
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<tr>
<td>Letter exchanges from various perspectives</td>
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<tr>
<td>Diary entries/lab reports from various perspectives</td>
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</tbody>
</table>
Wiggins and McTighe argue that when we truly understand, we exhibit six facets of understanding. Each facet implies questions that teachers should ask to guide instructional planning for student learning. In other words, the facets can serve as a problem-solving guide for planning unit organization and instructional sequencing.

Using Wiggins and McTighe, we will identify each facet, explain how those who understand exhibit the facet, and then provide questions that can facilitate backwards planning for reaching each facet. We will also show how Jeff addressed each facet in the survival unit. Such facet-oriented questions can easily be based on curriculum standards, thereby helping you to plan backwards from standards in ways that will make sense in the school and to communities of practice in the world outside of school. (Material in this section is quoted, adapted, and inspired by Wiggins and McTighe 1998.)

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**FACET ONE**

**Explanation:** Those who understand can provide thorough and verifiable accounts of phenomena and other data from the studied material.

**Backwards Planning Questions:** What theory or foundational principle provides the support and justification for the current conception of these facts? What kinds of problems, experiences, and contextualized data must students “encounter if they are to grasp that which is not obvious, meet new ideas and theories, test and verify them, and build their own (or fully internalize someone else’s) theory or explanation?” (p. 125)

In the survival unit, for example, students would need to explain theories about how and why various plants and animals (or cultures, ideas, fashions, movements) have gone extinct and why others have survived. They would need to extract principles of survivability and articulate features that make a life form susceptible to extinction. Therefore, Jeff, as the teacher, needed to provide a wide variety of readings and experiences that would engage students with the problems of survival. Jeff read *The Incredible Journey* with his students, as well as a variety of nonfiction about cockroaches, dinosaurs, the hermit crab, the Tasaday tribe in the Philippines, the cultural survival of Aboriginal and native groups, the effect of nuclear fallout on various life forms, and much more. Students were asked to explain the principles, conditions, and characteristics that promoted or endangered survival. They were asked to explain why biologists had come to believe what they accepted about survival.
FACET TWO

**Interpretation:** Those who understand can see patterns across data related to the topic; they can “tell meaningful stories; offer apt translations; provide a revealing historical or personal dimension to ideas and events; make it personal or accessible through images, anecdotes, analogies and models.” (p. 44)

**Backwards Planning Questions:** Why is this disciplinary notion so important and compelling? What is the story behind these ideas, and why and how did these ideas develop the way they did? How do these ideas help explain the world and the way it works? “How did this statement come to be argued or believed? How could it be interpreted or understood differently?” (p. 123) How can learning activities encourage or require students to see connections and patterns across data and materials, to construct interpretations, and to “derive meaning, explore the importance, or find the significance” (p. 125) in the material? What materials, texts, experiences, informants, and so forth will be provided to show students all angles on the topic and provide opportunity and inspiration for student engagement and interpretation?

For example, in the survival unit, students were asked to see patterns across the various materials and situations they studied. By comparing situations, the students were able to extract similarities, differences, and foundational principles that applied in all cases. They used tools like Venn diagrams and semantic feature analyses to help make comparisons and see connections. The students were engaged with seeing across varied cases and situations involving survival so they could infer their own connections and see new explanatory patterns.

FACET THREE

**Application:** Those who understand will powerfully use, transfer, and adapt what is known in a variety of contexts.

**Backwards Planning Questions:** How can we use this knowledge? What do adults and professional experts do with these understandings and how can we do something similar? How will instructional activity “require and enable students to use and test their understandings in apt and varying contexts, where authentic situations, purposes and audiences require it? How can the work encourage students to propose or even invent new applications?” (p. 125)

In the survival unit, students discussed the importance of understanding survival in terms of human behavior, public policy, and planning for the future. They explored the effects of particular behaviors and possible
interventions on human beings, rain forests, and other life forms. Students made plans and proposals to use what had been learned to justify and enact a zero-waste school, to purchase rain forest acreage, and to create a PSA to inform people of what they could do to promote the survival of current life forms. In later uses of the unit, what we learned about life-form survival was compared to various kinds of cultural survival (of movements, ideas, fashions) so students could see if and how principles worked across cases.

FACET FOUR

**Perspective:** Those who understand will critically perceive and respect multiple points of view to see the big picture of how different points of view weigh in on the topic.

**Backwards Planning Questions:** From what particular perspective was this knowledge created? From what point of view is the statement of fact made? What other points of view are possible besides the one stated here? How will instructional materials and activities be sequenced and used so that students generate, take on, evaluate, and critique multiple points of view on the topic? How will students come to understand the process and the debates behind the construction of this knowledge? How will the activities help them to understand the various perspectives on the issue and why a particular one is most compelling?

In the survival unit, students gathered information through videos, websites, and speeches by radical environmentalists, businesspeople, and both promoters and critics of the Kyoto accord so they could encounter various perspectives on issues of survival. Dramatic role playing that cast students as scientists, darter fish, various interest groups, and so forth also promoted the taking of different strategies, as did the simulation described next under the facet of empathy.

FACET FIVE

**Empathy:** Those who understand will respect and “find value in what others might find odd, alien, or implausible; perceive sensitively on the basis of prior direct experience” (p. 44). They will work to understand the personal dimensions of various knowledge constructions for different people.

**Backwards Planning Questions:** What would it feel like to have had these experiences, or to think and believe in this way? What would someone need to experience
(or not have experienced) to believe this? How will the activities help students to get beyond the abstract and connect personally with the human experiences and values that might be distant from their own experience, or that they might find nonsensical, counterintuitive, or unappealing? "What kinds of direct or simulated experiences might cause students to viscerally connect with the experiences of others?" (p. 125)

In the survival unit, students also engaged in a simulation in which they played the roles of a “beast,” a rancher, local community members suffering from unemployment, businesspeople, and environmentalists. They had to solve the problem of what to do about “the beast” that was eating cattle on local ranches in a way that would consider all the competing interests. Students played various roles and did in-role writing of manifestos that traced the reasons for their beliefs as ranchers, environmentalists, or other stakeholders. Each student also created a correspondence with someone who held a differing point of view on how to address current issues of survivability for humans or other life forms. They were asked to present arguments and counterarguments from their own and another’s point of view.

**FACET SIX**

**Self-Knowledge:** Those who understand possess the ability to reflect on, consider, critique, and revise their own thinking. They recognize what they do and do not understand, know what true understanding entails, and grasp why it is hard to achieve. They can “perceive the personal style, prejudices, projections, and habits of mind that both shape and impede our own understanding.” (p. 44)

**Backwards Planning Questions:** Which student biases could make it easy/hard for them to accept/question/critique this knowledge? What activities will help students reflect on and assess what they do and do not know, believe, and understand and how they have come to understand in this way? How will the learning experiences help students to see and critique their own biases and habits of mind, those of others, and those of their culture?

At the conclusion of the survival unit, students wrote reflective pieces on their own biases going into the unit and their opinions at the end. They considered why they believed what they did, what experiences/readings/evidence had compelled or changed their attitudes (or not), and why. They also created an action plan for learning more and enacting their knowledge.
Notice that the first three facets deal with factual information but reflect conceptual and cognitive abilities that move well beyond how facts are typically taught in school. These facets consider the who, how, why, when, and where aspects of learning. They demonstrate that understanding moves along a continuum from grasping information to interpreting and operating on it, then applying and critiquing it; that is, a movement from topical research to critical inquiry. Information in itself does not constitute understanding. We both use this continuum to consider the trajectory of our units and to organize the various unit activities to move students from topical research into the materials of the curriculum and then onward to critical inquiry.

Facets three through six move to critical literacy and show that true understanding involves not only critical evaluation but also feelings, self-awareness, and a recognition of the complex nature of knowledge construction. These facets reemphasize the important role of motivation, affect, self-knowledge, and self-monitoring in learning.

**Putting the Process into Practice**

To further illustrate this process in action, we’d like to briefly highlight how three national demonstration site teachers reframed a unit they had already taught by using the process we have proposed. They first transformed the unit into topical research and made it “edgier,” or more provocative, through the use of an essential question. They then identified a kind of “meaningful making” that would display and apply deep understanding. Finally, the concepts and strategies necessary to meaningful making were developed through backwards planning from the culminating project. Though the units discussed here were designed for particular grade levels, like all inquiry topics, they could be adapted for use with all grade levels.

K–1 classroom teacher Katrina Bence had taught a unit on the topic of habitats for several years and was vaguely dissatisfied with it. During our national demo site summer institute she reframed the unit with this essential question: What makes a good home (for us, for lobsters, for bears)? She felt that this question brought the topic closer to home and would help lead students toward big conceptual understandings about habitats by moving them from what they already knew about their own home to ideas that were further from their experience. She also felt that the question was stimulating and
engaging, and invited multiple perspectives since students would probably have a wide variety of ideas about what makes a good home. Katrina decided that although differing points of view would be encouraged, she did want all students to reach a common big understanding, such as: “Creatures have basic requirements that include shelter, warmth, and food. Different creatures have different requirements and they meet their needs in different ways.”

The next task was to identify “meaningful making”—culminating design projects that would demonstrate strategic and conceptual understandings put to use. Katrina decided on several design projects that students would complete during the unit. First, students would make floor plans of living spaces and propose ways to improve that space to meet various needs. Next, she would challenge small groups of students to create big books about different animals and how they meet their needs for shelter. This would have the additional benefit of reinforcing the big book story structure of texts they were reading. At the end of the unit, students would build a museum of model animal homes—burrows, coral reefs, shells, and so on—and use these as part of a living history museum. Students would role-play different creatures to explain how different animals use their homes to meet their needs.

Katrina then identified the various concepts and strategies students would have to learn to complete the projects. Concepts, for example, might include the story structure of big books as well as the needs for food, shelter, and warmth; strategies could require students to apply personal experience when thinking about the world, to compare/contrast ideas, and to look for and identify information that answers a particular question. Katrina started her backwards planning with frontloading about human needs and then brainstorming about what humans look for in a home. She then moved on to materials and texts that would help students develop both conceptual understandings, such as how the features of lobsters and black bears determine what they require of a habitat, and procedural understandings, like how to compare and contrast.

Middle school teacher Ryan Mahan taught a unit on mythology entitled Heroes, Gods, and Monsters. Instead of having students just read the required myths, he wanted them to delve into the purpose of myths and what they can reveal about a culture and human needs and fears. He wanted to get at the deeper reasons all groups of people tell them. He first reframed his unit with this essential question: How does a culture express its deepest values and fears? He wanted students to achieve the big understanding that all cultures express their values and fears through their myths and stories and, moreover, to connect Greek mythology to a consideration and critique of our own
heroes (e.g., sports figures) and cultural stories (anybody can become anything) and what these reveal about our deepest values and fears.

The next step was for Ryan to identify culminating design projects that would constitute meaningful making and doing. He came up with the following ideas for use throughout the unit. First, he asked students to create a modern superhero and explain what cultural values s/he expresses. Later, he asked small groups of students to analyze a current movie for the cultural values and fears it expressed and to write a movie review or perform a movie review show exploring these. The final project was for small groups to take a Greek myth and rewrite it as a modern version, amending the hero’s traits and actions to reflect modern American values. Many students used this as a chance to satirize or critique American values, particularly as they were evident in the life of the school. He then asked the groups to make some kind of video of their mythic transformation that would contrast ancient Grecian and modern American values. Some students reenacted their story; others performed talk shows with the ancient and modern heroes or found another creative way to explore their ideas.

As Ryan considered backwards planning, he identified several concepts related to values (e.g., understanding values from altruism to wealth) and to myths (e.g., hero quest archetypes) that students had to understand to complete their projects. He also identified strategies like reading for implied main ideas. More specifically, he wanted students to understand and use genre knowledge to interpret cultural stories like fables, folktales, myths, and modern advertisements so they could see what values are being implicitly promoted. Ryan used a frontloading activity called the “values profile” (Kahn, Walter, and Johannessen 1984) that asked students to rank their own values. Then each time they read a myth they applied the profile to the hero. Students engaged in debates in which they identified a hero’s top value and justified this with evidence from the text. They then translated how what happened to the hero because of his values indicated particular cultural values and fears. Ryan returned to this frontloading activity over and over again in ways that helped students develop most of the requisite conceptual and procedural understandings for completing their various projects.

In a ninth-grade unit on the text Of Mice and Men, teacher Seth Jones reframed a simple “schoolish” study of the text as an artifact into a “toolish” inquiry with the question: How do dreams shape our lives? Because he felt his students had a disconnect between their aspirations and what they thought was needed to achieve them, he also asked the subquestion, What does it take
to make various kinds of dreams into reality? He knew that he wanted his students to achieve some form of the big understanding that human behavior is driven by our hopes and aspirations, and by what kind of life we want for ourselves and others whom we care about. He also wanted them to learn that it takes specialized hard work to actualize particular dreams, and sometimes people fail for various reasons, both within and outside their control.

When he began to consider what kinds of meaningful making would demonstrate understanding of the important concepts and processes, he identified the following: Compose a narrative process description of how a new invention was created, or a new social policy was implemented, including how obstacles were overcome and what resulted. Create a video documentary featuring interviews with senior citizens about their dreams and how they were or were not achieved, or with immigrants about their “American dream,” or with any other group of people about their aspirations. Interpret the effect of dreams on behavior and attitude. Consider what makes various kinds of dreams possible or difficult to achieve.

For his students to create one of these final projects, he thought they would need to understand cause and effect, particularly how narrative describes the effect of certain motivations and conditions on resulting situations. He began his backwards plan with a frontloading activity around the students’ dreams. He began the unit with short stories and newspaper articles about various people achieving some version of their dreams, or failing to. Throughout the unit, and particularly while reading *Of Mice and Men,* he returned to the frontloading to help students identify the dreams of George, Lennie, Crook, Curly’s wife, and others, and to explain why they had these dreams, what kept the dreams alive and made their achievement possible, and what obstacles kept them from the dreams. They began to look at various causes and effects, and consider which were under the characters’ control and which were not.

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**Rethinking Teaching and Learning**

**Rethinking Coverage**

When we’ve presented the ideas we’ve shared so far in this chapter to audiences of teachers, we’ve often heard someone in the audience say something
like the following: “I would like to do inquiry or go into greater depth or do more to engage students—but I have to cover the content!” Wiggins and McTighe (1998) argue that this kind of statement is based on a misunderstanding of the relationship between information and knowledge, data gluts and true understanding, and between teaching as mentioning and teaching as leading students toward understanding.

We understand that as teachers, we are all limited by time and other constraints. We must decide what is most worth emphasizing in the little time we have. We must deeply consider which learning goals are most important and how to best meet them. For us, this means reflecting on what activities and assistance will most powerfully support our students to be better readers, writers, problem solvers, and democratic citizens.

Wiggins and McTighe (1998) argue that the “coverer” acts under the illusion that textbook and test-driven instruction encourages retention and understanding. This untested belief flies in the face of existing research. For example, the TIMSS (Third International Mathematics and Science Study 1998) revealed that the opposite was true: Inquiry leads to more retention, real learning, application, and higher test scores. More recent studies by the Whirlwind (Rose, Parks, Androes, and McMahon 2000) and Annenberg Projects (Annenberg 2002) in Chicago’s schools demonstrated that even brief inquiry treatments motivated students, raised achievement, and led to higher test scores.

More important, the “coverage” viewpoint works against what cognitive science tells us about why and how people learn—to answer questions, solve problems, and do work by accruing schematic knowledge and procedural skills over time through performing actual tasks in real situations. Wiggins and McTighe (1998) maintain:

Coverage involves a sad irony. In the absence of guiding questions, ideas and methods that are meant to recur and inform all learning, students are left to guess what is important and what is going to be tested. Test results reflect this lack, even when the teaching is otherwise good.

(p. 132)

Think of anything you have ever learned of significance. You became expert at joke-telling, kayaking, sewing, reading, piano playing, or any other skill by revisiting and repeating the task in different and ever more challenging situations. There is no significant achievement, be it kissing or cooking, that you got right the first time. (Don’t lie to yourself about this!) You needed a clear goal, a clearly understood purpose, lots of practice, eventual control, and a way to share and use your knowledge.
Rethinking the Role of Textbooks

In inquiry contexts, the role of the textbook is obviously changed from that of sacred text to a resource guide of summary ideas from a dominant perspective. When Jeff and his team teaching partner Paul Friedemann were pursuing inquiry with their students, they used the textbooks solely as a resource. When the time came for textbook adoptions, they asked to keep the old textbooks and use the allotted money for a variety of print and nonprint resources for the library that would support their various inquiry units. The number and variety of interesting materials from various perspectives that could be purchased for the cost of a textbook adoption was amazing.

Various national commissions have called for reducing reliance on textbooks (which in effect become the syllabus for most courses) and increasing the use of primary documents and materials for hands-on learning. For example, Ernest Boyer’s Carnegie Commission report (1983) had this to say:

Most textbooks present students with a highly simplified view of reality and practically no insight into the methods by which the information has been gathered and the facts distilled. Moreover, textbooks seldom communicate to students the richness and excitement of original works. (p. 143)

Inquiry units provide the occasion to do just that.

Rethinking Assessment

Any model of teaching works, depending on what counts as learning. If filling in worksheet blanks qualifies as learning, then standardized tests are sufficient proof of effective teaching and student learning. If student effort and engagement are what counts, then student projects of any kind can be used as evidence of learning. But if you hold the higher standard of student engagement in the flow of learning and of developing real-world expertise and use, then students must prove they have learned by participating as knowledge makers and knowledge users in ongoing conversations from within the disciplines and the world at large.

As one of our teachers wrote in her national demo site evaluation: “I’ve come to realize that Life is the test! And that Life is filled with testing situations. So the standard I now have for student learning is this: Can students show what they have learned through real learning performances—not standardized tests?”
Regarding an inquiry unit based on the question, What determines who we are and become? another teacher wrote that students were reading an article about how genetics determines child development. The kids went nuts resisting the author’s point where before they would have just read it. They started to talk about how they could find or collect data to show that genetics is not the whole story and how they could share this. Wow! I thought—we are doing inquiry instead of doing school. It was so fun to see what the kids can do when they are allowed to bring their own energy and viewpoints to the task. This invigorated my teaching.

And yet another wrote:

It seems to me that education should be about placing personal power and responsibility in the hands of the students versus accountability that consists in jumping through someone else’s hoops. I want my kids to make conscious attempts to learn in ways that are considered justified and right and honorable—by themselves and others. Having kids inquire and design knowledge artifacts about what they have learned promoted this.

By focusing on disciplinary questions and meaningful making, assessment becomes an evaluation of a performance during which knowledge is displayed, shared, and used. In this way a congruence of means and ends is achieved. Such a focus helps us to teach students what they need to know and do to meet challenges that extend beyond our classrooms, those challenges that are presented by life itself.

Best of all, students will be brought to internalize the standards for knowledge production and use that exist in the various disciplines. By internalizing critical standards through use, they will learn how to think like linguists, physicists, ethicists, mathematicians, and other kinds of disciplinary practitioners; and eventually, they will be able to self-assess their own learning.

Learning How to Learn

Jeff has a fond memory of the time a seventh-grade student named Erika came to visit him at the end of the last day of school. He had organized the curricula for that whole year around inquiry.
“Well, Mr. Wilhelm,” she asked, “what have we not learned this year?”

Jeff laughed.

“I mean it,” she said. “If we have learned how to ask questions, find information, read, develop new information, organize and analyze it, represent, share and revise it, and then use it in the world, then what have we not learned?”

Erika was arguing that she had learned how to learn and how to assess her own understanding. And if she knew how to do that, what could she not do? Though there is certainly more for all of us to learn, we concur with Erika’s sentiment that she had developed foundational abilities that will serve her throughout her lifetime. We can only hope as much for all our students, our daughters, and ourselves. That is the goal of inquiry-oriented instruction organized around essential questions.
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